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Law and Economics of the Financial Crisis: Rethinking Market and Regulatory Failures in a World of Uncertainty

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Abstract:

The vast majority of commentators, along with the public opinion, are inclined to identify the causes of the current financial crisis in a combination of traditional market and regulatory failures in the operation and regulation of financial markets. Whatever cannot be explained along these lines is interpreted as evidence of inability of individuals, including market professionals, to make rational choices. Without denying the importance of these factors in explaining the behavior of some of the players involved, this paper argues that the extraordinary proportions of the crisis we are experiencing today are better understood by looking at the specific dynamics of financial innovation through securitization of illiquid assets. Particularly, a perverse combination of Knightian uncertainty and externalities in banking seems to have been the major responsible of the financial crisis. In this perspective, short of being too lax or too lenient, financial regulation have distorted the choices of financial intermediaries ex ante (inducing them to rely too much and too quickly on market liquidity) and it has turned out to be too rigid ex post (forcing intermediaries to acknowledge market losses exceeding the default risk of the underlying assets).

INTRODUCTION

In spite of the extraordinary proportions of the financial crisis that developed economies are experiencing worldwide, its explanation seems, at first glance, rather trivial. A combination of lax monetary policy, misplaced incentives, and regulatory failures in the US and other countries of the Wealthy West is apparently responsible of what happened. In hindsight, the failure to regulate adequately the subprime mortgage market, its securitization, and the exposure of the banking system to it is reported as the main culprit. This triggered the downward spiral transforming a liquidity crisis in a credit crunch, a cyclical slowdown of the economy in a severe recession, underperformance of financial assets in banks' inability to fuel investments and growth. Perhaps due to the absence of retrospection, the way out of this situation is still unclear. But received wisdom tells us that all this could have been avoided with more regulation and less reliance on individuals' ability to make rational choices. I am not denying the relevance of these arguments for a few factors that undoubtedly contributed to the subprime market meltdown and its dramatic consequences. However, this paper will argue that the main drivers of this financial crisis depend on rational choices under uncertainty and on a number of regulatory distortions that aggravated the negative externalities/systemic problems in banking, instead of correcting them.

[structure of the paper - TBC]

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A TALE OF SCAMS AND FOOLS

The story of subprime mortgage securitization is well known, and it will not be recounted in detail in this paper. Yet, in order to appreciate its bearing on the financial crisis, it is important to look at the market exchange of securitized mortgages. The prevailing view is that this exchange was severely tainted by conflicts of interest, asymmetric information, and irrationality. Falling short of addressing these market failures, (absence of) regulation bears the major responsibility of what happened. This line of reasoning has an immediate appeal, which I will initially try to follow in stylized terms. The resulting tale of 'scams and fools' fits, indeed, a few facts, but it leaves key questions unanswered and the big picture unclear. Taking stock of these open questions, I will try to articulate a different, albeit complementary, explanation of the determinants of the current financial crisis in the following section.

To start, subprime mortgages had to be 'sold' to household willing to bear their burden. There is evidence that, especially in the US, mortgages were increasingly offered – often with the aid of pressure sale tactics – to non-creditworthy households. Allegedly, they failed to appreciate the long-run implications of this engagement (Akerlof & Shiller 2008). How could that happen? In the years preceding the burst of the house market bubble, Americans were talked into using real estates as leveraged investments. So long as house prices are increasing, you do not need to repay a burdensome mortgage – you can refinance it based on the increased market value of the house. This outcome is profitable for both the borrower and the lender. Mortgage originators were thus eager to sell this scheme to as many people as possible. In spite of the decreasing quality of credit in the subprime mortgage market, the risk premia were decreasing between 2001 and 2006 (Hellwig 2008). This shows that the mechanism was entirely supply-driven, similarly to the sale of financial investments, in spite of the fact that financial intermediaries were ultimately lending, not borrowing, money. Two questions are in order. First, the leverage game can be as profitable in good times as disastrous in bad times – and good times do not last forever. How could this elementary circumstance be neglected by households? The second question is even more important. Mortgage defaults affect the lenders more than the borrowers. Why were then the former so insisting in offering mortgages to the latter, knowing that most of them would have never been able to repay the loan?

The first question seems to have an easy answer, fitting the 'scams and fools' paradigm. The risks of leveraged bets are not known to financially unsophisticated households. Retail investors have limited information and knowledge to appreciate whether and on what terms they should enter into a financial transaction, and their decisions are often subject to a number of behavioral biases. The two effects go in the same direction, suggesting that the retail sale of financial products (both investments and loans) should be regulated to account for the suitability of the product for the buyer and for the conflicts of interest of the seller. This conclusion parallels the mainstream approach to the regulation of retail financial services, and it has been recently extended to the mortgage market (Macey, O'Hara, and Rosenberg 2009). Although the issue of consumer protection against excessive indebtedness has gained considerable momentum in both the policy and the academic debates, this part of the story plays a minor role in the development of subprime mortgages market. Regardless of whether consumer choice was flawed by ignorance, irrationality, or fraud, this choice was induced by suppliers of credit, not debit, instruments. However, the problem of having loans paid back belongs to the lenders, not to the borrowers. The investigation of subprime market

development thus points at the second question: why were mortgages offered, rather than purchased, on such terms?

