

The Road to Long Finance: A Systems View of the Credit Scrunch

by Michael Mainelli
and Bob Giffords



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Financial Innovation

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The Road to Long Finance: A Systems View of the Credit Scrunch

Michael Mainelli
Bob Giffords

Preface

The CSFI is determined that governments, regulators and the financial sector should not waste this crisis. This discussion paper is being published amid signs that the banking sector is creeping back to "business as usual" and that its lobbying efforts are muffling calls for radical change. But, as co-authors Bob Giffords and Michael Mainelli, point out, this would leave unaddressed such important problems as banks that are too big to fail; abusive risk-taking; perverse incentives; and a dangerous lack of competition and diversity within the financial system. These are the conditions that allow the failure of individual institutions to trigger systemic crises through moral hazard, over-reliance on debt and liquid markets, herd effects and a lack of resilience.

So, it could not be more timely to publish a paper that both reminds people of the fundamental weaknesses in the financial system and comes up with some provocative ideas for reform. These include that we need less regulation, not more as is the dismal prospect over the next year or two; and that competition is the key to restoring the system's health.

The authors have drawn on a formidable array of evidence and commentary in surveying thinking about the financial system. This alone makes the paper worth reading. But mirroring their own concern about inter-connectedness, they have woven together arguments about liquidity, leverage, business culture and technology to explain the fragility of the system. The questions come thick and fast. Some are answered, others are deliberately left as catalysts for debate. And since the theme is that this is a systemic problem – not one that can just be blamed on bankers – no reader is left without a sense of responsibility for the choices that must now be made.

We at the CSFI are grateful to Bob and Michael for bringing this discussion paper to us, and to the City of London Corporation for its financial support.

Jane Fuller
Co-director, CSFI

Foreword City of London Corporation

The severity of the recent financial crisis threatens the relationship between the financial sector and wider society. The City of London Corporation does not have a position on the causes or solutions, but does believe that the future of London as a business and financial centre depends on it adapting successfully to the inevitable changes that will flow from recent events. Moving towards a post-crisis world means that people who work in London's financial centres, and others around the world, must embrace debate about the causes and the way ahead in order to discover the lessons that should be learned from the crisis.

As part of our continuing work in many areas to advance debate, the City of London Corporation is pleased to have sponsored the publication of this important discussion paper on the recent financial crisis: "*The Road To Long Finance: A Systems View of the Credit Scrunch*". The authors of this report have worked hard to raise some new arguments, dismiss some old ones and change the priorities for others. We will consider our sponsorship a success if the ensuing discussions help all of us to generate better answers.

We are grateful to the Centre for the Study of Financial Innovation for publishing the discussion paper as part of their programme of responses to the crisis.

Paul Sizeland
Director of Economic Development

The City of London Corporation works to enhance and maintain the status of the 'Square Mile' as the world's leading financial and business centre, by providing high standard governmental services and policies. It combines ancient traditions and ceremonial functions with the role of a modern and efficient authority looking after the needs of its residents, businesses and over 320,000 people who come to work in the City every day.

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We consulted a wide variety of sources. If you wish to continue the debate, please feel free to consult our bibliography at: http://www.zyen.com/Knowledge/Articles/credit_scrunch.htm.

We have tried to note the sources of facts or influences, though this is an essay on our opinions, not a piece of research. The breadth of the subject and our resources force us to draw a line under the extent of researching original sources. To all the unsung heroes we may have missed, who helped advance our thinking, we would like to express our gratitude. Without the wisdom and insight of our sources, this analysis would never have emerged. If we have inadvertently misattributed, misunderstood, misquoted or got some numbers wrong, it was not intentional and the fault is clearly ours.

The publication of this report was generously sponsored by the City of London Corporation.

**Short-term
thinking got
us into this
mess**

Introduction

The aim of this paper is to stimulate debate about the global financial crisis that began in 2007, and continues still. We wish to promote a "systems" view of the problems and to set the debate in a long-term context. If short-term thinking got us into this mess, it is unlikely to get us out of it. Yet short-term thinking abounds, with potentially adverse consequences for the speed and surety of recovery.

The strategic question is whether the crisis is a short-term bump on an endlessly rising road to prosperity, or an apocalyptic warning that severe design faults imperil political and economic activity. If you believe the crisis is a blip, then you hunker down and simply ask: "when will things get back to normal?" If you believe it foreshadows apocalyptic changes, then the question becomes: "how will we know when the financial system is working?"

We offer an alternative interpretation of what we call the "Credit Scrunch", in the firm conviction that more is at stake than recovery from the current economic confusion. Scrunch means to crush, crumple or squeeze. Reacting to current events with current mindsets is likely to exacerbate the scrunching of the world economy, but likewise we may need to crush, crumple and throw away traditional responses in financial markets. An important discontinuity requires a holistic rethink and response.

We examine some common fallacies and how well-meaning regulatory and private decisions produced disasters. We identify four fundamental failures as the root causes of the Scrunch and six further systemic exacerbations. These unintended consequences were magnified and transmitted through the global financial system until the weakest link, the US sub-prime mortgage market, failed, releasing a chain reaction that dramatically damaged the global economy.

Since the Scrunch was a systems failure, there is no single cause or person to blame and no single quick-fix. However, in today's bullet-point world, we can foreshadow some high-level conclusions:

- the Scrunch was not a failure of open markets but a failure of highly regulated markets due to unexpected consequences of regulation and private decisions;
- too big to fail is too big to regulate – the fundamental regulatory tool in all markets is competition in open markets and we need to increase competition in financial services, not reduce it;
- increases in regulation reduce diversity – a healthy financial services ecosystem needs diversity, yet society appears to over-value standardisation and presumed economies of scale in financial services;
- less regulation enforced within a coherent fiscal and monetary policy framework is better than more regulation. We recommend less regulation but with more competition and probing supervision;

Competitive markets make the world a better place

- root causes must be addressed, not just proximate causes. Until authorities seriously address and correct global trade imbalances and lack of savings in Western economies, short-term remedies will continue to make things worse and forestall genuine reform;
- government intervention displaces private sector investment. The sooner government activity and funding of financial services can return to minimal levels, the sooner longer-term reforms can begin;
- much more widespread recognition of involvement and responsibility by all concerned should reduce quick fixes by partisan "experts" and reduce the democratic deficit of control;
- teachers must rethink their lessons. Many of the assumptions of modern finance and professional best practice do not adequately account for systemic market dynamics and need to be reworked with wisdom, courage and humility.

If you are wondering whether this analysis will have something to say to you, we set out recommendations for nearly everyone in an appendix. However, since everything in a global system is inter-connected, solutions are neither simple nor straightforward, but messy and manifold. Solutions will need to have the requisite variety to match the complex, recursive nature of the global financial system itself.

We believe that competitive markets can make the world a better place, but equally that markets are social tools requiring design, oversight and justice to meet their objectives. Many of the proposed, easy-to-implement patches will make things worse. Much more thinking needs to be done and we hope at least some of our conclusions are sufficiently uncomfortable to encourage debate. Our key recommendation requires bravery and trust in open markets, but not blind faith. We hope that deeper debate can lead to genuine reform and encourage you, gentle reader, to join in.

Chapter 1: The Problem Of Wicked Finance

You can't get there from here...
[Anon]

The Scrunch is so momentous and wide-ranging we see it as a systemic crisis of democratic capitalism rather than just mass hysteria following one profession's "irrational exuberance". Most explanations tend to focus on one or two causes such as banker greed, conflicted rating agencies or offshore tax havens. There is little evidence to suggest that any factor alone, or even a handful together, was sufficient cause for the global financial ructions. A broader analysis of democratic capitalism from a systemic viewpoint is needed. As the economist Willem Buiter noted in the *Financial Times*, "The worst outcome of the current financial crisis would be a return to the status quo ante" [18 April 2008].

Our analysis is structured in four parts:

- Risk rules – where we review the fundamentals of markets, risk and human behaviour and suggest where conventional wisdom is wrong;
- Tragic flaws – regulatory dissonance and the excesses of private capital, the driving forces of the Scrunch;
- Fundamental failures – four of them: liquidity inflation, extreme connectivity, deluded demutualisation and perverse incentives;
- Systemic exacerbations – six interactions among the failures: over-leveraging, model failure, artificial innovation, loss of diversity, asset bubbles and growing externalities, all of which illustrate the powerful dynamics at work.

When problems and solutions affect each other recursively and solutions are enmeshed in society, you probably have a "wicked problem", a term coined by Horst Rittel and Melvin Webber¹. Wicked problems are not just about global risks. Building a new power station or credit risk system can be a wicked problem. Certainly most global risks, involving long timescales and distant countries, qualify as wicked problems. People want solutions that do not damage economic growth at home, but if it did not cost anything it would be happening already. The few who say that "if we want it so much, let's pay for it" are considered either scuppering realists or unrealistic idealists.

There are repeated calls for fundamental change, with even George Soros stating, at the 2008 World Economic Forum in Davos: "This is not a normal crisis. It is the end of an era." Despite these calls, little has changed. Financial markets are the means by which global risks and rewards are transmitted. We want to use markets for social

1. RITTEL, Horst, and WEBBER, Melvin; "Dilemmas in a General Theory of Planning" *Policy Sciences*, Volume 4 [1973]

**'It is the end
of an era'**

Omniscient super-regulators do not exist

improvement, for example, through microfinance, control of carbon emissions, or to focus drug companies' research. Yet organisations tend to address risks they feel able to control, and ignore global risks beyond their control.

The Scrunch leads many people to argue that financial markets are themselves a problem needing a solution. Given that the real world is complex and highly interconnected, fundamental change is not easy. By recognising systemic interactions, perhaps wicked finance can become a more tractable problem.

Fixes are either resilient or robust. Resilient fixes get by – resilient systems perform within the range of historical volatility. Robust fixes try to solve the root cause of the problem and can handle step changes in volatility. In some cases, robust approaches have achieved wonders, such as the eradication of smallpox. At other times quests are overdone or quixotic, e.g. seeking a silver bullet energy technology such as nuclear fusion. More often, a robust solution to a wicked problem involves many different approaches acting in some degree of concert, for example the European Recovery Program (or Marshall Plan) after World War II.

At the moment "more regulation" is widely hailed as the solution to the Scrunch, as if more "density" of oversight, across a broader "scope", looking at more activities and entities, with more "convergence" between regulators might somehow avoid past mistakes. Yet where will we find such omniscient super-regulators? Sadly, they do not exist. Muhammad Yunus, founder of Grameen Bank and winner of the 2006 Nobel Peace Prize, observes: *"it is tempting to simply dump our world's social problems into the lap of government and say, 'Here, fix this'. But if this approach were effective, the problems would have been solved long ago...governments can be inefficient, slow, prone to corruption, bureaucratic and self-perpetuating"*². Indeed, governments are heavily implicated in the Scrunch.

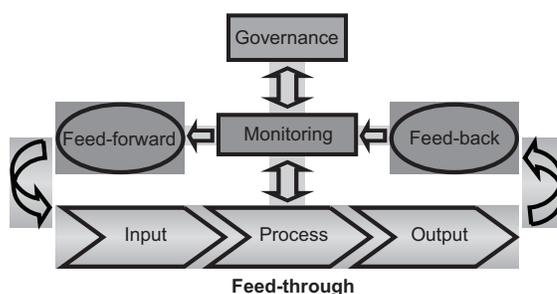
Wicked problems cannot be solved by larger government intervention, but equally we cannot just sit back and wait for the free market to save the day. What may be needed is bolder, yet more pointed, government intervention.

2. YUNUS, Muhammad, "Creating A World Without Poverty: Social Business And The Future Of Capitalism", New York: BBS Public Affairs [2007]

Chapter 2: Systems Thinking

What is important is that complex systems, richly cross-connected internally, have complex behaviours, and that these behaviours can be goal-seeking in complex patterns.
[W. Ross Ashby 1956]

Our analysis is structured around systems thinking. The basic elements are illustrated below. The interesting dynamics are feed-forward, feed-through and feedback.



Feedback is the most familiar concept and relates to the news we get back from the system to tell us what happened. Feed-forward denotes our expectations about what will happen, given some input signal and the control signals we give to affect system performance. Feed-through

covers not only the input-process-output loop but also the cascades and recursive circulation of flows across multiple processes in complex systems, typical in the real world. Feed-through highlights the effect of people's perceptions or actions on the probability of future feedback events and the time-dependence of those linkages.

Real world systems are seldom closed. Inputs are difficult to identify. Outputs are seldom linear, even less predictable, and certainly not Gaussian (normally distributed in the familiar bell curve). Computer models, even the most sophisticated, are trivial compared with economies. One particularly useful concept from systems theory is Ashby's "law of requisite variety", which states that the number of possible states of the control system must be at least as rich as those of the system it is trying to control. By implication, controlling markets requires a wide range of tools.

Feed-forward relies on our mental models. We often only see what we are looking for. The psychologist Max Bazerman's research shows how often outcomes influence our ethical judgements [Bazerman *et al.*, 2008]³. Good outcomes encourage us to judge preceding behaviours as sound – the end justifies the means – whereas bad outcomes lead us to question preceding behaviours.

We often only see what we are looking for

Regulators tend to focus on process. The process is not changed until things go wrong, then regulators respond by adding to the process, ostensibly to reduce risk. The process becomes more complex and people become buried in procedures, to the detriment of outcomes. The targets set by management may cut across this because staff must violate procedures to meet them. When they get caught, however, everyone blames the procedures and we begin again.

3. BAZERMAN, Max H., GINO, Francesca, SHU Lisa L., "Nameless + Harmless = Blameless: When Seemingly Irrelevant Factors Influence Judgment of [Un]ethical Behavior", HBS Working Paper 09-020 [2008]

Financial markets resemble an ecosystem

We see global financial markets as more analogous to a biological process or ecosystem than to a machine. Process-based compliance activity, the machine approach, encourages regulated entities to tick-the-box unthinkingly.

There has been a lot of soul searching about how the world could have condoned all the perverse incentives and dodgy deals done before the Scrunch. Bazerman [2005]⁴ maintains that these "predictable surprises" occur frequently. Organisations have an institutional blind spot and tend to discount the so-called tail risks, the low probability, high impact risks. Factors that encourage such behaviour include:

- a tendency to simplify explanations, "monocausal" bias;
- a defensive, egocentric focus that always tends to blame someone else;
- positive illusions: "it couldn't happen to me";
- over-discounting the future;
- organisational barriers including silo structures or dysfunctional incentives;
- failure to see the endogenous, systemic nature of many breakdowns.

No surprise that these factors can be identified in financial services pre-Scrunch.

Historical Drivers

The quality of information we now receive from companies in the U.S. is about the best we have ever seen and exceeds that of almost any other nation...
[Abby Joseph Cohen 2000]

Economists often fail to take account of the myriad political, social, cultural and environmental forces acting on an economy. Some of the historical forces that collided in the current crisis are:

Globalisation and the beginning of the "Asian" century: BRIC (Brazil, Russia, India and China) and Middle East oil-exporting countries grew to hold about 50% of global foreign exchange reserves while the G7 countries held only 7%. With Asian economies focused on exports, the Yen carry trade proliferating and Asian savers pumping up Western asset price inflation to keep their production lines rolling, trade imbalances played a major role in the boom. Until the 1990s the so-classified "developed" world comprised about 1 billion of the world's 5.5 billion inhabitants and was located mainly in Western Europe, North America and Japan. Within the next 20 years the developed world will most likely have trebled and perhaps will treble again by the end of the century.

Low US savings rate: At only 1.4% over the five years before the Scrunch, it created current account deficits that pulled in around 75% of the world's surplus savings, yet exports had effectively stagnated once inflation and dollar depreciation are taken into account.

4. BAZERMAN, Max H., "Negotiation, Organizations and Markets - Research Papers: Climate Change as a Predictable Surprise", Harvard NOM Research Paper Number 06-03 [7 June 2005]

The developed world is likely to treble

Wars strain the Treasuries

Dollar-euro volatility: The euro currency union of 16 countries has similar stresses and strains to the old gold standard. With a population greater than that of the US and a comparable GDP, the euro provides a reserve currency alternative to the dollar. Between 2001 and 2008 the dollar had depreciated against the euro by 32%, and dollar-euro forex volatility was a key element in the crisis.

Population growth and urbanisation: Demand for commodities has been stimulated in emerging markets, resulting in price spikes. Oil production is estimated to peak within the next 10 to 15 years, yet price volatility has led to underinvestment (compared with demand) in refining and supply infrastructure.

Technological advance: The total amount of digital data created, captured or replicated is forecast to grow ten-fold in the next five years, and e-commerce collaboration, a hundred-fold.⁵ As technology advances, the costs of manufactured goods come down and global events feed-through more rapidly. As the proportion of GDP represented by agriculture and manufacturing fall, so opportunities to benefit from a falling exchange rate diminish and the levers of economic power shift.

