The Role and the Future of Regulation in the Financial Crisis:
The Uncertainty Perspective

Alessio M. Pacces ([*])

Abstract

This paper analyzes the last financial crisis in the perspective of financial innovation focussing on the dynamics of systemic externalities in banking. After discussing the peculiar nature of banking and its external effects to society, it shows that one major determinant of the financial crisis was the failure of regulation to address the evolution of financial intermediation under uncertainty. Differently from the standard explanations, which are variously based on unanticipated opportunism and/or irrationality of financial intermediaries, this analysis suggests that regulation has not been insufficient. On the contrary, regulation has been so overly demanding towards traditional banking to promote unregulated forms of financial intermediation, thereby exacerbating the externalities of financial innovation.

In contrast to the initiatives of regulatory reform on both sides of the Atlantic, which address the accidental aspects of the last financial crisis, this paper contends that the overhaul of financial regulation should focus on the general problem of banks' dealing with uncertainty. As uncertainty makes externalities in banking most dangerous, this approach could fare better in preventing the next crisis.

Three major implications are derived from this analysis. First, regulation should avoid inducing banks to make leveraged bets on new forms of short-term funding in order to compete with unregulated intermediaries. The latter should be prevented from engaging in the functional core of banking, maturity transformation, which is the recurrent source of systemic externalities. Second, in relying upon ratings, regulation should correct the incentives it provides to rating agencies to inflate their grades by making them liable for rating intractable uncertainties instead of measurable risks. Finally, regulation should avoid tampering with the corporate governance of banks. Allowing bank managers to protect their autonomy via contractual choices is a more promising solution to short-termism in carrying out financial innovation than regulation of bankers' pay.

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[*] Associate Professor of Law and Economics, Rotterdam Institute of Law and Economics (Erasmus School of Law, Erasmus University Rotterdam) and Research Associate, ECGI. I am indebted to Jonathan Klick for extremely helpful discussions on the core ideas of the paper. All errors are mine.

1. Introduction

Rethinking the role of financial regulation has high priority in the agenda of policymakers.[1] This is hardly surprising given the impact of the last financial crisis on the most important economies in the world. Likewise unsurprising is the engagement of virtually all financial economists in the study of what is now universally considered the most severe financial crisis after the Great Depression of the 1930s. As it turns out, the public opinion looks at both categories of students with suspicion for the simple reason that both, albeit carrying different burdens of responsibility, failed to anticipate the crisis, which resulted in the recession most people are still struggling with.[2]

In this situation, it is quite natural for both policymakers and the economists' profession to call for "stricter," "more vigorous", or just "more" regulation. The former can thus deflect the attention from how existing regulations concurred in determining the crisis. The latter may and most often do not share this goal. However, also the economists who blame existing regulations for what they did, and not just for what they failed to do, benefit from advocating more stringent rules for addressing market failures and/or irrationality that had been long denounced, but apparently, do not give early warnings on their disruptive consequences.

It seems then unavoidable that banking and the financial sector in general will become even more regulated than it currently is. The only possible countervailing

[1] See e.g. Report of the Advisory Committee on the Future of Banks in the Netherlands, "Restoring Trust", 7 April 2009; Jacques de Larosière (Chairman), "Report of the High-Level Group on Financial Supervision in the EU", 25 February 2009 (henceforth "Larosière Report"); US Department of Treasury, "Financial Regulatory Reform: A New foundation", 17 June 2009 (henceforth "President Obama Plan").

[2] This account has received authoritative academic support in Law and Economics. See Richard H. Posner, *A Failure of Capitalism – The Crisis of '08 and the Descent into Depression*, Harvard University Press, 2009, 117-47 and 252-58. But see also, critically, Robert M. Solow, "How to Understand the Disaster", 56(8) *The New York Reviews of Books* (May 14, 2009).

force, the financial industry, is much too weak to prevent this from happening. This at least until the next boom comes, with the political and intellectual pressure to relax overly burdensome regulations that prevents people from reaping the benefits of financial innovation. These are the same people who will be hit by the next financial crisis, and demand again more regulation. This circle is not new, and it is not necessarily vicious. Historically, regulation has evolved through this "trial-and-error" process of catching up with innovation. But we have better ways to learn from past mistakes. For the limited purpose of this inquiry, that implies rethinking financial regulation already in the perspective of financial innovation in order to prevent the latter from resulting in the next crisis.

The existing analyses of the financial crisis, from the US subprime mortgages meltdown to its worldwide repercussions, are extremely articulated.[3] Yet important questions remain unanswered even in hindsight. First, it is clear that some key players (mortgage originators, bankers, rating agencies) had wrong incentives. What is less clear is how these players, who have all lost substantially from the crisis, could possibly manage to fool each other while being the most sophisticated professionals of the financial industry. In other words, since the crisis originally affected only wholesale finance, how could the same financial institutions be simultaneously victims and villains?

Certainly, these institutions have harmed the society, whether intentionally or not. Here comes another puzzling circumstance. It is quite settled that the securitization business created externalities on the financial system, with dramatic

[3] See e.g. Charles W. Calomiris, ''The Subprime Turmoil: What's Old, What's New, and What's Next,'' 15 *Journal of Structured Finance*, 2009, 6-52.

repercussions on the real economy.[4] But it is far from obvious how securitization, which uses the market to improve allocation of risks, could lead to a major systemic crisis through the paralysis of the very markets that nurtured its development. In other words, how could the same markets provide unthought-of profit opportunities and precipitate the financial industry into unexpected distress at two relatively close points in time?

These questions have an appealing answer, which explains its popularity among commentators and policymakers. People as well as markets have been irrational.[5] Irrationality is appealing because it explains excesses of otherwise professional players as it excuses failure to predict the consequences of those excesses. And, by claiming people's inability to protect from themselves, it brings a clear-cut case for regulation.

However, irrationality explanations are at odds with the evidence that both financial intermediaries and rating agencies knew what they were doing.[6] Specifically, they profited from the short-term profits from securitizing certain assets knowing, *not* ignoring, that the underlying economic conditions could not last forever – and that there was high risk of a sudden downturn. But they expected that the markets would have cleared at equilibrium upon a change in the fundamentals, allowing them to adjust to the new conditions – so why forego the profits meanwhile? They were wrong because those markets unexpectedly stopped working at the downturn of the newly created securities, thereby bringing the system and virtually all of its

[4] For a focus on the systemic implications of the financial crisis, see Martin Hellwig, "Systemic Risk in the Financial Sector: An Analysis of the Subprime-Mortgage Financial Crisis", MPI Collective Goods Preprint No. 2008/43, 35-60, November 2008 (available at SSRN: http://ssrn.com/abstract=1309442).
[5] George A. Akerlof and Robert Shiller, *Animal Spirits – How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism*, Princeton University Press, 2008.
[6] See e.g. Charles W. Calomiris, "The Debasement of Ratings: What's Wrong and How We Can Fix It" Working Paper available at http://www0.gsb.columbia.edu/faculty/ccalomiris/RatingAgenciesE21.pdf, October 2009. See also, on the relationship between AIG (the major issuer of credit default swaps on subprime mortgages) and the rest of the financial industry, Michael Lewis, "The Man Who Crashed the World", *Vanity Fair* (US edition), August 2009.

participants close to collapse. Being wrong does not necessarily depend on being irrational.[7] It may simply depend on limited knowledge. In at least one set of conditions acting upon limited knowledge is entirely rational, although, as irrationality, this implies failure to predict certain outcomes. That is innovation, which is carried out under uncertainty about the implications of the new technology employed. Securitization is a case in point.

It is rational for those involved in innovation to disregard its remote, but potentially disruptive, consequences.[8] Both magnitude and probability of these consequences are not known at the outset. That is the essence of uncertainty, as opposed to known and quantifiable risks, so the only relevant decision is whether to face it or not.[9] The decision to face it is both a necessary condition of innovation and a source of instability.[10] Successful innovation rapidly displaces previous technologies and market equilibria in a competitive process.[11] But progress is not always smooth, for the adverse consequences of innovation, which were not accounted for, may materialize all of a sudden. In other words, innovation may fail without notice. That is the dark side of uncertainty, which prompts the same individuals and firms who enthusiastically supported the innovation to stay away from it until the dust settles. This implication of uncertainty is all the more painful when, as in the case of banking,

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[7] See most efficaciously, Richard H. Posner, "Shorting Reason", Review of "Animal Spirits" by G.A. Akerlof and R. Shiller, in *The New Republic*, April 15, 2009.

