



The Global Credit Crisis and International Financial Regulation

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Financial Regulation, Behavioural Finance, and the Global Credit Crisis In Search of a New Regulatory Model

Emiliios Avgouleas*

Abstract

The global credit crisis has led to systemic instability, the accrual of massive losses in major US and European banks, and created significant public costs. It has also shown that the current model of national and international banking regulation is inadequate. This paper attempts to answer questions relating to the future shape of national and international financial regulation in light of lessons drawn from this crisis. While most policy proposals for the overhaul of the US, UK, and international financial regulation predominantly deal with issues relating to the containment of a systemic crisis, the paper offers more radical solutions, which deal with the prevention of such a crisis. In this mode, it suggests a pluralistic regime for the licensing and supervision of banking institutions at a domestic level and the establishment of a global multi-tiered licensing and supervisory scheme for transnational investment funds with systemic importance. The supervision of investment funds' compliance with the suggested prudential regime should be assigned to an independent global regulatory authority, which would utilize the market research and surveillance infrastructure of the IMF. The findings of behavioural finance provide solid support for the suggested reforms.

JEL: G15, G18, G21, G28

Keywords: Global Credit Crisis, Behavioural Finance, Banks, Banking Regulation, Hedge Funds, International Financial Regulation, Securitisations, CDOs, Systemic Risk

Reader in International Financial Law, School of Law, University of Manchester.

All comments and enquiries should be sent to emiliios.avgouleas@manchester.ac.uk

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I. Introduction

The global credit crisis is much more than a simple liquidity event. It has already led to the first depositors' run in the UK in 150 years and the near collapse of Northern Rock, a medium size UK mortgage provider, and the rescue of Bear Stearns, an upper-tier US investment bank. Very large US and European Banks have posted massive losses, mostly associated with their exposure to the collapsing US market for sub-prime mortgages. The public cost of the crisis is also incalculable and goes well beyond the significant cost of providing liquidity support to banking institutions and rescuing the ailing ones, although that is also significant.¹ The consequences of the crisis on corporate and private borrowers and the crisis of confidence, it has created, threaten to cause global economic recession and have an adverse impact on individual's welfare.² The credit crisis has also raised serious questions with respect to the effectiveness of the current model of banking regulation. Furthermore, the systemic implications of uncontrollable risk-taking by major hedge funds have fuelled the global debate about the need to regulate internationally active investment funds, including hedge funds.

In the case of banks, the regulatory model is characterized by its reliance on a set of internationally accepted supervisory standards and minimum interference. It has

¹ The Bank of England, 'Special Liquidity Scheme: Market Notice' 21 April 2008; Gary Duncan, 'US Federal Reserve and European Central Bank pump an extra \$82bn into banking system' *The Times*, 3 May 2008; Siobhan Kennedy, 'US Fed releases \$200bn as credit crisis hits new depths' *The Times*, 8 March 2008.

² IMF, Global Financial Stability Report, 'Containing Systemic Risks and Restoring Financial Soundness', April 2008, xi, 10-11, 50. [Hereinafter IMF, *GFSR, Containing Systemic Risks*]. In addition to other adverse consequences a global slowdown may have a significant impact on capital flows to developing countries. *Ibid.* 30. Obviously, if IMF's forecasts prove accurate and a global draught of capital affects FDI projects or forces investors to pull out from productive investments in developing countries this withdrawal will affect employment in those countries at a time of rising food prices with truly unforeseeable consequences for lower paid workers.

emerged as a result of the liberalization of banking business models in the early 1990s³ and the International consensus reached within the Basle Committee on Banking Supervision as regards the acceptable model of prudential supervision of banking institutions.⁴ The vast expansion of global investment funds has been the result of the nearly global abolition of restrictions on capital flows in the 1990s and the investment opportunities created by the rapid development of global capital markets, one of the main drivers of economic globalization. However, the operation of international investment funds is largely unregulated.

Arguably, allowing banking institutions to merge their investment and commercial banking activities, following the abolition of Glass-Steagall Act restrictions in the US and the implementation of the European Second Banking Coordination Directive,⁵ has allowed them to reap serious economies of scale in their operations. These efficiencies have significantly raised their profitability. At the same time, the

³ Having the advantage of holding banking law chairs both in the US and the UK, Professor J. J. Norton was the first legal scholar who identified and seriously examined the emerging global consensus for banking regulation in the 1990s. Norton's work set the course for many subsequent studies. See J. J. Norton, *Devising International Bank Supervisory Standards* (The Hague: Martinus-Nijhoff, 1995), and Norton (ed.), *Bank Regulation and Supervision in the 1990s* (Kluwer Law, 1991); Norton & I. Fletcher, *International Banking Regulation and Supervision: Change and Transformation in the 1990s* (Kluwer Law International, 1994).

⁴ Basle Committee on Banking Supervision, 'Core Principles for Effective Banking Supervision', Basle, September 1997, revised in October 2006. Basle Committee on Banking Supervision, 'International Convergence of Capital Measurement and Capital Standards, A Revised Framework', Updated November 2005. [Hereinafter, *The Basle II Accord*]. For a comprehensive review of the Basle Capital Adequacy Standards and especially of the Basle II framework see Hal Scott, *International Finance: Law and Regulation* (London: Sweet & Maxwell, 2nd ed., 2008), ch 7. For a critical review of the Basle Committee's workings and rulemaking processes see Kern Alexander *et al.*, *Global Governance of Financial Systems* (Oxford: OUP, 2006), pp. 37-55. Also for perceptive analysis that still remains relevant see Norton, *Devising International Bank Supervisory Standards*, ch. 4.

⁵ Second Banking Directive 89/646/EEC [1989] OJ L 386/1, replaced by Directive 2006/48/EC [2006] OJ L 177 relating to the taking up and pursuit of the business of credit institutions. The Second Banking Directive allowed deposit-taking European Banks to also engage in the kind of investment market activities that were usually reserved, at least outside of Germany, for securities firms and non-deposit taking investment banks.

liberalization of banking business has led a considerable number of global banks to exploit their safe funding (deposits) base and the implicit guarantee they enjoy from their country central banks to speculate at a vast scale. This situation has meant that commercial and investment banks utilized the prevailing conditions of excessive liquidity and innovative financial techniques to acquire huge and largely impossible to value exposures in the global credit markets with a speculative intent. The risks attached to those positions were of an unprecedented scale. Yet banking institutions adopted a very casual attitude to risk controls. The global credit crisis is to a large extent the result of this attitude. In much the same way, the vast growth in the number and size of global investment funds and their active participation in global credit markets have increased exponentially the possibility of their involvement in the catastrophic scenario of global financial system collapse.

This paper discusses the main causes of the global credit crisis. Adopting a conceptual approach the paper considers explanations to the current crisis to fall into two categories: those relying on the assumptions of rational choice theory and those stemming from the findings of behavioural finance. It finds most of them strongly linked to the findings of behavioural finance. In fact, a close examination of the causes of the crisis defeats the common assumption that professional investors are almost immune to cognitive distortions.

The paper also highlights the flaws of the current model of domestic and international banking regulation and the absence of prudential regulation for systemically important investment funds. Although financial regulation is a concept that extends beyond the licensing and supervision of banks and investment funds, the focus of this

paper is only on the aforementioned areas. In this mode, the paper evaluates most of the recent suggestions of national regulators such as the US Treasury⁶ and the Presidents' Working Group on Financial Markets,⁷ the UK Tripartite Authorities⁸ and global regulatory fora such as the Financial Stability Forum (FSF)⁹ for the revamping of regulatory systems dealing with financial institutions in the US, the UK, and Internationally.¹⁰ These are found to be inadequate as they are mostly concerned with the consolidation of regulatory processes and the overhauling of arrangements for the provision of liquidity, which would merely contain a credit crisis more effectively instead of preventing it.

Building on the above analysis this paper argues for more radical solutions to the challenges created by the global credit crisis, given also that the cost of this, pure social waste, has already reached the amount of 1 trillion US dollars.¹¹ It recommends, as a means of reducing systemic risk, the redrawing of national regulatory models dealing with banks and the separation of the savings and loans business from other forms of banking activities.

⁶ US Department of Treasury, 'Blueprint for a Modernized Financial Regulatory Structure', March 2008.

⁷ The President's Working Group on Financial Markets, 'Policy Statement on Financial Market Developments', March 2008. [Hereinafter PWGFM, *Policy Statement*].

⁸ Tripartite Authorities (HM Treasury, FSA, BoE), 'Banking Reform – Protecting Depositors: A Discussion Paper' October 2007; FSA, 'Review of the Liquidity Requirements for Banks and Building Societies', December 2007.

⁹ FSF, 'Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience', 7 April 2008 [Hereinafter, FSF, *Enhancing Market and Institutional Resilience*]; FSF, Working Group on Market and Institutional Resilience, 'Interim Report to the G7 Finance Ministers and Central Bank Governors', 5 February 2008. [Hereinafter, FSF, *Interim Report*].

¹⁰ For a critical overview of regulatory responses to the global credit crisis see Charles Goodhart, 'The Regulatory Responses to the Financial Crisis', LSE-FMG, Mimeo, March 2008.

¹¹ IMF, *GFSR, Containing Systemic Risks*, above n 2.

National regimes for banking regulation must be pluralistic and supervisors proactive. The crisis has clearly shown that following one licensing size and supervisory style is an inadequate way of regulating the banking industry. The objective of banking regulation should be to minimize the savings and loans industry's exposure, since inevitably this will continue to operate under an implicit public guarantee, to the extreme swings of global capital markets. Other forms of licensed banking entities will be obliged to take liquidity insurance (at market rates) from public or private providers and also comply with Basle Capital Adequacy Standards, as they apply to investment activities, sharply reducing their leverage. However, while the proposed regulatory re-classification would lead to increased regulatory activism in relation to savings and loans institutions, other institutions will continue to enjoy a lighter regulatory touch.

Furthermore, the paper suggests the establishment of a multi-tiered global licensing and supervisory regime for internationally active and systemically important investment funds, regardless of their place of incorporation/registration. This should be operated by a global authority assigned with the task of supervision of the systemic risk and investment conduct aspects of hedge fund and sovereign wealth fund activities. Arguments for the establishment of a global supervisory regime for systemically important investment funds constitute the logical and realistic extension of scholarly work discussing mechanisms for the containment of systemic risk at a national and transnational level¹² and proposing the establishment of a world financial authority.¹³

¹² Steven Schwarcz, 'Systemic Risk', Duke Law School Legal Studies, Research Paper No. 163, March 2008. [Hereinafter Schwarcz, *Systemic Risk*].

¹³ John Eatwell and Lance Taylor (eds), *International Capital Markets, Systems in Transition* (Oxford: Oxford University Press, 2002), chs 2 & 5.

This paper is structured as follows: Section II provides a brief outline of the rational choice foundations of the Efficient Market Hypothesis and a concise analysis of the findings of behavioural finance that are most pertinent to the present discussion. The largest segment of the secondary market for structured credit securities is not highly liquid rendering the EMH approach inapplicable. However, the contrast is still useful for methodological reasons and by reference to the liquid part of secondary credit markets. Section III discusses the causes of the global credit crisis drawing on a number of reports published in recent months by national and global regulators. It examines the diagnosed causes of the global credit crisis both with respect to the initial building up of excessive credit exposures and to subsequent developments that triggered and amplified the turmoil in credit markets. The main argument advanced in this Section is that several of the diagnosed causes of the global credit crisis exhibit strong behavioural elements. Section IV discusses regulatory reform proposals set out by national regulators such as the US Treasury and the UK Tripartite Authorities and global regulatory fora, such as the Financial Stability Forum. The main criticism directed at these proposals is that, although they would constitute a substantial improvement from the previous regime, if implemented, they are still mostly concerned with the effective management of a credit crunch or of a systemic crisis and not with their prevention. Section V sets out the recommendations of this paper. It advances an argument for the radical overhauling of national licensing regimes for credit institutions and the establishment of a global multi-tiered licensing regime for internationally active and systemically important investment funds. It also explains the advantages the proposals present in terms of preventing a systemic crisis. The findings of behavioural finance provide convincing support for these

proposals. Section VI brings the different straddles of the present paper to a comprehensive conclusion.

II. Modern Finance Theory, Behavioural Finance, and Market

‘Anomalies’

1. Rational Choice Theory vs Behavioural Decision Theory

Modern Finance Theory is deeply rooted to a rational choice view of the markets. The fundamental assumption of rational choice theory about financial markets is that markets move only on the basis of rational expectations. Namely, asset prices are set by rational investors.¹⁴

Providing a complete account of the concept of rationality and of its principles is by itself a challenging task. There is even disagreement as to whether rationality has been conceived to be a theoretical framework that defines individual preferences or explains prediction.¹⁵ Nonetheless, it is assumed here that rational choice theory proposes that human agents strive to maximize their utility from a stable set of well-defined preferences accumulating, in the process, an optimal amount of information and other inputs in a variety of contexts.¹⁶ The theory that, in the face of uncertain outcomes, individuals will choose a decision or a course of action that maximizes expected utility, so called *expected utility hypothesis*, was first clearly expressed by Daniel Bernoulli in

¹⁴ M. Friedman, ‘The Methodology of Positive Economics’ in Friedman, *Essays in Positive Economics* (1953), 3–43.

¹⁵ For an analytical account of the difficulty to describe rationality see C. Jolls, C. R. Sunstein, and R. Thaler, ‘A Behavioural Approach to Law and Economics’ (1998) 50 *Stan. L. Rev.* 1471, 1488.

¹⁶ See Gary S. Becker, *The Economic Approach to Human Behavior* (1976), 14 and Richard Posner, *Economic Analysis of Law* (6th ed., 2003), chs. 1-3.

1738.¹⁷ The concept of *expected utility* as the foundation of rational choice theory was further refined by Von Neumann and Morgenstern.¹⁸ Accordingly, the proverbial rational man of neoclassical economics (the famous ‘homo economicus’) is supposed to act to maximize expected utility, because his/her preferences are given, consistent, and representable in the form of a utility function. Rational agents are assumed to be indifferent between receiving a given financial bundle or a gamble with the same expected value. Moreover, where individuals operate in conditions of uncertainty about the results of their actions, they are assumed to be able to assess the probability distribution in accordance with their level of knowledge. If new information can be collected from the environment, individuals know the information's possible content and assess it, in accordance with Bayes’ law, by calculating the probability distribution based on the interplay between the new information’s content and their prior knowledge.

Kahneman and Tversky’s pioneer research is the foundation of the so-called Psychology of Choice and Judgment which constitutes the first pillar of Behavioural Decision Theory (BDT).¹⁹ The first finding of Kahneman and Tversky’s joint work challenging rational choice theory was so-called *Prospect Theory*, which is a study of how individuals manage risk and uncertainty. The original version of *Prospect Theory* was designed for gambles with at most two non-zero outcomes. Kahneman and Tversky suggested in their 1979 paper that, when offered a gamble where outcome x has probability p and outcome y has probability q , people assign it with a value of $\pi(p)v(x) +$

¹⁷ D. Bernoulli, ‘Exposition of a New Theory on the Measurement of Risk’ originally published in 1738 and reproduced in (1954) 22 *Econometrica* 23.