While it is no surprise that unscrupulous brokers tend to sell risky investments to 'widows and orphans', the same situation becomes puzzling when it is applied to loans. In principle, brokers earn fees based on how many products they sell, not on how the products perform. Yet this should not apply to mortgage brokerage, so long as the mortgage originator (to whom the broker is accountable) risks his/her own money instead of collecting funds from investors. This was not the case in the residential mortgage business in the US. Individual mortgage deals were closed as they were pooled together with thousands of similar mortgages, securitized, and sold immediately to investors in different tranches of Mortgage-Backed Securities (MBS). In this way, originators could earn their fees without bearing any risk. This is the essence of the 'originate-to-distribute' model. Mortgage originators were not disciplining their brokers for they were acting as brokers themselves. They did not have incentives to screen the quality of the credit being provided, for the simple reason they did not have sufficient (if any) skin in the game (Hellwig 2008). To be sure, this last circumstance is controversial: the crisis effectively wiped out the mortgage origination business (Gorton 2009). But misaligned incentives in mortgage origination do not automatically result in deceit that regulation should prevent.[1] However flawed, the 'originate-to-distribute' model says nothing about who ultimately supplied credit to households and why. Here the 'scam story' starts getting problematic. MBS were not bought by unsophisticated investors, but by professional financial institutions. Most of them were banks, often operating through their affiliations in the less regulated sectors of the financial industry. By purchasing MBS, they did bear the risk of mortgage default, and indeed, they have been most severely hit by the meltdown of the market for these securities. Before assessing whether and how regulation could have prevented this meltdown and its dramatic repercussions, one should understand why MBS were so popular in spite of the problems with their origination.

What made securitization so popular is the risk assessment by credit rating agencies (CRAs), which apparently, could overcome the deficiencies in the origination process. Securitization of loans has two important advantages. It allows for diversification of the risk of individual loans and makes the latter marketable. The two aspects are related, most prominently through the division in tranches of the cash flow generated by the underlying pool of loans. This division allows concentrating the default risk of the pool (which is by definition lower than the sum of individual risks) in the junior tranches, while making the senior tranches relatively safe. The beauty of this mechanism would vanish in transaction costs in the absence of information intermediaries certifying the riskiness of each tranche. Thus, CRAs have been crucial for the development of the securitization business, including the securitization of subprime mortgages. With the appropriate securitization structure, they could certify the safety of certain tranches of Asset-Backed Securities (ABS) whatever the riskiness of the underlying assets (Fabozzi and Modigliani 2003). This risk was absorbed progressively by the junior tranches (also with the aid of other credit enhancements based on collateral and insurance), so that – in essence – *all* the securities generated in this way offered a better risk/return combination than the underlying assets. In hindsight, we know that risk was seriously underestimated, and even more so its correlations within the pools of underlying assets; but ex-ante, these were investment opportunities too profitable to be refused. The role of

[1] A closer look at the agency literature would validate this statement – e.g. Jensen & Meckling (1976)

CRAs provides us with the answer we are looking for. Financial institutions were eager to fund the subprime mortgage business by purchasing MBS (and re-securitization thereof) that offered terrific earnings relative to default risk. However, it seems that, in making this judgment, financial intermediaries were fooled by overoptimistic assessments of risk by the CRAs. Bottom line: CRAs, whose central role in the financial industry is unaccompanied by adequate regulatory oversight, need a substantial injection of regulation to cope with information asymmetry in financial intermediation.

Asymmetric information is a problem as old as the study of finance. Yet, anybody familiar with bankers, investment managers, and the big players in the financial industry will have reservations that these professionals can be fooled so easily. All the more so as CRAs have been operating the securitization business under well-known conflicts of interest. Not only the major CRAs operate under the issuer-pays model; perhaps more important, they normally act as advisors of the same securitizations they rate. These circumstances, which are nowadays regarded as major calls for regulation, might be overlooked by unsophisticated investors; but they should have alerted the professional management of MBS purchasers. Once we add that the ability of CRAs to stay in business depends on their reputation with these professional investors (which rebounds to, but is not determined by, reputation with the issuers), it is hard to believe that CRAs were certifying as good investments a "modern form of snake oil" (Akerlof & Shiller 2008).[2] Most likely, CRAs were just giving financial intermediaries what they wanted. This was investments earning more than their risk premium, which happened to fuel both aggressive marketing of subprime mortgages (certainly piling risk) and their securitizations and re-securitizations (apparently shredding risk). Undoubtedly, originators and CRAs orchestrated the whole thing with a view to maximizing their profits (what else?). But, whatever motivated the alchemy (masked appetite for risk or true financial innovation), this must have been in the interest of financial intermediaries, not against it (Calomiris 2009). This observation does not undermine the pivotal role of CRAs in the securitization business, only helps put it in the right perspective. More than preventing financial institutions from being fooled by CRAs, regulation should worry that the two do not collude. As we will see shortly, this is the opposite of what financial regulation has been doing.