Services industries: These come to dominate post-industrial economies but non-essential service industries, such as leisure, are more prone to feed-through effects and rapid shifts in consumer demand.

The integration of Eastern Europe into the EU: This had an enormous impact on trade and investment flows and created the first pan-European banking groups, locking the fates of different countries more closely together. Eastern European immigration into Western countries helped to keep down wage inflation and boosted short-term GDP.

International conflict: Wars in Iraq and Afghanistan strain the Treasuries and foreign exchange reserves of the US and the UK. Intensified fear of terrorism increases speculation and financial markets volatility.

Climate change: The policy reaction has kept shifting, generating uncertainty. Transport is the fastest growing component of greenhouse gas emissions, for example, and the political shift of the Obama presidency and tightening legislation in Europe could have a dramatic impact on political and investor sentiment.

Compliance fatigue: Increases in risk management and regulation and corporate social responsibility initiatives lead to compliance fatigue in the boardroom, and armies of pen pushers in the public and NGO sectors.

More specifically, the financial services sector has seen:

- rapid growth of complex credit-risk-transfer products and originate-to-distribute business models;
- the rise of the shadow banking sector, including off-balance-sheet special investment vehicles (SIV) and conduits, government sponsored

5. GANTZ John F et al., "The Diverse and Exploding Digital Universe", An IDC White Paper, sponsored by EMC, Framingham, Massachusetts, March 2008

**Obligations
for banks
to support
welfare
objectives**

- entities such as Fannie Mae and Freddie Mac, private equity firms and hedge funds;
- a surge in the creation of over-the-counter (OTC) derivatives to a staggering \$595 trillion of nominal open interest at the end of 2007, while between 1980 and 2007 securitised funding of private non-financial debt rose from less than 30% to more than 55% of total bank assets; [Greenlaw; *et al.* 2008]⁶
- dramatic growth in standards-based e-trading, e-banking and straight-through-processing (STP), resulting in faster funding and higher volumes, which have encouraged self-service transaction banking and market-centric solutions;
- unprecedented growth in leverage and the rise of universal banking, removing the constraints of the Glass-Steagall Act.
- growing obligations for banks to support a range of social welfare objectives including affordable housing in the US. This led, for example, to the ten-fold growth in investment by Freddie Mac and Fannie Mae in sub-prime and other retained portfolios in the 12 years up to 2005, boosting the market to the tune of nearly \$1.5 trillion.
- financial crises of the late 1990s and 2000 (Long Term Capital Management, the Asian crisis, dot.bombs, accounting scandals), followed by the 9/11 terrorist attack on New York in 2001 prolonged the low interest rate and easy credit regimes into the noughties.

The Scrunch reflects the conjunction of dramatic changes. The complexity above should give pause for thought *as the factors are all systematically interdependent.*

No Single Cause

We see the law of unintended consequences everywhere. Take two simple examples from the Credit Scrunch:

1. Consumers want goods and companies want to provide them for profit, which creates economic activity. To expand, companies go to financial institutions, which evaluate their credit and provide loans. Meanwhile, consumers save with financial institutions, thus completing the funding circle. Under the fractional reserve banking rules, banks create money by keeping only a fraction of deposits in liquid reserves to service withdrawals. The fraction depends on the maturity mismatch between loans and deposits and the liquidity of the assets: how easily they can sell or pledge them as collateral to borrow more. This funding circle can be enhanced if financial institutions tap into the money markets. Such leverage is core to the system, but in the early noughties interest rates were historically low and credit was easy. Companies borrowed more to expand, while individuals used their houses as investment vehicles, encouraged by apparently ever increasing prices. Regulators used to monitor the money supply closely, but in recent years focused on consumer

6. GREENLAW, David, HATZIUS, Jan, KASHYAP, Anil K., and SHIN, Hyun Song, "Leveraged Losses: Lessons from the Mortgage Market Meltdown", US Monetary Policy Forum Conference [February 2008]

**Individuals
used their
houses as
investment
vehicles**

price inflation (CPI), which has been kept artificially low by globalisation. With money sloshing around, particularly in the US and UK, people bid up house prices (not included in CPI), spent more – stoking imports – and saved less. Meanwhile, Asian exporting countries were saving hugely and keeping their reserves in dollar assets, fuelling the boom and demand for their goods. It all depended on confidence and feed-forward expectations. Eventually house prices exceeded income to such an extent that it all collapsed.

2. Large US public sector pension funds need investment managers. These managers need to be trustworthy and competent, but having regulators watch over them will not hurt. Regulators restrict pension funds to investing in rated entities, bonds or companies, above a certain quality level e.g. AA. Regulators equally give Basel II risk preference weightings to rated entities. Who does the rating? A Nationally Recognized Statistical Rating Organisation (NRSRO). Who creates an NRSRO? The SEC. What are the criteria? Before 2003, the criteria were not published and there were only four NRSROs (today there are 10). Entities that need a rating pay an oligopoly of NRSROs to make their products more attractive to institutions that are required to invest in rated entities. The NRSROs claim it takes decades to learn how to rate investments. Despite this, as Lloyd C Blankfein, CEO of Goldman Sachs, pointed out to the Council of Institutional Investors in April 2009: "In January 2008, there were 12 triple A-rated companies in the world. At the same time, there were 64,000 structured finance instruments, like collateralised debt obligation (CDO) tranches, rated triple A." This included securitised, sub-prime mortgage debt. Meanwhile, Basel II exported the triple A idea globally to insurance and pension funds. Investment managers are benchmarked. They seek higher returns by ensuring that they are not wholly invested in rated entities. At the end of each trading day they have some cash left over. This cash is handed to a bank to invest "safely" in overnight money markets that have higher risk, but higher returns. When these returns are blended back into their performance, the majority of investment managers beat the benchmark. In effect, to beat their benchmark, investment managers want products that are riskier than the NRSRO rating implies. In a perverse twist, the more wrong the NRSROs are, the better for the investment managers (well, up to a point).

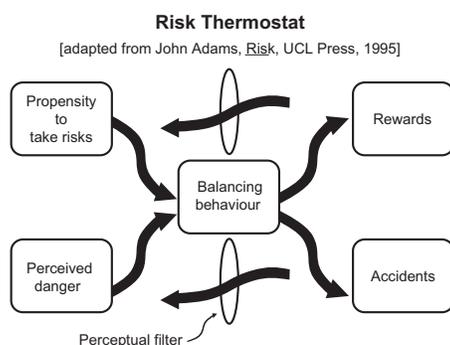
**The more
wrong the
agencies are,
the better**

Chapter 3: Risk Rules

...yet when we achieved and the new world dawned, the old men came out again and took our victory to re-make in the likeness of the former world they knew.
[T.E. Lawrence 1926]

John Adams⁷ developed some interesting framing devices for risk management. He identified three risk types: directly perceived risks that can be dealt with using judgement; risks perceived through science that dominate risk management literature; and virtual risks that are culturally constructed.

In finance, a directly perceived risk might be a large creditor's risk of default, a risk perceived through science might be a credit portfolio default rate, and a virtual risk could be the role of a regulator in evaluating credit. Adams puts forward a risk "thermostat" diagram that illustrates the balancing act of risk management.



Most risk managers deal with the bottom loop of reacting to accidents and danger. "A one-sided concern for reducing accidents without considering the opportunity costs of so doing fosters excessive risk aversion – worthwhile activities with very small risks are inhibited or banned. Conversely, the pursuit of the rewards of risk to the neglect of social and environmental ‘externalities’ can also produce undesirable outcomes,"

wrote Adams. This illustrates how easy it is for risk management to yield unexpected consequences.

The financial world is not short of crises or fraud. At the criminal end, recent examples include Société Générale's rogue trader and the Madoff pyramid game. At the macro-level, in the past dozen years the world has suffered two severe attacks of "irrational exuberance": the dot.com boom of 1997-2000 and the real estate bubble of 2004-2007. Regulators initially ignored these bubbles, then forced a crisis by raising interest rates, and finally sought recovery by quickly dropping rates and pumping in liquidity. This asymmetric policy response, known as the "Greenspan put", had worked before, but faced with bank and insurance failures in 2007-08 the cure did not work. The reasons for that failure lie in our misunderstanding of risk.

Financial world not short of crises or fraud

7. ADAMS, John, "Risk", UCL Press, London [1995]

Was risk management a confidence trick?

Need to represent variety of a complex world

1. Risk Is Not A Number

Can we know the risks we face, now or in the future? No, we cannot: but, yes, we must act as if we do.

[Douglas and Wildavsky 1983]

For investment managers risk is all about performance. Improved risk management should improve net returns and allow firms to take bigger risks with confidence, just as racing cars with improved braking systems enable drivers to go faster into the curves. The risk debate reflects the myth of control: the need for governments and businesses to be seen to avoid predictable surprises and protect their stakeholders.

It is a curious coincidence that risk management has risen to prominence on the public agenda since the mid 1990s, with voluminous research and debate, yet we are in the biggest financial crisis since the 1930s. Did our extensive risk assessments make us overly confident and willing to accept excessive levels of risk? Various regulatory bodies, including the Bank of International Settlements and the Bank of England, did warn but no action was taken. Was risk management a confidence trick?

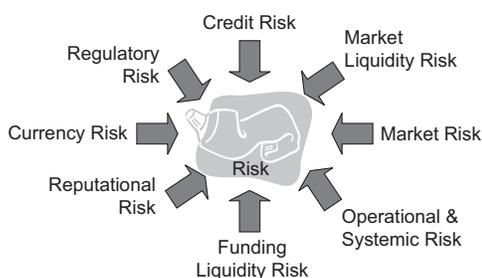
In its candid report to shareholders following its traumatic \$37 billion write-down on risk assets, UBS said: "Hedging resulted in positions being netted off and therefore not showing up in the overall position data." In some cases the hedge was against the expected historical volatility of the position, and not on the nominal position in total, so the scale of the assets at risk was lost. Clearly the sub-prime markets remained risky, yet the bank's methods, supported by the auditor's and regulator's methods, allowed these offsetting hedges as a fair and true account of risk. All were following conventional wisdom, and wrong.

The first and foremost lesson we can draw is that *risk is not a number* that can be simply averaged, added or netted off as though it no longer existed. Perhaps the most interesting flaw of all in financial services regulation is the use of "discrete" numbers in accounting rather than ranges, as in other science and engineering disciplines. By throwing away this fuzziness, auditors have gained spurious precision at the expense of accuracy. Mainelli and Harris⁸ have called for a new approach, confidence accounting, where uncertainties (ranges) are presented to investors and managers, rather than "discrete" numbers. We need to represent some of the variety of a complex world, rather than hide complexity in simple accounting entries and a single "bottom line" number.

Despite apparent precision, risk hedges are never exact. Exogenous future events may render hedged numbers irrelevant. For example, derivative hedges may fail if the issuer fails, as in the case of Lehman Brothers. Counter-cyclical positions may fail because liquidity dries up or the market collapses, causing fire sales, as it did with auction rate securities or CDOs. Currency volatility may generate unexpected cash calls even in unrelated parts of the portfolio as with the Icelandic Krona.

8. MAINELLI, Michael and HARRIS, Ian, "Balancing the Odds: Stochastic Accounting", *Balance Sheet*, MCB University Press, Volume 10, Issue 2 [2002]

Unexpected regulatory intervention may destroy a long-short market neutral hedge, as when short selling was suddenly restricted in several jurisdictions in late 2008. The efficiency of a diverse portfolio may similarly morph into something quite different in a bear market panic. At night all cats are black, no matter how colourful and distinctive they may appear in the daylight.



Rather than think of risk as a number, providing a precise point estimate of the expected probability of default, we should think of it rather as a toothpaste tube. We may squeeze and shift the risks about, or more precisely the expected losses, but the risks still remain and may crystallise in unexpected ways.

Call this the law of the conservation of

risk: you can *shift* exposures but not eliminate the underlying risks until positions are eventually closed out. At a global level risk is not reduced.

At a global level, risk is not reduced

Carol Loomis, writing in *Fortune* magazine⁹, put it this way: "transferring... a risk doesn't wipe it away. The risk simply gets passed by the initial contract to a dealer, who in turn may hedge it by a separate contract with still another dealer... What results is a tightly wound market of many, many interconnections – global interconnections – that is altogether quite different from anything that has ever existed before." Hedging, as risk mitigation, will only reduce the likelihood of local loss under certain macro conditions. Under different conditions the hedge will fail, or even import global risks. Gary Gorton¹⁰ suggests that the problem was not the originate-to-distribute business model, nor a fall in underwriting standards, but rather the opacity of the risk transfer process itself. He concludes: "What is 'collateralizable' is very intimately related to information. There is simply no financial wealth that can be thought of as 'collateralizable' in all states of the world." In fact, a fully collateralizable currency would be the perfect long-term store of wealth. Hedging only means that if losses do occur, we will hopefully receive compensation from the party who issued the hedge or insurance, or be able to sell another asset at a price that compensates us. A hedge displaces some local risk, while importing some global risk. It is true that, at a global level, things may improve if those who bear the greater risks are better able to bear them, but overall risk is a constant.

Over the past 18 months market participants have painfully had to learn the difference between expected net risks and gross risk. Gross risk looms large as credit risks rise. Risks inhere in each financial transaction we enter into, and last for as long as our open interest in that transaction. Risk mitigation affects the likelihood of loss under given conditions: it transfers the risks, but never changes them. Risk is neither created nor destroyed, but conserved.

9. LOOMIS, Carol, "The risk that won't go away", *Fortune* [7 March 1994]

10. GORTON, Gary, "The Panic of 2007", Yale School of Management and NBER, paper given at the Jackson Hole Conference of the Federal Reserve Bank of Kansas City [25 August 2008]

2. Risk Uncertainty Principle

What is a cynic? A man who knows the price of everything and the value of nothing.
[Oscar Wilde 1892]

**Even blue-chip
stock prices
fluctuate wildly**

For trading assets, mark-to-market pricing is now the standard for accounting in both Europe and the US. Where judgement is required, we see a slightly looser use of "fair value" accounting. However, market values are prices at the margin. In the major stock markets, for example, only around 0.5% of the market value changes hands each day and mostly in liquid shares. In the thin markets of the Scrunch much less than that can generate the "market value". Even blue chip stock prices can fluctuate wildly as they did recently with Volvo and Volkswagen. How representative are such prices of market sentiment overall and long-term value? To what extent does it make sense to value positions at current marginal prices? Traders know that large positions move markets.

Yet historic cost accounting is equally, some would argue even more, misleading. Different assets ought to have different values to different owners. If there were no differences among owners in perceived values, why trade? The Scrunch has reignited the debate about fair value. Everyone wants a consistent basis for comparison. The trouble is that information is an answer to a question and some questions depend on who is asking them and for what purpose. What is valuable to me may not be valuable to you. A price is usually somewhere between your value and mine, affected by our feed-forward views of future opportunities and values together with the discount rates we apply to such futures.

It seems the more we try to get close to "real values", the more they slip away. Accounting standards bodies try to develop rules for markets where values are either unavailable or unreliable. These rules permit mark-to-model values or sometimes historical cost, which continues to be used for loans and other assets "held to maturity". Different audit firms accept different models, so what happens to comparability? Some call this mark-to-myth.

If values are so slippery, risk, which represents a derivative of value, must be even less certain. Investment managers have complained recently not so much about the volatility of the markets, but about uncertainty. Rules of thumb do not work any more, correlations no longer hold, or worse, sometimes they hold and sometimes not.

**There is no
single number**

We look forward through a cloud of probabilities of expected outcomes. We look back at a denser, more coherent cloud of history, which we interpret in order to learn. As the present moves into the future, the clouds of possibility cohere and move behind us. Risks move from expected outcomes and errors of estimation to actual outcomes and errors of interpretation. Risk viewed *ex ante* differs depending on your point of view and market sentiment, and *ex ante* risk differs even more from risk viewed *ex post*. There is no single number.

What we need are risk barometers

Bankers have been uncomfortable with *ex ante* risk estimates for some time. Timothy Geithner¹¹, then head of the Federal Reserve Bank of New York (NY Fed), noted in 2006: "The focus should be not on the specific estimates produced for various types of asset price movements or stress events, but the uncertainty that surrounds those estimates and the magnitude of the potential underestimation of losses... we probably need to spend as much time discussing the limits of the quantitative outputs of the risk-management process as we do on the estimates produced by the models." Claudio Borio, at the Bank for International Settlements in Basel, came to a similar conclusion¹²: we need to focus more on the higher moments of risk and not just "expected values". We must stress our *ex ante* forecasts in qualitative ways, as well as their sensitivity to long-tail risks. What we have, Borio contends, are just risk thermometers that reflect our understanding of today's risks today, when what we need are risk barometers about the rate of change that may be coming. Paul Tucker, deputy governor for financial stability at the Bank of England, noted in March 2009 that accounting with IFRS fair value, instead of being a passive reporting system, becomes a driver of decisions.