¹⁸ John Von Neumann and Oskar Morgenstern, *Theory of Games and Economic Behavior* (1944).

¹⁹ The other pillar of BDT is experimental economics.

$\pi(q)v(y)$ and pick the one with the highest value.²⁰ This formulation leads to the conclusion that individuals measure utility over gains and losses rather than over final wealth positions.²¹ Namely, unlike what is assumed by the theory of expected utility, individuals' preferences are reference dependent. Therefore, the value assigned to a given state of wealth does vary with the decision maker's initial state of wealth.

The next most relevant, for the purposes of the present paper, of the many important findings of *Prospect Theory* is the shape of the value function v . This is concave over gains and convex over losses. As a result, it reveals a deep seated *loss aversion* by individuals. This bias has been identified in several empirical studies. The documented loss aversion goes beyond conventional risk aversion, since relevant studies show that people are significantly *loss averse* even for small amounts of money. Tversky and Kahneman suggested in their 1991 paper that in most fields, where the sizes of losses and gains can be measured, people value moderate losses roughly twice as much as equal-sized gains.²²

Moreover, empirical research conducted by psychologists has demonstrated that individual's judgements originate in impressions as well as in deliberate reasoning. Namely, individuals make decisions using automatic processes (perception), cognitive processes (intuition) and controlled processes (reasoning). The processes of intuition are

²⁰ See D. Kahneman and A. Tversky, 'Prospect Theory: An Analysis of Decision under Risk' (1979) 47 *Econometrica* 263.

²¹ An idea first advanced by Harry M. Markowitz in 'The Utility of Wealth' (1952) 60 *Journal of Political Economy* 151.

²² A. Tversky and D. Kahneman, 'Loss Aversion in Riskless Choice: A Reference-Dependent Model' (1991) 106 *Quarterly Journal of Economics* 1039.

called *heuristics* or *rules of thumb*.²³ Another distinction is that between *heuristics* and *biases*. While *heuristics* are cognitive processes, *biases* are the results of the use of *heuristics*, when they lead to: (a) ‘systematic errors in estimates of known quantities and statistical facts’ and (b) systematic departures of intuitive judgments from the principles of probability theory. I discuss here only those *heuristics* that are most pertinent to the present analysis, namely, *representativeness*, *availability*, and *anchoring*.

Kahneman and Tversky have shown that, when people try to determine the probability that a data set A was generated by a model B, or that an object A belongs to a class B, they often use the *representativeness* heuristic. This means that individuals evaluate probability by the degree to which A reflects the essential characteristics of B. Much of the time, *representativeness* is a helpful heuristic, but it can generate some severe biases.²⁴ It may also lead to sample size neglect. This term is used to describe the common phenomenon, where, in judging the likelihood that a data set was generated by a particular model, people do not take into account the size of the sample, namely they assume that a small sample can be just as representative as a large one. This bias was called by Kahneman and Tversky the *law of small numbers*.

The *availability* heuristic controls estimates of the frequency or probability of events, which are judged by the ease with which instances of such events come to mind.²⁵ In other words, the availability heuristic is an assessment of accessibility. Another

²³ Daniel Kahneman and Amos Tversky, ‘Judgment under Uncertainty: Heuristics and Biases’ (1974) 185 *Science* 1124. See also J. T. Harvey, ‘Heuristic Judgement Theory’ (1998) 32 *Journal of Economic Issues* 47.

²⁴ A. Tversky and D. Kahneman, ‘Extensional vs. Intuitive Reasoning: The Conjunction Fallacy in Probability Judgment’ (1983) 90 *Psychological Review* 293.

²⁵ The long list of studies discussing the *availability heuristic* starts with A. Tversky and D. Kahneman, ‘Availability: A Heuristic for Judging Frequency and Probability’ (1973) 5 *Cognitive Psychology* 207.

heuristic studied systematically by the psychology of judgement and choice is *anchoring*. In forming estimates, people often start with some initial, possibly arbitrary value, and then adjust away from it. In other words, anchoring refers to the process by which an individual decision maker gravitates to a reference point that she subsequently uses as an initial condition for arriving at a final decision. Experimental evidence shows that people anchor too much on the initial value, *e.g.* on prevailing current interest rates or stock prices, and subsequent adjustment is often insufficient.

Heuristics and cognitive biases were first used by Richard Thaler to explain market phenomena, called ‘puzzles’ or ‘anomalies’ that could not be interpreted by the Efficient Market Hypothesis in the series of ‘Anomalies’ columns he published in every issue of the *Journal of Economic Perspectives* from 1987 to 1990. Further research inspired by Thaler’s observations shaped what is now called *behavioural finance*.²⁶

2. Efficient Markets Hypothesis vs Behavioural Finance

The Efficient Markets Hypothesis (EMH) constitutes the centrepiece of modern finance theory.²⁷ It assumes that market prices reflect (equal) fundamental value and change on the basis of new information. Thus, in an efficient market no investment strategy can yield average returns higher than the risk assumed (‘there is no free lunch’) and no trader can consistently outperform the market or accurately predict future price levels, as new

²⁶ See Nicholas Barberis and Richard Thaler, ‘A Survey of Behavioral Finance’ National Bureau of Economic Research, Working Paper No. 9222, 20 September 2002. The paper is available at the SSRN. It also appears in a modified form as a chapter in George M. Constantinides *et al.* (eds), *Handbook of the Economics of Finance* (2003).

²⁷ See P. Samuelson, ‘Proof that Properly Anticipated Prices Fluctuate Randomly’ (1965) 6 *Industrial Management Review* 41 and B. Mandelbrot, ‘Forecasts of Future Prices, Unbiased Markets, and Martingale Models’ (1966) 39 *Journal of Business* 242.

information is instantly absorbed by market prices.²⁸ Another EMH assumption is that markets are efficient and transaction costs relatively low, giving ‘professionally-informed traders’ the opportunity to quickly observe and exploit through arbitrage trading any price deviations from fundamental value, as this would create an opportunity to profit from such discrepancy. The result of arbitrage activity is that prices reach a new equilibrium, which reflects more accurately the traded asset’s value and corrects any mis-pricings.²⁹

Accordingly, inefficient markets are exclusively due to information asymmetries, lack of competition, high transaction costs, and various forms of conflict of interests in the principal agent relationships generated by the market. Behavioural finance challenges most of the assumptions of EMH.³⁰ The main tenets of behavioural finance are that³¹: (a) certain market phenomena called ‘anomalies’ or ‘puzzles’ cannot be explained by the EMH, whereas the use of psychology can provide convincing explanations and (b) the corrective influence of arbitrage trading is limited due to a number of restrictions.

Starting from the second point, convincing evidence has been offered indicating that arbitrage trading may not have the strong corrective role ascribed to it by EMH,

²⁸ See E. F. Fama, ‘Efficient Capital Markets: A Review of Theory and Empirical Work’ (1970) 25 *Journal of Finance* 383; Fama, ‘Efficient Capital Markets II’ (1991) 46 *Journal of Finance* 1575.

²⁹ R. J. Gilson and R. H. Kraakman, ‘The Mechanisms of Market Efficiency’ (1984) 70 *Va. L. Rev.* 549, 560 and 565; Gilson and Kraakman, ‘The Mechanisms of Market Efficiency Twenty Years Later: The Hindsight Bias’ (2003) 28 *Iowa J. Corp. L.* 715, 723.

³⁰ See for an overview G. M. Frankfurter and E. G. McGoun, ‘Market Efficiency or Behavioral Finance: The Nature of the Debate’ (2000) 1 *Journal of Psychology and Financial Markets* 200; R. J. Shiller, ‘From Efficient Markets Theory to Behavioral Finance’ (2003) 17 *Journal of Economic Perspectives* 83, 96-101.

³¹ See, in general, Barberis and Thaler, A Survey of Behavioral Finance, above n 26, 4 and 13; D. Hirshliefer, ‘Investor Psychology and Asset Pricing’ (2001) 56 *Journal of Finance* 1533; E. F. Fama, ‘Market Efficiency, Long-Term Returns, and Behavioral Finance’ (1998) 49 *Journal Financial Economics* 283.

because, it is not a cost-free but a risky activity.³² If we assume two kinds of investors in the market: (a) rational speculators or arbitrageurs who trade on the basis of information and (b) quasi-rational investors,³³ called noise traders,³⁴ then it follows that a number of investors act on imperfect information.³⁵ Thus, they cause prices to deviate from their equilibrium values. However, as EMH proponents accurately counter, the actions of noise traders alone are ‘insufficient to result in inefficient market prices’. Any price inefficiencies created by noise trading will be exploited by arbitrageurs (so-called ‘smart money’). Three additional elements are required: (a) the biases exhibited by noise traders must be consistent;³⁶ if they are not, most economists would agree that, in a world of heterogeneous biases as much as beliefs, some individuals’ biases will cancel out those of others,³⁷ (b) the effect of such biases must be so strong as to ‘blind’ arbitrage traders to the obvious profit opportunities because of widespread ‘price inaccuracies’; for instance, hedge funds not only have available to invest very large pools of funds, but also they search on a continuous basis for profit opportunities on a global scale, (c) arbitrage is limited by other financial or regulatory restrictions.

As regards the first argument, sometimes, ‘a single bias extends across most noise traders’, and thus not only there is no cancelling out of different biases, but also the

³² See A. Shleifer and R. Vishny, ‘Limits of Arbitrage’ (1997) 52 *Journal of Finance* 35.

³³ R. H. Thaler, ‘The End of Behavioral Finance’ (November/December 1999) *Financial Analysts Journal* 12 at 12-13.

³⁴ The issue of ‘noise’ and its impact on the markets was first analytically discussed by the late Fischer Black. See F. Black, ‘Noise’ (1986) 41 *Journal of Finance* 529.

³⁵ A. Shleifer and L.H. Summers, ‘The Noise Trader Approach to Finance’ (1990) 4 *Journal of Economic Perspectives* 19.

³⁶ See Gilson and Kraakman, *Twenty Years Later*, above n 29, 725, 733.

³⁷ *Ibid.*

impact of a single bias, *e.g.*, overconfidence, is exacerbated leading to a price spike or a ‘bubble’.³⁸ It is accurately argued that a ‘sharp increase in the participation of individual investors’ in trading activity that moves prices toward one direction, as is the case with stock market bubbles, ‘is a powerful indication that they share a common bias’.³⁹

Secondly, the agency relationship that governs the actions of fund managers and of other professional investors (so-called ‘separation of brains from capital’)⁴⁰ often places limits to arbitrage. Career and compensation concerns closely linked to the need to show short-term profits that are at least comparable with those of competitors force fund managers to herd. As a result, they forego arbitrage opportunities. Namely, noise traders force professional investors to herd in order to post short-term gains.⁴¹

Thirdly, arbitrage is often subject to regulatory restrictions on short-sales, considerable transaction costs (*e.g.*, high costs in stock-lending). Considering the corrective influence on the market of short sales,⁴² regulatory and transaction cost restrictions sharply reduce their volume and thus their effectiveness. The so-called Royal Dutch Shell and Closed-End Funds puzzles and the phenomenon of asset bubbles constitute strong evidence of the limited impact of arbitrage, due to noise trading.

³⁸ A. Shleifer, *Inefficient Markets: An Introduction to Behavioral Finance* (2000) at 173-174; J. B. DeLong, A. Shleifer, L. H. Summers, and R. J. Waldmann, ‘The Survival of Noise Traders in Financial Markets’ (1991) 64 *Journal of Business* 1.

³⁹ Gilson & Kraakman, *Twenty Years Later*, above n. 29, 733.

⁴⁰ Shleifer and Vishny, *Limits of Arbitrage*, above n 32.

⁴¹ See John Nofsinger and Richard Sias, ‘Herding and Feedback Trading by Institutional and Individual Investors’ (1999) 54 *Journal of Finance* 2263.

⁴² See J. Macey *et al.*, ‘Restrictions on Short Sales: An Analysis of the Uptick Rule and its Role in the 1987 Stock Market Crash’ (1989) 74 *Cornell L. Rev.* 799; P. M. Dechow *et al.*, ‘Short-sellers, Fundamental Analysis and Stock Returns’ (2001) 61 *Journal of Financial Economics.* 77.

(i) Royal Dutch Shell

The pricing of the shares of the Royal Dutch/Shell Group has been one of the first market phenomena used by behavioural finance scholars to show the limitations of the EMH.⁴³ Royal Dutch Shell is the result of the 1907 merger of Royal Dutch Petroleum and Shell Transport, which were independently incorporated in, respectively, the Netherlands and England. The merger of the two companies' assets was agreed on a 60-40 basis. Roughly this ratio remained the basis for the division of cash flows between the two segments of Royal Dutch Shell until 2005. The legacy companies maintained separate listings and Royal Dutch traded primarily in the United States (where it was part of the S&P 500 Index) and the Netherlands, and Shell has traded primarily in London, where it has been a major constituent of the Financial Times Stock Exchange Index (FTSE 100). According to the EMH model, the shares of the two components of this company should have traded at a 60–40 ratio, following exchange rate adjustments. Yet, the history of the price movement of the stocks shows a consistent deviation of over thirty five percent (35%) from the expected ratio. Even when explanations, such as taxes and transaction costs are taken into account, this very wide disparity cannot be explained but by reference to noise trading, clearly illustrating the limits of arbitrage.

(ii) Closed-end funds

Arguments concerning the inability of arbitrage to correct pricing inaccuracies, in the presence of noise trader activity, are lent additional force by the widely observed mis-

⁴³ See L. Rosenthal and C. Young, 'The Seemingly Anomalous Price Behavior of Royal Dutch/Shell and Unilever NV/PLC' (1990) 26 *Journal of Financial Economics* 123; K. A. Froot and E.M. Dabora, 'How are Stock Prices Affected by the Location of Trade?' (1999) 53 *Journal of Financial Economics* 189. This paradox was also examined by Shleifer and Vishny in their article on the limits of arbitrage. See Shleifer and Vishny, above n 34.

pricing of the shares/units of closed-end funds. Unlike open-end funds, closed-end funds issue a fixed number of shares/units. Thus, the rational way to find a price for their shares is to divide the net value of the fund's total assets (NAV) by the number of shares outstanding. Yet the average closed-end fund seems to trade at ten percent (10%) discount or premium over NAV.⁴⁴ Lee, Shleifer, and Thaler in their 1991 paper suggested that some of the individual investors who are the primary owners of closed-end funds are noise traders, exhibiting irrational swings in their expectations about future fund returns.⁴⁵ Sometimes they are too optimistic, while, at other times, they are too pessimistic. Sentiment changes affect fund share prices explaining thus the difference between share prices and NAV. This view has been received with serious skepticism by EMH scholars, who have offered a number of rational choice explanations to this puzzle. These include arguments about the impact of transaction costs (redemption expenses), expectations about future fund manager performance (agency costs), and tax liabilities.