If banks and other financial institutions have not been fooled by originators and CRAs, they must have chosen deliberately to flirt with bankruptcy. Rational actors take this strategy when they play the 'tail-I-win-head-you-lose' game, also known as moral hazard. Moral hazard of banks and bank managers is, with reason, the prevailing explanation of the financial crisis (Calomiris 2008). Banks have a tendency to engage in overly risky operations, since this may increase their profits while most of the downside risk is borne by their creditors. Banking regulation only makes things worse by providing a safety net that lowers creditors' incentives to monitor. Besides deposit insurance, governments and central banks are credibly committed not to let banks fail when this may lead to the collapse of the entire financial system. This is also a well-know problem, which is addressed by combining banking supervision, capital adequacy requirements, and residual market discipline by shareholders and uninsured creditors. In a sense, what went wrong here is rather trivial (Hellwig 2008). Banks could circumvent regulation and supervision operating through highly leveraged off-balance sheet affiliations with the unregulated segments of the industry. Managers could make shareholders happy with the higher returns of operating in MBS, their re-securitizations,

[2] Qualification: this holds in a hypothetical world undistorted by regulation (see infra)

and credit derivatives on all these securities, while sharing in the profits via bonuses and stock options. No surprise that these two circumstances are now a major target of the regulatory response to come.

However, authentication of the moral hazard paradigm requires a further step: the risks of this game should have been effectively shifted to other players. It is at least questionable that this has happened. One striking feature of this financial crisis is that it has hit virtually everybody. Not only the banks that took leveraged bets on the mortgage market, but also their uninsured creditors and counterparties. Consistent with the moral hazard explanation is that both the former and the latter were relying on the implicit guarantee by the state that it would not let them go under. In fact, it is now clear that banks and non-banks were all playing the same game. But it must be foolish to believe that governments, however large, are politically and financially able to bail out the entire financial system. One piece of evidence against this belief is that wholesale short-term creditors (including the much-too-blamed hedge funds) were ready to run, and they did run at the first sign of trouble with MBS (Gorton 2009). So they did monitor after all. It did not help. After the US government let Lehman Brothers go bankrupt, liquidity was drained across the board. The following credit crunch – triggering the severe recession we are experiencing – spared nobody, whether or not still invested in what had become meanwhile the 'toxic assets.' Therefore, moral hazard was constrained by some moderate market discipline. Discipline had to stop when the market itself disappeared, upon realization that the game had become bigger than the system could stand. How big, nobody knows. This is the reason to dismiss the moral hazard paradigm as incomplete (De La Torre and Ize 2009), for it requires at least one player to know what the others do not know and to profit from it. The fact that no financial intermediary anticipated the systemic implications of operating the mortgage business shows that this was not just 'the perfect scam.' That leaves us with the 'fools' side of the story, which, in spite of its intuitive appeal, is no more satisfactory.

The 'irrational investors' approach (Akerlof & Shiller 2008; Avgouleas 2009) contends that all of the above actors (including credit rating agencies) did not exactly know what they were doing. They honestly thought, the argument runs, that securitization was an ideal way to separate default risk from the underlying assets and they irrationally underestimated the effects of correlations on the mortgage pools' exposure to systematic risk (i.e., the risk that the house market bubble bursts, eventually, across different geographic areas – which has happened at last). To complicate the picture, securitization of increasingly riskier mortgages was just the beginning of this play. It concentrated risk in the lower tranches that became increasingly thinner, and yet they kept outperforming securities of comparable rating (Gorton 2009). These tranches were then re-securitized and re-securitized again until gains from trade were exhausted. A similar strategy was pursued through Credit Default Swaps (CDS), which allowed hedging the riskier positions while earning more than the risk-free return. What lends support to the irrationality explanation is that the multiple layers of securitization, especially when combined with the swapping of default risk, were after all too difficult to understand also for market professionals. But investing without knowing does not implies irrationality. This perspective confuses being irrational with being wrong (Posner 2009), neglecting that the latter judgment is performed ex-post while most of the decisions of rational actors are taken ex-ante under uncertainty about future states of the world (I will return to this crucial point momentarily). In addition, differently from stock markets, markets for liquidity of fixed income assets are less information-sensitive and operate on trust. Trading complex debt securities without meticulously assessing

creditworthiness is then no more irrational than buying wholesale diamonds in a sealed packet (Holmstrom 2009).