Nassim Nicholas Taleb in his 2008 essay, *The Fourth Quadrant: A Map of the Limits of Statistics*, proposes a philosophical foundation for these weaknesses. He describes how we infer probability distributions from historical outcomes *ex post* creating what he calls the "inverse problem": the rarer the event, the more data we need *ex ante*. He thus warns of the dangers of misusing statistical models as a basis for policy.

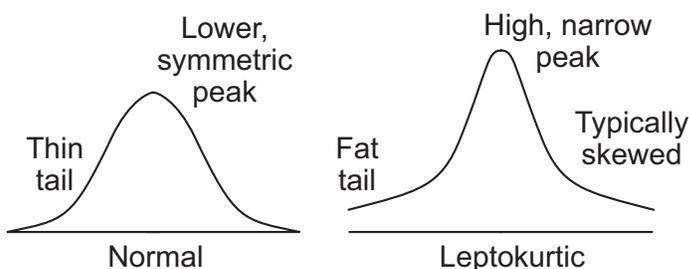
3. Incompleteness Theorem of Risk Models

There are known knowns. There are things we know that we know. There are known unknowns. That is to say, there are things that we now know we don't know. But there are also unknown unknowns. There are things we do not know we don't know.
[Donald Rumsfeld 2002]

There will always be off-model risks no matter how rich and sophisticated our models. Investors are herd animals. When they see an opportunity they all pile in, but when things go wrong there is a flight to safety. Because of herd behaviour, outcome distributions are leptokurtic – they have fat tails of low probability but high impact. Leptokurtosis also explains why liquidity is so "sticky". Feed-through systems are non-linear – and the bigger the system the more abrupt and discontinuous the change. This gives us the law of tail risks: the leptokurtosis of human behaviour combined with the unending search for alpha will eventually undermine any risk mitigation structure and any regulatory model. Human behaviour is definitely not normal, as the right hand side of the following chart shows.

11. GEITHNER, Timothy F., "Hedge Funds and Derivatives and their Implications for the Financial System", speech to the Hong Kong Monetary Authority and Hong Kong Association of Banks, Hong Kong [September 15 2006]

12. BORIO, Claudio, "The financial turmoil of 2007: a preliminary assessment and some policy considerations", Bank of International Settlements, BIS Working Papers No 251 [March 2008]



Following the oil crisis in 1973, Charles Goodhart, then working at the Bank of England, coined Goodhart's Law, while Robert Lucas, economist at Chicago University, put forward the Lucas Critique. Goodhart's Law asserts that any observed statistical regularity will tend to collapse once pressure is placed upon it for control purposes, while the Lucas Critique notes that "the limitation of modeling exercises as a guide to policy arises from the fact that models typically do not allow for the impact of policy changes on the model itself".¹³ Both recognise, as does Nassim Taleb with his "black swans", that the circular effect of feed-through creates discontinuities and inevitable tail risks that cannot be hedged. The law of tail risks just synthesises the conclusion of these earlier insights.

Consider an example: research into residential mortgage-backed securities failures by Rajan *et al.*¹⁴ suggests that increasing the distance between risk holder and risk issuer, through securitisation, resulted in shrinkage of the variance of interest rates and increased focus on hard parameters, such as credit ratings or loan to value (LTV) ratios, with a reduction in the collection and distribution of soft information. However, historic data emanated from a regime with little securitisation, where soft variables had dominated. Thus the data on which the models were based were not relevant to the conditions in which the models were used. Consequently, securitisation underestimated default risk precisely where it was highest.

Securitisation underestimated default risk

Reformers often ignore Goodhart-Lucas warnings on the inherent limitations of prescriptive regulatory models and the off-model tail risks they create, insisting that the next model will somehow be "better". Sadly for the reformers, the Goodhart-Lucas insight accords with Goedel's Incompleteness Theorem that a mathematical-logical system cannot ever prove itself correct. So any financial model will necessarily be incomplete. We must go outside the model to the wider world in order to validate the model, but external validation alters the model.

Model data can also be circular. In both auction rate securities and CDO/ mortgage-backed-securities (MBS) markets, large holdings of the securities by the issuing firms wound up supporting the market. Prices were, therefore, biased towards the issuers, views rather than an independent market view. Both the auction rate and CDO/MBS markets were early casualties in the Scrunch.

13. CRYSTAL, K. Alec, and MIZEN, Paul D., "Goodhart's Law: Its Origins, Meaning and Implications for Monetary Policy", Festschrift in Honour of Charles Goodhart, Bank of England [November 2001]
 14. RAJAN, Uday, SERU, Amit, and VIG, Vikrant, "The Failure of Models that Predict Failure: Distance, Incentives and Defaults", Chicago GSB Research Paper Number 08-19; Ross School of Business, Paper Number 1122 [December 15 2008]

The over-inspected becomes embalmed

After every financial crisis we seem to come back to the same three policy recommendations: more transparency and disclosure, more risk management and regulation, and more accountability, which usually implies an expanded bureaucracy, new models and targets. Yet reformers still ignore the way regulation reduces diversity. Dwight D. Eisenhower said that "the uninspected deteriorates", but we might say that the overinspected becomes embalmed. Financial regulatory models are licences for regulated entities to deploy leverage as long as they tick the boxes. Regulatory models allow the many to trade up to the limits, rather than slowing down the few that threaten to exceed them.

Size matters. If small firms drive too fast, a few of them will fail and society moves on. However, when large firms become too big or too connected to fail, we have to save them, encouraging moral hazard. Too big to fail means too big to regulate. Yet governments continue to encourage ever larger entities as a solution to the crisis, creating ever-bigger tail risks that cannot be hedged.

4. Misrule of Mistrust: Caveat Emptor

Our revolution in accountability has not reduced attitudes of mistrust, but rather reinforced a culture of suspicion. Instead of working towards intelligent accountability based on good governance, independent inspection and careful reporting, we are galloping towards central planning by performance indicators, reinforced by obsessions with blame and compensation.
[Baroness Onora O'Neill 2002]

Free markets rely on trust backed up by law, as exemplified by the London Stock Exchange motto, *pactum verbum meum* (my word is my bond). Today's financial crisis is, at heart, a crisis of trust, a loss of confidence in counterparties and regulators. A few years ago, banks knew how badly they managed their own risks, how aggressively they had priced their assets, and how much their bonuses depended on these aggressive valuations. "If we are acting so irresponsibly, think how much more irresponsibly other banks must be acting," they thought. Thus, when repricing started, overshoot was inevitable. As banks lost trust in each other, interbank interest rates rose. Simultaneously, regulators lose trust in the banks. "A principles-based approach does not work with participants who have no principles," said Hector Sants, chief executive of the FSA, in March 2009. The public loses trust in both banks and regulators as the problems and scandals unfold.

Bailing out the profligate results in resentment

Adam Smith, in the *Wealth of Nations* [1776], stressed: "Justice is the main pillar that supports the whole building." Justice is questioned when those who should have borne responsibility either escape censure or job loss, or lose jobs but with golden handshakes. Bailing out the profligate at the expense of the prudent results in resentment and even outrage, as expressed by some UK Anglican bishops in December 2008.

O'Neill's "culture of suspicion" aligns with the "naughty banker" theme. The public is told that bankers are guilty of greed, imprudence and deception insofar as they allegedly hid the extent of their toxic assets. Fines for malpractice and product mis-selling further undermine trust between banks, the public and regulators and breed cynicism since corporate fines fall on shareholders, while bonuses were paid into private pockets.

However, banks also feel let down by the regulators given:

- thousands of pages of regulation foisted upon them, which have not really protected anyone from the ravages of the Scrunch;
- lack of censure for the regulators responsible for financial stability;
- public knowledge for years of what the banks had been doing, including the extravagant bonuses, excessive leverage and funding gaps, asset price inflation, self-certified mortgages, increasing loan-to-value ratios, the explosion in OTC derivatives and opaque structured credits;
- the slow response of the authorities to the crisis followed by penal costs imposed by the "lender of last resort", particularly in the UK and the US;
- calls for more regulation, even though existing regulation may have exacerbated the banks' losses through pro-cyclical rules, such as fair value accounting and Basel II;
- over-regulation being voted the top banking "banana skin", or risk, in the CSFI/ PWC annual surveys in 2005 and 2006;
- policy-makers turning on banks after pressing them to support home ownership and sub-prime community policies, which the banks delivered with the help of complex financial engineering.

Trust unlikely to emerge from applying rules

In her Reith Lectures, Onora O'Neill¹⁵ explained that to promote trust we need to think less about rights and more about duties, less about accountability and more about good governance, less about transparency and more about limiting deception, while improving checkable communication. Trust and confidence are unlikely to emerge by applying more rules.

Confidence Accounting

One concrete way we might address the subtleties of risk described above is to develop a system of confidence accounting. If auditors practise risk-based auditing, why can't we see the odds they face? This simple question raises a number of concerns about the current approach to financial statements, which presents a singular guess at what reality might be. Accountants and auditors throw away masses of information as they use fixed numbers in almost all their calculations. The financial community knows that the annual report is subject to considerable uncertainty, but finds little evidence therein. Investors spend time reconstructing the underlying ranges, while guessing what other investors' sentiments might be. Surely no theory of measurement has wasted so much effort ignoring the real world and thereby encouraging tail risks.

As in other areas of measurement, we should track four numbers over time – bottom, expected, top and the percentage of things expected to be in that range, or BET% for the sake of an acronym. The obvious implication for auditors is that a specific number is the wrong measure. Too many things in profit, as in all accounting statements, are ranges, from the estimate of gains in freehold land value to the likely profit on individual contracts to the value of insurances. We litter the financial

15. O'NEILL, Onora, "A Question of Trust", BBC Radio 4 Reith Lectures [2002]

Accountants indulge false simplicity

accounts with explanatory footnotes to the point that even highly sophisticated financial analysts cannot understand them. When the accounts are presented, these analysts tear them apart to try to rebuild estimates based on ranges. Intriguingly, the auditors get off very lightly. How do you hold an auditor to account? Is being off by £1 enough to claim the accounts are invalid? Certainly not. £2? Well, when? In fact auditors have cleverly avoided giving us anything substantive to go on, such as "we are 95% certain that profits were between £X and £Y". Let us think about forcing auditors to lay out these ranges.

This theoretical framework can be called "confidence accounting". If every output is a probability distribution, we need to have statements of the confidence the accountant or auditor has in the range. A single number for accounting terms such as turnover is clear and simple, but wrong. As long as accountants continue to indulge this false simplicity, they will remain exposed to misunderstandings of their role.

Confidence accounting would be the presentation of audited accounts in a probabilistic manner. Beneath that evidence we would expect to see methods that established input distributions, determined their interactions, sensitivity and tail risks, and presented their impact in meaningful, machine-readable statements to facilitate aggregation, data mining and analysis. The auditor would ensure that the distribution functions were not materially misleading, and would compare the firm's estimates with external views. People will claim that the mythical Aunt Agatha cannot understand this, but neither can she understand today's footnotes.

The value of confidence accounting becomes even greater at a systemic level. Since the balance of risks will begin to shift for some firms sooner than others, by making them more explicit, analysts and regulators will be able to see trends and outlier behaviour. Macro-prudential regulators can then highlight systemic flows or risk points in a similarly stochastic manner, which can feed back into the judgements of individual firms.

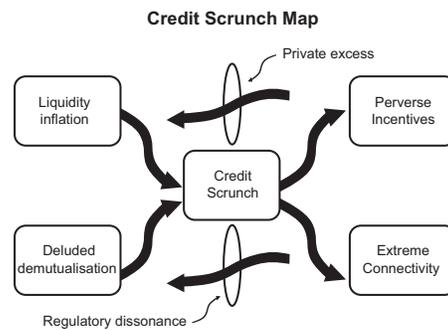
If accountants are to move from a deterministic towards a stochastic paradigm, much work needs to be done, largely in three areas – commitment by the accounting establishment to reform, restructuring of accountant training and better communication with users of financial information. The starting point is an open debate about extending the conceptual framework of accounting to include stochastic concepts. Evidence of that commitment would be more presentations incorporating distributions rather than single points, a review of accounting standards (GAAP and IFRS) to see where replacing a single number with a distribution would simplify statements and a review of audit methodology to change risk-based auditing to a more rigorous method based on quantitative evidence of estimation. Real evidence might also consist of indemnity – auditors stating clearly the amount of indemnity they will provide to shareholders or equity markets for any material misstatement, as Professor Joshua Ronen¹⁶ posited during a lecture at Gresham College.

Review of audit methodology

16. RONEN, Joshua, Professor of Accounting, New York University Leonard N Stern School of Business, "Reforming Auditing – Incremental Change or Radical Action?" lecture given at Gresham College, London [6 February 2006]

Chapter 4: Tragic Flaws

(A tragic hero is)...a person who neither is superior in virtue and justice, nor undergoes a change to misfortune because of vice and wickedness, but because of some error; and who is one of those people with a great reputation and good fortune.
[Aristotle]



We see the current financial crisis as the sad but perhaps inevitable downfall of bankers and regulators as a result of their tragic flaws applied to four fundamental failures, as illustrated:

There were many errors in judgement, sometimes exacerbated by hubris and leading to nemesis. We are now undergoing catharsis. To understand what happened, it is more useful to seek tragic flaws than malevolent intent or

gross misconduct – to try to understand the systemic dynamic rather than seeking someone, anyone, to blame.

1. Regulatory Dissonance

Government's view of the economy could be summed up in a few short phrases: If it moves, tax it. If it keeps moving, regulate it. And if it stops moving, subsidize it.
[Ronald Reagan]

FSA's rulebook amassed 8,000 pages

In theory regulation is quite simple, but in practice it often reflects dissonance between fiscal and monetary policies, the intention behind the rules and enforcement, and overlapping jurisdictions.

First, there is the sheer volume of it. The FSA's rulebook amassed 8,000 pages. The UK government's tax code is a similar length. The EU's Financial Services Action Plan comprised around 30 directives aimed at increasing harmonisation. As banks extend their interests across borders, they have to comply with them all. Another layer of supra-national organisations adds to the cacophony, including the International Monetary Fund, the World Bank, the Organisation for Economic Co-operation and Development and the Bank for International Settlements. Co-ordination has been found wanting and they have been blind to the impact of human behaviour on the system, creating ideal conditions for unintended consequences.

Second, there is organisational fragmentation. Even in countries with a consolidated structure there are several silos. The UK, for example, has the FSA, the Bank of England, the Treasury, the Financial Ombudsman and the Office of Fair Trading. Moreover, within each organisation there will be separate teams looking after particular subjects. No one sees the whole picture and inconsistencies are inevitable.

Governments try to do too much with misguided methods

For example, while the Bank of England was worrying publicly about the funding gap between loans and deposits, the FSA was "supervising" Northern Rock. By 2006 Northern Rock had captured 20% of UK mortgage issuance and was known to be pushing the frontiers with loan-to-value ratios of up to 125%, high income multiples, self-certified mortgages and off-balance sheet use of special purpose vehicles. The FSA has admitted to a string of unjustifiable weaknesses in its supervision following Northern Rock's collapse and nationalisation in 2007-08.

Third, there is pervasive regulatory dissonance. In evidence to the UK Treasury Select Committee in January 2009, Professor Willem Buiters observed: "Different parts of the Government are pursuing different agendas: the FSA says 'stop lending' and the Government says 'start lending'; the FSA says 'whatever you put in your balance sheet make sure it is the Treasury's' and the Government says 'Whatever you put in your balance sheet, make it loans to homeowners and small businesses'. You cannot do both, so at the moment they are conflicted."

In the US, conflicting goals between affordable housing and sound banking unraveled first in accounting scandals at Fannie Mae and Freddie Mac and eventually in government conservatorship. These government sponsored entities (GSEs) played a unique role because their securities were eligible as collateral for the huge repo markets. In the Bank of England's view, they kicked off the banking crisis of September 2008. Although governments try to do the right thing, they are themselves dissonant, trying to improve social welfare, ensure economic growth, maintain financial stability and fiscal rectitude, but always, and most importantly, aiming to get re-elected. Even if their intentions are good, they try to do too much with misguided methods and the outcomes are often perverse.

Fourth, decisions made under stress are even more political. In a panic, a variety of players jostles for regulatory mind-share, including government departments and ministries, other government sponsored agencies, judicial reviewers, government auditors, NGO advocates, the media and representatives of regulated interests themselves. In normal times there might be advisory public consultations and cost-benefit analyses, but in times of stress decisions are taken in haste and behind closed doors, without formal consultation or review. Large swathes of private enterprise have been nationalised and shareholders expropriated without serious public debate.

The Regulator, as Tragic Hero

Politicians invariably respond to crises – that in most cases they themselves created – by spawning new government programs, laws and regulations. These, in turn, generate more havoc and poverty, which inspires the politicians to create more programs...and the downward spiral repeats itself until the productive sectors of the economy collapse under the collective weight of taxes and other burdens imposed in the name of fairness, equality and do-goodism.