While, these arguments may explain why funds usually sell at discount, they do not say why sometimes funds sell at substantial premia or why discounts tend to vary on a weekly basis.⁴⁶ Furthermore, the noise trader argument provides a powerful explanation of why it is possible to sell new closed-end funds at a premium encouraging the establishment of closed-end funds at times of investor exuberance and why when a closed-end fund is liquidated the share price converges towards NAV. In the latter case,

⁴⁴ Barberis and Thaler, *A Survey of Behavioral Finance*, above n 26, 41.

⁴⁵ M. C. C. Lee, A. Shleifer, and R. H. Thaler, 'Investor Sentiment and the Closed-end Fund Puzzle' (1991) 46 *Journal of Finance* 75; N. Chopra, M.C. C. Lee, A. Shleifer, and R. Thaler, 'Yes, Discounts on Closed-end Funds Are a Sentiment Index' (1993) 48 *Journal of Finance* 801.

⁴⁶ See Barberis and Thaler, *A Survey of Behavioral finance*, above n 26, 41.

investors no longer have to worry about shifts in noise trader sentiment and they cease demanding discounted prices over NAV to compensate for this risk.⁴⁷

(iii) Asset bubbles and investor herding

Arguably, asset bubbles constitute one of the market phenomena the occurrence of which shakes to its foundations the view that markets move in the way described by EMH.⁴⁸

Convincing explanations about asset bubbles may be derived from the psychology of judgment and choice, especially when considering the operation of the *availability heuristic* and the impact of the cognitive biases such as overconfidence.⁴⁹ Empirical research has shown that individuals frequently exhibit a deep-seated bias toward optimism in predicting future events.⁵⁰ In a rising stock market or any other asset market (including housing) individuals embrace unsustainable beliefs that the price rises will continue indefinitely.⁵¹ Institutional investors seem also susceptible to *overconfidence*.

The above do not mean that ‘bubbles’ have no rational explanations. A very convincing one is that herding which leads to the creation of ‘bubbles’ is investors’ reasonable response to *bounded rationality* and information asymmetries. Yet,

⁴⁷ In fact, Lee, Shleifer, and Thaler found that there is a strong co-movement in the prices of closed-end funds, which is a powerful indication that noise trader risk is systematic. See above n 45. Tests carried by Barberis *et al* on the impact of the inclusion of stocks on S &P 500, in the absence of any other information affecting the value of the issuer, have lent further force to this assumption. See N. Barberis, A. Shleifer, and J. Wurgler, ‘Why Do Stocks Comove? Evidence from S&P 500 Inclusions’ (2001) Working Paper, University of Chicago.

⁴⁸ See on stock market over-reaction W. F. M. DeBondt, and R. Thaler, ‘Does the Stock Market Overreact?’ (1985) 40 *Journal of Finance* 793 and Debondt and Thaler, ‘Further Evidence on Investor Overreaction and Stock Market Seasonality’ (1997) 42 *Journal of Finance* 557.

⁴⁹ R. J. Shiller, ‘Measuring Bubble Expectations and Investor Confidence’ (2000) 1 *Journal of Psychology and Financial Markets* 49.

⁵⁰ N. D. Weinstein, ‘Unrealistic Optimism about Future Life Events’ (1980) 39 *Journal of Personality and Social Psychology* 806.

⁵¹ See Shiller, above n 49.

individuals' role in the creation of asset bubbles seems to be predominantly rooted to behavioural causes. For instance, the role of *overconfidence* in favourable market conditions and anchoring loan re-payment calculations to prevailing, but short-lived, low interest rates seem to have played a major role in the recent housing bubbles in the US and Europe. At the same time, institutional investors' role in the creation of stock market and other asset bubbles might be better explained by behavioural analysis. The role of institutional investors' herding in both creating conditions of excessive liquidity by following the trend and buying structured credit products of uncertain value and also their role in deserting credit markets and exacerbating the credit crunch is explained in Section III.

It has become clear from the above discussion that the main contribution of behavioural finance is that it shifts attention from the analysis of the relationship between prices and information (one of the cornerstones of modern finance theory) to investor behaviour. Thus, the search for new information and the concept of 'fundamental value' become matters of secondary importance.⁵² Very large market changes and excessive volatility are attributed to 'irrational' investors who overreact to a given flow of information.⁵³ A number of market 'puzzles' such as (a) the *Equity premium*,⁵⁴ (b)

⁵² See from the law and economics literature L. Cunningham, 'From Random Walks to Chaotic Crashes: The Linear Genealogy of the Efficient Capital Market Hypothesis' (1994) 62 *Geo. Wash. L. Rev.* 546; Cunningham, 'Capital Market Theory, Mandatory Disclosure and Price Discovery' (1994) 51 *Wash. & Lee L. Rev.* 843 at 853.

⁵³ See Shleifer and Summers, above n 35; L. H. Summers, 'Does the Stock Market Rationally Reflect Fundamental Values?' (1986) 41 *Journal of Finance* 591.

⁵⁴ R. Mehra and E. Prescott, 'The Equity Premium: A Puzzle' (1985) 15 *Journal of Monetary Economics* 145; N. R. Kocherlakota, 'The Equity Premium: It's Still a Puzzle' (1996) 34 *Journal of Economic Literature* 42. For a behavioral analysis see S. Benartzi and R.H. Thaler, 'Myopic Loss Aversion and the Equity Premium Puzzle' (1995) 110 *Quarterly Journal of Economics* 73.

excessive *volatility*,⁵⁵ (c) higher than what would be justified by rational choice assumptions trading *volume*,⁵⁶ which is plausibly attributed to *overconfidence*, and (d) the payment of dividend, while there are better forms of rewarding a company's shareholders, may all be convincingly explained by reference to the role of *heuristics* and cognitive biases. Therefore, although behavioural finance suffers from its intrinsic inability to be a useful forecasting tool, it remains a very powerful interpretative tool when it comes to extreme market phenomena such as the global credit crisis. For this reason, as shown in the next Section, many the findings of behavioural finance, discussed above, provide convincing explanations about the causes of the global credit crisis.

III. A Critical Analysis of the Causes of the Global Credit Crisis

1. The Nature and Identified Causes of the Crisis

In mid-July 2007 the global credit markets came to a standstill. On the face of it, the continuous decline in the US housing market and the over-expansion of US and European banks in the US market for sub-prime mortgages led them to accumulate serious and mostly hidden losses. This outcome created a crisis of confidence where no bank would lend money to any other regardless of its credit standing. At the same time, the flow of capital to the global market for structured products all but disappeared.

⁵⁵ R. Shiller, 'Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?' (1981) 71 *American Economic Review* 421. S. F. LeRoy and R. D. Porter, 'The Present-Value Relation: Tests based on Implied Variance Bounds' (1981) 49 *Econometrica* 555.

⁵⁶ T. Odean and B. Barber, 'Trading is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors' (2000) 55 *Journal of Finance* 773.

In the process, the liquidity problems encountered by US and European banks escalated to such a degree as to develop into a full blown financial crisis, possibly the worst the western world has seen in the post-war era. This crisis has already had some very high profile victims from the financial sector. The first sign of the severity of the crisis appeared in the UK, where Northern Rock, a medium size UK commercial bank with a focus on the residential mortgages market, had to be effectively nationalized in order to be rescued from certain collapse. This, however, was followed by the posting of massive losses by big US based commercial banks such as Citigroup, gigantic US Investment banks such as Merrill Lynch, and some of the biggest European Banks such as UBS. These developments have raised grave concerns on both sides of the Atlantic as to the very real possibility of a collapse of the financial system (systemic collapse). In March 2008 these concerns led to the quasi-compulsory takeover of Bear Stearns, a big Wall Street Investment Bank, by JP Morgan, following the purchase by the US central bank, the Federal Reserve, of some of the worst performing assets of Bear Sterns at a cost of USD 28 billion.⁵⁷ In general, the private cost of the crisis has been calculated by the IMF to a minimum of around 945 billion USD,⁵⁸ of which losses ranging between 440 billion and 510 billion USD shall accrue to global banks and the remainder to bond

⁵⁷ M Grynbaum, 'Fed Officials Defend Rescue of Bear Stearns' NY Times, Business Section, 3 April 2008, available at <http://www.nytimes.com/2008/04/03/business/03cnd-fed.html?hp>

⁵⁸ The IMF has calculated that total losses from broad credit market deterioration are in the order of \$945 billion globally, \$565 billion of which is due to losses on residential mortgage debt (sub-prime and prime), \$240 billion on commercial real estate debt, \$120 billion on corporate debt ((including leveraged loans and CLOs), and \$20 billion on consumer credit debt. Securitized debt (rather than whole loans) accounts for the bulk of losses, and even most of the nonprime losses are in securities rather than unsecuritized loans. IMF, *GFSR, Containing Systemic Risks*, above n 2, 10-11, 50 and Tables 1.1 and 1.5. In fact according to the IMF, [a]t present, pricing of mortgage-related derivative indices suggests higher losses than do calculations based on projected cash flows for the underlying loans.' *Id.* 50.

insurers and other financial institutions.⁵⁹ This figure does not include losses to investors of around 720 billion USD which is, according to the IMF, the loss of investors from the decline of the market capitalization of global banks.⁶⁰ Even worse the public cost of the crisis, including the fiscal cost of the Northern Rock nationalisation and the Bear Sterns rescue, the cost of the various asset swaps between the BoE, the Fed, the ECB, and other central banks,⁶¹ and commercial lenders, as well as the impact on national economies of a likely global recession has not been calculated.

However, the picture painted above is in sharp contrast with a record of rapid expansion and widespread euphoria experienced by global credit markets for almost a decade. The main reason for the expansion of global credit markets was a combination of benign macro-economic conditions and expansive monetary policies based on low and relatively stable long-term interest rates, of ‘financial innovation, and of the broadening list of financial market participants’. Excessive liquidity and unrestrained availability of credit led to the creation of an asset bubble primarily in the US housing market⁶² and also, as is the case in most periods of financial euphoria, to serious deterioration of risk controls for extension of credit.

The prevalence of low interests in the biggest world economies, with the exception of China, was mainly the result of four factors. First, a low interest rate policy

⁵⁹ *Ibid.* 11.

⁶⁰ *Ibid.* 12.

⁶¹ See above n. 1.

⁶² For a journalistic analysis of the extent of the current credit crisis see, *inter alia*, Clive Crook, ‘Regulation Needs More than Tuning’, *Financial Times*, 6 April 2008, available at <http://www.ft.com/cms/s/0/0d0bcb40-03db-11dd-b28b-000077b07658.html>; S. Jagger, ‘Sub-prime and banking crisis: Who caused this nightmare? The blame spreads’, *The Times*, 19 March 2008, available at http://business.timesonline.co.uk/tol/business/industry_sectors/banking_and_finance/article3579171.ece

to foster consumer spending and growth that was followed by the US Fed during the second part of Allan Greenspan's tenure. Second, in May 1997 the newly elected Labour government handed over monetary policy decisions to an independent Monetary Policy Committee controlled by the Bank of England. The MPC reversed the trend of high interest rates in the UK. Third, the introduction of the Euro and the delegation by the Member States of the European Monetary Union of interest rate policy to the European System of Central Banks, headed by the European Central Bank, meant that the German approach of tight price controls and relatively low interest rates prevailed. This brought a monetary revolution in Euro-zone members, including Southern European countries, which in the past had suffered from high inflation and high interest rates. Fourth, the Bank of Japan, in its struggle to counter deflation, following the burst of the huge Japanese asset bubble in the mid-90s, kept throughout the second half of the 1990s and up to the best part of the next decade interest rates close to zero.

At the same time, market forces resorted to excessive use of financial innovation for the laying off of credit risk. Financial innovation mainly took the form of spreading and disseminating widely credit risk through the use of the 'originate and distribute' model, other structured finance techniques and the use of credit derivatives such as credit default swaps (CDS).⁶³ Through the use of securitization and of other structured finance techniques banks were allowed to recycle income from their assets in order to facilitate

⁶³ A CDS is a swap (financial contract) in which two parties agree that one party pays the other a fixed periodic coupon for the specified life of the agreement. The other party makes no payments unless a specified 'credit event' occurs. 'Credit events' are typically defined to include a material default, bankruptcy or debt restructuring for a specified reference asset. If a 'credit event' occurs, the party makes a payment to the first party, and then the swap is terminated. The size of the payment is usually linked to the decline in the reference asset's market value following the occurrence of a 'credit event'. For a full analysis of the mechanics of financial innovation in the field of credit markets see paragraph III.3 below.

ever more bank lending and asset acquisition. This in the process both increased the profit margins of credit institutions and their financial leverage.

Finally, the global abolition of capital restrictions and the benign macro-economic and monetary environment allowed a large number of international investment funds, mostly hedge funds, to enter in various forms the global credit markets and in many ways simulate the function of major banks. These highly geared institutions acquired a massive exposure in credit markets both through their capital market activities: borrowing funds in order to purchase structured credit securities or credit derivatives, and through their more straightforward credit activities: borrowing funds at low interest rates in order to on-lend them. Through the use of novel techniques for the laying off of credit risk and the active involvement of investment funds in the relevant market, usually as purchasers (underwriters) of risk, credit risk spread much more widely to the global investment community but it did not disappear.

The causes of the crises have been examined by several regulatory bodies and international fora which seem more or less to concur in their findings.⁶⁴ Drawing in part on the synopsis offered by the President's Working Group on Financial Markets the causes of the global credit crisis may be summarised as follows⁶⁵:

- a breakdown in underwriting standards for subprime mortgages;

⁶⁴ See the FSF, *Interim Report*, above n 9; PWGFM, *Policy Statement*, above n 7; IMF, *GFSR, Containing Systemic Risks*, above n 2; Mark Carney, Governor of the Bank of Canada, 'Addressing Financial Market Turbulence', Remarks to the Toronto Board of Trade, 13 March 2008, 3. [Hereinafter, Carney, *Financial Market Turbulence*].

⁶⁵ PWGFM, *Policy Statement*, above n 7, 3; see also Ben S. Bernanke, 'Addressing Weaknesses in the Global Financial Markets: The Report of the President's Working Group on Financial Markets' Speech made at the World Affairs Council, April 10, 2008 available at <http://www.federalreserve.gov/newsevents/speech/bernanke20080410a.htm> [Hereinafter, Bernanke, *Addressing Weaknesses in the Global Financial Markets*].