Critics may reject these arguments as useless semantics, especially considering the long-standing perception by traders and CRAs – documented by the first public inquiries on the subprime crisis – that markets were not pricing risk correctly.[3] Given that, as I showed, moral hazard could not nurture inaction across the board, failure of all the players to act on this information set *must* have been irrational. As often in behavioral analyses (e.g. Thaler and Sunstein 2008), this reasoning misses one crucial point: the interface between individual action and market outcomes – the so-called market mechanism. Before the subprime market collapsed, it was uncertain whether financial innovation was riding a bubble or squaring the risk/return circle. In believing the former, you could think you are smarter than the market supporting the latter. But until a sufficient number of players think the same way, and they are ready to act accordingly, betting against the herd is an extremely risky strategy (besides, it would not change the market outcome). It is therefore fully rational to wait for the first signal of market downturn, because only then the number of 'smart' traders will be sufficiently large to avoid bankruptcy but still sufficiently small to allow making profits. What is often overlooked is that elaboration of this signal is not a question of individual rationality, but of market technology (markets do not think, so they cannot be irrational). This technology was lagging far behind the sophistication of mortgage securitization. As a result, the most information-sensitive products (lower grade MBS, their re-securitizations and CDS) were traded only over the counter. Dealers got better organized eventually, and in 2006 they set up a synthetic derivative index (ABX-CDS) pricing the risk of high and low grade MBS. This 'new' market could elaborate signals of inconsistency in risk assessment with impressive rapidity. So it did, and at the first sign of house prices decline in the US the index on junior tranches of subprime MBS precipitated. CRAs could not but follow, and downgraded massively all securities with the same risk exposure. This was the first subprime panic in 2007 and the beginning of the financial crisis (Gorton 2009).

The developments in the MBS market and its appendices provide compelling evidence that market players were not irrational altogether. Some of them – those that matter – could appreciate the riskiness of the new products. However, translating this into coherent market prices took quite some time. Similarly, a significant proportion of wholesale investors did not play the moral hazard card. They were ready to run, and so they did as soon as the market made this strategy more profitable than following the herd and so long as there was sufficient liquidity to play with. This shows that market forces were less tainted by irrationality and conflicts of interest than is commonly understood. Yet the functionality of the market itself was extremely fragile: it worked pretty well under a simple setting, which failed to appreciate the full implications of structured finance; it suddenly stopped working after new instruments allowed processing these implications. I have reviewed what are considered the major determinants of the financial crisis exactly with the purpose of showing how their role was ancillary to this dynamics. The market dynamics was driven mainly by two factors, which I have intentionally neglected so far: uncertainty and externalities.

[3] Hearings + comment (a AAA security earning 50 basis points over treasury bonds is not only a 'must buy;' it is also evidence of a risk premium)

UNCERTAINTY AND EXTERNALITIES IN BANKING

Since the beginning of the crisis, and especially after its development into a severe recession, we have experience an extraordinary popularity of Keynes' *General Theory of Employment, Interest and Money* (1936). While leaving to macroeconomists the discussion about the best way to get out of this recession (and the related controversy about Keynesian policies in this regard), there is one small passage of the *General Theory* which is especially pertinent to the subject of the present inquiry. I quote it below:

> "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. Enterprise only pretends to itself to be mainly actuated by the statements in its own prospectus, however candid and sincere. Only a little more than an expedition to the South Pole, is it based on an exact calculation of benefits to come. Thus if the animal spirits are dimmed and the spontaneous optimism falters, leaving us to depend on nothing but a mathematical expectation, enterprise will fade and die; – though fears of loss may have a basis no more reasonable than hopes of profit had before."

Not differently from other parts of the General Theory, Keynes' notion of "animal spirits" is open to interpretation. Stressing the emotional component of the animal spirits, two authoritative economists (Akerlof and Shiller 2008) have recently argued that Keynes was a behavioral economist *ante litteram*. (Actually, they have done more: they have tried to revisit macroeconomics and to interpret the financial crisis on this basis). They might be right, but if we put Keynes' words in context, and in a historical perspective, the interpretation changes considerably. As Posner (2009) correctly points out, Keynes was building on the work of Frank Knight (1921) a few years back – most notably on his distinction between risk and uncertainty.[4] According to Knight, risk is a future event that can be assigned a probability, whereas uncertainty cannot be quantified objectively. Neoclassical economic theory, including financial modeling, has traditionally neglected this distinction due to its mathematical intractability – which is exactly one of the points stressed by Keynes. Irrational behavior is likewise intractable, but the major difference from that approach is Keynes' reference to the enterprise. He might have possibly praising irrational entrepreneurial endeavors, but this is implausible (look at his discussion of speculation immediately before). Most likely, both Keynes and Knight were seeing entrepreneurs as major actors in a capitalist economy. Entrepreneurs do not act only on mathematical expectations, but on unique circumstances determining "a spontaneous urge to action rather than inaction." In Knightian terms, entrepreneurs face uncertainty, not risk. What Keynes adds to this framework is that, like speculation, the exercise of entrepreneurship in this fashion is a source of "instability." We are getting closer to the bearing of this digression on the determinants of the financial crisis.