[Stephen Moore]¹⁷

17. MOORE, Stephen, "'Atlas Shrugged' From Fiction to Fact in 52 years", [Wall Street Journal](#) [9 January 2009]

The crunch was a predictable surprise

Most people misprice risk. That goes *a fortiori* for regulators, who think, for example, hedged risks can reasonably be offset on the risk-adjusted balance sheet. *Hubris* may prevent them from appreciating how much the hedging they permitted contributed to the Scrunch. This is not to say regulators caused the Scrunch, any more than bankers, or credit rating agencies, or auditors, or any other single group. Still, governments and regulators are responsible for systemic financial stability. Some did recognise the bubble, and even had intervention tools that might have prevented the crunch. It was a predictable surprise. But current analyses, from institutions such as the IMF and BIS Joint Forum, while underlining failures in risk management by both firms and regulators, frequently conclude that traditional responses just need to be done again, only better: the religion of regulation. Given that traditional responses failed to work, perhaps we need to rethink the financial system, not just apply more risk management.

What drives regulators is their intense belief that regulation can help solve most, if not all, human problems, whether by detailed rules or lofty principles. Regulation is like religion. Whenever we fail (fall from grace) we should redouble our efforts, and try harder using the same methods. Regulatory professionalism punctiliously observes ritual, by-the-book enforcement of commandments such as treating customers fairly, knowing your customer, providing best execution, or maintaining risk-sensitive capital reserves. Tick-the-box compliance keeps out new entrants by increasing entry costs, but it also means that existing players become more homogenous because they are forced to follow the same strategies. Regulation does not, nor should it try to, stop bad decisions.

In a study on corporate bond markets, ECB analysts concluded: "If investors are homogeneous in their behaviour, the trading liquidity disappears down a black hole." [Laganà *et al* 2006]¹⁸ More specifically, they argue, "credit derivatives provide a greater capacity for investors to crowd into trades than in the cash market where such congestion would be more visible. Crowding and behaviour homogeneity will reduce systemic liquidity". So they conclude, because these instruments have been shifted away from credit experts with detailed knowledge, they may have indirectly led to a rise in the use of common sell "triggers" and to crowded exits as compliant investors fled.

True-believer zeal was the tragic flaw

The other religious analogy is a regulatory priesthood that reinterprets for modern ears the sacred macro-economic policy texts of John Maynard Keynes, Milton Friedman or the New Consensus, even though these texts periodically change and have yet to explain fully why credit crunches occur. During the monetarist ascendancy the priesthood worked mostly behind closed doors. Under the new Keynesian consensus, their deliberations are more transparent, but endlessly analysed for hidden meanings. Today few dare suggest that lowering interest rates to zero or flooding markets with quantitative easing might have perverse results, for that would be apostasy. Everyone quotes Keynes's conclusions without noting that today's conditions are very different to those he faced.

Such true-believer zeal was the tragic flaw that drove the regulators to stress compliance with scant regard to what was happening in the world around them. The

18. LAGANÀ, Marco, PERINA, Martin, VON KÖPPEN-MERTES, Isabel and PERSAUD, Avinash, "Implications for Liquidity from Innovation and Transparency in the European Corporate Bond Market", ECB Occasional Paper Series, Number 50 [August 2006]

"Greenspan put" was justification for ignoring the debt-driven asset price bubble and the declining dollar. Governments and regulators built an increasingly fragile superstructure on these dogmatic foundations and ignored what warnings there were, convinced that their models would work it out when the crunch occurred. Yet according to Roger Altman¹⁹: "It is widely acknowledged that this crisis reflects the greatest regulatory failure in modern history."

Market Failure – An Ode To Competition

Life is a school of probability.

[Walter Bagehot 1856]

'The greatest regulatory failure in modern history'

Market failures are generally due to: lack of competition, information asymmetry/agency problems, and externalities. Global finance exhibited all three:

- lack of competition – excessive salaries, in 2006 the banking industry's profits per employee were estimated to be 26 times higher than the average of all other industries, and its \$2.8 trillion in revenues equalled 6% of global GDP, according to McKinsey.²⁰ It is a sector that went from 5% of US market capitalisation in 1990 to 23.5% in 2007, and a cast list of the top 10 that would have been largely recognisable in 1929: Goldman Sachs, Merrill Lynch, Lehman Brothers, Bear Stearns, Morgan Stanley, JP Morgan Chase, Citi... plus only four auditing firms and three credit rating agencies that could be regarded as global.
- information asymmetry/agency problems – mortgage mis-selling, the auction rate securities debacle, collapse of highly rated CDOs, bonus structures that looted shareholders by extracting cash from inflated paper profits and insufficient prudential reserves, plus the scandals cited by Frank Partnoy in his book, *Infectious Greed*;
- externalities – whether it is third world debt, savings and loan defaults, dot.com bubbles, or the credit crunch, the taxpayer picked up the systemic costs of investment banking failures.

The clearest sign of market failure is the presumption that some investment banks are "too big to fail". Andrew Hilton, director of the CSFI, highlighted this in *Financial World*, in April 2008:

"Pre-Northern Rock, everyone accepted that a regulatory system in which no institution fails is itself a failure. It suggests too much regulation and no market discipline. Equally, it was accepted that there are some institutions that are ultimately underwritten by the Treasury. But Northern Rock was not one. The fact that it was bailed out so spectacularly was in part due to Alistair Darling's inexperience and in part to the emergence of a new doctrine – too political to fail."

19. ALTMAN, Roger C., "The Great Crash, 2008: A Geopolitical Setback for the West", *Foreign Affairs* [January/February 2009]

20. DIETZ, Miklos, WALTER, Cornelius and REIBESTEIN, Robert, "What's In Store For Global Banking", *McKinsey Quarterly* [January 2008]

Too big to fail ends in regulatory capture

*Private Eye*²¹ called a spade a spade: "Gordon Brown promised to increase regulation to deal with collapsing financial institutions, but his biggest move so far is a massive decrease in regulation" suspending normal competition and takeover rules for Lloyds and Santander. The religious faithful of regulation want to go much further and now seek powers to create mega-banks, rather than question whether size itself might be a sign of regulatory failure.

James Bullard, President of the Federal Reserve Bank of St Louis, recognises that too big to fail implies moral hazard: "Bailouts are expensive – not just because they commit taxpayer funds, but because they can encourage behavior that increases subsequent systemic risk. A firm that expects government protection if its investments go awry may take bigger gambles than a firm that expects no protection."²²

When banks grow across borders they have more opportunities to arbitrage the regulators. If large institutions live globally but die nationally, can we afford to bail out big banks that dwarf national treasuries and private sector savings, as happened in Iceland and Ireland? One answer would be to restrict financial firms to the competitive size appropriate to their market. Instead, regulators want to go cross-border, rationalise regulation and seek ways to control mega-banks, spreading their homogenisation around the globe.

Yet, too big to fail really does mean too big to regulate. Even if it were possible to regulate mega-banks effectively, there seem to be at least two other big problems. First, if the current series of regulators was not able to diagnose the problems, why should we expect the Babel of a global college of regulators to do any better? Second, cross-jurisdiction regulators require democratically accountable cross-jurisdiction political authorities to give them legitimacy and resources – creating another democratic deficit augurs ill for the enterprise.

Finally, too big to fail ends in regulatory capture. A regulator has to be able to look a firm in the eye and, if it refuses to bend, have the "nuclear" option of removing its licence to trade. This is no idle threat. Between 1980 and 1994 more than 1,600 banks insured by the Federal Deposit Insurance Corporation (FDIC) were closed or received FDIC financial assistance. From 1986 to 1995, the number of US federally insured savings and loans in the US declined from 3,234 to 1,645, at a direct cost to the government estimated at about \$125 billion.

Yet the Scrunch has actually accelerated the long-running consolidation process. The implicit guarantee of too big, too connected or too political to fail had become part of the competitive advantage of the megabanks. Governments cannot afford the recursive risk of a serious default, so they defend the entire sector. When they tried to use the nuclear option with Lehman Brothers, the world they knew reverberated in shock.

Competition matters. Historically market failure has been addressed through trust-busting or anti-monopoly regulation – the 1890s in Britain, the 1900s in the US. Competition prevents cartels and controls size: it is a form of regulation. It is worth

21. PRIVATE EYE [2 October 2008]

22. BULLARD, James, "Systemic Risk and the Macroeconomy: An Attempt at Perspective", Federal Reserve Bank of St. Louis [2 October 2008]

Choosy customers put pressure on weak firms

distinguishing competition (making sure one group does not make the rules) from supervision (knowing what is going on) from regulation (saying what should go on). In competitive markets, people snitch on each other to the benefit of customers, supervisors and regulators. With more – and smaller – firms around, more eyes are on the "coal face" of finance, watching risk and adding value to customers, while fewer are looking up the political ladders endemic to large organisations. Fewer problems can be hidden for shorter periods. Customers have choice and more relative power; choosy customers put pressure on weak firms. The US Department of Justice (Antitrust Division), the UK Competition Commission and the EU DG for Competition should be active participants in reform.

Society can afford a continual, low-level string of failures rather than periodic catastrophes and expensive rescues of a few dominant players. It should cause concern when an industry does not attract new entrants. Some, including Martin McElwee and Andrew Tyrie MP²³, called for encouraging competition to be a core objective of the FSA when its role was defined a decade ago. Instead the UK government believed in the dogma of "light touch" regulation over freer markets. In the event, Lloyds TSB was pressed to take over HBOS, while in the US the Treasury and the Federal Reserve Board (Fed) urged forward the mergers of Bear Stearns with JPMorgan Chase and Merrill Lynch with Bank of America, lessening competition, and all with inadequate due diligence.

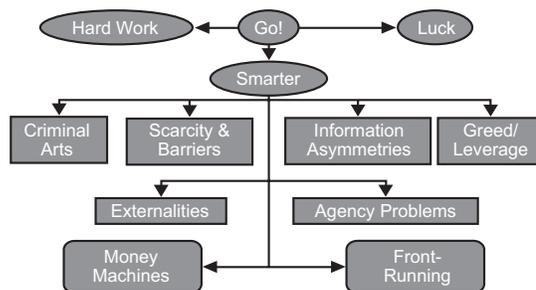
2. Private Excess

There are people in the world so greedy that God cannot appear to them except in the form of money
[Mahatma Ghandi]

If dissonance is the flaw of regulation, private excess is the tragic flaw of human existence. It may be motivated by pride, desperation or cynical opportunity, it may be encouraged by government action or the social context in which we live, but we follow a "Get Rich" path and no amount of public or private exhortation or retribution will stop us. Our "Get Rich Taxonomy" below depicts the options facing anyone who seriously wants to make money. The three choices are luck, hard work or smart practice.

Luck covers not only lotteries and gambling, but also good fortune, such as rising house prices. The rise of leisure industries in the 21st century will no doubt see the range of lucky opportunities erode incentives to hard work; celebrity television springs to mind. However, the real focus for people who want to create their own luck is the "smarter" route. This opens up a range of alternatives, some more dodgy than smart, from the criminal to the anti-competitive. This is what private excess is all about, the inevitable shift from hard work to luck to smart practice in the desire to better oneself.

23. MCELWEE, Martin and TYRIE, Andrew, "Leviathan at Large: The New Regulator for the Financial Markets", Centre for Policy Studies [2000]



Private excess is both natural and ubiquitous. Sometimes we try to control it through laws or regulation. Sometimes we tolerate or even promote it in the public interest. Adam Smith's key insight was that competitive private excess in aggregate may serve the common good. Our ambivalence towards luck and smart practice allows the

shadowy *demi monde* of sharp practice to flourish, and many respectable people make use of these options. From his experience in the US Senate investigations after the 1929 stock market crash, Ferdinand Pecora, the Senate Banking Committee's examining counsel, wrote in 1939 that the examinations "had certainly proved a shocking disclosure of low standards in high places", including the top echelons of the major banks. Sadly, in the 21st century with so many network effects around to magnify what Nassim Taleb calls scalable strategies, the opportunities for smart practice are endless.

The Banker, as Tragic Hero

It is easier to rob by setting up a bank than by holding up a bank clerk.
[Bertolt Brecht]

Despite Brecht's truism, consider the strange case of Bear Stearns. According to news reports at the time, on one day in March 2008, Bear Stearns was sitting on \$17 billion in cash and liquid assets while three days later, on the Friday, it could not meet a \$4 billion repo call and so went to the Federal Reserve. By the Sunday shareholders were wiped out and the bank had been handed over to JPMorgan Chase with a government guarantee. In between, Moody's and Fitch had downgraded Bear Stearns to near junk status, key counterparties had either failed or were teetering, others were calling margin or pulling their deposits, the share price collapsed, credit spreads on Bear Stearns had shot up, collateral requirements increased and rumours spread that hedge funds were betting on a fall. The Fed was talking about a new asset swap regime for GSE quality paper but that would only kick in after a couple of weeks. Everything happened so fast!

Markets and fair value driven by fear

Traders complain that in such conditions markets and fair value are driven by fear rather than fundamentals. The sub-prime fuss involved markets of between \$1 trillion and \$1.5 trillion. Many trillions more loomed in the background: mortgage-backed securities at over \$6 trillion. According to ISDA, global credit default swap (CDS) markets had a nominal gross open credit exposure of more than \$50 trillion, while nominal open interest on all OTC derivatives was an order of magnitude greater. In 2007, contagion spread rapidly from sub-prime MBS to asset-backed commercial paper issued by SIVs and conduits, then to general MBS, auction rate securities and the repo markets critical for overnight funding. More assets became toxic as balance sheets, time horizons and market liquidity deteriorated.

A solution needs to be systemic

Given the complexity of modern, global banks, how can individuals integrate all the views? There is either too much detail and diversity, or too much simplification, compounded by an accounting regime deliberately discarding data. The "naughty banker" or "bankster" thesis blamed short-termism in remuneration and asymmetric information flows. Bankers also shared responsibility for chasing high returns on equity, lacking controls, mispricing risk, selling opaque financial products and showing poor duty of care. But a solution is bigger than any one firm: it needs to be systemic.

Losing Control

For a normal trader, a gain of €30,000 to €40,000 was a good day... For me, €1m was a rubbish day... I made astronomical gains which gave me, sometimes, an orgasmic pleasure.
[Jérôme Kerviel]²⁴

Risks always arise where human frailty, ambition and loss of control coincide. The rogue trader, Jérôme Kerviel, claimed he made enormous profits for Société Générale by taking enormous risks and that his supervisors were aware of what he was doing. His very profitability should have been a warning signal to his supervisors. Although Société Générale seems to have had a sophisticated risk management system, it clearly had gaps. Given the rapid innovation and complexity of technology and procedures in the securities industry, even tight designs can quickly "decay" and become "leaky" from a security and control point of view.

During the boom this loss of control allows managers to loot their shareholders by rewarding themselves excessively, and 1,001 dodges create what J.K. Galbraith called the bezzle. Looting and embezzlement are significant inflators of the bubble. It is as if the party does not start to swing until the freeloaders arrive. Yet sooner or later the chickens come home to roost: for every boom there's a bust.

In boom years regulators tend to play master of ceremonies, choreographing the detail of ritual process. They get swept along too. Only when the bubble is near to bursting, when the dodgy deals are about to break cover and the victims begin staggering in, do the regulators start to take an interest in financial crimes. Pity the honest banker, the shareholder and the taxpayer, who have all been fleeced by the rogue trader or looted by celebratory dinners after the bonus round.

Benchmarking takes away responsibility

To keep out the crooks, bank management often makes more frequent evaluations of performance, but there is a "Catch 22". The more we mark to market, the more we use arbitrary, short-term prices for valuations and bonus or commission calculations. Similarly, aggressive benchmarking takes key decisions and responsibility away from financial professionals, restricting investments and the use of alternative valuations. The need to make money in the short term can lead to cheating, for example parking low-risk funds overnight in a high-risk account to beat a benchmark. And that's OK because society will pick up the true costs.

24. Quoted in "Jérôme Kerviel: Secrets of the rogue trader" by LICHFIELD, John, *The Independent* [23 January 2009]

In some cases risk controls worked and serious issues were flagged up, but then senior management shot the messenger. Paul Moore, former head of group regulatory risk at HBOS, claimed to have been dismissed after raising warnings.

When things go wrong, management too blames procedures and redoubles its efforts to "change the culture". The danger is that the new culture, whether dreamt up by the regulators or the latest business gurus, may simply undermine traditional virtues and values, as staff learn to sway with the wind of each new wave of religious fervour. All this creates a myth of control and masks the reality of underlying weakness.

Chapter 5: Fundamental Failures

There are no secrets to success. It is the result of preparation, hard work, and learning from failure.

[Colin Powell]

Managing risk is all about avoiding failure, so it is immensely important to understand how things fail.