- flaws in the *originate and distribute* model adopted in modern structured finance which were manifested in a significant erosion of market discipline by those involved in the securitization process, including originators, underwriters, credit rating agencies, and global investors, related in part to failures to provide or obtain adequate risk disclosures;
- flaws in credit rating agencies' assessments of subprime residential mortgage backed securities (RMBS) and other complex structured credit products, especially collateralized debt obligations (CDOs) that held RMBS and other asset-backed securities (CDOs or ABS);
- risk management weaknesses at some large U.S. and European financial institutions; and
- regulatory policies, including capital and disclosure requirements, that failed to mitigate risk management weaknesses.

A general observation regarding the identified causes of the crisis is that a significant number of them may be better explained by reference to the findings of behavioural finance. In the next few paragraphs, I provide a critical analysis of the causes of the global credit crisis highlighting their rational choice and behavioural aspects.⁶⁶

2. Excessive Liquidity, Financial Innovation, and a Behavioural Explanation of the Credit Crunch

a. Excessive Liquidity and Overconfidence

It is widely acknowledged that excessive liquidity was one of the main causes of the massive credit expansion which led to the present crisis. The reason for the credit

⁶⁶ For behavioural explanations to the meltdown of the US sub-prime market see Steven L. Schwarcz, 'Protecting Financial Markets: Lessons from the Subprime Mortgage Meltdown' Duke Law School Legal Studies, Research Paper Series, Research Paper No. 175, November 2007.

expansion was that the market having a short memory and being in a state of financial euphoria became increasingly, and irrationally, overconfident ‘that liquid markets would continually provide an outlet for new products and represent an ongoing source of funding liquidity for financial institutions.’ Market overconfidence was further refueled by financial innovation which led market participants to wrongfully believe that there is such a thing as unlimited credit expansion.

Keeping with tradition during periods of market overconfidence, given also the ability of innovative financial techniques to disperse credit risk very widely, the creditworthiness of the borrowers became a matter of secondary importance. As a result, ‘underwriting standards for U.S. adjustable-rate sub-prime mortgages weakened dramatically between late 2004 and early 2007’ and mortgages were extended to borrowers with weaker credit histories.⁶⁷ At the same time, mortgage borrowers in the Western world, *anchored* to the prevailing environment of low interest rates and overconfident that rising house prices will last forever, rushed to jump on the property bandwagon. However, in doing so they took no account of whether their borrowings were truly affordable on the basis of their earnings. It is not then surprising that the soaring default rates in those exact loans were the trigger of the present crisis.

b. The Impact of Financial Innovation

However, US and international banks did not retain the loans to US sub-prime and other housing market borrowers on their balance sheets. Most of those loans were re-packaged, through the use of the *originate-to-distribute* model, and sold to interested investors in the capital markets.⁶⁸

⁶⁷ PWGFM, *Policy Statement*, above n 7, 8.

The *originate-to-distribute* model is a method to break down the process of credit extension from ‘origination’ to ultimate financing. Starting from *origination*, the granting of the actual bank loan, the asset created (the borrower’s obligation) is normally sold by the ‘originator’ to another financial institution (‘the packager’) and is subsequently merged with other similar assets (‘repackaged’) to create a marketable security. This process normally involves the creation of a separate legal entity, which is a special purpose vehicle (SPV) or a special investment vehicle (SIV), as its sole function is to hold the underlying mortgages or other assets and issue claims (bonds) against itself. The most straightforward cases involved combining the mortgage with other mortgages to create mortgage-backed securities (MBS) or residential mortgage-backed securities (RMBS). The owners of MBS have a claim on the cash flows arising from the underlying mortgages. Furthermore, much more complex securities can also be created, normally called Collateralized Debt Obligations (CDOs) or Collateralized Loan Obligations (CLOs), which are backed by a mix of different types of bonds, loans, or other assets and may be covered by various guarantees or hedges.

In recent years the issuance of such structured credit products in the form of securities experienced a very significant increase.⁶⁹ Structured securities may be broken into pieces, called tranches, of varying seniority and credit quality.⁷⁰ Each tranche is rated separately by one or more credit rating agencies. Most of them obtained the highest rating triple A (AAA). The packager normally kept on their balance sheet the tranches that have

⁶⁸ *Ibid.*

⁶⁹ Bernanke, *Addressing Weaknesses in the Global Financial Markets*, above n 65.

⁷⁰ IMF, *GFSR, Containing Systemic Risks*, above n 2, 56, Box 2.1,

the lowest ratings and thus were not easily marketable.⁷¹ The CDOs or the CLOs in turn would be bought by the SPV or the SIV, which would obtain funds for this purchase from investors to whom it would issue asset backed notes, known as Asset Backed Paper (ABCP). Unlike CDOs, ABCP could often enjoy a liquid secondary market.

Thus, at the end of the *originate-to-distribute* chain stood investors, such as hedge funds, banks, pension funds, or other financial institutions that provided the ultimate funding of the loans. The bank that advanced the original high-risk or sub-prime loans, in the end had transferred most of this risk to the buyers of RMBS, CDOS, and other asset backed securities (ABS).

Those institutional investors, who bought ABCP or other structured credit securities in order to diversify their portfolios or (more often) speculate, instead of using their investible funds often borrowed from the banks, because of the prevailing conditions of excessive liquidity, using ABCP as collateral. As discussed in subsequent paragraph, this development not only increased the overall leverage of the financial system, but also created the conditions for the intensification of financial instability in the course of the credit crisis.

Of course, as long as house prices were rising, sub-prime and other borrowers saw the value of their house rise and thus their home equity increase. However, when house prices began to fall, default rates soared, particularly on sub-prime mortgages with adjustable rates. In late 2007 defaults affected more than 20 percent of the entire outstanding adjustable-rate sub-prime mortgages in the US.⁷² Because sub-prime

⁷¹ IMF, *GFSR, Containing Systemic Risk*, 56-59 & Box 2.2.

⁷² PWGFM, *Policy Statement*, above n 7, 8.

mortgages were part of complex structured credit products sold to capital market investors the losses associated with mortgage defaults spread throughout the financial system. Accordingly, the losses from the decline of the US housing market and defaults in sub-prime mortgages meant also massive losses for hedge funds, banks and other capital markets' investment vehicles which were buyers of RMBS, ABCP and CDOs relating to US mortgages. This development necessitated funding calls on behalf of the banks which kept those securities as collateral for the loans they had granted to investment funds, especially to speculative hedge funds that enjoyed very high leveraging in their balance sheets. Hedge funds had then to sell a bigger proportion of their credit securities in a declining market fuelling further the downward price spiral in an illiquid market. As a result, the IMF reports that since October 2007 the prices of Asset Backed Securities (ABS) 'have declined between 20 and 40 percent across tranches rated AAA to BBB-, and as much as 50 percent on ABS collateralized debt obligations (ABS - CDOs) across all ratings categories.⁷³

c. Loss Aversion and the Liquidity Crunch

Following the collapse of the market and the sudden realisation of the unreliability and unsuitable use of credit ratings - discussed in the next paragraph - a large number of market participants stopped trading in the expectation that the storm would be short-lived and they would survive it unscathed. The resulting lack of liquidity made price discovery in the markets for structured credit products much more difficult. At the same time, a large number of financial institutions discovered that they were unable to determine the size of their exposures to structured credit products and resulting losses, as they could not

⁷³ IMF, *GFSR, Containing Systemic Risks*, above n 2, 11.

accurately value those exposures. The models financial firms used for valuation were very reliant on market prices and credit ratings. Thus, they had not been adequately developed or were not appropriate to value complex credit securities in the absence of reliable market prices.⁷⁴ What happened next was that financial institutions became concerned about the adequacy of their capital and the size of their balance sheets. In the process, they lost confidence to their assessments of the credit risk posed by other market participants that were known or suspected to hold sub-prime and other structured credit securities. This loss of confidence also spread to their view of counterparties' valuation practices and information about their holdings of such securities that was not publicly available.⁷⁵ As banks came to suffer from a combination of liquidity and balance sheet pressures and were plagued by concerns about counterparties' credit risk they became reluctant to provide other banks with term funding. Thus, the wholesale inter-bank lending market either became very expensive or dried up.⁷⁶ The disappearance of liquidity was a clear manifestation of the *loss-aversion* bias, since the high interest rates offered a calculated gamble that a rational arbitrageur would have taken placing money in the markets instead of hoarding cash. Namely, unwillingness to lend each other meant that either all banks were virtually bankrupt (unlikely) and counterparties assumed that they will never see their money back, or that widespread and irrational panic gripped that market. Thus, even the promise of higher than normal returns meant nothing to *loss*

⁷⁴ PWGFM, *Policy Statement*, above n 7, 9-10.

⁷⁵ *Ibid.*

⁷⁶ The PWGFM notes that 'Term premiums embodied in LIBOR rates increased, at times to more than 100 basis points, and some other types of term funding became more difficult and costly. Traditional central bank liquidity tools were unable to bring term premiums in the interbank markets down'.

averse market actors, despite their high level of financial sophistication defeating the assumption that professional investors are relatively immune to cognitive distortions.

Furthermore, although the liquidity crunch led to an intervention of Central Banks to provide markets with liquidity by lending banks affected by the credit crunch even by accepting inferior collateral, the funding offered was not enough to relieve the crisis. The result of the collapse of inter-bank lending markets were in the beginning most pronounced in the UK as they led to a depositor's run on Northern Rock, a medium size UK mortgage provider, and ultimately to its nationalization. Because of its business model, Northern Rock relied heavily for funding on both the inter-bank market and the recycling of assets through the securitization of mortgages. Thus, as both markets came to a standstill, the bank was unable to fund its obligations and faced collapse.⁷⁷ Finally, the markets became very concerned by the financial health of specialized insurance firms which had guaranteed the protection of investor's capital on super-senior CDO tranches.⁷⁸

3. Financial Innovation Hits the Credit Markets

a. Misaligned Incentives in the Originate-to-Distribute Model

One of the most widely cited causes of the current crisis relates to weak incentives to generate and provide initial and ongoing information on the quality and performance of underlying assets (loans) that were repackaged through the *originate-to-distribute* model.

In principle, the *originate-to-distribute* model spreads risk and reduces financing costs as it affords to small and medium size borrowers greater access to capital.⁷⁹ In

⁷⁷ House of Commons, Treasury Committee, Fifth Report of Session 2007–08, 'The Run on the Rock', 24 January 2008, 10-17, 35-54.

⁷⁸ IMF, *GFSR, Containing Systemic Risks*, above n 2, 14-15.

⁷⁹ Bernanke, *Addressing Weaknesses in the Global Financial Markets*, above n 65.

practice, however, problems arose in recent years throughout the *originate-to-distribute* chain, resulting in a retreat from this model following the eruption of the global credit crisis.

As said in the previous paragraph, the original lender (the ‘originator’) is also responsible for carrying out due diligence regarding the borrower’s creditworthiness and ensuring that the terms of the mortgage appropriately reflect the risks of the transaction. However, at the point of origination, gradually credit controls became increasingly compromised. The best-known and most serious case is that of US sub-prime mortgages. To a degree that increased over time, these mortgages were often poorly documented and extended with insufficient attention to the borrower's ability to repay.

Traditional lenders (or originators of a credit) had to be diligent with their client vetting and documentation as they retained exposure to risk of default until repayment of the credit on maturity. Since the bank advancing the original mortgage did not retain the risk of the loan it originated but passed it on to other financial institutions who packaged the loan into MBS and CDOs, it had no incentive for proper due diligence and borrower monitoring. Namely, credit disintermediation based on the *originate-to-distribute* model and the consequent severing of the long-term relationship between the originator and the borrower created perverse incentives in the system leading to reckless lending.

In addition, the incentive structures often tied originator revenue to loan volume, rather than to the quality of the loans being passed through the chain.⁸⁰ Namely, originators were paid by reference to the amount of loans generated regardless of the repayment rate of those loans, which is inextricably linked the borrower’s

⁸⁰ Carney, *Financial Market Turbulence*, above n 64.

creditworthiness. Thus, they had every incentive to maximize the volume of loans granted independently of controls on borrower creditworthiness.

The misaligned incentives explanation seems to have solid rational choice foundations: the system failed to provide rational actors with appropriate incentives to conduct appropriate credit controls and disclose borrower information. However, it may also be well explained by reference to behavioural factors and *bounded rationality*.⁸¹ First, in the prevailing conditions of market euphoria and *overconfidence*, falling risk premia, a traditional measure of risk, were taken to mean actual reduction of credit risk.⁸² Second, *bounded rationality* meant that, as securitisation markets grew and products became more complex, expert investors showed limited capacity for understanding structured credit products and developing tools to value them. Instead, as explained in a subsequent paragraph, relying on the *availability* and *representativeness* heuristics investors replaced rigorous credit controls and valuation mechanisms with over-reliance on credit ratings, negating the assumption that cognitive biases have only marginal influence on professional investors' decisions.

b. SIVs and Credit Derivatives

The asset valuations and risk controls that followed the eruption of the crisis in July 2007 made a striking revelation about both the shortcomings of financial innovation and the limitations of the rational banker and regulator model. These controls first uncovered the

⁸¹ This concept describes individuals' limited ability to process information, since they possess 'limited computational skills and seriously flawed memories'. *Bounded rationality* was first discussed as a potential determining factor in the making of economic decisions by Herbert Simon. See Herbert A. Simon, 'A Behavioral Model of Rational Choice' (1955) 69 *Quarterly Journal of Economics* 99; Simon, 'Rational Choice in the Structure of the Environment', in Simon, *Models of Man: Social and Rational* (New York: Wiley and Sons, 1957), 261, 271.

⁸² Carney, *Financial Market Turbulence*, above n 64.

vast expansion of well-concealed obligations undertaken by means of credit derivatives or off- balance-sheet entities (OBSEs), such as SIVs, and commercial paper conduits. OBSEs are special entities that allow financial institutions to transfer risk off their balance sheet to improve their liquidity through asset (loan) securitization, to generate fee income, and to achieve relief from regulatory capital requirements.⁸³ Furthermore, while credit derivatives were a good way to offload and diversify credit risk did not immunize banks to it, as banking institutions often stood on both sides of massive transactions in credit derivatives through their proprietary trading desks. Therefore, the successive downgrades of structured credit securities that followed the eruption of the crisis in July 2007 meant that credit risk started returning to the banks' books through their prior speculative transactions in credit derivatives.

Paradoxically, the very painful truth uncovered by relevant controls was that liability through OBSEs and credit derivatives was invisible not only to most banking supervisors and investors (bank shareholders), but also the banks themselves, which did not have a clear idea about the true value of OBSEs or the level of their exposure to them.⁸⁴ First, following the market turmoil and the retrospective carrying out of internal reviews of risk exposure, banks discovered that they had not totally divested themselves from the risk of their loans as they believed until then. On the contrary, in many cases they had retained a slice (tranche) in those entities and that was in fact the riskiest and least worthy part of SIVs' assets. Second, several banks felt compelled to increase such exposures, when the value of those entities collapsed, in order to protect their good

⁸³ IMF, *GFSR, Containing Systemic Risks*, above n 2, 69.