Mortgage securitization was a financial innovation, and as such, the result of an entrepreneurial process in the financial industry. I will not elaborate on the macroeconomic conditions that stimulated this process. The aim was clear: finding

[4] Also Treatise on Probability (1921).

sources of higher earnings in a period of sustained growth coupled with ridiculously low interest rates. To many, this situation was the ultimate cause of the financial crisis, if not itself "a failure of capitalism" (Posner 2009). I prefer looking at how it stimulated ingenious developments in financial engineering, which is, in principle, the beauty of capitalism. (In principle, I said, for I will turn to the failure shortly). Financial institutions – let us consider a broad notion of 'bank' for the moment – had a lot of cash and cash-equivalent to manage and they could only extract competitive earnings by taking more risk. Given the trend of the US house market, subprime mortgages were an attractive option. But there are limits to a bank's ability to offer mortgages to borrowers who will only be able to sustain them out of appreciation of the collateral. Without overly complicating things, these limits are concentration of risk that collateral is devalued, long maturity of contracts, and the costs of individual monitoring. Securitization could solve all these problems. Risk was diversified geographically (house price *usually* do not move in the same direction across the US) and the costs of individual monitoring replaced by the securitization structure with the aid of CRAs certifying its soundness. The securitization structure also allowed shortening maturity. More importantly, however, the problem was addressed by the liquidity of the securities generated – banks could sell them or pledge them as collateral when they needed cash. This is a crucial point for banks, given that maturity transformation is the core function they perform in the financial system.

Securitization has changed the approach to maturity transformation, exposing banking to the uncertainties of financial innovation and the financial system to the consequent instability. Banks borrow short(-term) and lend long(-term), and this is what makes them so fragile in a systemic perspective. Traditionally, the safety net protects banks from runs by insuring depositors and providing lender-of-last resort facilities; in exchange, with the purpose of containing moral hazard, governments prevent banks from exceeding with leverage. This paradigm was considered outdated and the capital adequacy requirements "unnecessarily binding" (Hellwig 2008). Banks could borrow more against MBS than against traditional loans, because the former had liquidity properties not available to the latter and – thanks to the credit enhancements – their senior tranches were less risky. These advantages were reflected in lower risk-weighted capital ratios (20% as opposed to 50% of mortgage loans and 100% of commercial loans). But securitization had more potential. Apparently, re-securitization could shred risk further and generate high-grade securities out of much riskier ones (with the latter still fueling higher returns). Moreover, lower-grade securities could be hedged with a CDS and still generate a positive spread (Gorton 2008). All that the system needed in order to exploit this potential is access to higher leverage. Some institutions (hedge funds, investment banks) had that, and thus they could outperform commercial banks whose leverage was more tightly regulated. To keep up with this competitive pressure, banks set up off-balance sheet vehicles (SIV, conduits), which could perform as much maturity transformation as their financiers (e.g., money market funds) allowed.

Financiers allowed banks to perform a lot of maturity transformation in this fashion. Having dismissed both moral hazard and irrationality explanations as incomplete, why they did it is still an open question. Miracles of trust (in banks) and liquidity (of markets). Financiers knew the risks of leveraged banking, but they kept their exposure short-term counting that liquidity of MBS and re-securitization thereof would absorb the shocks (and protect their investment) even in the worst-case scenario. A part of these securities could be devalued by the sudden downturn of house market prices, but the vast majority of them were safe and marketable, which would allow the necessary price

adjustments and the smooth settlement of CDS. Banks would only make moderate losses in this scenario, so who could think of a bank run? A similar belief animated the inaugural sail of the Titanic. 'Unsinkable' – they all thought – for the ship could withstand the burst of up to 4 watertight compartments. The most famous iceberg in history hit 6 of them, pretty much as what will be remembered as the largest house market bubble burst in the US flooded the safest compartments of the mortgage securitization industry. They both sank.

Of course, errors of judgment are present in both stories. The funny thing about judgments under uncertainty is that mistakes only prove such in hindsight. In order to realize that a mistake was made, we need endeavors to fail under some contingencies that were too unlikely to be accounted for at the outset – and that, as Keynes suggest, would stop innovation if they were. Under a different set of contingencies, the same course of action would have been regarded as ingenious recipe for success. For instance, the Titanic could have avoided her destiny if the helmsman had not swerved in a last-minute attempt to avoid the iceberg. The very last chance to save the boat (hitting the iceberg frontally) was missed because of panic, which, not differently from the decision to sail in dangerous waters, depended on the failure to contemplate an iceberg of that size and shape. This perspective exhibits regularity across innovations that turned out badly, making specific mistakes less important than the general failure to correct them in time. As Keynes put it, instability depends on sweep swings between "hope of profit" and "fear of loss," none of which is supported by well-tottered knowledge. Therefore, the key issue for policymaking is not preventing mistakes in the innovation process, for new and old ones will never be alike and the only way to avoid them is deterring innovation altogether. Rather, one should focus on how errors of judgment are magnified by swinging between confidence and distrust in new technologies. As it turns out, these swings can harm society far more than the errors they uncover.