1. Liquidity Inflation

Liquidity is to a large extent a public good. It is a property of assets that can disappear when trust and confidence disappear...banks should not be required to hold more inherently liquid assets than is necessary for the ordinary conduct of business during ordinary markets. For the rest the central bank has to be on stand-by.

[Willem Buiter]²⁵

Do we have the self-discipline for slower growth?

Liquidity inflation distorts market prices on the way up and down, which is why it is so dangerous. Globalisation and technology stoked the boilers of "irrational exuberance", and when governments obliged with low interest rates and regulators with high leverage allowances, liquidity inflation soared. The boom was built on easy credit and banks held only enough liquid assets for "ordinary markets", which presumed low volatility around continuing non-inflationary credit expansion, the "NICE" conditions. Central banks too thought in "ordinary" terms. Of course, if central banks and regulators only managed for the worst case, they would seriously hamper growth. Do democratic electorates or politicians have the self-discipline for slower, but less crash-prone, growth?

The funding gap of UK banks grew from nil over deposits in 2000 to £750 billion by 2008. In the US between 1980 and 2007 securitised funding of private non-financial debt rose from less than 30% to more than 55% of total bank assets [Greenlaw *et al.* 2008]. According to Kevin Walsh²⁶, Federal Reserve Bank governor, securitisation volumes peaked in 2006, funding over 25% of net borrowing in the US credit markets. He stressed that the liquidity squeeze was more fundamental than sub-prime housing in the unfolding crisis. The contagion spread rapidly across asset classes since mortgage-backed securities were frequently used as collateral for repos, which funded other investment.

Earlier, Walsh²⁷ had emphasised the international sources of liquidity, which raises the question of whether the failure in confidence was linked to the fall of the dollar. Two highly leveraged German banks with offshore conduits in Dublin were early casualties in the summer of 2007. Not only were these banks suffering losses, but their US asset

25. BUITER, Willem, evidence to the House of Commons Treasury Select Committee [13 January 2009]

26. WALSH, Kevin, "Financial Market Turmoil and the Federal Reserve: The Plot Thickens", speech to New York University School of Law [14 April 2008]

27. WALSH, Kevin, "Market Liquidity: Definitions and Implications", speech to the Institute of International Bankers [5 March 2007]

values in euros were declining as well, so cutting their losses at fire sale prices would dramatically impair their balance sheets. Moreover, Walsh notes, "high liquidity is generally accompanied by low risk premiums". In other words, a sudden shift in perceptions of risk premiums will magnify the adverse impact on liquidity.

Two species of liquidity

Sir Andrew Crockett, former general manager of the Bank for International Settlements, identifies two species of liquidity:

- Market liquidity – the availability of buyers and sellers who will trade a given instrument at a reasonable spread in reasonable size on demand and who are resilient to disturbances;
- Funding liquidity – the ability of a financial firm to meet its short-term cash commitments and ongoing operating expenses when they fall due.

It is possible to have one without the other, but they are closely linked in times of crisis when firms try to convert assets into cash. The Bank of England uses, for example, market liquidity indicators incorporating bid-ask spreads, return-to-volume ratios and estimated liquidity premia.

When market liquidity gets squeezed, it can morph suddenly into liquidity black holes that bear a strong resemblance to bank runs. Janeway states that "when average opinion comes to believe that average opinion will decide to turn assets into cash, then liquidity may be confidently expected to go to zero."²⁸ People head for the exits. The ones who precipitate the crisis have their cash, while the laggards are left penniless. As Brandon Davies, a founder of the Global Association of Risk Professionals (GARP), points out, in a black hole "he who panics first, panics best", while in a liquidity boom Michael Mainelli says, "he who smugs first, smugs best".²⁹

Rarely there when you need it

Liquid markets are both good and bad. Liquidity attracts liquidity because of the network effects of a larger pool and a keener price. Traders obviously like it because it is easier to trade and reduces risk. However, Michael Milken, the 1980s junk bond king, who also launched the first CDO, once remarked: "Liquidity is an illusion. It is always there when you don't need it, and rarely there when you do." A number of economists question the notion that liquidity is inherently good or bad. O'Hara³⁰ summarises Keynes's, Tobin's and Summers's criticisms as "liquidity begets instability". The ability to buy and sell easily, as well as false perceptions of apparent ease, might drive short-term markets but exacerbate market panic during crises. Yet liquidity is like most things, good in moderation, but bad in extremes.

Avinash Persaud, of Intelligence Capital, and others have pointed to problems with the structure of today's markets that increase their susceptibility to liquidity disruptions:

- interlinked global markets – liquidity problems now reverberate across markets and borders and there is greater correlation among asset classes;

28. JANEWAY, William H., "Risk versus Uncertainty: Frank Knight's "Brute" Facts of Economic Life", Social Science Research Council [19 October 2005]

29. MAINELLI, Michael, "Liquidity=Diversity", *Journal of Risk Finance*, Volume 9, Issue 2 [2008]

30. O'HARA, Maureen, "Liquidity and Financial Market Stability", National Bank of Belgium, Working Paper, Number 55 [May 2004]

- more rigorous and regular benchmarking – constant appraisal induces people to track benchmark indices in similar ways and to buy or sell at the same time;
- regulatory homogenisation – common strategies, credit policies and margin requirements can lead to selling frenzies;
- information systems commoditisation – using similar analytics and computer systems increases the likelihood of similar trading and investment strategies.

Our global system for the dispersion of risk may well have contributed excess liquidity in the form of *short-term* liabilities. After reviewing financial sector behaviour across many cycles, Tobias Adrian and Hyun Song Shin³¹ conclude: "Our look at how banks and other financial intermediaries manage their balance sheets reveals that these institutions increase their leverage during asset price booms and reduce it during busts. This pro-cyclical behavior is likely to exacerbate financial market fluctuations as institutions overturn the normal supply and demand responses by buying assets when the price rises and selling them when the price falls." They define financial market liquidity as the growth rate of aggregate balance sheets or, more specifically, as "the growth rate of repurchase agreements"; in other words, collateralised interbank lending. They note the huge growth in repo trading and the correlation with monetary policy. A looser monetary policy increases repo volumes and leverage. Without leverage many financial models cannot work, for example, hedge funds' "two and twenty" charging structures.

It is excess liquidity we need to watch

Consumer price inflation (CPI) and money supply are now probably less important than rising liquidity driven by leverage. Broad lending rates rather than the money supply take on new significance, partly due to the rise of the shadow banking system, whose expanding balance sheets are excluded from the money supply figures. Whether rising liquidity manifests itself in a bull market, house price inflation, consumer price inflation, commodity-energy prices, it is the excess liquidity that we need to watch.

Some economists (and politicians) argue that confidence is all important. Yet the science fiction novelist Philip K. Dick put it nicely: "Reality is that which, when you stop believing in it, doesn't go away." Debt doesn't go away. A drop in creditor nation dollar recycling doesn't go away. When we leverage ourselves beyond our means, a correction is inevitable, regardless of "confidence" induced by Keynesian pump priming or anything else, particularly if the debt-generating behaviour is still in place.

2. Extreme Connectivity

Connectivity, Speed and Intangibles – the derivatives of time, space and mass – are blurring the rules and redefining our businesses and our lives.

[Stan Davis and Christopher Meyer 1998]

The Scrunch is about connectivity and feed-through. In the late 1990s many business gurus made a fortune with breathless panegyrics to the internet. Marshall McLuhan

31. ADRIAN, Tobias and SHIN Hyun Song, "Liquidity, Monetary Policy, and Financial Cycles", *Current Issues in Economics and Finance*, New York Federal Reserve Board [January-February 2008]

The world becomes flatter

had been right back in 1964: the medium *is* the message; we are living in a global village. The dot.com boom and bust did not really change anything. We would just arrive at the global village a little later. If liquidity provides the flow, connectivity provides the plumbing to pump it round the system.

Extreme connectivity accelerated the systemic feed-through mechanisms on all levels, creating more leptokurtic exposures and increasing volatility. Walt Lukken, of the Commodity Futures Trading Commission (CFTC), recognised this fundamental shift in 2006, when he spoke of the world becoming flatter:

"Without regard to borders or government ideologies, individuals and businesses today have the tools and abilities to communicate with each other and allocate capital and intellectual assets to where those resources can be utilized most efficiently with minimal cost. This technological and communications revolution has become the great equalizer or 'flattener' around the global economy, empowering individuals around the world to compete successfully with more established 'brick and mortar' businesses."

Lukken concludes that derivatives may be one of the "flattest" of global industries. His "aha" moment came when he realised that electronic traders in Gibraltar could now compete directly with the Chicago traders in the pits. "Clearly a flat world gives the advantage to the Rock over the Windy City," he concluded, given their off-shore tax and regulatory concessions. He traced this flattening across six events:

- the birth of financial futures in Chicago in 1972, after the US closed the gold window with the collapse of the Bretton Woods accord in 1971;
- development of common standards, for example on 23 May 1985 when ISDA first published its standards for swaps trades;
- the birth of electronic futures trading in the early 1990s;
- the US Commodity Futures Modernization Act (CFMA) in 2000, which instituted a rules framework with "a sliding scale of risk-based regulation for exchanges and participants, depending on a product's susceptibility to manipulation and the sophistication of its traders. This tiered structure has allowed a variety of innovative trading models to blossom";
- demutualisation of exchanges: Lukken highlighted 5 December 2002 when Chicago Mercantile Exchange went public;
- regulatory arbitrage, such as February 2006, when the CFTC issued a no-action letter to the Intercontinental Exchange (ICE) to trade "West Texas' Intermediate" crude oil futures electronically with cash settlement in competition with NYMEX. The CFTC felt constrained to approve this, according to Lukken, because of an FSA precedent in the UK, even though the Commission had concerns about market manipulation.

This illustrates how regulatory, financial and technical innovations combined to create the *extreme connectivity* of the global financial system, increasing leptokurtosis and accentuating the economic cycle.

Regulatory innovation encouraged:

- homogenisation of behaviour and crowded trades and triggers;
- pro-cyclical lending, underpinned by IFRS and Basel II combined with optimistic hedging and short term funding rules;
- credit risk transfer and relaxation of leverage rules;
- pressure on affordable housing for client electorates leading to growth of complex financial products to hedge the risk;
- democratic deficit with impulsive decisions taken behind closed doors due either to industry lobbying or crisis conditions.

Financial innovation provided:

- complex, opaque products and indexed or tranching pools of opaque products;
- credit risk transfer focused on hard measurable indicators for credit underwriting decisions, ignoring traditional soft indicators and peer pressure;
- contingent rules and embedded leverage in the products, executed with robotic speed and insouciance;
- increasing uncertainty around higher moments of risk: volatility, momentum, confidence factors, and the sensitivity skew of delta/gamma/vega hedges, the fat tails of which were not covered by their models;
- a colourful array of complex derivatives that essentially priced sentiment, transforming emotions into tradable values, opening up opportunities for speculation or market manipulation, and increasing the focus on the ultra short-term.

Technical innovation provided:

- ever-faster, ever-smarter webs of interconnection and global electronic trading collaboration;
- data deluge of billions of market price movements per day demanding ultra-low-latency messaging capacity;
- a progressive linking of pricing models to a web of externalities to the underlying trade;
- prediction of nearly everything for global, cross-asset, cross-jurisdiction trading using grid computing to make the regulatory and financial innovation practicable.

Huge spike in implied volatilities

Gertrude Tumpel-Gugerell, executive board member at the European Central Bank, noted the effect of extreme connectivity on equity volatility in 2003. Historical and implied volatilities on stock options had doubled from about 15% to 30% in a matter of six years on European and American stocks. She attributed this to, among other things, technology and questioned whether such pricing volatility might have an adverse impact on capital allocation decisions. More recently she pointed to the huge spike in implied volatilities on stock options on the DJ Eurostoxx index from 15% in 2006 to more than 75% in late 2008. In Chicago the CBOE VIX volatility index hit nearly 90 in October 2008 before falling back to 60 in December. It is hard to imagine such volatilities without the speed and connectivity of electronic trading and straight-through-processing. The *Financial Times* attributed the American volatility to the use of "aggressive algorithms" based on

intraday pricing feeds³². The linkage between equity and derivatives markets is also increasing, with some market participants suggesting that 20% or more of US equity trades probably involve a derivative play. In London anything up to 40% of equity trades are now said to be driven by contracts for differences (CFDs).

Together, these innovations translate into faster systemic feed-through and complex chains of systemic causality. People using similar models add to homogenisation and leptokurtosis. Much of this risk was concentrated in fewer than 20 global sell-side brokerages at the investment banks – in their roles as brokers for the buy-side, issuing dealers for derivatives and proprietary traders. Failure became almost inevitable.

3. Deluded Demutualisation

Competition has been shown to be useful up to a certain point and no further; but cooperation, which is the thing we must strive for today, begins where competition leaves off.
[Franklin D. Roosevelt]

We have to work to keep markets in balance

Historically, capitalism involved considerable co-operation in the form of mutual societies, which exerted peer pressure. Credit expansion, borrowing short to lend long, works only as long as everyone works together to keep things in balance. There is plenty of room for competition but only within the rules, what Adam Smith called justice. When things get badly out of balance, or when participants dump each other for a quick profit, the system will collapse. This is what the conservation of risk and the law of tail risks are all about. We have to work to keep markets in balance, they do not do it on their own or only over the very long run, by which time we are, as Keynes noted, all dead. That "work" is the mutual recognition that we cannot rock the boat. If all the weight is lined up on one side of a boat it capsizes. The same thing happens to the system if all the money bets against one participant. Before we had the Fed, US banks recognised this and protected each other. With the Fed providing the ultimate backstop, individual firms do not have to work together and the system becomes more fragile.

Mutuality is more than just "mutuals", but take the UK building societies as an example. Members share in the value of the society, but they need to share in the risks as well if peer pressure is to work. Yet if their deposits are protected by the taxpayer through the Financial Services Compensation Scheme, members cease to worry about what management is doing because their risks are covered. Indeed, they encourage risk taking because it is not their risk. The mutuality is lost. So, building societies have been demutualised with the blessing of well-meaning governments that also seem to have largely got rid of bankruptcy for banks. What is left? Perverse incentives, liquidity inflation and the vortex of extreme connectivity.

Mutuality is about pooling of risk and caring for the community through enlightened self-interest. Once you remove pooling you remove automatic stabilisers in the system. Prudential controls are about not rocking the systemic boat for everyone else, as well as ensuring that we can meet our own commitments, hence our word is our bond. So, the solution to the toxic debt challenge might be more mutuality to share the overall losses and thus encourage everyone to work to minimise them at a systemic level.

32. GANGAHAR, Anuj, "Algorithmic trades heighten volatility", [Financial Times](#) [4 December 2008]

A culture of sharing and solidarity

Decline in Mutuality

Mutuals used to be ubiquitous, from building societies and credit unions, to stock exchanges and credit card networks. They provided diversity, social cohesion and community. The classic objective of a mutual is to provide goods and services financed in the interests of its members, with governance based on one member one vote, and no member rights to net assets. Mutuals differ from co-operatives, which normally involve the collaboration of a group of suppliers with governance based on invested share capital and rights to net assets. However, mutuals and co-operatives both encourage a culture of sharing and solidarity, while their organisational differences from the public company model increase diversity.

While mutuals may still have a competitive advantage in establishing trust, which gives them cheap capital and valuable relationships with their members, John Kay³³ has argued that "conflicting expectations of different users and slow adaptation to changing technology in the face of vested customer interests" undermined their viability. Trust was a competitive advantage as long as they remained small, but "the best of them grew large and their managers pursued growth and diversification. Once mutual companies became large financial conglomerates and gave sales targets to employees, they seemed indistinguishable from other financial institutions. Success eliminated the factors that had given rise to that success." It also undermined mutuality by accumulating reserves and goodwill that could be tapped in windfall profits by the carpet-baggers.

Their limited size and collective governance should limit the risk of agency problems and make them inherently conservative and slower moving. Society needs innovation and thrusting personalities to move forward, but it also needs prudence and caution, independence and diversity to allow the wisdom of crowds to counter-balance the irrational exuberance of the mob. Clearing houses with mutual indemnity arrangements have performed well, perhaps because they were over-collateralised.

Milton Friedman and Anna Schwarz³⁴, in their monetary history of the US, made the case that the Fed turned a normal recession, starting with the Wall Street crash of 1929, into the Great Depression by not providing liquidity to the system. Prior to the Fed, i.e. 1907, local banks formed clearing houses to stop runs and large banks would help out smaller banks knowing they too could be at risk. However, once the Fed was supposed to bail out the financial system, large banks no longer saw it as their job to support the locals, nor were they at risk since the Fed backed them. But the Fed did not come to the rescue. So the small banks collapsed and progressively larger ones too, the money supply contracted, the public lost confidence in the banks and hoarded money, and the crash became the Depression.

One recommendation for reform is to increase mutuality at key points of conflict in the system to encourage social connections that moderate systemic behaviours. Yet excessive reliance on mutuality would also be self-deceptive and unworkable.