⁸⁴ IMF, *GFSR, Containing Systemic Risks*, above n 2, 70-72.

reputation with investors. So they choose to purchase assets from, or extend credit to OBSEs that were set up or managed by them.⁸⁵

4. Flawed Credit Ratings

a. The Shortcomings of Credit Ratings

Another major cause of the liquidity crunch that eventually became a global credit crisis was the loss of confidence by the market to credit ratings. In the decade preceding the crisis Credit Rating Agencies had enjoyed a quasi-religious status. Credit ratings were often seen as the cornerstone of the effective operation of credit markets and of the capital market activities relating to them, *e.g.*, issues of ABCP. However, credit ratings have been used by investors in the valuation of structured credit products because they have wrongfully been perceived to provide comparability between different fixed-income instruments. Even worse the same investors used credit ratings in order to price fixed income products, when reliable price quotations were unavailable,⁸⁶ which in the case of structured credit products was not unusual. As a result, credit ratings came to play a key role in the ‘valuation of customized or illiquid structured credit products’.⁸⁷

Furthermore, as explained in a subsequent paragraph, regulators’ rulebooks placed so much importance on credit ratings as to mandate the acquisition by institutional investors, such as pension funds, of only highly rated structured credit products or require a high rating in order to acknowledge transfers of credit risk off balance sheet. Thus, most investors relied heavily on the ratings in making investment decisions rather than undertaking their own independent credit analysis on instruments that often were quite

⁸⁵PWGM, *Policy Statement*, above n 7,

⁸⁶ IMF, *GFSR, Containing Systemic Risks*, above n 2, 55.

⁸⁷ *Ibid.*

complex. When it became apparent that even AAA tranches of some asset backed securities and other structured credit products could face large write-downs, investors largely lost faith in the ratings of complex structured products. Thus, as investors were no longer willing to rely on ratings and unable to perform their own credit analyses, they withdrew from a wide range of structured product markets. This meant that the recycling of bank assets through securitizations to fund business expansion became almost impossible resulting in a serious liquidity crunch.

The impact of the drying up of the market for securitizations was tremendous on banking institutions that relied heavily on this form of funding. The best illustration of this result was Northern Rock, which as a result of the disappearance of the market for credit products and of funding from the wholesale money markets initially had to be given liquidity support by the BoE, which, arguably, acted with substantial delay, and subsequently to be nationalized.

Of course the mega-paradox revealed by the above analysis is the fact that all the supposedly hyper-rational and certainly highly sophisticated market participants knew very well that the ratings produced by the major CRAS suffered several shortcomings. First, the insatiable appetite of global markets for credit ratings and the fact that the relevant market is highly oligopolistic, as three major agencies: Standard & Poors, Fitch, and Moodys' have traditionally dominated the market, meant that the industry suffered from a serious lack of incentives to significantly stress test their ratings. Second, the global credit rating agencies are often subject to colossal conflicts of interest, as the buyers of their ratings are the issuers whose products they rate.⁸⁸

⁸⁸ For an excellent analysis of the Credit Rating Agencies' paradox see Steven L. Schwarcz, 'Private Ordering of Public Markets: The Rating Agency Paradox' (2002) *U Ill L. Rev.* 1 and for an evaluation of

Yet CRAs evaded several attempts to bring their operations under a formal regulatory framework⁸⁹ and are still subject to a largely voluntary code of conduct issued by IOSCO.⁹⁰ Third, their methodologies were insufficiently scrutinized because of their complexity and lack of a designated regulator specifically assigned the task of stress testing the rating results of credit rating agencies. For instance, the ‘default and ratings transition probabilities of structured products have not always been consistent with those of corporate and sovereign ratings.’⁹¹ Also, CESR has raised concerns about the relevancy of the methodologies used by CRAs for the rating of structured products. More specifically, ‘the concept of the average probability of default under “normal” circumstances and the need for complementary approaches based on stress testing’ do not currently take into account the fat tails of the distribution curve of risks,⁹² *i.e.*, the more extreme default scenarios.

Furthermore, CRAs in the case of structured credit securities, which often bundle together underlying debt obligations emanating from a multitude of obligors, did not make public the estimated correlation of obligors in the asset pool. This is a major shortcoming as the cross-correlations, would greatly assist investors in assessing whether

their role in the global economy Howell E. Jackson, ‘The Role of Credit Rating Agencies in the Establishment of Capital Standards for Financial Institutions in a Global Economy’, in Eilis Ferran & Charles A.E. Goodhart (eds), *The Challenges Facing Financial Regulation* (2001).

⁸⁹ See CESR, ‘The Role of Credit Rating Agencies in Structured Finance’, Consultation Paper’, February 2008. [Hereinafter, CESR, *The Role of Credit Rating Agencies*]. This paper constituted the basis of CESR’s consultation on the role and regulation of CRAs, see ‘CESR launches a consultation on the Role of Credit Rating Agencies in Structured Finance’, Press Release, 13 February 2008, CESR 08-131.

⁹⁰ IOSCO, ‘Code of Conduct Fundamental for Credit Rating Agencies’, December 2004 and IOSCO, ‘Statement of Principles Regarding the Activities of Credit Rating Agencies’, September 2003. See also EU Commission ‘Communication from the Commission on Credit Rating Agencies’ OJ C 59/02/2006, 11.03.2006, requesting CRAs operating in the EU to comply with IOSCO’s Code of Conduct.

⁹¹ Carney, *Financial Market Turbulence*, above n 64.

⁹² CESR, *The Role of Credit Rating Agencies*, above n 89, para. 87.

the rating is based on expectations that are in-line with their own.⁹³ Finally, asset value in the case of securities is often intrinsically linked to the marketability/liquidity of a financial product and it is not measured by credit rating agencies.

b. Causes of Reliance on Credit Ratings

Arguably, investor reliance on credit ratings, in order to economise substantial research costs for buyers of structured securities and thus facilitate transactions, would have been deemed rational from a transaction costs perspective, if the rating flaws were less pronounced and serious. Furthermore, asset value in the case of securities is very often intrinsically linked to the marketability/liquidity of a financial product, which is not measured by credit ratings. Therefore, it was clearly irrational for investors to use credit ratings as the predominant benchmark of value for CDOs, ABS, and other structured credit products. What was then the reason that forced big, well resourced, and highly sophisticated banks and institutional investors to ignore all of the aforementioned faults of the ratings production process and perform little or no in-house credit analysis of their investments? In other words, what forced supposedly hyper-rational market actors to substitute proper analysis and due diligence for ‘a subscription to a ratings publication’?⁹⁴

It is the author’s view that the incredible amount of trust placed on the ratings of credit rating agencies, which, as a result, ‘had grown more powerful than anyone intended’,⁹⁵ was the result of the operation of the *availability* and *representativeness heuristics*. Namely, market participants relying much more heavily on *heuristics* rather than any rational

⁹³ ‘One of the distinctive characteristics of structured products is the fact that changes to these assumptions and the related correlations have an impact on the rating that can be greatly magnified.’ *Ibid.* para. 86

⁹⁴ Carney, *Addressing Financial Market Turbulence*, above n 64, 3-4.

⁹⁵ IMF, *GFSR, Containing Systemic Risks*, above n 2, 56.

calculations came to the conclusion that painstaking and accurate calculations of market value were not necessary for structured credit products. There was no memory of serious failures of the ratings process, since structured credit securities were predominantly new products without long trading histories. On the contrary, given also the prevailing conditions of market euphoria, credit ratings, inspite of their shortcomings, could serve as a usable, although inaccurate, benchmark of value so that trading and profiteering could go on. Namely, rational actors' cognitive limitations and the discussed in the next paragraph focus on short-term profit, forced sophisticated investors to ignore the warning signals and simply follow the herd.

Additional credibility to the above argument is lent by that fact that, while investors and regulators were placing nearly blind trust on credit ratings, CRAs frequently warned the market about the true function of their ratings. Naturally, since the entirely unjustifiable trust that regulators and investors placed on credit ratings created a vast and very lucrative market for CRAs, their warnings were neither very prominent nor widely publicized.⁹⁶ Yet a rational investor or regulator, given also their vast technical sophistication and expertise, would have easily identified and properly incorporated them into their decision making model discounting instead of exaggerating the importance of credit ratings.

5. Institutional Failures, Risk Management Controls and Compensation Structures

A recurring theme in every regulatory report on the causes of the global credit crisis is the role of lax risk management controls within financial institutions. As discussed in

⁹⁶ IMF, *GFSR, Containing Systemic Risks*, above n 2, 55. 'Although credit rating agencies insist that ratings measure only default risk, and not the likelihood or intensity of downgrades or mark-to-market losses, many investors were seemingly unaware of these warnings and disclaimers.' *Id.*

previous paragraphs, the failures of internal risk management controls were concentrated in five areas: (a) failing credit control and borrower vetting standards, (b) inability to properly value positions in structured credit securities, (c) excessive reliance on credit ratings inspite of their widely known shortcomings, (d) inadequate use of information when this was provided, and (e) ignorance of senior bank management of the true function of SIVs and thus of the institution's actual exposure to them which resulted in 'weak controls over potential balance sheet growth, including ineffective limits on the growth of business lines and poor monitoring of off-balance sheet exposures'.⁹⁷

I have already argued that there does not seem to be a convincing rational choice explanation for these failures and most of them should be attributed to behavioural causes. This argument is further reinforced by the flaws identified in bankers' compensation structures which exacerbated risk-taking and institutional focus on short-term profits.

The identified problems with employee-employer incentive alignment in several global financial institutions mostly pertain to mismatches between the timing of trader compensation and the realization of profits from their trades. The misaligned incentives extended further to insufficient recognition and compensation of risk-management professionals and provision of funding at risk free rates to trading desks that placed risky bets. Especially the structure of compensation schemes in financial institutions encouraged excessive risk-taking without sufficient regard to longer-term risks.⁹⁸

⁹⁷ According to the President's Working Group, these weaknesses 'were particularly evident with respect to the management of certain business lines: (a) CDO warehouses; (b) syndication of leveraged loans; and (c) conduit businesses (sponsorship or liquidity support for SIVs and other conduits that issued ABCP).' PWGFM, *Policy Statement*, above n 7, 15.

⁹⁸ FSF, *Interim Report*, above n 9, 4.

Arguably, the view that holds flawed compensation structures as a fundamental cause of the crisis does not have only rational choice – flawed incentives did not allow rational actors to redress market *anomalies* - but also behavioural foundations. Bank shareholders' or institutional investors' money is today managed by expert individuals, who allocate, as agents, the money of their principals. Their interests, as in most principal-agent relationships, are not perfectly aligned and sometimes diverge considerably. While shareholders or fund investors are concerned, under the rational choice model, with an optimal mixture of risk and return that ensures sustained profitability, bankers' and fund managers' concerns are markedly different. They have to show that their performance is equal or better than the rest of the market.⁹⁹ Performance affects bonus payments and the bankers' and fund managers' tenure in the job.¹⁰⁰ Individuals, who work for institutional investors, are in the market in order to make money and save their jobs and not in order to 'correct' prices. Thus, they are very likely to follow the herd,¹⁰¹ conveniently forgetting the value of painstaking risk-management controls and the possibility of long-term market reverses.

⁹⁹ For an analysis of the impact of the principal-agent relationship (within financial institutions) on the failure of disclosure in the market for structured credit securities see Steven L Schwarcz, 'Disclosure's Failure in the Subprime Mortgage Crisis' Duke Law School Legal Studies, Research Paper Series, Research Paper No. 203, March 2008, 8-9.

¹⁰⁰ See J. Chevalier and G. Ellison, 'Career Concerns of Mutual Fund Managers' (1999) 114 *Quarterly Journal of Economics* 389.

¹⁰¹ P. Gompers and A. Metrick, 'Institutional Investors and Equity Prices' (2001) 116 *Quarterly Journal of Economics* 229; R. Wermers, 'Mutual Fund Herding and the Impact on Stock Prices' (1999) 54 *Journal of Finance* 58; see also D. S. Scharfstein and J. Stein, 'Herd Behavior and Investment' (1990) 80 *American Economic Review* 465.

This might seem like a reasonable response to noise trader activity. Professional investors follow the herd and its trading choices playing the ‘momentum game’¹⁰² in the hope that they will be able to sell and materialize their gains, before noise traders decide to sell. Namely, bankers, traders, and fund managers concentrate on trades and trading techniques that enable them, if not to beat the market, at least not to lag behind it saving their jobs and securing large compensation packages.¹⁰³ However, as their reaction prolongs and deepens an eventual asset bubble,¹⁰⁴ the short-term and non-contrarian nature of their behaviour goes counter to game theory (strong) view of rationality.¹⁰⁵

6. Inadequate Disclosure and Product Transparency

Inadequate disclosure is blamed for the crisis in three contexts: (a) inadequate disclosure of risks to subprime borrowers, (b) opacity of highly structured financial products, which also incorporated very complex pricing formulas, and obfuscation by financial institutions of the risks associated with such products, inspite of relevant legal and regulatory requirements, and (c) inadequate disclosure by financial institutions of their on and off-balance sheet exposures.

In the context of structured credit products, inadequate disclosure and lack of standardization meant that the market had considerable difficulty to fill the gaps and properly price structured credit products or evaluate their risks. This built uncertainty that

¹⁰² D. C. Langevoort, ‘Taming the Animal Spirits of the Stock Markets: A Behavioral Approach to Securities Regulation’ (2002) 97 *Nw. U. L. Rev.* 135 at 158-159.

¹⁰³ Paul M. Healy & Krishna Palepu, ‘Governance and Intermediation Problems in Capital Markets: Evidence from the Fall of Enron’ (2003) 17 *Journal of Economic Perspectives* 3-26.

¹⁰⁴ J. R. Nofsinger and R. W. Sias, ‘Herding and Feedback Trading by Institutional and Individual Investors’ (1999) 54 *Journal of Finance* 2263.

¹⁰⁵ John Nash, ‘Equilibrium Points in n-person Games’ (1950) 36 *Proceedings of the National Academy of the USA* 48 and Nash, ‘Non-Cooperative Games’ (1951) 54 *Annals of Mathematics* 286.

eventually gripped the markets, following the trigger of the credit crisis. The same uncertainty has also prevented new entrants to the structured products market. Furthermore, as discussed above, banks either deliberately or because of their own ignorance have given the market incomplete information regarding their on- and off-balance sheet exposures to structured credit products. As a result, uncertainty about their true exposure led to considerable reluctance by counterparties to trade and the subsequent amplification of the market turmoil.