The illusion of safety of MBS, making banks sail in the dangerous waters of leveraged maturity transformation with the blessing of both creditors and regulators, owes much to the errors of judgment by CRAs. Their estimate of correlations between default risks proved wrong after the house market bubble burst. However, this does not explain the meltdown of the entire MBS market, including the senior tranches. The security of senior tranches depends on two factors: one is the quality of the underlying assets; the other is the thickness of the junior tranches. The two factors are related: the lower the quality of underlying mortgages, the higher the size of junior tranches required to protect the senior tranches – with the magnitude of this effect increasing in the correlations (the pool's exposure to systematic risk). This mechanism gets more complicated with re-securitization, which generated the notoriously opaque Collateralized Debt Obligations (CDO) first targeted by the market panic, but the intuition stands. So long as the underlying assets had not lost all of their value, CRAs could have updated the securitizations exposure to systematic risk by resizing (rerating) their tranches. Yet CRAs followed, instead of anticipating, the market panic. The market was as inclined to provide liquidity under a veil of ignorance supported by reliable ratings as obstinate in stopping trading MBS and CDO in the presence of a few investors knowing (or trading as they knew) their riskiness better than CRAs. This effect – total drain of liquidity – and its feedbacks on mortgage defaults was unpredictable, also because it is unjustified. Almost two years after the first panic, and in spite of the recession, none of the scenarios that would support wiping out of the senior tranches of MBS (if not also of some CDO) has materialized. Still, nobody knows what the so-called 'toxic assets' are worth because, after being the most popular

financial investment for half a decade, they have currently no market. The process of marketing this financial innovation had simply gone too far.

How could CRAs be relied upon so much in good times and so little in bad times? The reasons are manifold, and regulatory distortion of incentives is one of them. Regulation, as I am going to show, induced mistaken underestimation of risk by CRAs, but it could not determine market overreaction to these mistakes and to the uncertainty surrounding their implications. This was a flaw in the market mechanisms. MBS markets were not pricing mortgage risk consistently in good times; neither have they been doing it in bad times. In a sense, they have never learned this job. It was not theirs. Markets were traditionally unable to price mortgage risk across the board; that was for banks to do. Through securitization, banks have managed to create a profitable market for their illiquid assets. In doing this, they have relinquished their role of information processors before markets could avail themselves of the instruments for taking over. As a result, markets were as eager to provide abundant liquidity while trusting that banks and CRAs were jointly monitoring risks as ready to withdraw from any liquidity as soon as they realized that nobody was actually performing this task.

This free rider problem is well illustrated by Holmstrom (2009). In the presence of trust, markets for liquidity of fixed-income assets work without much information. It is thus no surprise that investment grade MBS were just priced according to their rating. The problem was with the junior tranches, which are more information-sensitive since they are closer to equity. It was solved by repackaging them into higher-grade CDO and/or hedging their risk with CDS. Everybody was as happy as the passengers of a ship cruising in the sunshine, until they realize that nobody is at the helm. For many years, information on fundamentals was 'lost' in this process (Gorton 2009). But as soon as the ABX-CDS index allowed a few players to trade credit derivatives on fundamentals, instead of on pure market arbitrage, markets overreacted withdrawing liquidity from all asset-backed securities, and eventually, from the banking system altogether. Currently, the estimated write-downs of assets by banks are 5 to 6 times larger than the aggregate default risk of securitized mortgages under the worst-case scenario (IMF 2008 and 2009). As before, markets are not pricing default risk on asset-backed securities, but banks' ability to deal with them.

Shall we blame banks for placing on the market a heavier burden than it could stand? Yes and no. It should be clear by now that banks have been acting rationally in the pursuit of profit opportunities made available by financial innovation, and that moral hazard played no larger role than in the performance of more traditional banking. In this perspective, blaming bankers for maximizing profits in spite of the dangers for the financial system sounds like blaming a lion for eating a zebra (Posner 2009). A lion is not supposed to spare a zebra based on concern that zebras are eaten faster than they can reproduce. Similarly, it cannot be expected that market players internalize the systemic risk of massive leveraged bets on MBS so long as liquidity is there. Neither the extinction of zebras nor the collapse of the financial system is socially optimal though. Here is the crucial point. The strategy of banks was implemented taking liquidity for granted. But liquidity is a positive externality, which turns into a negative systemic externality when it is withdrawn through a bank run. The fundamental rationale of banking regulation is preventing and correcting collective action problems that may turn liquidity externalities upside down. In principle, then, this crisis is a regulatory failure.