[8] This view was popularized just before the explosion of the crisis. See Nassim Nicholas Taleb, *The Black Swan – The Impact of the Highly Improbable*, New York: Random House, 2007.

[9] On the divide between risk and uncertainty, see Frank H. Knight, *Risk, Uncertainty, and Profit*, Boston (MA): Houghton Mifflin, 1921.

[10] John M. Keynes, *The General Theory of Employment, Interest, and Money*, Cambridge: Macmillan, 1936 (reprint BN Publishing 2008), notes at 12, VII (p. 104):

> "Even apart from the instability due to speculation, there is the instability due to the characteristic of human nature that a large proportion of our positive activities depend on spontaneous optimism rather than on a mathematical expectation, whether moral or hedonistic or economic. Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as a result of *animal spirits* — of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities." (emphasis added)

[11] Joseph A. Schumpeter, *Capitalism, Socialism, and Democracy*, New York: Harper & Row, 1942.

innovation and its malfunctioning produce 'external' effects on other members of society. People benefited from greater access to credit granted by securitization; but they lost much more than that, in terms of income, unemployment, and prospective tax burden, when the uncertainties of securitization resulted in a credit crunch.

In this paper, I will argue that one major determinant of the financial crisis was the failure of regulation to cope with the externalities of financial innovation. Differently from the interpretations based on various combinations of opportunism and irrationality, I contend that this failure did not depend on financial regulation being insufficient. In a sense, the opposite is true, for there is even too much of it. Rather, the problem is that the existing approach to regulation fails to account for uncertainty and its dynamics in the development of banking.[12] Since bankers are entrepreneurs who naturally seek for innovative ways to make banking profitable, the paradigm of systemic externalities (as of other market failures) is also subject to changes. Failure to account for this circumstance makes regulation not only ineffective in the face of innovation, but also conducive to the very crises it is intended to avoid. Studying this problem, instead of its accidental implications, is probably the key to avoid the next financial crisis.

The paper is structured as follows. Section 2 reviews the economic rationales for regulating banking and the main instruments of regulation. In section 3, I will show how regulation worked against its very rationales with respect to three fundamental determinants of the last financial crisis: the divide between regulated and unregulated financial intermediation (the so-called "shadow banking"); the role of credit rating agencies; and the corporate governance of banks. Section 4 briefly discusses the proposals of regulatory reform and why they miss the crux of the matter.

[12] For a similar approach, see Augusto de la Torre and Alain Ize, "Regulatory Reform: Integrating Paradigms", World Bank Policy Research WP No. 4842, February 2009 (available at SSRN: http://ssrn.com/abstract=1348983).

Section 5 draws on the implications of the uncertainty perspective for the regulatory framework, hinting at how banking regulations should welcome innovation while being, at the same time, prepared to contain its externalities. Section 6 concludes.

2. Why Are Banks Regulated?

Regulation of banks lies at the core of an otherwise extensive financial regulation. The reason is that banks run an inherently fragile business and this fragility has potentially enormous repercussions on the society because banks channel two vital resources in a capitalist economy: money and savings.[13] The fragility of banking depends on the way they intermediate financial resources between their providers and recipients. Banks make financial exchange happen, in spite of a structural mismatch in time horizons between borrowers and lenders, by issuing two separate financial claims: banks borrow short-term from lenders and lend long-term to borrowers. A bank's profits depend on its ability to borrow short and lend long, which is called maturity transformation.[14] This ability depends, in turn, on investors' trust that banks can cope better with asymmetric information of long-term lending, which allows banks to enjoy comparably lower costs of funding. Therefore, a bank typically issues liabilities that carry low risk premia and are redeemable on demand. These liabilities are 'liquid' and in many respects – including monetary policy – they are a substitute for cash.

This operation is stable so long as there is no asymmetric information on banks' liquid liabilities.[15] When these are perceived as safe, banks can and do cope

[13] On the economics of banking regulation, see Dirk Heremans, "Regulation of Banking and Financial Markets", in Alessio M. Pacces and Roger Van den Bergh (Eds.), *Economics of Regulation*, in Encyclopaedia of Law and Economics, second edition, Vol. 6, forthcoming 2011 (on file with author).
[14] For the implications on real-estate finance, see Hellwig, *supra* note 4, 7-10.
[15] Gary B. Gorton, "Slapped in the Face by the Invisible Hand: Banking and the Panic of 2007", Working Paper, May 2009 (available at SSRN: http://ssrn.com/abstract=1401882).

with temporary liquidity problems borrowing from each other. The problem is when some investors believe that the quality of the assets of one or more banks is deteriorating. Whether this belief is correct or not does not matter, because investors are prompted anyway to withdraw their cash knowing that only the first to do so will be satisfied (so-called 'bank run'). Faced with widespread demand to redeem its liquid liabilities, a bank is forced to sell its illiquid assets at fire-sale prices – whatever their quality actually is – until it goes bankrupt.

But the most dramatic part of the story is that it does not stop here.[16] A bank's failure may trigger a general panic about other banks, which either have similar credit exposures or are interconnected via interbank lending. Both individual bank runs and its contagion potential are specific to 'banking' (although, as we shall see, not to 'banks' as legally defined) and are the very source of systemic externalities. A banking crisis typically leads to a credit crunch, reduction in the aggregate money supply, and cash hoarding, which in turn implies failure of savings to flow to investments, reduction of consumption and employment, and in the worst cases, deflation. In the aftermath of a crisis, the banks' losses are negligible relative to the social costs of recession and they may even turn out to be nil in the aggregate.[17]

This explains the main reason why banks are regulated: avoiding externalities. There are different ways to pursue that goal, but historically, the major instruments have been public insurance of deposit and lending of last resort (LLR) by the central banks.[18] Deposit insurance prevents investors from running on banks' demand liabilities, since investors will always be paid in full despite of the banks' troubles

[16] For a detailed overview of the determinants of systemic externalities in banking, see Markus Brunnermeier, Andrew Crockett, Charles Goodhart, Avinash D. Persuad and Hyun Shin, "The Fundamental Principles of Financial Regulation", 11 *Geneva Reports on the World Economy*, ICMB & CEPR, 2009, 1-12.
[17] See e.g. Gorton, *supra* note 15, 16.
[18] See generally Heremans, *supra* note 13.

with their assets. LLR is instead a remedy against interbank contagion, which should relieve banks and their counterparties from temporary liquidity shocks. Both instruments need be used with great care, for they are most effective ex-post when they undermine banks' incentives to avoid illiquidity and insolvency ex-ante. Unlimited access to deposit insurance and LLR would be unsustainable because of bank's moral hazard – implying that banks find it profitable to pile as much risk as possible, because the losses are ultimately borne by taxpayers. For this reason, the safety net aimed at countering systemic externalities is left intentionally incomplete and it is supplemented by regulation of bank's ability to enter risky courses of actions.

The typical regulatory framework tries to prevent banks' moral hazard by limiting deposit insurance up to a certain amount and refraining from insuring the reminder of bank's liabilities, which incentivizes large investors to monitor banks' risk-taking. In a similar vein, LLR facilities are supplied parsimoniously and on unfavourable terms relative to market rates. Intuitively, with these restrictions, the safety net cannot entirely rule out banking crises. And it does not. However, the consequences of such crises are so dramatic that governments and central banks cannot be credibly committed not to intervene when the financial system is endangered. The safety net is in fact broader than what the law on the book says, which implies that the systemically relevant financial intermediaries (those who are deemed to be "too big" or "too interconnected" to fail) face an implicit insurance of their liabilities for they stand to be bailed out in case of trouble. Moral hazard is thus inherent to 'protected' banking, which makes its regulation crucial.[19]

Regulation of banking has evolved from structural measures to limit risk-taking, which hinder competition and adversely affect efficiency, to a more market-

[19] See e.g. Charles W. Calomiris, ''Financial Innovation, Regulation, and Reform,'' 29 *Cato Journal*, 2009, 65-92.

oriented prudential regulation.[20] Prudential regulation aims to constrain banks' attitude to take excessive risks by requiring that a certain percentage of the assets (typically 8%) be financed by equity capital.[21] Because of moral hazard, banks would otherwise tend to provide as little capital as possible. Capital Adequacy Requirements (CAR) are supposed to improve bank stability by providing a cushion of safety against unexpected losses ('risk buffer') and incentives to monitor the quality of assets. The second goal is more important than the first one. CAR forces banks to have 'skin in the game', which should prompt them to assess carefully the creditworthiness of their borrowers. Both shareholders and uninsured creditors would reduce their funding and/or make it more expensive (i.e., demand higher returns on capital) when the bank's assets get riskier. The CAR make this constraint binding on the size of a bank's balance sheet, which would otherwise grow at the expenses of insured creditors and ultimately, of taxpayers. One of the basic rationales of CAR is thus 'market discipline.'