However, even the inadequate information explanation presents considerable behavioural elements. First, it is highly unlikely that sub-prime borrowers would have been able to accurately value the risks of the loans they obtained due to their significant lack of financial sophistication. Second, the huge discounts with which structured credit products were offered to new buyers without much success means that widespread *loss-aversion*, rather than incomplete information, was at the root of the disappearance of trading counterparties. Namely, unless we assume that the market estimated on the basis of all available information that all credit products were worthless and all banking institutions bankrupt, the only possible explanation of banks' unwillingness to provide short-term loans to each other is by reference to psychological factors: *loss aversion*. Third, due to bounded rationality it is not very likely that even in the event of full disclosure the risks involved in complex credit securities and OBSEs would be fully understood by investors and regulators.

7. Flawed Regulations

It is often argued that flawed regulations have also played a role. The capital framework that preceded Basle II encouraged banks to securitise low risk assets and, importantly, to support securitisation of high risk assets through instruments with lower regulatory capital charges. This had two consequences. First, bank balance sheets were also

deprived of high quality low risk assets that would provide counterparties with comfort during the crisis. This was particularly the case with Northern Rock that had transferred most of its loan book to a repackaging vehicle called ‘the Granite Fund’. As a result of this transfer of high quality assets (loans), the UK Treasury may never fully recover the whole of its exposure, through loans and investment, to the nationalized Northern Rock.¹⁰⁶ Second, banks resorted to excessive uses of bank sponsored SIVs, which however, were inadequately capitalized and lacked sufficient liquidity support mechanisms, which meant that liability for their funding and maintenance as going concern returned to the banks that had to expend considerable resources on this task.

Furthermore, regulations forcing banks and institutional investors to invest only in triple A rated assets also meant that the downgrades, which followed the eruption of the crisis, led to massive sales. Namely, investors had to sell the downgraded credit products in a declining market because they had a legal mandate to invest only in credit products attracting the highest rating. However, the ‘crowded trades’ that ensued proved very

¹⁰⁶ This issue generated a wave of negative publicity for the UK government in the press and some fierce Parliamentary questioning of the chancellor by opposition MPs who fear that the taxpayer is left with least desirable of Northern Rock’s mortgage book and the high end loans were moved to Granite on which no claim could be raised by the government. See Philip Webster, Greg Hurst and Siobhan Kennedy, ‘Northern Rock Nationalisation Runs into £49bn Granite barrier’, *Times*, 21 February 21 2008, available at <http://www.timesonline.co.uk/tol/news/politics/article3406368.ece> ; Patrick Wintour, Phillip Inman and Jill Treanor, ‘Northern Rock Nationalisation in Turmoil over Offshore Trust’, *The Guardian*, 21 February 2008, available at <http://www.guardian.co.uk/business/2008/feb/21/northernrock.banking>; John McDonnell, MP, Comment, ‘Granite Features’, 20 February 2008, available at

destabilizing for the market because they led to a full blown downward price spiral for structured credit securities.¹⁰⁷

IV. Regulatory Policy Proposals to Remedy the Crisis

There is a great diversity in the policy recommendations issued by national regulators, global regulatory fora, and industry organizations regarding the measures that have to be adopted in order to alleviate the credit crunch and prevent its re-occurrence. Relevant policy proposals range from improved self-regulation, suggested by the International Institute of Finance,¹⁰⁸ the global representative of the investment banking industry, to the concrete measures suggested by the FSF accepted by the G7 ministers,¹⁰⁹ and the President's Working Group on Financial Markets. In addition, the UK Tripartite Authorities, the US Treasury and EU bodies have issued a number of discussion papers dealing with issues of domestic banking regulation and the possible regulation of CRAs and of the Hedge Fund industry.

Suggestions calling for improved self-regulation have largely attracted derision,¹¹⁰ both due to the abysmal performance of the financial services industry in this area and because of practical problems associated with collective action. Therefore, in the next few paragraphs I discuss the various policy recommendations for the overhauling of formal financial regulation in order to address the problems that led to the crisis.

¹⁰⁷ Carney, *Addressing Financial Market Turbulence*, above n 64, 4.

¹⁰⁸ Institute of International Finance, 'Interim Report of the IIF Committee on Best Market Practices', 9 April 2008, available at

¹⁰⁹ FSF, *Enhancing Market and Institutional Resilience*, n 8 above. See also Krishna Guha and Chris Giles, 'G7 urges banks to boost capital', FT.com, 11 April 2008, available at <http://www.ft.com/cms/s/0/cf4f9d18-07ef-11dd-a922-0000779fd2ac.html>

¹¹⁰ See Willem Buiter's Analysis in 'Self-Regulation Means No Regulation' 10 April 2008, available at <http://blogs.ft.com/maverecon/2008/04/self-regulation-means-no-regulation/>

a. International Supervision of Financial Institutions

The FSF has called for the creation of a “college of supervisors” from different countries to oversee each of the largest global financial institutions.¹¹¹ In addition, suggestions have been made at various times that hedge funds should provide regulators with a list of their exposures.¹¹² Both of these measures, if implemented, would be a significant improvement in terms of international supervision of global banking institutions and of hedge funds. However, such improvement shall only be marginal in the process of building risky positions that may lead to a systemic crisis if, first, the model of domestic banking regulation is not subjected to radical rethinking, and, second, there is no international body to deal with systemic risks posed by the investment activities of hedge funds.

Furthermore, suggestions to subject hedge funds to the same kind of regulation and supervision as other EU registered investment funds would prove a significant improvement over the current situation,¹¹³ but also bound to prove incomplete. The hedge fund industry is a global industry and similarly global is the investment mandate of most SWFs. Therefore, in the absence of a global regime for the licensing and supervision of

¹¹¹ ‘Supervisors should build on existing examples of supervisory colleges, both in the Basel II framework and in regional arrangements such as the EU, to establish an international college of the most relevant supervisors for each of the largest global financial institutions by end-2008. The purpose of the colleges would be to enhance cooperation on ongoing supervisory issues. The design and membership of each college would need to be tailored to the institution that it oversees in order to ensure that the college is able to operate in an effective and flexible fashion. Colleges should hold their first meetings by December 2008 to exchange information and assessments and, as appropriate, to cooperate in supervision.’ FSF, *Enhancing Market and Institutional Resilience*, above n 9, 42.

¹¹² For the merits and complications of such a proposal see Ben S. Bernanke, ‘Hedge Funds and Systemic Risk’, Speech at the Federal Reserve Bank of Atlanta’s 2006 Financial Markets Conference, 16 May 2006. On the systemic risk implications created by hedge fund activity and possible regulatory responses see President's Working Group on Financial Markets, ‘Hedge Funds, Leverage, and the Lessons of Long-Term Capital Management’, Report-3097, 15 April 1999.

¹¹³

systemically important investment funds, regional regulations are bound to provide excessive loopholes. Thus, such investment funds, which normally maintain an offshore registration, will still be able to carry on building up highly geared and speculative positions that will generate colossal systemic risk implications.

b. Re-alignment of incentives and improved corporate governance

According to most policy recommendations aimed at remedying the credit crisis and preventing its re-occurrence, one of the biggest areas of priority is the proper alignment of principal-agent incentives in the *originate-to-distribute* model and the pay structure of financial institutions. Suggested measures include making originators and distributors liable for first loss within the securitized pool of credits or otherwise retain exposure through reputational risk. They also ask investors to take the lead in demanding compensation structures that are more aligned with their interests with supervisors merely assessing the impact of compensation arrangements on the risk-management and internal control systems of the supervised institutions.¹¹⁴

The simple redressing of incentives in the *originate-to-distribute* model will not suffice. Because banks in the era of financial innovation will inevitably invent new techniques to layoff risk and it is not for regulators to tell the market which financing techniques they should follow. Furthermore, it is arguable that regulators of banking institutions which take deposits from the public and are subject to an implicit public guarantee of their liabilities should be very concerned about the quality of banks' balance sheets. As excessive use of securitizations can lead to substantial weakening of the quality of bank balance sheets, it is hard to envisage how a re-alignment of incentives will address this concern. Therefore, it is suggested in Section V that placing a limit to

¹¹⁴ *Addressing Financial Market Turbulence*, above n 64, 7.

the amount of assets Tier I (loans and savings) institutions should be allowed to securitize - keeping assets of varied quality above that ratio on their balance sheet - could be a more effective risk reduction mechanism.

Moreover, due to investors' cognitive limitations, focus on short-term profit, and the limited impact of learning on remedying cognitive biases, a proper re-alignment of compensation structures by virtue of shareholders' sustained pressure on highly aggressive/highly competitive financial institutions' management is bound to remain wishful thinking. In addition, strong support to the assertion that improved corporate governance is not a sufficient solution offers the fact that most of the institutions in the centre of the present crisis maintain a US listing. As a result, they have already been subject to the highest, and most expensive, corporate governance regulation ever experienced in the modern world, because of the impact of the US Sarbanes Oxley Act.¹¹⁵ At the same time, regulatory intervention in bankers' pay¹¹⁶ is plausibly viewed as an unacceptable and highly questionable remedy. Accordingly, only a radical rethinking of the organizational structures of the banking industry may lead to a serious correction of misaligned incentives through the construction of institutions with a more benign and long-term orientation towards profit-making, as by nature would be the Tier I and Tier II banks of the Section V proposal.

c. Streamlining of regulatory and liquidity support process

The US Treasury and the UK Tripartite authorities have mainly suggested as solutions to the credit crisis the streamlining of their very complex and convoluted supervisory and

¹¹⁵ Sarbanes-Oxley Act of 2002, 15 U.S.C. §§ 7201 – 7266 (2002).

¹¹⁶ M. Wolf, 'Why Regulators Should Intervene in Bankers' Pay,' *Financial Times*, 16 January 2008, 11.

and liquidity support processes.¹¹⁷ Some of the proposals of the Financial Stability forum were also following the same line. In addition, the US Treasury proposes the extension of the Federal Reserve's LoLR facility in exchange for liquidity supervision.¹¹⁸ Also, the UK Authorities have revamped the depositor protection scheme in order to avoid another banking run such as that witnessed in September 2007 on Northern Rock. These proposals have been widely criticized as lacking both in terms of breadth and thrust to re-regulate an industry that is in bad need of fixing. Furthermore, while the suggested measures are definitely good cushions against another crisis it is very doubtful that they could prevent it.

d. Buying Bad/Illiquid Assets

The IMF, respected economists, and the Financial Stability Forum have suggested that state intervention would be needed to help big banks to clean up their balance sheet from bad assets and restore confidence in the markets. In fact, some have suggested the establishment of an international fund owned by the big nations that will buy non-performing bank assets mostly in the form of debt held by SIVs and keep it to maturity. However, the shortcomings of this proposal are several. First, it amounts to partial nationalization of the banking industry. Secondly, it will lead to increased budget deficits for western economies which are already facing fiscal challenges due to the impending economic downturn. Also this solution presents serious problems with fiscal transparency

¹¹⁷ See above nn 7-9.

¹¹⁸ See above n 6.

rules.¹¹⁹ Finally, and more importantly, it increases moral hazard by sending a very wrong signal to the markets, namely, that all banks are ‘too big to fail’. This will be even more the case as the establishment of such a fund may only acquire a permanent nature, as some of these assets have very long maturities.

e. Streamlining Mortgage Selling Processes

Proposals to enhance the quality of customer and trading counterparty disclosure in the US mortgage markets and impose safeguards for responsible mortgage selling could eventually prove very useful measures. However, their effectiveness may also prove short-lived. Strict adherence with them will probably be neglected as soon as the conditions of financial euphoria return and behaviourally challenged customers and bankers start again behaving in a reckless way. It is much better to restrict this business, as suggested in the next Section, to smaller and specialized institutions that are fully aware that the only way to make profit from their business is through adherence to strict due diligence procedures in the course of underwriting and selling mortgages.

f. Capital Increases and Liquidity Buffers

The FSF has raised the possibility of rule changes to make capital requirements more counter-cyclical – forcing banks to set aside larger cushions of capital in good times.¹²⁰

This is undoubtedly a proposal to the right direction as it will reduce financial institutions’ leverage, which according to the IMF, is one of the most important reasons

¹¹⁹ See Willem Buiters’ Analysis in ‘Quasi-fiscal scoundrels 4: helping banks’, April 12, 2008, available at <http://blogs.ft.com/maverecon/2008/04/quasi-fiscal-scoundrels-4-helping-banks/#more-182>

¹²⁰ FSF, *Enhancing Market and Institutional Resilience*, n 8 above. On the role of bank capital adequacy requirements in increasing pro-cyclicality see C. Goodhart, B. Hofman & M. Segoviano, ‘Bank Regulation and Macroeconomic Fluctuations’ (2004) 20 *Oxford Review of Economic Policy* 591-615 and Goodhart and A. Taylor, ‘Procyclicality and Volatility in the Financial System: The Implementation of Basel II and IAS 39’ in Stefan Gerlach and Paul Gruenwald (eds), *Procyclicality of Financial Systems in Asia* (Palgrave, 2006).

of the current crisis.¹²¹ However, this measure may also prove ineffective. Unless the current business model of the banking industry is broken down in smaller and self-contained pieces, in accordance with the proposal advanced in the next Section, higher capital charges will remain an incomplete and possibly wasteful measure. Namely, depending on the kind of business they pursue, banks will have to reserve more or less capital than is warranted by the business they undertake. Moreover, inevitably the powerful and very innovative banking industry will find ways to by-pass the higher capital requirements through the issue of instruments that will mimic the function of equity capital without providing the same security. Finally, unless banks build massive capital positions in advance, in the absence of the suggested below business segregation, just a boosted capital ratio shall not prevent a re-occurrence of the crisis or significantly reduce systemic risk.¹²² Universal banks through the use of SIVs, synthetic CDOs, and of credit derivatives, are able to build risk exposures that can stay well hidden until losses starting eating up into the bank's capital.¹²³

¹²¹ IMF, *GFSR, Containing Systemic Risks*, above n 2,

¹²² Barth, Caprio and Levine have found that '[T]here is not a strong relationship between the stringency of official capital requirements and the likelihood of a crisis after controlling for other features of the regulatory and supervisory regime.' See James R. Barth, Gerard Caprio, Jr. and Ross Levine, *Bank Regulation and Supervision: What Works Best?* NBER Working Paper No. W9323, November 2002, 34. Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=351423. [Hereinafter, Barth, Caprio & Levine, *Bank Regulation and Supervision*].