The picture is complicated by the fact that the draining of liquidity from the interbank and money markets was different from previous experiences of bank run. It has been both unexpected and difficult to handle (even the extension of deposit insurance and lender-of-last-resort facilities did not help). If markets are unprepared to handle uncertainty, how could regulators fare any better? This is the whole point of the foregoing discussion of risky innovations under uncertainty. Regulation and supervision could have not prevented the mistakes that resulted in the crisis. Correcting them in hindsight would be like building a fence after the cows are gone: it would not prevent the next crisis. A more fruitful line of inquiry is how regulation can induce caution in relying on developing market mechanisms, in spite of the natural tendency of financial intermediaries to cash in the profits of financial innovation whatever the externalities of this strategy on the system.

REGULATORY DISTORTIONS: A WAY FORWARD

Despite of the prevailing view that financial regulation has been too lax in the last few decades (allowing 'unbridled innovation' and 'reckless appetites for risk'), the attractiveness of mortgages securitization for banks depended considerably on the existing regulatory framework. A few factors seem to have been particularly relevant in motivating banks to rely on markets in the quest for more favorable risk/return combinations. With no claim of being exhaustive, these include most prominently: a) Supply of 'regulatory licenses' by otherwise unregulated credit rating agencies; b) Loopholes in the regulation of capital adequacy; c) Regulatory insistence on market discipline. The combination of these factors induced banks to depend increasingly on security markets, for profits in good time as well as for survival in bad times. In the absence of firm knowledge of how bank assets could be marketed smoothly, this amplified banks' exposure to swings between euphoria and panic. This perspective partly connects with others advanced by authoritative commentators. Posner (2009) identifies in the excesses of a 'free-market' ideology the main cause of regulatory failure (albeit stressing as more worrisome the combination of market failure with uncertainty). Calomiris (2009) blames governments and central banks for "errors of commission" rather than for "errors of omission." Hellwig (2008) suggests that, especially in a systemic perspective, "errors of governance" may have been more important than "errors of judgment." What I argue, as a synthesis of all this, is that regulation has mistakenly supported the ideal of a market governance of the banking enterprise. Had it not done so, banks could have avoided relying immediately on a shaky market mechanism for cashing in the profits of financial innovation. In what follows, I will try to illustrate the above-mentioned regulatory distortions with a view to this general dynamics (and to how it should be avoided in the future) more than to the specific details the sustained it in this crisis.

Credit Rating Agencies

On both sides of the Atlantic, CRAs are a major target of regulatory reform. The argument, attracting widespread consensus, is that they have failed to do their job for lack of transparency, of rules preventing conflicts of interest, and of public oversight. This debate misses one crucial point. CRAs have been indeed very lightly regulated, but regulation is not neutral to them. Regulation of banks and of other major financial institutions (e.g., pension funds) provides CRAs with substantial regulatory rents. Banks

can economize on equity capital (and engage in higher leverage) when their marketable assets are rated high enough. Pension funds and some mutual funds are prevented from, or contractually committed to, investing only in top rated securities. The assumption by regulators (which proved wrong only in hindsight) is that high-grade securities are safer. Investors have therefore a strong interest in purchasing high-grade securities, and the whole purpose of subprime market securitization was – as I showed – to combine this regulatory incentive (or outright obligation) with higher earnings. In this perspective, the celebrated conflicts of interest of CRAs in dealing with issuers are of secondary importance. In most cases, CRAs are paid by issuers, but for what? Mainly for certifying that their securities qualify for minimizing the investors' costs of compliance with financial regulation. This is how, in the securitization business, the role of issuers became merely instrumental to the investors' strategy. Securitizations were conceived with the double purpose of marketing illiquid assets and reducing the amount of banks' capital to be booked against those assets. CRAs were asked to devise with issuers the appropriate securitization structures to this purpose. That ratings turned out to be inflated is thus no surprise.

The question is, rather, why ratings were not *more* inflated. Besides managing "regulatory licenses" (Partnoy 2009), CRAs do also a more traditional job. They help overcome asymmetric information in trading fixed-income securities by staking their reputation on the ratings they provide. The oligopolistic structure of the ratings market supports reputational rents constraining CRAs' incentives to inflate ratings, for this strategy would reduce their rents in the long run. Had they been not credible in rating securitization tranches, there would have been no market for MBS and CDO (in fact, those markets disappeared when CRAs lost their credibility) and much less business to extract rents from. The supply of regulatory licenses generates a substitution effect: CRAs may afford to be less strict with ratings inasmuch as their prospective loss in reputation is compensated by regulatory rents. There is evidence that they ended up providing securitization ratings without having sufficient resources to handle the increased size of the business.[5] This gave market players the illusion that the new financial products were as safe as regulation wanted them to be, with the dramatic consequences that we have seen when this turned out not to be the case. Surprisingly, regulation continues to reward this strategy by maintaining the CRAs' role as providers of regulatory licenses and focusing, instead, on how to make their judgment independent from issuers. CRAs would hardly have any incentive to collude with investors, and consequently to provide issuers with inflated ratings, in the absence of regulatory distortions of their incentives.