The mechanism is imperfect for a number of reasons. To start, the buffer function of CAR is very limited and ultimately illusory. It is limited because CAR does not effectively constrain leverage. The capital charges of each category of assets are weighted for their risk (so-called ratios) in order to preserve banks' incentives to optimize risk-taking. The problem is that banks have high-powered incentives to increase leverage (which implies higher returns on equity) as opposed to low-powered incentives of regulators and bank themselves to get the risk weights right. As a result, banks' capital buffers tend to shrink with the investment in uncertain assets carrying a favourable risk assessment either externally (ratings) or internally (VaR, value-at-risk

[20] Heremans, *supra* note 13.
[21] See Basel Committee on Banking Supervision, "Accord on International Convergence of Capital Measurement and Capital Standards", July 1988 (*Basel I*), available at www.bis.org.

models of quantitative risk assessment).[22] In addition, the idea that CAR (as direct constraints on leverage) can sustain a buffer is illusory because they are mechanical and they bite exactly when the equity cushion would be needed to absorb the bank's losses.[23] CAR provide loose constrains when asset prices move upwards, whereas they prompt banks to recapitalize or to sell their assets at fire-sale prices in case of distress.

The ideal of market discipline does not fare much better.[24] Particularly in times of low interest rates, one easy way to make shareholders happy while complying with CAR is to invest in risky assets carrying a low capital charge. Top-rated securities are a case in point. In principle, this strategy would be constrained by uninsured creditors, who should demand a higher risk premium for supporting increased leverage with long-term liabilities. However, marketable securities provide an alternative. They can be posted as collateral for short-term financing. The bank then finances the securities on its balance sheet with instruments that are functionally equivalent to demand deposits, save that they are not insured. Investors park their cash at the bank and they can withdraw it anytime by redeeming or re-hypothecating the collateral.[25]

The perceived safety of collateral makes funding risky assets with short-term liabilities attractive for investors and relatively inexpensive for banks. The advantage over insured deposits is that the guarantee is provided by markets, not by governments, and it is not capped at a certain amount; whereas investors who doubt about the safety of collateral can curtail their funding by increasing the margins or

[22] See Basel Committee on Banking Supervision, "Amendment to the Capital Accord to Incorporate Market Risks", January 1996 (*1996 Amendment to Basel I*) and "International Convergence of Capital Measurement and Capital Standards: A Revised Framework", November 2005 (*Basel II*), available at www.bis.org.
[23] Hellwig, *supra* note 4, 64-66.
[24] Id., at 29-33.
[25] Gorton, *supra* note 15, 14.

'haircuts' on the securities' market value.[26] Therefore, this mechanism is not particularly exposed to moral hazard, but it allows banks to overcome market discipline inasmuch as they manage to issue liquid liabilities. This implies that the amount of maturity transformation performed by banks goes largely undetected by prudential regulation, with the only exception of the loose constraints on leverage provided by CAR.

One final limitation of CAR is that they apply to banks, not to banking.[27] While collecting funds in the form of demand deposit is reserved to banks, other functionally equivalent forms of short-term funding are not. The operation previously described is effectively banking, but it can be implemented also by other financial intermediaries. A great many of them are loosely regulated (or not at all) on grounds that – at least formally – they do not have access to the safety net. In principle, they could perform as much maturity transformation as they wish. Financiers, however, do require unregulated intermediaries to have 'skin in the game,' which sets a constraint on the amount of funds they can intermediate given that they are smaller and less diversified then banks (and thus, they can raise comparatively less equity). Still, unregulated intermediaries do not face CAR, which implies that they can be more leveraged and earn higher returns on equity than banks by funding investment in securities with short-term debt.

Facing the threat of increasing disintermediation, it is natural for bank to respond using their comparative advantage. Instead of allowing equity capital to flow towards the more profitable, unregulated financial sector, banks would rather increase their leverage. The creation of off-balance-sheet investment vehicles enjoying the

[26] Gary B. Gorton and Andrew Metrick, "Haircuts", NBER Working Paper No. w15273, August 2009 (available at SSRN: http://ssrn.com/abstract=1459574).
[27] On the so-called 'boundary problem' in financial regulation, see Brunnermeier et al., *supra* note 16, 67-74.

implicit or explicit guarantee of the parent bank is a perfect instrument to get around CAR and outperform unregulated intermediaries in leverage (the bank's guarantee allows the vehicles to be minimally capitalized).[28] This is how the so-called "shadow banking" emerged.[29] Whether this was a major determinant of the financial crisis, as the standard narrative suggests, or rather a natural development of innovation in banking, is another story.

3. What Went Wrong: A Simple Analysis of the Financial Crisis

The last financial crisis is often called "The Subprime Crisis," as it is understood mainly as a consequence of the meltdown of the US non-prime mortgage markets.[30] This depiction is misleading, for it tends to confuse the symptoms with the disease. The problems underlying securitization of subprime mortgages did actually trigger the crisis, but they are evidence of a much larger set of contradictions developed inside the financial system. In a sense, subprime mortgages were the tip of the iceberg – but it was its submerged part to sink the boat. Fixing the mortgage market would contribute little to prevent the next financial crisis. Therefore, in the following analysis, I will not enter the lively discussion on consumer protection in banking. On the one hand, the issue is not new.[31] On the other hand, consumers may be those who benefit or suffer from financial innovation, but they are certainly not those who generate it.

[28] Martin Hellwig, "The Causes of the Financial Crisis", *CESifo Forum* 4/2008, 16.
[29] Gorton, *supra* note 15, 23-31.
[30] E.g. Steven L. Schwarcz, "Protecting Financial Markets: Lessons from the Subprime Mortgage Meltdown", 93 *Minnesota Law Review*, 2008, 373-406.
[31] See particularly Jonathan R. Macey, Geoffrey Miller, Maureen O'Hara and Gabriel D. Rosenberg "Helping Law Catch Up to Markets: Applying Broker-Dealer Law to Subprime Mortgages", 34 *Journal of Corporation Law*, 2009, 789-842.

The US subprime market is still interesting because it show that the process of securitization of increasingly less creditworthy loans was entirely supply-driven.[32] Despite of the documented decline in the quality of borrowers, the risk premia on subprime mortgages remained low up until the real-estate market downturn. Without securitization, that would simply show that financial intermediaries had an appetite for risk. Securitization, however, seemed to have squared the risk-return circle. The idea was, in principle, a good one. Real-estate prices very seldom move together across the US territory (and even more so worldwide), thus securitization of a pool of geographically diverse mortgages reduces default risk through diversification. In addition, securitization creates different classes of risks by allocating the pool's cash flow by seniority of different securities tranches. These tranches were rated from AAA until below investment grade, with the lowest equity tranche being supposed to absorb all the losses under normal conditions. The credit rating agencies commonly estimated the size of equity to be about 5-6% of the pool. The remaining securities (including the AAA tranches, accounting for 80-85% of the pool) were considered 'safe.'[33]

It is easy to question the validity of this mechanism in hindsight.[34] Real-estate prices *can* move together and they tend to do so especially when their upward trend is sustained by the same systematic factors that make securitization attractive (and thus, boost real-estate finance and prices): that is, low interest rates and a steady demand for marketable securities. The failure to account for these correlations explains the losses in the subprime mortgage business, but it cannot explain the financial crisis.[35] Albeit large, the figures of non-prime US mortgages securitization are too little for

[32] Hellwig, *supra* note 28, 15.
[33] For an excellent illustration of the securitization mechanism, see Gary B. Gorton, *The Subprime Panic*, 15 European Financial Management, 2009, 12-30.
[34] See e.g. Calomiris, *supra* note 3, 13-15.
[35] Hellwig, *supra* note 28, 12 and 16-17.

that. At the same time, the estimated write-downs on asset-backed securities (of which mortgage-backed securities are an important subset) exceeded, at least at the peak of the crisis, the most pessimistic forecasts on the decline in the price of the underlying assets (including real-estates).[36] While markets at some point refused to trade asset-backed securities altogether, it is unlikely that their AAA tranches will be actually wiped out when the dust settles. Securitization was not just a scam of massive proportions or the effect of irrational euphoria. The problem is that it went beyond what financial markets could stand.