¹²³ *E.g.*, ensuring the current crisis banks have been repeatedly found to have built large risk exposures through 'purchases of securities based on loans that had initially been sold on by banks, implicit guarantees provided to off-balance-sheet vehicles, and large lines of credit extended to hedge funds and other high risk clients, among others. At the same time, the degree of leverage undertaken by hedge funds and other market participants has often turned out to be much higher than expected.' IMF, *GFSR, Containing Systemic Risks*, above n 2, 37.

g. Improving Risk Controls, Product Transparency and Standardization, and OTC Market Processes

Among other proposals for remedying the credit crisis are suggestions for (a) the overhaul of disclosure in relation to structured credit products and the securitization process, (b) the building of operation infrastructure for the trading of credit derivatives, including a trading protocol,¹²⁴ and (c) standardization of credit products. The implementation of these very important measures, especially product standardization and the operational infrastructure for credit derivatives traded OTC, would remedy a number of infrastructural defects of global credit markets making them safer and more efficient. However, placing too much emphasis on disclosure will not produce the desired results due to the aforementioned behavioural factors and the increasing complexity of transactions and markets. The complexity increases when derivatives are involved. It is doubtful whether for investment strategies utilizing derivatives, even under conditions of adequate disclosure, sophisticated investors and regulators are capable to fully appreciate the risks involved. Furthermore, disclosure is an insufficient tool when regulation targets systemic risk reduction.¹²⁵

V. A New Regulatory Regime for Banks and International Investment Funds

1. The Proposal

Banking is a regulated industry and the question of whether regulation is the right approach to containing the various risks inherent in the operation of banking businesses has been exhaustively discussed elsewhere.¹²⁶ Thus, if the need to regulate the banking

¹²⁴ FSF, *Enhancing Market and Institutional Resilience*, *supra* n 10, 19-31.

¹²⁵ Schwarcz, *Systemic Risk*, *supra* n 13, 34-35 & 63.

industry is recognized, then the question becomes an issue of regulation content and direction. The objectives of financial regulation in the field of credit markets are clear: minimizing systemic instability and safeguarding the protection of depositors. To these most commentators add a third: minimization of public costs. The costs of a crisis in the credit markets are in the form of (a) fiscal expenditure directed towards rescuing ailing financial institutions and (b) the adverse impact of a credit crisis on economic growth. The global credit crisis has shown that both of the above costs can take colossal dimensions.

As noticed above the current framework proved inadequate to prevent the global credit crisis. Also the forms of regulatory intervention proposed in order to improve disclosure and overhaul current regulatory and risk management process will neither prevent a new global credit crisis nor will they remedy the impact of market actors' cognitive limitations. Furthermore, in the above areas de-biasing may only be attained through law¹²⁷ and not through further investor education, delegation of the task of choosing investments to professionals, or through mere improvement of the quality of disclosed information. Thus, more radical proposals must also be considered. Such proposals should neither discard existing regulations nor should they dismiss the aforementioned policy recommendations. Yet they must go beyond what is currently

¹²⁶ For a very good exposition of the market failures, such as information asymmetries, and other policy concerns, such as banking runs and the risk of contagion, which underpin banking regulation see Richard Dale, *The Regulation of International Banking* (London: Prentice Hall, 1984), ch. 3.

¹²⁷ '[W]e define debiasing of boundedly rational actors as using *techniques that intervene in and alter the situation that produces the boundedly rational behavior, without operating on the degree of motivation or effort an actor brings to the task*. Debiasing through law is then the use of legal rules to achieve such debiasing of boundedly rational actors.' See C. Jolls and C. R. Sunstein, 'Debiasing through Law', Univ. of Chicago Law & Economics, Olin Working Paper No. 225; Harvard Law and Economics Discussion Paper No. 495, rev. March 2005, 10. Available at http://ssrn.com/abstract_id=590929.

suggested and redraw the boundaries of financial regulation in order to allow it to work better and provide a higher level of safety and also keep in check the behavioural and other factors that could cause a repetition of a global credit crisis. This is the aim of the proposals for regulatory reform advanced below.

Radical proposals for the reform of the regulatory framework governing credit markets either recommend strict regulations governing the structure and use of innovative financial products and techniques or deal with the organizational structure of the banking industry. The proposals advanced below target the latter and entail a minimal intervention at the level of structure and design of financial products or identification of the proper financing, trading, or investment technique, which is largely left to market forces.

a. Redrawing the Boundaries of Banking Regulation

In the table below, I map the boundaries of the suggested regulatory system for banking institutions. The suggested pluralistic system for the licensing and supervision of banking institutions is arguably a powerful mechanism for the containment of systemic risk and the avoidance of depositors' run within national credit markets. At the same time, it remains neutral regarding the nature of the competent regulatory authority.

Of course, the proposal described in the table below is just a first approach to the restructuring of the boundaries of banking regulation. The appropriate bodies to decide its final shape and form are the participants of the Basle Committee, of the Financial Stability Forum, the EU Commission, and national regulators. Furthermore, in the absence of a global consensus the recommendations will not work because of regulatory arbitrage. Therefore, the true value of the present proposal is that it provides a clear framework for the establishment of pluralistic and multi-tiered regimes for the regulation

of banking institutions, although the exact content of this framework is largely to be determined by the aforementioned bodies.

A New Model for Bank Authorisation and Supervision					
Permitted Activities	Type of License	Deposit Insurance	Capital Adequacy	Liquidity Insurance	Prohibited Activities
<ul style="list-style-type: none"> • Deposit taking • Consumer lending • Mortgage Lending • Corporate Lending • Leasing • Treasury & FX Operations <p><i>Funding basis</i></p> <ul style="list-style-type: none"> • (1) Deposits • (2) Shareholders' Equity • (3) Bond issues • (4) Wholesale banking markets up to a ratio of other funding sources (<i>e.g.</i>, 30% of total deposits or 300% of shareholders' equity) • (5) securitizations up to a ratio over total assets (<i>e.g.</i>, 30% of total assets) 	Tier I Savings and Loans Institution	100% Up to a limit that covers all small and medium size deposits Pre-funded but co-insurance scheme ¹²⁸	Basle II	Lender of Last Resort (inevitably at subsidized rates) but pre-funded scheme	Balance sheet securitization not exceeding a set ratio (<i>e.g.</i> , 30%) of total assets Treasury & FX Operations only in connection to balance sheet and maturity mismatches management Lending to the inter-bank market up to a ratio of total deposits (<i>e.g.</i> , 50% of deposits) All other regulatory restrictions in respect of large exposures etc remain applicable

¹²⁸ The preference for this instead of a 100% insurance scheme regardless of size of deposits is very convincingly argued by Charles Goodhart in a recent paper citing also empirical work carried by World Bank economists pointing to the same direction. See Goodhart, *The Regulatory Responses*, above n 10,

<ul style="list-style-type: none"> • Issuing of short-term bills and long-term bonds to the public • Mortgage lending • Corporate Lending • Leasing • Treasury & FX Operations • Asset Management • Client Broking Services • Limited ability to underwrite securities issues or take proprietary positions in the capital markets <p><i>Funding basis</i></p> <p>(1) short-term bills and long-term bonds issued to public savers</p> <p>(2) Shareholders' Equity</p> <p>(3) Bond issues targeting the wholesale capital markets</p> <p>(4) Wholesale banking markets up to 100% of shareholders' equity and long-term debt</p> <p>(5) securitizations up to a ratio over total assets (e.g., 50% of total assets)</p>	Tier II Bank	<p>50%</p> <p>Pre-funded co-insurance scheme</p>	Basle II	Lender of Last Resort (inevitably at subsidized rates) but pre-funded scheme	<p>No underwriting of securities or proprietary trading exceeding a ratio over (e.g., 300%) shareholders' equity</p> <p>All other regulatory restrictions in respect of large exposures etc remain applicable</p>
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<ul style="list-style-type: none"> • Full range of Capital market activities including: Underwriting of securities issues, • Trading(proprietary) in derivatives • Trading in (proprietary) securities • Underwriting • Broking <p><i>Funding basis</i></p> <p>(1) Shares or bonds that may be offered to the public under the applicable public offer of securities regime or issued to the wholesale capital markets</p> <p>(2) Wholesale banking markets (no restriction)</p> <p>(3) Securitization of assets (no restriction)</p>	<p>Tier III Firm (Investment Bank, or Investment (Securities Firm)</p>	<p>None</p>	<p>Basle II</p>	<p>Liquidity Insurance from Central Bank or Private Provider at market rates</p>	<p>No deposit taking</p> <p>No short-term debt issued to the public</p>
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Cross-shareholdings between the institutions of each Tier should not exceed 20% and the same should be the highest stake held by a licensed securities firm that engages into proprietary trading or underwriting activities, insurance company, or international investment fund (licensed under the regime discussed below) to the share-capital of any Tier I bank. These restrictions ensure that systemic risk does not return to the savings and loans industry by virtue of substantial cross-shareholdings (ownership participations).

b. A Global Licensing Regime for Systemically Important Investment Funds

The systemic importance of global hedge funds and their widespread involvement in credit markets as well as their role in exacerbating the present crisis has highlighted the

need to design a suitable regulatory regime dealing with these highly geared investors. Arguably, the relevant regime may only prove successful if it has a global reach. Attempts to license and regulate hedge funds on a national or regional basis will prove ineffective due to the highly integrated nature of global capital markets and of hedge fund activities within them. Therefore, it is suggested that an independent International Investment Funds Authority (IIFA) must be established that would deal with the licensing and supervision of the prudential aspects of the operation of systemically important international investment funds (IIFs). The same authority should supervise the investment conduct of such funds on the basis of a mandatory global code of investment conduct.¹²⁹ Funds engaging into investment and trading activities with an international focus shall be brought within the IIFA scheme and comply with attendant licensing and supervisory requirements based on the size of their balance sheet and the ratio of fund's gearing. Admittedly, such a scheme would prove totally ineffective if Sovereign Wealth Funds were not also brought within the regulatory reach of the IIFA.

(b) A Global Licensing Regime for Systemically Important Investment Funds

The systemic importance of global hedge funds and their widespread involvement in credit markets as well as their role in exacerbating the present crisis has highlighted the need to design a suitable regulatory regime dealing with these highly geared investors. Arguably, the relevant regime may only prove successful if it has a global reach. Therefore, it is suggested that an International Investment Funds Authority (IIFA) must be established that would deal with the licensing and supervision of certain prudential aspects of the operation of systemically important international investment funds (IIFs).

¹²⁹ See IMF, Press Release No. 08/97, 'International Working Group of Sovereign Wealth Funds is Established to Facilitate Work on Voluntary Principles', 1 May 2008, available at <http://www.imf.org/external/np/sec/pr/2008/pr0897.htm>.

The same authority should supervise the investment conduct of such funds on the basis of a mandatory global code of investment conduct.¹³⁰ Funds engaging into investment and trading activities with an international focus should be brought within the IIFA scheme and comply with attendant licensing and supervisory requirements depending on the size of their balance sheet and the size of funds' gearing. Admittedly, such a scheme would prove totally ineffective if Sovereign Wealth Funds were not also brought within the regulatory reach of the IIFA.

The scheme would work on the basis of a global common passport and the funds that have opted to stay outside the scheme could be legally disbarred from undertaking significant (above a specified threshold) trading and/or investment activities on markets supervised by states that would participate in the scheme. This would place non-participating funds at a considerable competitive disadvantage over licensed funds. In keeping with suggestions for re-inventing and restructuring the mission and activities of the IMF, the Fund could be providing all necessary research and surveillance facilities to the new entity for a fee. Also, the IMF could set up a pre-funded liquidity insurance scheme for international investment funds interested in entering the IIFA scheme.

Both the Long Term Capital Management (LTCM) debacle and the global credit crisis have shown that the systemic implications arising from hedge fund trading are attributable to their high leverage and the illiquidity, even temporary illiquidity, of their positions. Therefore, given their proven systemic importance and the common admission that systemic risk¹³¹ may not be diversified away, International funds would be allowed

¹³⁰ See IMF, Press Release No. 08/97, "International Working Group of Sovereign Wealth Funds is Established to Facilitate Work on Voluntary Principles", 1 May 2008.

to register with the scheme under two conditions: (a) provide the IIFA with full access to information regarding the composition and structure of their balance sheets (but not to the composition of their membership, which is a sensitive issue, especially for SWFs) and (b) prove that they have (i) subscribed with a new (pre-funded) global liquidity/systemic risk insurance scheme for IIFs, administered by the IMF, or (ii) entered into pre-funded liquidity support/systemic risk insurance arrangements provided by central banks from a G 25 country or by a credible private organization. The more leveraged the positions that the funds wished to take the higher the systemic risk premium that the suggested liquidity insurance scheme would consider charging them.

2. In Defense of a New Approach to Financial Regulation

The global credit crisis has shown that the systemic threats posed by irresponsible practice within the investment industry can bring down the international financial system and cause a global economic meltdown. Collapse may have been avoided this time because of the extension of public funds, at a huge cost to the taxpayer, and the liquidity enjoyed by oil producing countries and exporting countries, such as China, which needed to invest their excessive trade surpluses through their SWFs. The next time the crisis will be uncontrollable if things stay the same as today. Most of the proposals offered by national regulators and global regulatory fora will lead, if implemented, to an improvement of current risk management, disclosure, liquidity insurance practices and of supervisory practices. However, they do not insure against the re-occurrence of a crisis of similar if not larger severity.

¹³¹ As systemic risk is defined here the likelihood that a series of defaults of bank counterparties, within a short period of time, can lead to banks' inability to pay their obligations to each other causing a series of institutional collapses and a possible depositors' run. See GG Kaufman, 'Bank Failures, Systemic Risk, and Bank Regulation' (1996) 16 *The Cato Journal* 17, 20. See for other definitions, Schwarcz, supra n 13, 5-16.

As there is no certainty that the next time the taxpayer will be able to bail out the banking markets or that some trading nations will enjoy the same amount of investible surpluses, more far-reaching solutions have to be considered. Systemic instability is a very dangerous scenario that can cripple a country's economic life and threaten the health of the global financial system, including a cease of payments and other transnational flows of funds, if it has international dimensions. It may also adversely affect global growth.

Hedge funds seem to cause systemic problems during any kind of market turmoil and often require the same kind of liquidity support as that offered to banks. For example, hedge funds required liquidity support both during the bond markets downward spiral of 1998, which led to the rescue of the LCTM, and during the current crisis, when hedge funds proved to be particularly “vulnerable to mutually enforcing funding and market liquidity spirals”. Hedge funds’ selling to meet margin and other funding requirements, fuelled severe price declines,¹³² which in turn reinforced investors’ loss of confidence, further sales, and thus further funding pressures.¹³³ In fact, because their positions are so leveraged, the IMF maintains that a far from unprecedented increase in margins to ten percent (10%), from an initial three percent (3%), would force the average hedge “fund to sell nearly 70 percent of its holdings”, even if there is no change in the fund’s value and investors do not redeem the fund units or securities they hold.¹³⁴

¹³² IMF, *GFSR*, above n 2, 32-33.

¹³³ *Ibid.* 3.

¹³⁴ *Ibid.* 22.