33. KAY, John, "The recipe for a mutual success", *Financial Times* [9 August 2000]

34. FRIEDMAN, Milton and SCHWARZ, Anna, "A Monetary History of the United States 1867 to 1960", Princeton University Press [1971]

The Fed did not come to the rescue

We see an increasing convergence of behaviour

Rise of the Virtual Market Monoculture

Alongside demutualisation we have seen a rising monoculture of reckless self-interest that undermined the old simplicities. Curiously it may have been encouraged by the blurring of distinctions between the public and private sectors that came with the regulatory state, regulating private companies in the public interest, and the growth of social enterprise, for-profit organisations committed to a common social purpose. "Third Way" institutions evolved as left-of-centre politicians sought to find a path between free markets and socialist aspirations. But were they able to fill the gap left by the mutuals?

In theory, social enterprises devote their financial surpluses to achieving their social aims rather than generating a return on investment for owners, and many good works are done. They comprise a wide range of institutions from housing associations to the trading arms of charities and trusts. In practice, they often struggle in weak markets and risk being co-opted into the values and agendas of the companies and governments they work with. While we appear to live with an increasing diversity of institutional forms, we actually see an increasing convergence of behaviour, a growing monoculture focused on the market.

The traditional equivalence of a company brand with a defined group of people producing a product or service has, however, also blurred into complex supply chains and interdependencies. Although joint stock companies form the core of the private sector, new vehicles confuse the picture with growing webs of private equity cross holdings, agency agreements, outsourcing, joint ventures and other distributed, or virtual, operations. Traditional mutuals and social enterprises alike have been sucked into this evolution, homogenising their behaviour and expectations through ever more institutional connections.

In the financial sector this gave rise to the "shadow banking system", which includes:

- private equity and hedge funds;
- "near" banks – special investment vehicles (SIVs), special purpose vehicles, conduits, money market funds, government sponsored entities such as Fannie Mae and Freddie Mac.

Shadow banks are bank-like in that they can create money through leverage, but they have not been regulated as banks. Indeed, many shadow banks emerged in response to regulation as off-balance-sheet methods to manage assets and credit. Such "qualifying special purpose entities" exploited loopholes in regulations introduced to control off-balance-sheet activity after the Enron scandal.

This blurring has been exacerbated by other institutional arrangements that have an impact on market dynamics. Notably, changes to the US bankruptcy legislation in 2006 allowed creditors to unwind trades on derivatives transactions even in a situation where bankruptcy is pending. The investment banks supported the change thinking it would protect them from hedge fund insolvencies. In fact this allowed hedge funds to drain Bear Stearns, Lehman, AIG and others, knowing they could

Governments like banks to be big

not seek Chapter 11 protection from their derivative counterparties. The previous situation had been uncertain, but the current situation means that some market participants are now too connected to save within Chapter 11, which forces the regulators either to let the banks fail or to launch a pre-emptive rescue.

In the NICE years, the banks and shadow banks surged, mobilising funds and increasing leverage and liquidity. By focusing capital on shadow banking counterparties, which in some cases had leverage levels as high as the investment banks themselves, and by drawing on huge investments from the global creditor countries, US and European banks turned fractional reserve banking into astonishing levels of credit expansion. Timothy Geithner, when head of the Federal Reserve Bank of New York, described how the top 10 banks controlled around half of US banking assets in 2006, as opposed to less than a third in 1990. Through the shadow banking system they controlled or influenced much more.

Governments like banks to be big so they can mobilise the huge sums needed to implement policy. People are impressed by the net earnings of these banks, which are presumed to have large economies of scale. But perhaps high earnings are more about lack of competition, the price momentum of assets under management, liquidity bubbles, under-provisioning of reserves or the government's management of the economy, than about the skill of bank staff. Banks operate in markets that are neither free (from supervision) nor open (to competition).

However, the monoculture has been further blurred and homogenised by the breakdown of the ownership concept itself. Equity voting rights form the pillar on which private ownership is based. Hu and Black, in their 2007 study on hedge funds and morphable ownership, describe how multiple share types, short selling and equity derivatives are transforming the very nature of one-share-one-vote ownership, concluding that serious distortions of market dynamics can occur. The volatility in VW shares in the autumn of 2008 is a case in point, where Porsche apparently managed to control most of the free shares either directly or via equity options. For a short period, VW became the most highly capitalised company on earth as hedge funds scrambled to cover short positions! Yet another example of how mark-to-market in a strict sense may not be reliable for fair value, but also of the increased disassociation of shareholding from the mutuality of the old joint stock company model. Similarly CDS protection on corporate bonds may break the mutual interest of bondholders in a bankruptcy reorganisation or reinforce a short equity position, as highlighted recently by George Soros³⁵. Thus ownership and control become blurred and gamed by stealthy financial speculation.

This evolution of decreasing mutuality and increasing monoculture creates real challenges for supervisors, investors, voters and managers alike. It increases homogenisation of behaviour, it weakens automatic systemic stabilisers, and intensifies the agency problems between owners and managers. None of the remedies for the Scrunch currently being discussed really addresses these issues that undermine stability.

35. SOROS, George, "One Way to Stop Bear Raids", [Wall Street Journal](#) [23 March 2009]

Bonuses as a mark of celebrity

‘Determination to do more of the clever stuff’

4. Perverse Incentives

An infectious greed seemed to grip much of our business community. It is not that humans have become any more greedy than in generations past. It is that the avenues to express greed had grown so enormously.

[Alan Greenspan 2002]

When the economy bubbled with growth, bankers celebrated annual bonuses as a mark of celebrity, like pop stars and footballers. When it all started to crumble, perverse incentives were found everywhere, and not just for the bankers or hedge fund managers, but for credit rating agencies and regulators as well. The Fed's asymmetric "Greenspan put" encouraged people to bet during bubbles, knowing their bonuses would be paid and that they held golden parachutes. On the whole they were right, although a few had to take some stick after their golden jump. Banks' customers and shareholders, or taxpayers, have paid the price rather than executives.

There are many areas where risks and rewards between principals and agents are misaligned. Take stock options. While less buoyant markets and requirements to expense options have lessened their attraction, it is arguable that options should never be used for management remuneration. Options increase in value as share price volatility increases, thus rewarding managers who create volatility in their company's shares. Empirical studies show that shareholders value companies with lower volatility, so options perversely give managers incentives to *decrease* shareholder value. Thus options, *ab initio*, divide the interests of managers and shareholders.

Regardless of the risks involved, remuneration committees – populated by other companies' executives who also benefit from options – continue to recommend them. Institutional investors, who may themselves enjoy similar incentives, may genuinely believe that they generate long-term profitability. As long as everyone is doing it, it is difficult not to follow suit. Genuine equity in the form of restricted stock and longer-term incentives based on competitive benchmarks are preferable. Nevertheless, so long as options are an option, quick-fixers will opt for these non-optimal methods.

When agents extract value from others without contributing to productivity, and sometimes at the expense of sustainability, the behaviour is termed "rent-seeking". Adair Turner, chairman of the Financial Services Authority (FSA), in his 2009 Review, highlighted two perverse factors, bubbles and rent extraction, that tended to swell the size of the banking sector in relation to other industries:

"The illusory (short-term factor)...arises from mark to market profits in a rising market. If the bank and near-bank system in total holds a net long position in those assets which we mark to market – which it does – and if irrational exuberance can push the price of those assets to irrationally high levels (which I think it clearly did in the years running up to early 2007) then mark to market accounting will swell declared profit in an unsustainable way, but in a way which, reflected in bonuses, may reinforce management and traders' determination to do more of the clever stuff, which is delivering those profits...The possible long-term and harmful possibility is rent extraction."³⁶

36. TURNER, Adair, "The Financial Crisis and the Future of Financial Regulation", speech at The Economist's Inaugural City Lecture [21 January 2009]

**We over-pay
for luck**

A Failure to Remunerate

There are at least three conflicts that emerge from our desire to link remuneration with accountability. The first conflict is that we tend to value "commission over omission". We want to believe that people made a difference. We over-pay for luck, we under-appreciate preparedness and we under-penalise failure to anticipate. Remuneration committees find it difficult to account for luck.

The second conflict is that we value "losses over gains". Remuneration committees are happy to pay out when things are going well. In fact, when things go very well they pay out too much. But when losses occur, they tend to make people suffer too much for both accidents and mistakes. Given that losses are disproportionately penalised, yet serious remuneration only kicks in for positive results, an unintended result is to increase risk-taking. If you get paid well for gains, but get kicked out for small mistakes, you might as well risk a big mistake.

The third conflict is that we value "present over future". Preparing a company for the future is not as important as good results today. This leads to under-investment. We tend to discount the future at such a rate that we tend to penalise the person who plans for a rainy day if the rainy day does not arrive. We tend to reward the person who does not plan for a rainy day so long as it does not rain or, when it does, everyone else is rained on too. Since returns are directly related to risks, should not exceptional returns be presumed to entail higher risks and, therefore, the payout of incentives be spread over longer periods?

Methods of accountability require measurement, but evaluation also requires judgement. Measurement can displace judgement. Professor Marilyn Strathern's statement of Goodhart's Law is: "When a measure becomes a target, it ceases to be a good measure." As Goodhart noted, "financial institutions can...easily devise new types of financial assets," which may slip through the good intentions of the remuneration committee.

One corollary to Goodhart's Law might be: "When a target is overtaken by time pressures, it turns into a measure of popularity." There are numerous examples where remuneration committees either cannot or will not take responsibility for agreeing that today's actions are, or are not, a responsible approach to the future. Performance is evaluated on historical numerical benchmarks rather than taking subjective, future probabilities into account. Instead of evaluating a fund manager on long-term prospects they evaluate on just this year's performance (tough if he or she has just had a bad year), killing the fund manager's interest in long-term prospects. Current available measures are more likely to be popularity measures, such as growth of funds under management.

**The pursuit of
popularity**

This pursuit of popularity is evident in CEOs seeking to be on the front covers of business magazines, in managers pursuing popular strategies rather than correct ones (no one ever got fired for following the herd), in regulators pushing people to do what others are doing or remuneration committees relying on outside consultants

In effect looting the company

who judge whether management is doing what everyone else is doing. In a financial system where we value commission over omission, losses over gains and present over future, all the while measuring popularity, it is no surprise that we increase risk.

It is difficult to devise remuneration policies, especially for banks with implicit government guarantees. Citing the US savings and loan scandal, Enron, junk bonds and other scandals, Akerlof and Romer argue that companies have "an incentive to go broke for profit at society's expense (to loot) instead of to go for broke (to gamble on success). Bankruptcy for profit will occur if poor accounting, lax regulation, or low penalties for abuse give owners an incentive to pay themselves more than their firms are worth and then default on their debt obligations."³⁷ On that basis, bankers that under-allocate reserves and pay out more in bonuses than they are worth on a long-term basis are in effect looting the company and relying on government guarantees to bail them out.

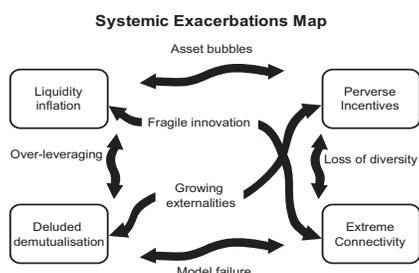
People want to punish the banksters. Yet simplistic punishment does not teach; it tends to be based on false conclusions and leads to a feeling of victimisation. Instead of trying to blame people for being in charge we need to think much more creatively about how we remunerate in ways that will improve the systemic results over the long term.

37. AKERLOF, George A. and ROMER, Paul M., "Looting: The Economic Underworld of Bankruptcy for Profit", NBER Working Paper Number R1869 [April 1994]

Chapter 6: Systemic Exacerbations

It may sound like a counsel of despair but the best thing may simply be to hunker down and wait for prices to adjust and for the banks to restore their reserves so they're once again willing to lend.

[Sir Howard Davies 2008]



Six systemic exacerbations – over-leveraging, model failure, fragile innovation, loss of diversity, asset bubbles and growing externalities – magnify the four fundamental failures: liquidity inflation, extreme connectivity, deluded demutualisation and perverse incentives.

1. Over-Leveraging: Deluded Demutualisation meets Liquidity Inflation

When two German banks with off-shore special purpose vehicles in Ireland ran into trouble in 2007, the German regulator appealed to the Irish regulator. The Irish regulator rejected responsibility since the SPVs were not regulated entities. The arbitrage opportunity had been created by the EU decision to deprive the Landesbanken of their state guarantees. During a transition Landesbanken were still able to borrow cheaply and invest in high-yield mortgage securities. Huge leverage was gained with minimal supervision.

When liquidity inflation intersects with demutualised vehicles, leveraging works faster. It works mostly on the liability and funding side of the balance sheet, just as loss of diversity works on the asset side. Both are examples of private excess. Excess leverage caused the asset bubble and deleveraging accelerated the crash. Adair Turner concluded³⁸: "The more that we can ensure that bank deleveraging takes the form of the stripping out of inter-trader complexity, and the less it takes the form of deleveraging vis-à-vis the non-bank real economy, the better."

Where there is less consensus is on what we actually *mean* by leverage. Sometimes it means excessive borrowing, sometimes, a way to increase returns by focusing risk, as in the embedded leverage of derivative structures or carry trades. Thus risk sensitive regulation can actually encourage leverage. There are debates over the extent to which low interest rates and growth in the money supply, or credit, were important factors on the boom side, and over the role of exchange rates and fiscal policy in the downward

38. TURNER, Adair, "The Financial Crisis and the Future of Financial Regulation", speech at The Economist's Inaugural City Lecture [21 January 2009]

**Deleveraging
accelerated
the crash**

Even mutuals are swept along

swing. Does impending tax inhibit spending, for example? The velocity of money in the US has fallen to about half its historical level. Everyone seems agreed that Basel II and IFRS fair value accounting had pro-cyclical effects, but there is less agreement about how that interacted with leverage. How important were hedge accounting and short-term funding rules? Some place the emphasis on one factor, some on another.

Listed companies focus on quarterly earnings and daily market sentiment. When money is plentiful and credit spreads have tightened – periods of high liquidity inflation – the cost of borrowing falls and the temptation to leverage rises. During a bull market leverage adds to returns on equity, encouraging companies to join in the credit binge. Because governments have replaced mutual consortia as lenders of last resort, there are few constraints. The more firms leverage their balance sheets, the more money they make. Leverage in pursuit of "shareholder value" increases instability, favouring the short-term investor. Shadow banks, operating beyond regulatory control, can leverage even more. Liquidity rises, so do asset prices; even mutuals are swept along. When the economy moves into recession, short-term liabilities need to be rolled over. Counterparties call for more collateral. Assets are sold off in falling markets, which spooks counterparties even more, leading to higher haircuts on margin calls. As prices slide, loan covenants are breached and lenders tighten terms.

Some have called for leverage to be controlled directly by the regulators, and the SEC's 2004 Net Capital rules suggest limits are feasible. But, as the Group of 30 indicated, leverage controls need to be debated within a systemic context. This should include rules on liquidity and maturity mismatches, insolvency and Chapter 11 protection, derivative counterparty rights and fair value accounting, as well as the impact on loan covenants and the shadow banking system. It is all so interdependent.

2. Model Failure – Excess Connectivity meets Deluded Demutualisation

Although it is true that it is the goal of science to discover rules which permit the association and foretelling of facts, this is not its only aim. It also seeks to reduce the connexions discovered to the smallest possible number of mutually independent conceptual elements. It is in this striving after the rational unification of the manifold that it encounters its greatest successes, even though it is precisely this attempt which causes it to run the greatest risk of falling a prey to illusions.

[Albert Einstein 1940]

Models - regulatory, financial, technological - form the core of our connected world. Connectivity happens through the cascading interaction and accelerating dynamics of models. In deluded demutualisation, the brakes of prudent mutuality are replaced with the "pedal to the metal" private mind-set complete with its racy new models. The complex interaction of cultural change with poorly understood models means failures are inevitable. Portfolio models and quantitative economic or technical market models drive the decisions on what and when to trade. Execution algorithms drive how and where to trade. Execution strategy models link portfolio models

These models are at best approximations

to trading execution models to decide, for example, which broker to use, which algorithm or smart order router to use, or whether to bring in a human trader. Post-trade models evaluate best execution and broker performance. Value-at-risk and real-time profit-and-loss models signal excessive risk.

Despite challenges by Benoît Mandelbrot to classical portfolio theory and Nassim Taleb to risk modelling based on normal Gaussian distributions, a typical reaction is: "I don't care how it works if it helps me make money". Avinash Persaud and colleagues³⁹ point to the homogenising role of the Gaussian copula model for mark-to-market valuation with its "implied correlation" coefficient. This was key to the pricing of CDOs and other structured products. Yet, if human behaviour is not Gaussian, these models – already limited by insufficient historical data – are at best approximations. They fail to capture either behavioural changes or extreme events. In a crisis, correlation increases as default rates increase. As Persaud says: "The major weaknesses in the CRD (capital requirements directive) stems from the flawed regulatory model of Basel II – a model that attempts to approximate a bank's regulatory capital to its economic capital without directly focusing on the externality of systemic risk – and hence fails to protect society from the social cost of bank risk-taking."