Securitization undoubtedly completes financial markets, by financing assets (e.g., mortgages, credit cards, student loans) that are not sufficiently creditworthy for traditional intermediation.[37] Those who blame securitization for what has happened should be then reminded of what securitization means for our societies. But we need to understand what went wrong with it. The usual suspect is the originate-to-distribute model with which securitization is carried out. Mortgage originators, for instance, seem not to risk anything for their deals are closed the moment the mortgages are pooled in the securitization vehicle and the securities are placed with the investors. Rating agencies, which are paid by the issuer, apparently face the same incentives in structuring as many deals (and rating their tranches as attractively) as possible. This cannot be entirely true, for both originators (which, at least in the private sector, were mainly sponsored by banks) and rating agencies were severely hit by the crisis.[38] Perhaps more importantly, this perspective neglects that however bad the sellers'

[36] Compare International Monetary Fund (IMF), "Financial Stress and Deleveraging: Macro-Financial Implications and Policy", Global Financial Stability Report (October 2008), and IMF, "Responding to the Financial Crisis and Measuring Systemic Risks", Global Financial Stability Report (April 2009), with IMF, "Navigating the Financial Challenges Ahead", Global Financial Stability Report (October 2009).
[37] Hellwig, *supra* note 28, 13-14.
[38] Gorton, *supra* note 33, 38-41.

incentives are to produce "a modern form of snake oil,"[39] they need to find buyers. Apparently, there were plenty of investors hungry for asset-backed securities despite of the alleged problems with their origination. The question is why.

Again there are two unconvincing answers to that question. The first is based on moral hazard.[40] Investors had little incentives to be careful with the risky output of securitization because either they had access to the safety net or they could rely on the implicit government guarantee when they did not. As we have seen, moral hazard is intrinsic to regulated banking, but that cannot be the full story. There are two important circumstances suggesting that the prospect of government bailouts was too uncertain to support widespread moral hazard. First, those who financed banks' and non-banks' operation in asset-backed securities were ready to run (i.e. withdraw from short-term funding) and they did run at the first sign of trouble (recall that a major reason for moral hazard is that financiers do not run when they believe they are insured).[41] Second, government bailouts could not be relied upon. Despite of any statement to the contrary, they were implemented quite randomly at least until the gravity of the problem was understood by the authorities.[42] Since the failure to save Lehman Brothers was recognized as a mistake, moral hazard is likely to be a problem in the future but it was not sufficient reason to flirt with bankruptcy in the past.

Equally unconvincing is the claim that professional investors have been irrational.[43] To support irrationality, the behaviour of investors should have systematically disregarded pieces of available knowledge. That did not happen. For investors, the available knowledge was that asset-backed securities (and especially

[39] Akerlof and Shiller, *supra* note 5, 37.
[40] See e.g. Calomiris, *supra* note 3, 12-20; Hellwig, *supra* note 4, 23-35.
[41] See de la Torre and Ize, *supra* note 12, 10-11.
[42] See e.g. the "events logbook" of the crisis in Markus Brunnermeier, "Deciphering the Liquidity and Credit Crunch 2007-2008", 23 *Journal of Economic Perspectives*, 2009, 88-91.
[43] See e.g. Emilios Avgouleas, "The Global Financial Crisis, Behavioural Finance and Financial Regulation: In Search of a New Orthodoxy", 9 *Journal of Corporate Law Studies*, 23-59.

mortgage-backed securities) earned higher returns than corporate and government bonds with the same rating. In addition, those securities were widely accepted as collateral for short-term funding, which high-grade financial institutions were able to regularly roll over with no haircuts and at ridiculously low interest rates. It would have irrational to forego these profit opportunities.[44]

The aggregate size of this operation was allowed to grow by credit rating agencies – who continued to supply high-grade securities out of pools of risky assets – and credit default swaps – which multiplied the bets providing opportunities for both hedging and arbitrage. Ratings and counterparties to swap relied on the same models of risk assessment whose flaws – failure to account for systemic correlations – were revealed only in hindsight. On the contrary, those models allowed for considerable arbitrage opportunities between the mezzanine tranches (e.g., BBB-rated) and credit default swaps, which prompted originators to create securitizations of securitizations (CDO and CDO^2) and investors to buy their high-grade outputs.[45] We now know that these processes exacerbated the impact of systemic correlations unaccounted for, but that was neither known nor foreseeable at the outset.

To be sure, one may wonder why theoretical models of risk assessment were accepted at face value.[46] In part, that was due to the regulatory distortions attached to ratings. Banks can economize on their equity capital when they invest in high-grade securities. Likewise, the majority of institutional investors are prevented by regulation or by contract from investing in below-investment-grade securities. Still, there is a bunch of unregulated investors (e.g., hedge funds) who should not care. If they have good reasons to question the ratings, short-selling would be the rational thing to do. It is unclear whether this has happened – the anecdotal evidence that hedge funds

[44] For a brilliant defence of this account, see Posner, *supra* note 2, 75-116.
[45] Gorton, *supra* note 33, 25-26.
[46] Calomiris, *supra* note 3, 15-17.

performed better than other intermediaries in the crisis may suggest that it did. But it is clear that whatever short-selling took place, this was not sufficient to stop the volume of securitization business from growing. The reason is that there was no market platform which could sustain arbitrage.[47] Up until that platform developed, the models of risk assessment underlying ratings and credit default swaps were the only way to price asset-backed securities.

This picture shows that the whole securitization business was surrounded by a deep uncertainty. Therefore, it is surprising how it could grow at such a furious rate. Granted that they were not irrational, and that they had no particular reason to engage in moral hazard, investors should have been more cautious with their exposure to asset-backed securities. This at least until the market could develop the instruments for a more consistent pricing. Instead, investors and their financiers chose to rely on the liquidity of those securities to 'churn' their portfolios – i.e., to transform increasing amounts of securities in short-term funds available for purchase of additional securities – and make as much profits as possible until the party was over.[48] At that point, whenever it will have come, financial intermediaries would have had to unwind their positions, most probably at a loss. Asset-backed securities would have been worth less, the whole 'shadow banking' business would have shrunk, *but the securities would not have stopped trading*. This judgment exhibits a typical mistake of (rational) choices under uncertainty. The sudden illiquidity of asset-backed securities, which makes large positions simply unsustainable with short-term funding, was an event too remote to be worth considering.

[47] Gorton, *supra* note 33, 28-34.

[48] As late as on July 10, 2007, Chuck Prince – former CEO of Citigroup – famously stated: "When the music stops, in terms of liquidity, things will be complicated. But as long as the music is playing, you've got to get up and dance. We're still dancing."

While uncertainty explains the growth dynamics of shadow banking despite of its so-called 'tail risks' (risks too remote to be worth quantifying, let alone contemplating), externalities tell us why this resulted in harm to society. The above strategy takes liquidity for granted, but liquidity is a positive externality based on the perceived absence of asymmetric information on the assets backing short-term liabilities.[49] We have seen that the peculiar structure of banks' balance sheet generates this externality on a large scale. However, as in the case of demand deposits, the insurgence of asymmetric information leads to sudden withdrawal of liquidity, which reverses the direction of the externality through a bank run. Thus, shadow banking was as fragile as traditional banking prior to the introduction of deposit insurance and perhaps even more so given the innovative character of the underlying assets. Consensus on inevitably uncertain models of risk assessment should not have gone as far as to generate a new form of systemically unstable bank liquidity, or at least not so quickly. But there is little reason to expect banks, which individually free ride on the liquidity they collectively establish, to worry about that.[50] That is the task of regulation. By neglecting the innovation dynamics, regulation did the opposite: it focussed so much on traditional banking that it nurtured, instead of constraining, the growth of shadow banking.

We have already seen how regulation encouraged reliance on ratings. This contributed to creating the illusion of safety underlying the liquidity of asset-backed securities. In spite of that, credit rating agencies, counterparties to swap, and banks themselves realized the problems with the theoretical models of risk assessment as soon as the real-estate prices started to fall in 2006 (affecting the ultimate borrower's

[49] Gorton, *supra* note 15, 6-14.
[50] "[I]t would make no more sense for a individual businessman to worry that because of the instability of the banking industry his decision and those of his competitors might trigger a depression than for a lion to spare a zebra out of concern that lions are eating zebra faster than zebra can reproduce." Posner, *supra* note 2, 284-285.

prospective ability to repay their loans).[51] By that time, however, the size of shadow banking had become simply too large, and a sudden revision of risk assessments would have anticipated everybody's losses without providing benefits to anyone.