Given the value of the public goods of systemic stability,¹³⁵ orderly function of the national and global financial system, and steady economic growth, the passing of new and more radical regulations, as suggested in this paper, may, *inter alia*, be justified on the basis of *precautionary principle*.¹³⁶ Yet this is only because we miss three crucial figures. First, we do not have yet the full measure of the costs of the global credit crisis. Second, the approximate cost of the hedge fund licensing remains unknown. Third, the approximate cost of abolition of universal banking and segregation of certain functions within banking institutions, which, under the present proposal, would be made available on the basis of external contracts, is also unknown. It is possible that, once the above costs have been quantified, the present proposal would pass even the most rigorous cost-benefit test.¹³⁷

The most serious objection to a proposal of organizational segregation of banking business comes from empirical studies suggesting that restrictions on bank activities are not conducive to bank stability and development.¹³⁸ It is argued that permitting banks to conduct securities and insurance activities presents several advantages¹³⁹: (a) exploitation

¹³⁵ Professor Steven Schwarcz has offered an excellent analysis of the impossibility of controlling systemic risk by any means other than regulation, because of the tragedy of the “commons”. Schwarcz, above n 12, 56-59.

¹³⁶ As a moral and political principle the *precautionary principle* is used to support (health and safety / environmental) regulation, even in the absence of scientific evidence, when there is a threat (an action or policy) that could cause very serious or irreversible harm to the public. Thus, it may justify, in certain cases, the cost of protective regulation, regardless of a cost benefit analysis. Steven Schwarcz has stressed the role of the “precautionary principle” in justifying regulation that protects the financial system from systemic risk. *Ibid.*

¹³⁷ For a first approach to providing a metric of systemic stability see C Goodhart and DP Tsomokos, “Analysis of Financial Stability”, LSE-FMG mimeo, 2008. For a first formulation of a cost benefit analysis pertaining to the impact of possible systemic risk regulations see Schwarcz, above n 12, 63-66.

¹³⁸

of economies of scale and scope in gathering and processing information about firms, (b) risk diversification, (c) building a diversified base of activities leads to a more stable source of income and thus more stable banks, (d) building reputation capital with clients, (e) increase the franchise value of banks and thereby augment incentives for banks to behave prudently. Also it is suggested that restricting the kind of activities a bank may undertake hinders bank development¹⁴⁰ and thus economic growth, since bank development has been found to positive influence economic growth.¹⁴¹

Yet the above arguments/findings have a number of different readings and can attract alternative views and even serious objections. First, the Barth, Caprio, and Levine study is equally sceptical about the impact of capital adequacy standards on bank stability, in the absence of other forms of regulation safeguarding it.¹⁴² However, raising capital adequacy buffers is the standard recipe currently offered for alleviating the current crisis. Second, the Barth, Caprio, and Levine study preceded the global credit crisis by several years and has not considered the behavioural roots of the current crisis. Third, the argument that banks, which are allowed to participate in securities markets, have more diversified sources of income helping banks' financial stability is valid only for countries with developed securities markets.¹⁴³ Fourth, the best test for every theory is market experience. Thus, the argument that bank development positively affects growth and a

¹³⁹ See JR Barth, RD Brumbaugh and JA Wilcox, "The Repeal of Glass-Steagall and the Advent of Broad Banking" (2000) 14 *Journal of Economic Perspectives* 191-204; S Claessens and D Klingebiel, "Competition and Scope of Activities in Financial Services", World Bank, mimeo, April 2000.

¹⁴⁰ Barth, Caprio & Levine, above n 122, 31-32.

¹⁴¹ R Levine, N Loayza and T Beck, "Financial Intermediation and Growth: Causality and Causes" (2000) 46 *Journal of Monetary Economics* 77.

¹⁴² See Barth, Caprio & Levine, above n 122.

¹⁴³ *Ibid.*

restriction of bank activities affects bank development has to be weighted against the current situation, where often banks either do not lend money to individuals and corporations or lend at very high interest rate premiums. Certainly, a liquidity crunch can have a much stronger negative impact on growth than the positive impact of any measure that fosters bank development.

Fifth, creating banks that specialize in certain areas of business lending might mean better services for customers. Sixth, it has been convincingly argued and empirically tested that, while access to finance is an essential ingredient of economic growth, there does not seem to be any preference in favour of bank based funding over market based funding.¹⁴⁴ Therefore, the size of banks may not be as important as their ability to efficiently offer intermediation services to interested users of finance. Eighth, breaking down financial conglomerates means higher competition and lower barriers to entry. A weakened domestic financial services industry would be less able to restrict the arrival of foreign banks. Foreign entry into domestic banking markets is a factor that enhances bank stability.¹⁴⁵ Finally, breaking down the current model of universal banking would lead to fewer conflicts of interest, a situation that currently plagues the financial services industry and its reputation. Thus, it would allow banks to offer better services to their clients and build stronger reputations for their franchise.

The policy recommendations made in this paper present several other advantages:

¹⁴⁴ T Beck, A Demirguc-Kunt, R Levine and V Maksimovic, “Financial Structure and Economic Development: Firm, Industry, and Country Evidence” World Bank Policy Research Working Paper 2423, June 2000; RG Rajan and L Zingales, “Financial Systems, Industrial Structure, and Growth” (2001) 17 *Oxford Review of Economic Policy* 467.

¹⁴⁵ Barth, Caprio & Levine, above n 122, 34-35. Barth, Caprio, & Levine conclude that “[c]ountries that do not impose severe limits on foreign bank entry enjoy greater banking-sector stability.” *Id.* 38.

- (1) Choosing the right policy tool to prevent a banking crisis is crucial and, as the current crisis has shown, containing liquidity risk is at least as crucial for the health of the financial system as avoiding bank bankruptcies.¹⁴⁶ The segregation suggested here makes a number of provisions for maintaining the liquidity of Tier I and Tier II banks. At the same time, the implicit public guarantee remains given strong doubts as to whether a private liquidity provider could meet demand under conditions of crisis.¹⁴⁷
- (2) Under the suggested scheme, deposits are guaranteed, up to a certain level, under a co-insurance scheme. Thus, the system of publicly guaranteed deposits does not become over-generous, causing moral hazard. It has been suggested that all other forms of insuring bank obligations apart from a deposit insurance scheme, which normally entails an implicit public guarantee, would make unviable the banking business as it would trigger frequent crises of confidence.¹⁴⁸ This risk is clearly avoided under the present proposal.
- (3) At the same time, the assets of the loans and savings industry are ring-fenced. Ring-fencing the loans and savings sector from excessive speculation is very important. The sectors' activities play a major role, first, in providing liquidity on demand,¹⁴⁹ second, in amortizing financial burdens for individuals and businesses,

¹⁴⁶ See DW Diamond and RG Rajan, "Liquidity Shortages and Banking Crises" (2005) 60 *Journal of Finance* 615.

¹⁴⁷ B Holmström and J Tirole, "Private and Public Supply of Liquidity" (1998) 106 *Journal of Political Economy* 1.

¹⁴⁸ DW Diamond and PH Dybvig, "Banking Theory, Deposit Insurance, and Bank Regulation" (1986) 59 *Journal of Business* 55.

- and, third, in reducing financial risks. Also access to credit, *e.g.*, corporate loans, is very crucial for economic growth.
- (4) A transparent and workable regime would be introduced for the operation and supervision of the global hedge fund industry and the containment of the systemic risk generated by its activities. The objective of this regime would not be to curb the innovative instincts of the market, as is the hidden message of the current policy proposals of national regulators and global fora. It would just target the social costs of investment fund activities and force them to internalize the cost of their speculative activities to a significant degree. Namely, the suggested scheme for global investment funds would sharply reduce their ability to free ride on the implicit public guarantee enjoyed by their counterparty banks, or even themselves by virtue of the systemic importance of their activities. This would inevitably mean lower leveraging and more prudent investment positions leading to a corresponding reduction of systemic risk. However, choice is not restricted. Hedge funds could still choose to trade in financial instruments of any risk profile.
- (5) Leverage would be lowered considerably for both investment banks and investment funds, because they would both need to find funds to finance, in advance and on a continuous basis, liquidity insurance schemes, as a regulatory condition for authorization and continuous operation. Reducing the ability of financial institutions to leverage their balance sheets also limits the otherwise uncontrollable behavioural tendency of bankers and of fund managers to focus on

¹⁴⁹ AK Kashyap, R Rajan, and JC Stein, “Banks as Liquidity Provider: An Explanation for the Coexistence of Lending and Deposit-Taking” (2002) *57 Journal of Finance* 33-73.

- short-term profit, which is commonly described as greed.¹⁵⁰ Moreover, the increased sunk costs the scheme would entail for the operation of global hedge funds would have beneficial consequences for the industry. It would essentially weed out the “bad apples”, in the form of under-funded and undercapitalized funds, from the market.
- (6) While regulation often creates moral hazard, as it gives the impression that market discipline is replaced by regulatory oversight, this is not a significant risk under the proposed scheme. Eventual implementation of the present proposal would reinforce market discipline incentives. For instance, the public would know that placing their savings with Tier II banks attracted only limited safety as such savings would be insured only up to 50%. In addition, counterparties of Tier II and Tier III banks would not be able to assume that any of those institutions was too big to fail, since public guarantees would be partly or totally withdrawn. In the same mode, the systemic risk/liquidity insurance schemes that investment funds would have to subscribe to would be no substitute for bankruptcy risk controls. Such funds could still default in their positions increasing the importance of counterparty risk controls.
- (7) While objections may be raised regarding the cost of capital and market efficiency in respect of both proposals, they are essentially unfounded. Global investment banks do not really provide capital to corporate issuers, they just act as

¹⁵⁰ The most striking of the numerous writings on banker’s greed is the *Financial Times* Editorial of 11 April 2008, ‘Saving Banking from the Bankers’. The individual and collective culture of greed within financial institutions is also held to be the main cause for the failure of regulatory and institutional risk controls to prevent rogue traders. See KD Krawiec, “Accounting for Greed: Unraveling the Rogue Trader Mystery” (2000) 79 *Oregon Law Review* 301.

intermediaries, and they would keep discharging that role. Essentially, what is so far done internally would be done on the basis of external contracting. For instance, in the case of underwriting they would need to borrow funds at a market rate, instead of free riding on the low cost of funding ensured by the deposit base of big universal banks.

(8) The aforementioned regulatory policy proposals on disclosure, transparency, product standardization for structured credit markets, and streamlining of risk control and regulatory processes are, of course useful, but of limited value. First, they will significantly curtail the market appetite for innovation without containing the externalities created by transactions in complex financial products. Second, because of the behavioural factors explained above, in the next phase of market euphoria many of those guidelines and binding rules will be forgotten and the markets will return to excessive risk taking without paying much attention to levels of transparency, product comparability, and disclosure. Third, the use of such risk reduction methods is by itself self-defeating, in the case of individual investors as a result of the impact of the discussed cognitive biases or of framing,¹⁵¹ and in the case of institutional investors because of *bounded rationality*.¹⁵² For instance, even operating under the strictest rules on disclosure

¹⁵¹ The framing effect refers to the way a problem is posed for the decision maker. It has been documented to have a distorting impact on individuals' decision-making. See Amos Tversky and Daniel Kahneman, 'Rational Choice and the Framing of Decisions' (1986) 59 *Journal of Business* S251-S278 and R. A. LeBoeuf and E. Shafir, 'Deep Thoughts and Shallow Frames: On the Susceptibility to Framing Effects' (2003) 16 *Journal of Behavioral Decision Making* 77.

¹⁵² For the limited impact of disclosure on structured credit markets see Schwarcz, *Disclosure's Failure*, above n 99,

firms may be able to frame investment information in a way that can at same time comply with the rules and be misleading or not sufficiently revealing of risks.¹⁵³

- (9) In keeping with suggestions for re-inventing and restructuring the mission and activities of the IMF, the Fund would be providing all necessary research and surveillance facilities to the IFFA, giving it a very meaningful new role.

VI. Conclusion

The global credit crisis has shown that the systemic threats posed by irresponsible practices within the banking industry can cause the collapse of the international financial system and a global economic crisis. Collapse may have been avoided this time because of the extension of public funds and the excess liquidity enjoyed by countries with massive trade surpluses.

Most of the policy recommendations offered by national and global regulators and think tanks would lead, if implemented, to an improvement of current regulatory processes and risk management practices. However, they do not address the fundamental causes of the credit crisis, which as shown in this paper, were mostly behavioural. Therefore, the suggested reforms provide only limited insurance against the re-occurrence of a crisis of similar if not larger severity.

This paper has argued for a new global regulatory consensus with respect to the radical redrawing of the current model of national and international financial regulation. It has proposed the breaking down of licensing and supervisory regimes governing credit institutions and the segregation of the savings and loans industry from other financial services activities. The high risk/high return activities shall remain outside the ambit of

¹⁵³ See Emiliios Avgouleas, 'Cognitive Biases and Investor Protection Regulation, An Evolutionary Approach', mimeo, School of Law, University of Manchester, July 2007.

the implicit government guarantee enjoyed by the savings and loans industry, and banking undertakings engaging in higher risk activities would be obliged to take expensive liquidity insurance from public or private functionaries. In addition, as the possibility of exploiting the cheap funding basis that deposits provide would disappear, they would become more prudent with the use of their funds and less prone to take huge investment bets on the basis of high leverage. The combined outcome of these measures would be a safer and less leveraged banking industry.

The current crisis has also focused regulators' and policy makers' minds on the systemic importance of global investment funds, whether hedge funds, SWFs, or Private Equity Funds. Their widespread involvement in credit markets and their role in generating and exacerbating the present crisis have made necessary the drawing of a global prudential regulation regime dealing with internationally active and systemically important investment funds. The paper has suggested the establishment of a global multi-tiered licensing and supervisory scheme for such funds. The rule-making and supervisory functions of this scheme should be discharged by a new global financial authority.

The above proposals present several advantages. First, leverage is lowered considerably for both investment banks and investment funds, because they would both need to find funds to finance, in advance and on a continuous basis, liquidity insurance schemes, as a regulatory condition for authorization and continuous operation. Second, the savings and loans industry would be protected from extreme forms of financial speculation and the risks these entail. Third, a transparent and workable regime would be founded for the operation and supervision of the global hedge fund industry and the containment of the systemic risk generated by its activities. Fourth, the objective of the

above policy recommendations is not to curb the innovative and speculative instincts of the market. They just target the social costs of those activities force them to internalize those costs to a significant degree. Fifth, while regulation often creates moral hazard, the proposed scheme, in fact, reinforces market discipline incentives.

Further suggestions on disclosure, transparency, product standardization for structured credit markets and other similar proposals are deemed useful but still of limited value. First, they significantly curtail the market appetite for innovation without containing systemic risk. Second, because of the discussed above behavioural factors, during the next period of market euphoria, whenever this occurs, many of the guidelines and even binding rules issued this period will be forgotten. The markets will return to excessive risk taking without paying much attention to levels of transparency, product comparability, and disclosure. The global credit crisis has vividly shown that this is a gamble that the global economy and national and international regulators and policy makers can ill afford to take!