Professor Andrew Lo, of the MIT Sloan School of Management, testified to the House of Representatives' committee hearing on hedge funds in 2008:

"Models...are central to the current financial crisis, and their mis-calibration is one possible explanation for how so many firms under-estimated the risks of sub-prime-related securities so significantly. Unless senior management has the technical expertise to evaluate and challenge the calibrations of these models, they cannot manage their risks effectively."

Even Nobel prizewinners can get it wrong, as the failure of Long Term Capital Management showed. Regulators need to recognise that participant size and their own regulation exacerbate such risks by homogenising and concentrating the aggregate effect. If regulators want to reduce these risks, they should look at the institutional structure of markets and encourage smaller players, diversely motivated and regulated, using different models, and less susceptible to herd behaviour.

3. Fragile Innovation – Excess Connectivity meets Liquidity Inflation

Financial globalization and financial innovation are closely tied, with each trend promoting the other. As a consequence, global regulatory coordination and collaboration are more vital than ever.

[Ben Bernanke 2007]

39. ALEXANDER, Kern, EATWELL, John, PERSAUD, Avinash, and REOCH, Robert, "Financial Supervision and Crisis Management in the EU", European Union Policy Department, Economic and Scientific Policy [2007]

Innovation creates more interdependence

We agree with Bernanke about connectivity and disagree about global regulatory solutions. Global solutions are as likely to exacerbate instability as resolve it, since greater connectivity increases leptokurtosis. If most countries kept their banking industries within their lender-of-last-resort capabilities, there would be less need for such regulatory co-ordination and more diversity globally. Bernanke states: "In some respects financial innovation makes risk management easier...but in some respects, new instruments and trading strategies make risk measurement and management more difficult. Notably, risk-management challenges are associated with the complexity of contemporary instruments and trading strategies; the potential for market illiquidity to magnify the riskiness of those instruments and strategies; and the greater leverage that their use can entail."

Austrian economist Joseph Schumpeter rightly called innovation "creative destruction" and Woody Allen quipped, "if you're not failing every now and again, it is a sign you're not doing anything very innovative." Yet today we emphasise innovation's creative power and neglect its destructive effect. Hyman Minsky, the American economist, worried about the way financial innovation creates more interdependence, reduces transparency and increases unregulated trading and complexity. More seriously it encourages speculation and Ponzi finance. In good times people innovate and borrow to invest; there is a natural progression from:

- hedge finance, where debts are funded by cash flows, to
- speculative finance, where debts are used to speculate and debt rollover is needed to repay existing debt, and finally to
- Ponzi finance, where further credit expansion is used to increase leverage while funding the repayment of debt.

The market becomes increasingly fragile until the weakest credit brings down the structure. US sub-prime failure was only a *trigger* for the collapse, it did not *cause* it. The sub-prime fiasco had a good narrative, but hyperinflated commodity prices could have substituted, or automotive company funding, any trigger would have done.

4. Loss of Diversity– Perverse Incentives meet Excess Connectivity

Contrary to common belief, the liquidity of a market today rests not so much on its size (as measured by market capitalization or turnover) but in the diversity of its participants...But diversity is often richer in appearance than in the reality of behaviour.
[Kern Alexander, John Eatwell, Avinash Persaud and John Reoch 2007]

Many types of herd behaviour

Regulators have traditionally placed great store in diversity to absorb losses, and therefore promoted the benefits of OTC derivatives and structured debt prior to 2007. For example in 2006, Timothy Geithner said: "In terms of enhancing overall market efficiency, the growth of these private leveraged institutions (hedge funds, private equity funds, etc) can be expected to provide benefits in terms of improved liquidity, price discovery via arbitrage, diversity of opinion and diversification opportunities

Crowded trades due to common information

for investors." Analysts have long argued for acquiring diverse assets rather than practising diverse investment behaviour. As a result of the Scrunch, they now talk of many types of herd behaviour in: investment preferences, portfolio holdings, trigger points for trading, market intelligence and macroeconomic responses.

Alexander *et al.* noted: "Supervisors ignored or misunderstood the distinction between risk traders and risk absorbers, and the need for heterogeneity." Consequently regulators wrongly focused on search liquidity, which needs risk traders, rather than systemic liquidity, which needs risk absorbers – people who hold assets for the long run. By obliging firms to use mark-to-market accounting and allocate capital based on Basel II, regulators homogenised behavioural diversity unnecessarily.

In modern portfolio theory, Harry Markovitz and Robert Merton put emphasis on daily earnings at risk (DEAR) limits as the origin of regulatory risk models. The risk metrics of the "enNobeled" economists, Markovitz, Merton and Sharp, became embedded in Basel I in 1996 for market risk, and later in Basel II, and were applied regardless of risk preferences and holding strategies. DEAR models assume statistical independence of risks from actions. This is fine for short-term bank liability management of liquid assets but becomes more debatable for long-term, but less liquid, investment strategies, with high gearing and many feed-forward effects. The imposition of these models systematically underestimates risk in quiet times and overestimates it in periods of stress.

The regulatory obligations for transparency and market disclosure also had an effect. Alexander *et al.* again: "The emphasis on disclosure reduces the diversity of information that has in the past created diversity of views. Today information is ever more readily available, and disclosure of price sensitive information is legally binding before it can be traded upon. Insider dealing on private information is, rightly, characterised as market abuse, but the attainment of equal information is bought at a cost – increased homogeneity and hence potentially reduced liquidity." So not only do we see homogeneity of portfolio holdings based on credit ratings and regulator-preferred asset types, but we also see crowded trades due to common information.

In August 2007 a group of quantitative trading algorithms caused a sudden fall in the market, a mini black hole affecting certain hedge funds with similar trading strategies. The market soon recovered. Khandani and Lo⁴⁰ concluded: "The fact that the entire class of long/short equity strategies moved together so tightly during August 2007 implies the existence of certain common factors within that class." The inference was that they were all using similar software models. Quantitative analysts had independently arrived at similar design conclusions, technical homogenisation, due to common intellectual roots. Traders attend the same seminars and conferences. Many quantitative analysts share ideas anonymously through websites for high-frequency traders. Through the internet they access much of the same knowledge base. The world of ideas for a quantitative trader is actually quite small.

40. KHANDANI, Amir E. and LO, Andrew W., "What Happened To The Quants In August 2007?", *Journal of Investment Management*, MIT Sloan School of Management, Volume 5, Number 4 [2007]

**People float
away from the
fundamentals**

Another source of technical homogenisation is the small number of software packages that support compliance and best practice requirements. While some software is potentially quite rich, most people stick to the basics, or follow pre-defined templates for algorithms. Once again, the outcome is unintended destruction of diversity. Perverse incentives to keep up with the competition combine with increasing transparency and rapid knowledge transfer in connected markets to drive out diversity. This actually encourages crowded trades until all the advantage has been competed away.

5. Asset Bubbles: Liquidity Inflation meets Perverse Incentives

Throughout history, speculative bubbles have usually coincided with outbreaks of fraud and scandal, followed by calls for more regulation once the bubble has burst.
[Kevin J. Lansing 2007]

Asset bubbles power the feed-forward loop that links perverse incentives to liquidity inflation. Urged on by smooth talkers and confidence tricksters, and succumbing to greed, people float away from economic fundamentals into a predictable surprise. Kevin Lansing notes that the meteoric rise is usually accompanied by some "new era" theory (internet, globalisation, no more land) to justify the new level of valuations, and explains how investors can become "locked in" by the momentum of the herd. Others argue that the speculation may be rational, if people believe that conventional wisdom will continue to push markets higher. Everyone seems to agree that bubbles are driven by feed-forward effects, the Keynesian beauty contest. How might regulators nip bubbles in the bud, without inflicting gratuitous damage, to achieve the fabled "soft landing"?

After the November 2008 G20 summit in Washington DC, the final memorandum concluded that international authorities in the medium term "should ensure that regulatory policy makers are aware and able to respond rapidly to evolution and innovation in financial markets and products". In particular, "Authorities should monitor substantial changes in asset prices and their implications for the macroeconomy and the financial system." The conclusion could not have been clearer: regulators must take responsibility for managing bubbles and other macroprudential risks.

That is easier said than done. Professor Goodhart explained the dilemma in his testimony to the Treasury Select Committee early in 2009: "At a time of crisis the tendency of the regulators is to tighten up on everything, but the more that you tighten up, whether it is on capital, liquidity or anything else, the less easy it is for the banks to undertake expansion because you are tightening the controls, and I think that is of greater concern on the capital side than it is on the liquidity side because at the moment there are no real liquidity constraints." The solution is to make the regulation counter-cyclical so you tighten in the boom and ease off in the bust.

6. Growing Externalities: Deluded Demutualisation meets Perverse Incentives

Given the role that hedge funds have begun to play in financial markets – namely, active providers of liquidity and credit — they impose externalities on the economy that are no longer negligible.

[Professor Andrew W. Lo 2007]

A key element of the hot-house monoculture, in which perverse incentives flourished, was the interaction between banks and shadow banks that created huge externalities for governments and the real economy. Banks and investment firms grew accustomed to the liquidity that hedge funds provided. Their activity reassured market makers that they could unwind their positions at the end of day. They smoothed out the peaks and troughs and gave some dependability to the trading curves. They did a lot of risk trading but were also, to some extent, risk absorbers. Redemptions and capital draw-downs have thinned their ranks and left the markets much less predictable. Only now do people realise what a good service these so-called "locusts" provided. Spreads widened, as volumes dropped. When banks suffer they cut back on their credit and investment roles. This hits the main street corporations that rely on them for working capital and other credit critical to trade, as well as finance for capital projects. Banks, near banks and hedge funds all impose externalities on the economy.

Michael Power⁴¹ has argued that the current obsession with risk management has nothing to do with organisational efficiency, rather it arises from the increasingly defensive mood of agents who previously absorbed risk on behalf of others – auditors, insurers, bankers, the state etc. It is not that financial markets have generally become more volatile or organisational activities more dangerous, but rather that there are more *externalities*, more costs we have to pick up through taxes, subsidies, litigation or unexpected losses. Speaking of the law-intense environment, Power says: "Coupled to institutionalised assumptions and myths about the manageability of risks, there is an intensification of strategies to avoid blame when things go wrong."

The blame game over the Scrunch has been remarkable. A general level of suspicion now prevails about all in authority. While some fat cats eat humble pie in set-piece encounters with angry politicians, others, including the non-bankers who are equally responsible, carry on as before. The fact that externalities from the Scrunch spilled out of the financial sector to affect the real economy argues that the solutions will involve far more than the reform of financial regulation. The danger is that we focus more on image management and communications issues, rather than on resolving the material root causes of the Scrunch.

General suspicion about all in authority

41. POWER, Michael, "The Risk Management of Everything: Rethinking the politics of uncertainty", Demos, London [2004]

Chapter 7: Unintended Consequences

There is only one difference between a bad economist and a good one: the bad economist confines himself to the visible effect; the good economist takes into account both the effect that can be seen and those effects that must be foreseen.

[Frédéric Bastiat 1848]

Before drawing conclusions, we should remind ourselves how feed-through turns well-intended policy into unintended consequences.

Limits Become Licences

Regulation is full of limits on capital, on leverage, on asset quality the list goes on. If limits are set too high, they are ineffective, if set too low they stifle activity and innovation. However, competition often drives participants to trade up to the limits since these are seen as safe harbours. This applies to regulators as well as to the regulated entities. For instance, the UK government has given the Bank of England an inflation target, measured by CPI, of 2%. Without that mandate, given that globalisation and immigration were tending to reduce CPI, the Bank might have tried to manage to a lower rate. Yet, it was encouraged to keep the rate close to 2% because anything less would have put a brake on growth. That turned out to be quite expansionist, as the money supply and M4 lending figures indicate.

Targets Distort Feedback

Following from Goodhart's law, as soon as you set targets with incentives, human nature will bend the rules, stretch definitions or provide false witness to achieve them. Resources will be shifted from things that do not have targets to those that do. Broader targets, however, encourage obfuscation: one cannot optimise for everything but it is possible to fudge a wide set of results.

Investment banks and hedge funds actually seek to sail close to the wind, since regulatory fines can even become badges of honour. Once firms start budgeting for fines, the game is up. Yet when there are a plethora of rules, some level of transgression is inevitable and fines become a form of tax farming, rather than a regulatory tool.

Competitive Barriers Promote Greed and Crooks

Banks are leveraged. That is what a bank does: borrow short to lend long. In a bull market, leverage magnifies profits. In a bear market it works in reverse, so leverage is exciting. Bazerman and Watkins's⁴² concept of predictable surprise explains in psychological terms why greed thrives in boom years. If people refuse to see the downside, they will over-commit, believing either that failure will not happen or, or if it does, everyone will go down, in which case they will not lose face and may even

42. BAZERMAN, Max H., and WATKINS, Michael, "Predictable surprises: the disasters you should have seen coming, and how to prevent them", Harvard Business Press [2004]

**Human nature
will bend the
rules**

Inside banking, fraudsters can ply their trade

be bailed out. The same logic attracts the crooks. Moreover, once inside the banking system, fraudsters can ply their trade for years.

Regulation creates competitive barriers to entry. The costs it imposes create huge economies of scale in terms of technology and knowledge management. This increases profits for those on the inside, encouraging both greed and chicanery.

The Best Undermines The Good

Regulators are keen on best: best execution for traders, best price for market makers, best advice for financial advisors, best practice to benchmark. Yet there are inherent problems with predicting *ex ante* what will only be known *ex post* in a world where microseconds matter and liquidity is fragmented. Benchmarks depend on their relevance to the present transaction and may be distorting when markets are volatile. As Gareth Adams, at Fidelity Investments, put it in 2002, "in a fragmented market place the notion of a single benchmark price is essentially prehistoric".

Mechanical processes inhibit art and deskill practitioners. In uncertain markets the best becomes the enemy of the good: the need to comply with a process overrides the freedom of the trader to use *and improve* his skill to outperform the model. Of course, the artful trader will sometimes be wrong and under-perform. Anecdotal evidence suggests a common outcome is that firms spend a lot of time and money on trade cost analysis to demonstrate best execution, but usually wind up demonstrating that they were not consistently worse than some benchmark. Processes designed to ensure such consistency sacrifice a risky better performance by playing safe. We cannot define rules for all circumstances. The application of best practice and benchmarks tends to drive out diversity and increase homogenous behaviour. In markets, a diversity of views creates liquidity while conformity destroys it.

Too Much Transparency Displaces Too Much Trust

Increased transparency is a favourite response to financial crises. O'Neill pointed out that "deception is the antithesis of trust" and suggests that "transparency may add to uncertainty rather than to trust by increasing a flood of irrelevant or misleading information". In particular she noted that trust depends on having confidence in the sources, so that "the proliferation and masking of sources of much information makes trust increasingly difficult". Truth depends on free and open debate, but transparency and accountability are making this increasingly difficult because they are born of a "culture of suspicion".

The accountability culture aims at increasing administrative control of institutional and professional life, which undermines trust and traditional forms of quality control. This has led to what Power has called the "audit explosion", a proliferation of performance indicators and enforcement processes at the expense of freedom. There is growing concern about a tick-the-box mentality, which undermines personal responsibility and causes compliance fatigue, with mounting complaints about the costs, inappropriateness, anti-competitiveness and distraction from fundamental issues.

The EU's Markets in Financial Instruments Directive (MiFID) tried to increase transparency in equities markets but has led to increasing trader stealth and mistrust

Concern about a tick-the-box mentality

Annual reports are incomprehensible

in displayed prices⁴³. Similarly, when regulators restricted short selling in the autumn of 2008, liquidity fell in the cash markets and shorting strategies shifted to the stealthy synthetic markets. The FSA recognised⁴⁴ that increased disclosure may lead to herd effects.

Annual reports and accounts, driven by audit standards, are incomprehensible, serving neither the specialist nor the lay user. Jon Moulton, managing partner of Alchemy Partners, the private equity firm, put this nicely in evidence to the House of Commons Treasury Select Committee [2009]: "Transparency for me does not cut it. Nobody in this room can read the accounts of an HSBC or a Barclays and claim that they understand them." This was further confirmed by later testimony. The public are sceptical of the state of financial information produced by auditors and accountants, and by implication of the accounting techniques upon which their work is based. Accountants indulge in trendy ideas such as Triple Bottom Line reporting (corporate disclosure that integrates financial, environmental and social reporting) while studies of lay users show that they find the financial portions of annual reports incomprehensible.