Free riding on existing liquidity thus continued to be the individually rational course of action, both for investors and for those who sustained their leveraged investments with favourable risk assessments.[52] Being the latter the only source of information, there was no need to rush on unwinding the riskier positions. Meanwhile, however, the marked had developed forward-looking instruments for pricing default risk more consistently. In early 2007, the newly created ABX-CDS index on subprime risk precipitated, which forced rating agencies to downgrade the related securities. This circumstance created asymmetric information about the value of asset-backed securities, which eventually made all of them unreliable as collateral and triggered the panic on any sort of short-term funding.[53] Had the impact of ratings on liquidity generation been lower, the market downturn would have simply allocated losses to those who were willing to bear the uncertainties of securitization.

A second responsibility of regulation was the failure to recognize that whatever form of financing illiquid assets with liquid liabilities is effectively banking – which implies systemic fragility.[54] Both the definition of banking and its prudential regulation encouraged banks to engage in maturity transformation outside the boundaries of traditional banking – which implies failure to control externalities. The reason is twofold. First, banks need constantly to fight against disintermediation, which is most likely to occur when non-banks can offer more attractive terms for short-term funding. In this perspective, the boundaries of regulated banking are "a line

[51] See the references cited *supra*, note 6.
[52] Bengt Holmstrom, "Discussion of the Panic of 2007 by Gary Gorton", Working Paper, October 2008, available at http://econ-www.mit.edu/files/3784 (last accessed: 6 February 2010).
[53] For an accurate illustration of the unfolding of events, see Brunnermeier, *supra* note 42, 77-100.
[54] Gorton, *supra* note 15, 38-42.

in the sand,"[55] which banks have natural incentives to cross in order to defend their profits against financial innovation. Second, banks can intermediate comparatively higher volumes of resources, which gives them a competitive advantage in maturity transformation while exposing the system to bank runs. However, in order to fully exploit this advantage to the benefits of shareholders, banks need to get around the CAR with which regulation tries – however naively – to secure their stability.[56] There is no static setting of boundaries or CAR that can prevent this and the consequent systemic instability from happening. Banks need to outperform non-banks in the creation of liquid liabilities in order to survive.[57]

One last problem with banking regulation highlighted by the financial crisis is short-termism. The exponential growth of the securitization business was mainly due to the investors' inclination to realize profits as quickly as possible. Securitization was a way to realize the return spread between long-term and short-term funds. It did not need to be. A more long-term orientation would have simply postponed the real profits (if any) without overly feeding securitization with unstable liquidity. Regulation supported short-termism and its implications on the size of systemic externalities through its insistence on market discipline in the corporate governance of banks.[58] This created a major reason for banks to engage in highly levered maturity transformation: making shareholders happy with their quarterly results. Not differently from driving the bank into bankruptcy, failure to provide these would have costed managers their office. Financial institutions that are allowed to have larger shareholders and less independent directors are less prone to short-termism, which

[55] de la Torre and Ize, *supra* note 12, 6.
[56] Brunnermeier et al., *supra* note 16, 67-74.
[57] See, in a historical perspective, Gorton, *supra* note 15, esp. 38-39.
[58] Hellwig, *supra* note 4, 29-32.

explains why they performed better in the crisis (and why their managers have been in office throughout the good and the bad times).[59]

Regulatory constraints on the ownership and governance structure of banks foster short-termism of bank management more than any market-based compensation pattern. Yet the latter is one major focus of the reform agenda, together with a number of other items that fail to address the most important problems.

4. The Urge to Re-Regulate

On both sides of the Atlantic, the bulk of regulatory initiatives intended to address the problems highlighted by the financial crisis is extensive. It is hardly possible to review them in a single paper.[60] Even confining the analysis to the few key issues discussed in the previous section, I will not attempt to provide a detailed overview of the proposals on the table. More modestly, the purpose of this section is to show how financial regulation seems to evolve more in the direction of increasing regulatory distortions in banking rather than towards the correction of the existing ones. I will articulate this claim with respect to three important candidates for regulatory reform: i) the originate-to-distribute model of securitization; ii) regulatory arbitrage in shadow banking; and iii) corporate governance of banks. Looking at these problems from either a moral hazard or an irrationality perspective makes the case for more regulation almost straightforward. But, as I have attempted to demonstrate, moral hazard and irrationality did not play a major role in the unfolding of events that resulted in the crisis. In the next section, I will hint at how the uncertainty perspective

[59] The evidence of this circumstance is, so far, only anecdotal. However, it is widely reported. See e.g. Calomiris, *supra* note 3, 20; Posner, *supra* note 2, 99-100; Alberto Alesina and Francesco Giavazzi, *La crisi – Può la politica salvare il mondo?*, Milano: Il Saggiatore, 2008, 45.

[60] For a general overview, see Abel Mateus, "After the Crisis: Reforming Financial Regulation", Working Paper, November 2009 (available at SSRN: http://ssrn.com/abstract=1504895).

can provide better recipes for addressing a most important (and recurring) problem of banking crises: the externalities of financial innovation.

The standard narrative on the originate-to-distribute model is that it fails to provide credit originators with the incentives to screen and monitor the quality of borrowers.[61] Apparently, originators do not have sufficient 'skin in the game' to care. Therefore, the regulatory reform proposals are nearly unanimous in advocating the obligation for originators to retain the equity tranches of securitizations, with those tranches accounting for no less than 5 percent of credit risk.[62] The disadvantage of this proposal, as of any substantive discipline of financial instruments, is that it interferes with one major function of securitization: efficient allocation of credit risk. Perhaps more importantly, this solution would not produce countervailing benefits because the underlying reasoning focuses on the wrong side of the market. Originators were not responsible of the excessive growth of securitization: they were only providing investors what they wanted.[63]

The explanation of why investors trusted a flawed origination process is more elusive. They must have been irrational, or have played the moral hazard card, or both. Thus, even if we look at it from the investors' perspective, the originate-to-distribute model needs be regulated. As this interpretation is wrong,[64] so are the regulatory implications that it apparently supports. To start, originators are never insensitive to the credit risk they generate, for they retain the servicing and other financial interests in the securitization. This was sufficient for most of them to go

[61] See e.g. Hellwig, *supra* note 4, 14-16.
[62] See President Obama Plan, *supra* note 1, 44, and the annex US Department of Treasury, "Fact-Sheet on Systemic Risk", available at www.financialstability.gov; European Parliament, "Position adopted at first reading on the proposal for amending Directives 2006/48/EC, 2006/49/EC and 2007/64/EC as regards banks affiliated to central institutions, certain own funds items, large exposures, supervisory arrangements, and crisis management", 6 May 2009, available at www.europarl.europa.eu.
[63] Calomiris, *supra* note 19.
[64] See Gorton, *supra* note 33, 38-41 (illustrating the evidence discussed below in the text).

bankrupt. Investors, on the other hand, were not as foolish as to buy whatever originators tried to sell them. At least in the private sector, originators were sponsored by major banks committed to warehousing the junior tranches of securitization. Banks therefore, whether directly or through their off-balance-sheet conduits, were already providing the market with the guarantee that now policymakers seek to impose. The difference is that regulation will set a limit to the amount of risk that can be allocated by the market and implicitly suggest that anything below that limit is 'safe' for the market to handle. Short of preventing future troubles – the banks' guarantee ultimately did not help – this approach replicates one major distortion that concurred to determining the last financial crisis: regulatory support of ratings.

The originate-to-distribute model only generates tradable securities. But it is credit rating that certifies their degree of safety, thereby making them attractive as collateral. Once we take the investor's perspective, the crucial issue is how to finance asset-backed securities with as much short-term funds and as little equity capital as possible. Investing in high-grade securities (and placing the low-grade ones in guaranteed vehicles subject to no capital charge) is the strategy to achieve both goals. Ratings are essential to this game, which explains why – correctly – they are a major item in the regulatory reform agenda. Unfortunately, however, policymakers continue to focus on the wrong side of the market. Rating agencies – the argument runs – had incentives to collude with originators in over-rating securitizations (and especially re-securitization thereof), both because they act simultaneously as advisors and appraisers of the securitization and because their models of risk assessment are too complex and too obscure for other market players to understand. As a result, the

regulatory countermeasures address conflicts of interest and transparency as the main problems.[65]

While these proposals are unlikely to do much harm, they miss the crux of the matter: giving rating agencies the right incentives to provide state-of-art risk assessment. Some commentators believe that rating agencies tend to misbehave because they are paid by the issuers of the securities they rate.[66] However, high ratings are sought for by issuers because *investors* demand these instead of a neutral risk assessment. Regulation has conferred upon rating agencies a licensing role of securities' creditworthiness, thereby feeding investors' reliance on (and demand of) highly rated securities. Thus, who pays for ratings is irrelevant.[67] As long as regulation provides benefits to investing in rated assets, the market will tend to produce more ratings than optimal and high ratings will be inflated. This situation compromises the reputational incentives underlying the emergence of credit ratings as a market solution to asymmetric information.[68] In the unfolding of events that resulted in the last financial crisis, this explains why rating agencies did not promptly update their risk assessment with new information coming from the real-estate market[69] (notice that this would have probably avoided the asymmetric information that resulted in a series of bank runs).[70] The reputational loss of being outperformed by

[65] See EC Regulation No. 1060/2009 on credit rating agencies of 16 September 2009, OJ L 302, 17.11.2009, 1-31 (on which see also, critically, Fabian Amtenbrink and Jakob de Haan, "Regulating Credit Ratings in the European Union: A Critical First Assessment of Regulation 1060/2009 on Credit Rating Agencies", 46 *Common Market Law Review*, 2009, 1915-1949). In a similar vein, see President Obama Plan, *supra* note 1, 46, and the annex US Department of Treasury, "Fact-Sheet on Credit Rating Agency Reform", available at www.financialstability.gov.

[66] See e.g. Posner, *supra* note 2, 78. However, as the problems with the issuer-pay model are controversial, policymakers on both sides of the Atlantic have preferred to abstain from regulating the matter.

[67] Calomiris, *supra* note 3, 17.

[68] Frank Partnoy, "Rethinking Regulation of Credit Rating Agencies: An Institutional Investor Perspective", San Diego Legal Studies Paper No. 09-014, July 2009 (available at SSRN: http://ssrn.com/abstract=1430608).

[69] See *supra*, note 51 and accompanying text.

[70] See Gorton, *supra* note 15, 31-38.

market arbitrageurs could be offset by their regulatory rents. Which they have not lost or are about to lose.

Ratings had another ancillary implication on financial stability. Not only their attractiveness for banks and other financial institutions made ratings inflated, but ratings actually allowed banks to economize on equity capital. Policymakers have somewhat clearer views in this domain.[71] Banks and their investment vehicles were excessively leveraged in dealing with asset-backed securities, which made them insolvent when those became illiquid and fire sales further depressed their value. Policymakers also realize that this mechanism creates an enormous potential for contagion, which existing regulation fails to address both because it is too much focussed on individual stability and because it is pro-cyclical (i.e., it bites little in good times, whereas it exacerbates distress in bad times).

As a consequence, the proposals of reforming prudential regulation try to cope with all these problems. Issues of pro-cyclicality and macro-prudential regulation are under serious study by both academics and policymakers. I omit their discussion here only for reason of space.[72] In the micro-prudential setting: the CAR ratios of rated assets will be increased, most prominently in the case of re-securitization; banks will be required to monitor the riskiness of rated assets; the requirements of internal models of risk assessment (VaR) will be strengthened; guarantees on off-balance-sheet vehicles will face enhanced capital charges; and CAR will be supplemented by straight constrains on leverage as a backstop against regulatory arbitrage.[73]

[71] See Larosière Report, *supra* note 1, 15-26, and President Obama Plan, *supra* note 1, 19-42.
[72] For an excellent discussion, see Brunnermeier et al., *supra* note 16, 31-48.
[73] See Basel Committee on Banking Supervision, "Basel II Capital Framework Enhancements", 13 July 2009, available at www.bis.org; and Basel Committee on Banking Supervision, "Consultative Proposals to Strengthen the Resilience of the Banking Sector", 17 December 2009, available at www.bis.org.

These are all sensible measures against what happened, which means that they are likely to do little more than closing the barn after the horses have escaped. These policies again fail to address the crucial question of banking regulation: what is banking and what is not. The problem of regulatory arbitrage cannot simply be addressed by straightening the regulation of banks, because eventually banks will find a way to get around the equity capital requirements that penalize them in the competition with unregulated intermediaries.[74] As shown in the previous section, for banks this is a matter of survival. What makes the story even more complicated is that it is impossible for regulators to establish how banks will react to new threats of disintermediation. Financial innovation is unpredictable, which makes uncertainty in the future operation of banks a most dangerous source of systemic externalities. In order to prevent the latter, regulation must focus on banking not just on banks.

In theory, there is an easy way to avoid regulatory arbitrage.[75] Regulate either nothing or everything. The first option – free banking – seems to have failed historically, and anyway it would not be politically feasible today. The second option is very popular in times of financial crisis, but it is illusory and, even if it could be ever implemented, it would deprive society of the benefits of financial innovation. A somewhat more realistic version of broadening the regulatory coverage is supported by the US government.[76] The idea is that all systemically relevant institutions, whether banks or non-banks, should be subject to stringent prudential regulation and supervision when they cross certain thresholds especially regarding the volume of resources they intermediate. The Federal Reserve would be in charge of identifying the categories of financial intermediaries that qualify.

[74] de la Torre and Ize, *supra* note 12, 24-25.
[75] Brunnermeier et al., *supra* note 16, 69-70.
[76] President Obama Plan, *supra* note 1, 21-27.

This proposal has the merit to address the 'too-big-to-fail' problem, which most severely hit governments and central banks in the financial crisis. Since governments cannot credibly commit not to rescue systemically relevant intermediaries, the latter need to fall under the regulatory umbrella from the very beginning in order to prevent moral hazard. Moral hazard was most probably not a main determinant of the crisis given the original uncertainty of governments' response, but it could well be in the future after the bailout policies have been streamlined. Unfortunately, as the broadening of the regulatory umbrella is ineffective against regulatory arbitrage, it is unlikely to prevent moral hazard too. Defining systemically relevant intermediaries puts regulators in a bind.[77] If they make a list, the intermediaries (either independent or bank-sponsored) will try to circumvent the relevant thresholds, save claiming protection when things go wrong. If the identification is discretionary, regulators could be in theory as smart as to detect circumvention in real time. However, lacking any commitment, the exercise of this discretion will predictably be as time-inconsistent as it has been so far. Regulators knowingly ignored shadow banking when it was profitable, but they were prompted to rescue it when banks were troubled. Incentives matter for regulators too.

There is no easy solution to the problem of defining the boundaries of banking for regulatory purposes. But that problem is more urgent than any revision of prudential regulation. The uncertainty perspective suggests that banks engage in financial innovation to protect their turf and, in so doing, they generate intractable externalities for the financial system. One promising way forward is to define banking based on what banks can do that non-banks cannot do, namely maturity transformation on a large scale. Allowing only banks to issue short-term liabilities

[77] Brunnermeier et al., *supra* note 16, 71-74.

under strict capital adequacy requirements would ensure that the leverage (and the degree of moral hazard) in the system is constantly under control, whereas unregulated intermediaries would be free to pursue financial innovation without endangering systemic stability (and therefore without need or expectation to be bailed out if they fail). I will elaborate on this point in the next section.

A most popular item in the reform agenda is regulation of bankers' pay.[78] What makes this a sensible issue for policymakers is that most of the banks' losses are or will be borne by taxpayers, in the eyes of whom the generous compensation of the managers who determined those losses is just outrageous. From an economic perspective, however, the problem – if any – is one of structure not of level of compensation.[79] The fact that bank managers earn a lot of money is a market outcome, which can hardly be questioned on efficiency grounds. Besides, the levels of bankers' pay appear to be, on average, lower than those of managers of non-financial firms.[80] Still, the circumstance that bankers' pay-per-performance is highly sensitive to profit realization but insensitive to making losses is apparently problematic, for it is suspected of inducing both short-termism and excessive risk-taking – which, as we have seen, were two major determinants of the financial crisis.

[78] In the US, the reform proposal originally focused on so-called "say-on-pay" by shareholders, implying that executive compensation should be subject to a non-binding vote in order to ensure that management incentives are properly aligned with the long-term interest of the owners. See President Obama Plan, *supra* note 1, 74, and the annexes US Department of Treasury, "Fact-Sheet on Say-On-Pay" and "Fact-Sheet on New Independence for Compensation", both available at www.financialstability.gov. This has subsequently evolved towards proposals of direct regulation of the levels and structure of banks' executive compensation. See e.g. Federal Reserve, "Proposed Guidance on Sound Incentive Compensation Policies", Federal Register, Vol. 74, No. 206 (27 October 2009). This evolution parallels the European trend. See Larosière Report, *supra* note 1, 30-31 and European Commission, "Proposal for a Directive of the European Parliament and of the Council amending Directives 2006/48/EC and 2006/49/EC as regards capital requirements for the trading book and for re-securitisations, and the supervisory review of remuneration", SEC(2009)974 final and SEC(2009)975 final (13 July 2009). See also, internationally, Financial Stability Board, "FSF Principles for Sound Compensation Practices", available at http://www.financialstabilityboard.org/publications/r_0904b (2 April 2009).