Outsourcing increases Connectivity

Credit risk transfer and physical outsourcing have been hailed as ways to improve economic efficiency. People justify this with reference to diversified portfolios and the principles of lean production. However, outsourcing of services also increases connectivity, which leads to increased contagion in times of stress. On the one hand regulators allow firms to outsource services but not risks, which they are somehow supposed to manage across a deep and complex hierarchy of vendors and their subcontractors. On the other, they say financial risks can be transferred (outsourced) and so disappear from a risk-adjusted balance sheet. This is neither practical nor logically consistent.

Even in the event of relatively simple physical disasters such as a hurricane or flood, no amount of due diligence can penetrate the complex web of value-chain relationships to predict behaviour under stress and the impact on the originating firm. Vendor hierarchy relationships and methods of service delivery are both highly dynamic and depend on unknown third parties. The rate of change is just too great to *ensure* risk control.

Credit risk transfer is more complicated. It allows the dissection of risk into its various components: alpha and beta, credit risk and market risk, to name but a few. This can enhance market liquidity and reduce costs. However, research into the outcomes [Jenkinson *et al.* 2008⁴⁵, see also Gorton 2008 and Rajan *et al.* 2008] has found that key "frictions" have made it harder than expected to achieve the benefits. These frictions include incomplete information, misalignment of incentives and impacts on liquidity in the marketplace, resulting in a misperception of risks.

The paradox of policy

The Short vs. Long-Term Dilemma

In a speech, delivered to the CBI in January 2009, Mervyn King, Governor of the Bank of England, describes the paradox of policy: what one does for the short-term is

43. See for example: GIFFORDS, Bob, "Best Execution in Turbulent Markets", *The Trade Tech Daily*, Issue 1 [2009]

44. FINANCIAL SERVICES AUTHORITY, "Temporary Short Selling Measures", Consultation Paper [January 2009]

45. JENKINSON, Nigel, PENALVER, Adrian and VAUSE, Nicholas, "Financial Innovation: what have we learnt?", *Bank of England Quarterly Bulletin*, Q3 [2008]

Do we protect ourselves or our children?

often the opposite of what one wants in the long term. He cites two examples: in the short-term we need to spend to support the economy, but in the long term we need to save. In the short term banks should be encouraged to run down their capital, while in the long term they need to build up capital reserves. He concludes that we need a more counter-cyclical policy framework.

Any policy factor weighted to the short-term will have to be balanced in the other direction over the long-term to average out over the cycle. We want to spend but also know that saving is needed to lend, or else asset prices will fall as foreign investment withdraws or shifts to government debt. Perhaps we should encourage this price fall in a "short, sharp shock" in order to recover more quickly? The Bank of England made this point last year. Yet regulators want the banks to increase their capital now without recognising that this will inevitably choke off lending. So the real paradox is not the short versus the long-term priority, but the debate over what we should do now. Do we focus on demand or supply, on deleveraging and confidence, or on avoiding deflation? Do we protect ourselves or our children?

Perhaps the debate is really over how self-regulating and efficient the market will be. Altman argues that the risk is that "financial reform will go too far", pointing to the Sarbanes-Oxley legislation as an example: "Should something like this occur again, tighter restrictions on the US and European banking systems could delay their return to robust financing activity." The challenge is illustrated by two quotes. The first by French President Nicolas Sarkozy: "Le laissez-faire, c'est fini." Chinese Vice Premier Wang Qishan put it more diplomatically: "The teachers now have some problems." In other words, it is time to rethink the problem.

Conclusion

Progress, far from consisting in change, depends on retentiveness... Those who cannot remember the past are condemned to repeat it.

[George Santayana 1905]

Some 70 years after the Great Depression, we seem to be about to repeat at least some aspects of that sad history. Striking similarities include the asset bubble, the leverage, rapid innovation, perverse incentives, falling markets and rising unemployment. But the key similarity is perhaps the systemic nature of the collapse and loss of control by public authorities. This analysis has focused very much on these systemic issues. We cannot ignore the externalities of our actions, but must internalise them in our public and private policy decisions and recognise their mutual effects. On the one side we have the *private excesses* of the naughty bankers, while on the other we have the *regulatory dissonance* of the public authorities, their mixed signals and a cacophony of rules and policy initiatives. Has regulation actually caused bigger banks, bigger regulators and bigger boom and bust cycles? We suggest that it has.

Strong-arm regulation is now the fashion

Politicians are now on the warpath. Strong-arm, rather than arm's length, regulation is now the fashion to challenge (borrowing a phrase from Mary Kaldor) a "Baroque Arsenal" of financial instruments, complex and obscure in design and monumental and triumphant in delivery. In both the US and the UK a large percentage of GDP is at stake. Much of continental Europe views the practices of Anglo-Saxon derivatives trading and structured finance as "casino" economics. The post-industrial world is filled with regulatory, technological and cultural innovation developed as short-term responses to problems. There should be no need to fear good regulation, yet unless we refocus on the long term, most of what we do quickly will simply be undone later.

If we were talking about the internet crash of 2007 and saw 2 billion internet users focused through fewer than 20 nodes – at least two of which crashed, several of which wobbled and all of which were dodgy – our analysis would simply conclude: do not concentrate on just 20 nodes. Break it up. Wholesale investment banking is no different.

So we need to promote not only competition, but also mutuality, true heterogeneity, biodiversity and trust. We need to encourage people to be accountable to each other for their commitments, not accountable to central bureaucracies for observing a set of rules. Indeed, we need to slow down rule changes and not expect too much from regulation. It cannot do everything for us. We must do more for ourselves.

Over the past two years, people have stumbled and bumbled from incident to event to problem to one failed fix after another. The shock of the new has obsessed bankers, investors and regulators alike, focusing everything on "now". To move from temporary fixes to permanent solutions we need impertinent questions, such as "how would we know when the financial system is working?" In other words, what is truly our desired outcome?

A system incapable of dealing with the long term

Answers might include "when a 20-year-old can safely enter into a financial structure for retirement" or "when we can sensibly finance a forest" – sustainable financing over 75 to 100 years, not just quickly flipping transactions. Sustainable finance is a necessity that we have not yet been prepared to pay for. The financial system, if not broken, reveals itself to be incapable of dealing with the long term. There is an urgent need for research into the idea of Long Finance and the system dynamics that underpin it. Instead of focusing on the mechanical fix, we need to think more about cultivating and nurturing hardier breeds that can adapt to the new world order of global connectivity and restore some of the institutional diversity we have lost.

Key Recommendation

This damage has put the American model of free-market capitalism under a cloud. The financial system is seen as having collapsed; and the regulatory framework as having spectacularly failed to curb widespread abuses and corruption...No country will benefit economically from the financial crisis over the coming year, but a few states – most notably China – will achieve a stronger relative global position.

[Altman 2009]

Was it the failure of the competitive free market, with its greed and excess, or of the regulatory state, whose barriers to entry and homogenised rules inhibited competition and encouraged that excess? Our key point is that "too big to fail is too big to regulate". Regulation creates barriers to entry, promotes the large over the small, reduces competitive variation and opens up huge exposures to risks behind closed doors. The two biggest failures, Fannie Mae and Freddie Mac, had no competition and their own regulator. A corollary is that "too big to fail is too big to manage", as many former executives of failed firms now admit.

So our key recommendation is to bring competition back to the centre of the Scrunch debate. Injecting more competition means a serious re-examination of global investment banking concentration, audit firm concentration, credit rating agency concentration and actuarial firm concentration. We believe that the promotion of competition, then supervision, then regulation should be the order of discussion with an objective of promoting "open" markets. The debate should be about "open" markets rather than the dogma of "free" or "regulated" markets.

Worship at the altar of competition

"Too big to fail" is too late. We have to stop financial institutions either getting to that size or being in that position. Tellingly, one investment bank in the 1990s had as its strategic objective: "to become too big to be allowed to fail". It succeeded. Competition means having companies that can fail. Yes, society wishes to provide a safety net for retail investors and other groups, but that is a separate issue. The religion of regulation works best when it worships at the altar of competition.

Further questions:

- Should we be reducing regulation to encourage competition by tightening the definition and requirements of a bank rather than expanding it? Hedge funds were highly competitive. Now we want to regulate them.
- Does society overvalue size or economies of scale in investment banks, audit firms, rating agencies and even regulators themselves? Is the cost/benefit equation of size, inability to fail and heightened cycles of boom and bust justified by better economic growth over long periods?
- What cannot be regulated? Jon Moulton, managing partner at Alchemy, has observed, “we should limit what they (regulators) do to what they can reasonably understand.”⁴⁶
- Should we rely more on caveat emptor and remind people of risks, rather than raising the false expectation that we can protect everyone from the excesses of private capital and government obtuseness?
- How can we promote fast, efficient procedures for bankruptcy and judicial redress?
- How can we improve anti-monopoly laws to promote competition and prevent the emergence of over-sized banks and other players?

46. Quoted in “Moulton Hits Out At Ability Of Watchdog”, [City AM](#), [14 May 2008]

Making Friends: Something for Everyone

I am not a die-hard capitalist. I do not view capitalism as a credo. Much more important to me are freedom, compassion for the poor, respect for the social contract and equal opportunity. But for the moment, to achieve those goals, capitalism is the only game in town. It is the only system we know that provides us with the tools required to create massive surplus value.

[Hernando De Soto 2001]⁴⁷

Counteraction is a continuous effort, not just a one-off push from the top. Below we set out some challenges for various actors to stimulate further discussion and research.

Central Governments

When you are in uncharted waters, it is often better to slow down to avoid the rocks, rather than resort to rapid changes of tack in a misguided effort to show leadership. If the root problem lies in long-term, global trade imbalances, should we not address them directly? Can Asian savings be accommodated in global trade without their currencies being decoupled from the dollar? Are increased public spending and tax really going to make up for falling consumer spending? Government and public attitudes towards savings, credit and social policies need to be rethought.

Central Bankers

Are governments willing to give more discretion to central banks to consider economic and prudential factors – liquidity, leverage, asset price bubbles – as well as CPI? Does the central bank need more policy tools, rather than just interest rates? In the crisis, central banks have acted as market makers of last resort as well as lenders of last resort. But who should have the role as insurer of last resort? If governments insured central clearing houses for systemic risks, the clearers could strengthen mutuality across the financial system, demanding more collateral as systemic risks rise. Governments too should have to post collateral against their systemic risk position.

Regulators

Regulators should promote competition, not rules. If a regulator cannot pull the plug on a market participant because it is too big to fail, then the regulator has failed. In judging size, the ability of the central bank to play lender of last resort and government to be insurer of last resort should be key. Large countries can support bigger players but shoulder bigger responsibilities. Home-host jurisdiction rules need to be adapted accordingly.

Should we rethink the trend towards centralising regulation and introduce more competition in regulation itself? One alternative would be to make greater use of the standards markets found in other risky industries (shipping, aviation, oil). Regulators need to be more aware of the risks of homogenisation: the need is not just for more competitors but also for greater biodiversity to ensure long-term survival of financial systems. A clearer distinction between supervision (knowing what's going on) and regulation (saying what should go on) would enable regulators to focus on fraud, the intersection of systemic and idiosyncratic risks, and on encouraging trust between counterparties, rather than on the micro-prudential minutiae of process with accountability to central bureaucracies.

47. DE SOTO, Hernando, "The Mystery Of Capital: Why Capitalism Triumphs In The West And Fails Everywhere Else", Black Swan [2001]

Politicians

Governments spent excessively, building up debt that effectively "looted" reserves that should have cushioned down cycles. They have expropriated from savers, pensioners and future generations in favour of borrowers and current consumption. And they lacked seriousness regarding global trade imbalances. How do we address the lack of public understanding of these systemic effects? Have our democratic institutions failed? While recession may well bring temporary consolidation, what can encourage more long-term competition? For example, should nationalised banks be re-privatised in slices, including quasi-mutuals? Early slices could be priced to encourage take-up, as was done in earlier privatisations. Unsold slices would be equivalent to a "bad bank" or toxic loan guarantee. Along the way new firms could be created and competition encouraged.

Bankers

Bankers should rethink risk models and incentives to ensure the requisite variety of controls, circuit breakers and rebalancing mechanisms to deal with extreme connectivity and other fundamental failures. Should the notion of a "bank" be restricted to a "narrow" bank i.e. a heavily capitalised deposit taker? The racy players could become "capital managers" or "finance houses". There should be a serious debate on whether to bring back Glass-Steagall-style separation of retail banking, insurance and pensions from investment banking, and of agency trading from proprietary operations. In reporting bank profits, how about distinguishing between profits generated by the momentum of an asset price bubble and the long-term value created by staff? To help restore professional discipline, should there be more social sanctions, e.g. naming and shaming, rather than using corporate fines that tax the customer-victims?

Insurers

AIG, Fannie Mae and Freddie Mac, and the monolines have been among the biggest failures. Since insurers are essentially risk absorbers, do we need different accounting and capital rules for them than for risk traders? Insofar as insurers sell credit insurance, should we exclude systemic meltdowns, which would be covered by the central government? Since government actions may have led to systemic failure, how can any private firm insure against government negligence?

Accountants and Auditors

Have all the balance sheet, fair value accounting and going concern statements, costing billions of dollars, been a waste of time? Since marking to market becomes marking to model in thin markets, and since good models produce ranges of confidence, not discrete prices, should firms not be obliged to present this information? Auditing problems might be mitigated if we had more competition among accounting firms and more public, open-source standards for approved models. Should we require financial statements to be insured either directly against material misstatement, or as a spread against a credit index swap? And why are so few professionals being censured, or is it the professions themselves that are incapable?

Credit Rating Agencies

Why should governments mandate the use of rated instruments? Abolishing such mandates would reaffirm that responsibility for prudence lies with the investment managers. Do we need the Nationally Recognised Statistical Rating Organisation status? Should we rethink the role of indemnity for credit ratings? How do we tackle the dissonance between a discrete system of 20 rating buckets, from AAA downwards, and the continuous, dynamic pricing of credit markets?

Investment Managers and Pension Funds

To ignore fat-tail risks is fatal. If there has been an illusion of diversification with hidden concentration, an illusion of liquidity that disappeared when most needed, and a real difficulty in stress-testing diversification models, how can we either decrease the risks by reducing connectedness or increase transparency and trust to make the risks more apparent and managers more responsible? The virtualisation of ownership, via investment managers, pension funds and structured products, has increased the agency problem in public companies. Do we need to rethink corporate voting rights and economic interest, and reconnect public company governance to the ultimate beneficiary?

Stock Exchanges and Trading Platforms

A vicious circle of ever-faster, ever-smarter connectivity through electronic trading seems to be behind much of the instability. Markets need to be restructured to allow better supervision, e.g. through central counterparties. To what extent are first-in, first out, continuous auction micro-models and proximity trading options fulfilling the obligation for fair and orderly markets? These matching strategies tend to favour larger brokers who are able to fund the technology arms race to be first to market, consolidating volumes and decreasing diversity. Do they not also encourage high volatility on a systemic level as price changes ripple through the interconnected liquidity pools? Should we not make it easier for relatively low-tech brokers to compete, for instance by restricting the number of orders placed per second? If an intermittent or block auction model were used, fire-breaks might work by lengthening the period between auctions.

Analysts, Journalists and Academics

Should investment analysts focus more on the long-term systemic exposures of companies and their sensitivity to different scenarios? And how about re-orientating analysis towards attributing net value added i.e. how much value is due to the effect of the rising economic tide, and how much created by the staff? The challenge for journalists is not to find scapegoats, but to help explain what went wrong and the complex or counter-intuitive way things may need to be fixed. The academic community needs to take up the challenge implied to theory. Potentially fruitful areas of research include a recasting of our understanding of risk and much of the mathematics underpinning financial engineering.

The Public

The problems begin with our own demand for rights without duties, with our desire to enjoy the good things without working out how to pay for them. Jean Monnet observed: "People only accept change when they are faced with necessity, and only recognise necessity when a crisis is upon them." We must make use of this crisis. Do you want:

- Quick fixes to get back to business-as-usual; ever increasing regulation and more arbitrary enforcement; national champions created by waiving anti-monopoly legislation; government-induced slowdown and risk of corruption; or
- Much more, and more open, competition; growing trust and diversity; less dissonant but rigorously enforced regulation; greater emphasis on co-operation and mutualisation, locally controlled?

We have argued that the latter set is preferable, while politicians have been steadily moving towards the former. The public must now decide which argument they will trust.



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Professor Michael Mainelli FCCA FSI co-founded Z/Yen, the City of London's leading commercial think-tank, in 1994 to promote societal advance through better finance and technology, and holds professorships at Gresham College and the London School of Economics. Michael's aerospace and graphics research led him to start companies in seismology and cartography, including the first complete digital map of the world in 1983, Mundocart. He has been a partner and board member of one of the leading accountancy firms and served on the UK Ministry of Defence's Defence Evaluation and Research Agency board. Michael has won Foresight Challenge and Smart awards and was British Computer Society "Director of the Year" 2004-05.

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