[79] Lucian A. Bebchuk and Holger Spamann, "Regulating Bankers' Pay", Harvard Law and Economics Discussion Paper No. 641, October 2009 (available at SSRN: http://ssrn.com/abstract=1410072).

[80] Renée Adams, "Governance and the Financial Crisis", ECGI-Finance Working Paper No. 248/2009, May 2009 (available at SSRN: http://ssrn.com/abstract=1398583).

The regulatory proposals to cap the levels of bankers' pay will certainly not cope with the above problem.[81] To start, they may only constrain the structure of executive compensation indirectly, by preventing it from growing above a certain threshold. But experience with previous attempt to regulate managerial compensation shows that firms always find a way to get around the regulatory caps. And even if regulation succeeded in setting an upper bound to bankers' pay, that would only deprive banks of the best managers whose professionalism would flow towards unregulated intermediaries. This exacerbates, instead of mitigating, the problem of regulatory arbitrage.

The proposals by academics to mandate backloading of performance pay make, in principle, more sense.[82] The current structure of bonuses and stock option plans aligns bank managers' reward with the production of quarterly results, regardless of the losses that could follow. Undoubtedly, this supports short-termism. By including the subsequent losses in the calculation of incentive pay, backloading should induce managers to take a more long-term perspective. In a sense, this solution makes the incentive structure of managers similar to that of blockholders. What is unclear is why this solution should be mandated by regulation, instead of being left to shareholder choice.[83] One possible answer is that banks are special because of the externalities imposed by their instability. Those who support this contention consistently argue that bankers should be accountable not only to shareholders, but

[81] Steven N. Kaplan, "Should Banker Pay Be Regulated?", 6(11) *The Economists' Voice*, December 2009.
[82] See e.g. Posner, *supra* note 2, 299-300; Sanjai Bhagat and Roberta Romano, "Reforming Executive Compensation: Focusing and Committing to the Long-Term", Yale Law & Economics Research Paper No. 374, February 2009 (available at SSRN: http://ssrn.com/abstract=1336978). For the view that this would not be sufficient to counter excessive risk-taking by bank managers, see Bebchuk and Spamann, *supra* note 79.
[83] Strengthening shareholder choice is the rationale underlying the 'softer' approach to regulation of bankers' compensation based on say-on-pay. See *supra*, note 78.

also to creditors and taxpayers.[84] But it is at least debatable that the speciality of banks should be dealt with by corporate governance regulation, instead of by regulation of banking itself. If the latter works despite of the problems highlighted in the foregoing discussion, regulation should constrain the production of shareholder returns and thereby the actions of managers who are accountable to them.

However, if we look at shareholder choice more carefully, there is hardly any reason why diversified shareholders should care of the long term.[85] Managers at least have one, which is protection of their human capital. Actually, in the traditional corporate governance debate, this used to be an argument for claiming managerial risk-aversion as opposed to the risk-neutrality of diversified shareholders. Incentive pay was most welcome to align managerial incentives with the shareholder interest. And with the interest of society: after all, the more profitable banks are, the healthier and the more stable they look. The focus of reform initiatives on banker's pay deflects the attention from how regulation already affects the corporate governance of banks in this perspective.

Particularly, regulation interferes with the ownership structure of banks making it difficult, if not impossible, for large blockholders to be in control.[86] Controlling shareholders cannot afford short-termism, and would not allow managers to indulge in it. Conversely, it is not obvious that managers with backloaded compensation will care more of the long-term implications of their decisions, when diversified shareholders have the power to force them out of office upon failure to deliver short-term results.

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[84] Bebchuk and Spamann, *supra* note 79.

[85] For this novel perspective on the problem of short-termism in corporate governance, see William W. Bratton, and Michael L. Wachter, "The Case against Shareholder Empowerment", Georgetown Law and Economics Research Paper No. 1480290, December 2009, forthcoming in 158 *University of Pennsylvania Law Review*, 2010 (available at SSRN: http://ssrn.com/abstract=1480290.

[86] See, with special regard to the US Financial Holding Companies Act, Calomiris, *supra* note 19.

5. Making It Work: Financial Regulation in the Face of Uncertainty

As the foregoing analysis shows, production of systemic externalities is a fundamental reason for regulating the financial system, and banking in particular. However, in dealing with this problem, regulation may do both too much and too little. It may do too much by distorting market incentives. Moral hazard in banking, but also the problem of inflated ratings and short-termism in the realization of profits, illustrates how protection against externalities can ultimately result in higher costs to taxpayers. Regulation may also do too little by failing to address a major determinant of externalities: financial innovation. Banks' venturing in unknown territories that turn out to be disastrous for society tends to be retrospectively regarded as evidence of moral hazard or irrationality, which prompts policymakers to extend regulation (and its distortions) to areas not previously considered as banking. Whatever it adds to our understanding of past crises, which is arguably little, this attitude certainly does not help prospectively. Conversely, studying the regularities in banks' dealing with uncertainty may enable regulation to cope with the externalities of financial innovation.

Under uncertainty, regulation faces limits in preventing externalities for the simple reason that a major aim of financial innovation is getting around exiting regulations. Accepting this as the natural outcome of a dynamic process, instead of helplessly trying to counter it as the result of excesses (whether rational or not) in the quest for profit, allows focussing on the crux of the matter. That is, what features of banking – however banking is legally defined – systematically determine externalities and what regulation can do about this other than stifle innovation or be ineffective in the face of it. Looking at the cause and consequences of shadow-banking from this

angle help devise the boundaries of banking regulation and its dynamic features in a way that is most likely to contain, instead of exacerbate, the adverse effects of the next financial crisis.

Shadow banking is effectively banking, namely borrowing through short-term liabilities while lending long-term.[87] The innovation is the securitization of assets with a long maturity, which makes collateral available for short-term funding. As this operation could be carried out with higher leverage by non-banks, banks had to circumvent their CAR in order to keep up with competition. However, exactly because banks successfully avoided disintermediation by entering shadow banking, securitization could not have grown that large without banks guaranteeing to redeem the collateral on demand. That is equivalent to the more traditional form of liquid liabilities banks issue, namely demand deposit, and it is likewise exposed to run. No matter how effectively regulation manages to constrain the ability of financial intermediaries to borrow short on securitization, we do not know how banks will respond to the next threat of disintermediation. But we can expect that it will be by issuing short-term liabilities through some unregulated form of financial intermediation.

Albeit radical, one solution to this problem is reserving to banks the ability to borrow short on the market, in whatever form.[88] That would make banks the only providers of funding liquidity for the reminder of the financial sector,[89] keeping the systemic externalities problem within the pre-defined boundaries of banking and under its regulation and supervision. The idea is that "if it swims, flies and quacks it

[87] Gorton, *supra* note 15, 14.
[88] For a similar, albeit even more radical solution (reserving to regulated intermediaries the faculty to issue market liabilities with *any* maturity), see de la Torre and Ize, *supra* note 12, 28-29.
[89] On the notion of 'funding liquidity' and its connection with short-term liabilities, see Brunnermeier, *supra* note 42, 91-94.

should be a duck and be dealt with as such."[90] The quacking of banks is maturity transformation, which is also the source of systemic externalities. The advantage of a functional definition over size thresholds or discretionary naming of systemically relevant institutions is that the former is less prone to circumvention and it is not time-inconsistent. Regulators would be committed to bring under the regulatory umbrella every intermediary that issues short-term liabilities, which implies that both the ex-post safety net and the ex-ante regulation aimed at countering moral hazard could be more focused.

Conversely, all intermediaries that want to remain unregulated (or more lightly regulated) would be forced to borrow short-term from banks, which limits the extent to which they can engage in financial innovation (and attempt to disintermediate banks) up to the controlled amount of liquidity banks can generate. While this functional approach allows unregulated intermediaries to compete with banks under the unrestrictive condition of free entry and exit, it prevents banks from engaging in excessive maturity transformation and non-banks from growing too big to fail. The same approach could be extended to the problem of interconnectedness between non-banks, for instance by allowing only banks subject to CAR to establish and have direct access to clearing facilities (of e.g. credit derivatives, interbank lending, and whatever may involve sudden pulling of collateral through margins or 'haircuts').[91]

One second advantage of the uncertainty perspective is that it does not rule out rational choice. This implies that individuals and firms that bet on the unknown still respond to incentives, and thus regulation can cope with market failures by setting appropriate penalties or rewards on certain behaviours. The complication introduced by uncertainty is that regulation may also end up supporting new activities that mimic

[90] Ravi Jagannathan and John Boyd, "Avoiding the Next Crisis", 6(7) *The Economists' Voice*, July 2009, 3.
[91] Jean-Charles Rochet, "Regulating Systemic Institutions" 22 *Finnish Economic* Papers, 2009, 41-44.

desirable behaviour, but in fact generate externalities. The universal reliance on credit rating agencies in structuring and pricing securitizations, in spite of many reasons for questioning their assessment, is a prominent illustration of this circumstance. Other than being irrational or reckless, this reliance reflected the regulatory incentives of banks and institutional investors to invest in high-grade securities as opposed to the weak incentives of credit rating agencies to get the grading right. Regulation was primarily responsible of the illusion of safety that surrounded securitization and made it grow beyond what the system could stand. A more careful study of the incentives to create illusory liquidity (and thus, externalities) through financial innovation may have not avoided the losses on securitization, but it would have prevented the crisis.

Probably the best solution to avoid inflation of ratings in the face of uncertainties that cannot be accounted for would be making ratings irrelevant for regulatory purposes. But that cannot be reasonably expected to happen, also because regulators need to adjust the capital charges they impose on banks (and the restrictions on other forms of financial intermediation) to *some* form of risk assessment. Therefore, the only workable solution is to prevent rating agencies from messing up with uncertainty, which differently from risk is not measurable. Granted that rating agencies have the right to license *to investors* the regulatory benefits of dealing with the securities they rate, the question is how to induce them to perform this gate-keeping function correctly. Aside from the largely irrelevant policies reviewed in the previous section, two measures for improving incentive-compatibility of ratings in this direction have been proposed. One is to make rating agencies legally liable for their mistakes, which is currently prevented (at least in the US) by a broad interpretation of the Right to Free Speech.[92] The other is to force rating agencies to

[92] Partnoy, *supra* note 68, 14-16.

disclose their default risk assessments more precisely, and to punish them by suspension or revocation of their regulatory rents when these assessments are systematically contradicted by actual rates of default.[93]

Both proposals have the merit of hitting the key point: how to make ratings more responsible in certifying investments whose perceived 'safety' is a potential source of externalities. However, they neglect the dynamics of financial innovations. Any of these carries one or more uncertain components of the default risk. While credit ratings cannot be expected to account for uncertainty in their quantitative models, under the proposed solutions they would be held liable or punished with hindsight bias when uncertainty turns out badly. That implies that ratings would be over-deterred from financial innovation. This is not exactly what we want. What we want is that ratings do not fuel the *externalities* of financial innovation. Essentially this depends on covering up a situation of asymmetric information *as if* that was lack of knowledge. There is evidence that this situation emerged well before short-selling on subprime mortgage risk begun, thereby triggering massive downgrades and the panic. One way to avoid this, without incurring in hindsight bias, is making rating agencies liable when they fail to demonstrate that their over-optimism relative to market benchmarks (e.g. credit default swap spreads) was justified by state-of-art knowledge. In fact, rating agencies were sustaining securitizations while holding on their knowingly outdated risk models so long as they had nothing to lose; they would have been held liable by that standard.

Finally, uncertainty sheds some light on the problem of bankers' (and other professional investors') short-termism. In principle, those who engage in innovation have little reason to focus on the short term, because the markets are unprepared to

[93] Calomiris, *supra* note 6, 13-14.

price innovation and to allocate its rewards or losses. The problem is the so-called market discipline of corporate managers, which especially in banking has been a hallmark of modern regulation. Market discipline is supposed to complement CAR in fostering stability by inducing managers to maximize returns on the equity capital that regulation forces shareholders to post against the risk-weighted amount of a bank's assets.

Accountability of management to shareholder interest does not necessarily improve stability. Diversified shareholders demand a competitive rate of return on their investment, which is fine when risk-taking is effectively constrained by prudential regulation across the banking industry, but becomes dangerous when financial innovation is involved. As the risk ratios cannot account for uncertainty, shareholders can demand anticipation of the returns on financial innovation through higher leverage, which externalizes the adverse effects of uncertainty to creditors and taxpayers. Since liquid stock markets provide diversified shareholders with inexpensive exit options, failure to meet their demand would eventually result in bankers' losing their job.[94] A similar mechanism underlies the incentives to engage in regulatory arbitrage in order to increase the returns on equity.

Bank managers facing a flat compensation scheme stand to lose from shareholders' short-termism, for they are more deeply invested in the bank with their human capital. Therefore, it is normal for them to demand performance-based compensation in exchange for the promise to deliver short-term profits. In this perspective, the proposals to backload managerial pay-per-performance seem to counter the perverse alignment of managers' and shareholders' incentives against the interest of society. But this is unlikely to be sufficient. Strangely enough, the majority

[94] See Bratton and Wachter, *supra* note 85, 56.

of bankers engaged in the securitization business reinvested big chunks of their bonuses in the companies they worked for.[95] Managers appeared to believe in what they were doing so much as to create voluntarily the wedge with shareholder interest that commentators now seek to impose by regulation. However, managers still had to provide shareholders with the quarterly results they expected in order to avoid being fired.

We probably do not know enough about the corporate governance of banks to draw more than tentative conclusions.[96] But it is telling that recent studies suggest that 'shareholder-friendliness' of corporate governance is associated with poorer performance of banks in the financial crisis.[97] As this goes well beyond the problem of bankers' performance pay, the question is whether making management accountable only to shareholders instead of to a broader range of stakeholders fails to account for the 'speciality' of banks.

If the problem is just short-termism in carrying out financial innovation, we might not need to address the externalities of banking through regulation of corporate governance. What exposes shareholder-oriented corporate governance to short-termism is the empowerment of diversified, non-controlling shareholders. A natural market response to this problem is concentrated ownership, which implies long-term horizons in dealing with uncertainty, but also – differently from mere backloading of managerial compensation – control tenure while doing so. In banking, however, ownership concentration is limited by a number of restrictions on controlling shareholdings. Removing those restrictions is more important than tampering with

[95] Rüdiger Fahlenbrach and Rene M. Stulz, "Bank CEO Incentives and the Credit Crisis", NBER Working Paper No. w15212, July 2009 (available at SSRN: http://ssrn.com/abstract=1444714).
[96] In the same cautionary vein, see Peter O. Mülbert, "Corporate Governance of Banks", ECGI - Law Working Paper No. 130/2009, August 2009, (available at SSRN: http://ssrn.com/abstract=1448118).
[97] Andrea Beltratti and Rene M .Stulz, "Why Did Some Banks Perform Better during the Credit Crisis? A Cross-Country Study of the Impact of Governance and Regulation" NBER Working Paper No. w15180, July 2009 (available at SSRN: http://ssrn.com/abstract=1442652); Adams, *supra* note 80.

executive compensation as with other corporate governance choices. The unbridled operation of market forces may show that, whenever innovation is at stake, it is privately efficient to insulate managerial business judgment from interference by diversified shareholders. At least in banking, this would be also socially efficient.

6. Conclusion

The analysis of the last financial crisis in the perspective of financial innovation improves our understanding of the dynamics of systemic externalities in banking, which is the ultimate rationale of regulation. In this perspective, it becomes evident that a major determinant of the financial crisis was the failure of regulation to address the choices of financial intermediaries under uncertainty. Differently from the mainstream explanations, which are variously based on unanticipated opportunism and/or irrationality of those intermediaries, the foregoing analysis shows that regulation has not been insufficient. On the contrary, regulation has been so overly demanding towards traditional banking to promote unregulated forms of financial intermediation, thereby exacerbating the externalities of financial innovation.

With a view to preventing the next crisis, this paper contends that the overhaul of financial regulation should focus on the externalities of banks' dealing with uncertainty. Regulation should avoid inducing banks to take leveraged bets on new forms of short-term funding in order to compete with unregulated intermediaries. To this purpose, the latter should be prevented from engaging in the functional core of banking, maturity transformation, which is also the main source of systemic externalities. In relying upon ratings, regulation should correct the incentives it provides to rating agencies to inflate their grades, by making them liable for rating intractable uncertainties instead of measurable risks. Finally, regulation should avoid

tampering with the corporate governance of banks. Allowing bank managers to protect their autonomy via contractual choices is a more promising solution to short-termism in carrying out financial innovation than regulation of bankers' pay.