Imagining a world without regulatory distortions is 'Nirvana economics' (Demsetz 1969). The hypothesis that financial regulation does without ratings would be completely unrealistic nowadays, so rethinking the legal discipline of CRAs is the only option to cope with the existing distortions. The insistence of reform proposals on transparency of ratings procedures, registration and supervision of CRAs, and severe rules on conflicts of interest, addresses (sometimes mistakenly) a number of relatively unimportant issues (Sy 2009). For instance, although extremely popular, the idea of prohibiting the issuer-pays model has little bearing to the problem. Switching to any investor-pays model would be irrelevant, if not worse. No remuneration structure can tackle regulation-induced incentives to rate anything that can result in lower compliance costs (and thus in higher profits) for financial intermediaries.[6] The real problem is how

[5] [Public Hearing, Partnoy 2009]
[6] "it could be structured by cows and we would rate it."

to stop CRAs from certifying marketability and safety of financial innovations before they are proved such by a sound market mechanism. Two solutions seem to be apt to achieving this goal (Partnoy 2009). One is legal liability, from which American CRAs have been traditionally insulated thanks to a broad interpretation of the First Amendment (right of free speech). The other is competition with comparable sources of credit risk assessment.

I doubt that either of them would work alone. Imposing liability on CRAs brings about the problem of setting the right standard: it should be neither too lenient to stop reckless behavior nor so strict to prevent financial innovation for fear of hindsight bias in adjudication. Similarly, competition of ratings with other market indicators of credit risk is difficult to establish so long as the relevant choice for regulatory purposes rests with investors (choice by regulators would not foster competition, but only limit innovation). Investors would always choose ratings as long as they are more favorable than the market assessment – and so they would be. Yet, the suggestion to compare ratings with indicators such as CDS spreads or risk premia over Treasury Bonds (Calomiris 2009) becomes very useful with a view to administering a liability standard for CRAs. To escape liability, they should demonstrate that departure from market assessment in their ratings was justified ex-ante by superior expertise and access to information. One such standard should provide CRAs with sufficient market challenge while protecting their judgment from hindsight bias. In this respect, this solution is better than punishing CRAs that turn out to have underestimated risk ex-post with a reduction of their regulatory rents (Calomiris 2009). Both approaches hit the key point though: how to make CRAs more cautious in allowing marketing of financial innovations.

The Limits of Capital Adequacy Regulation

Regulation of bank's capital adequacy has two main purposes (Heremans 2008). One is to provide banks and their shareholders with sufficient 'skin in the game' in screening and monitoring the quality of the credit they provide. The other is protecting bank stability through sufficient equity buffers against shocks that may compromise its solvency. The first goal is linked with the issue of market discipline, which is one major 'pillar' of modern banking regulation.[7] I will discuss it in the next subsection. Here I focus on the buffering function of capital adequacy (CA) requirements.

Undoubtedly, CA requirements have failed to shield banks from the liquidity crisis. In combination with a few other regulatory items, CA requirements have also contributed to precipitating banks on the verge of insolvency after markets stopped trading mortgage securitizations. CA requirements have not protected banks for they are ill suited to deal with liquidity problems. In addition, these requirements vary significantly across different sectors of the financial industry, which reflects different exposure to systemic risk without corresponding with real differences in operation capacity. Therefore, in order to compete with less regulated intermediaries on their more profitable turf (Hellwig 2008), banks embarked upon leveraged investments in MBS and CDO through off-balance sheet vehicles. This concealed the build up of systemic danger. Similarly, capital adequacy regulations did not help banks to cope with the systemic crisis when it materialized. When liquidity drained up, banks faced two problems. Not only their equity cushions were insufficient to back up the leverage of

[7] Basel II

their SIV and conduits.[8] More importantly, the sudden depreciation of all securitized assets forced banks to acknowledge huge losses making both shareholders and creditors unwilling to recapitalize them.[9] As a result, banks could only manage to meet the CA requirements by liquidating their assets at fire-sale prices. Those that were too deeply invested in MBS and CDO did not have that option, and thus they became technically insolvent in no time. Some could be recapitalized through acquisition or otherwise, some were bailed out by governments. The others went under, like Lehman Brothers, triggering (the fear of) a 'daisy chain' effect on the intermediaries having survived the first wave of panic. The bottom line is that banks now sit on their cash, for this is the only real buffer they have against materialization of counterparty risks and/or further depreciation of their assets. Those circumstances are aggravated, instead of coped with, by CA requirements. They force banks to liquidate marketable assets at a loss in the absence of financiers willing to support holding of illiquid assets to maturity.

Had bank leverage been contained at the outset, this crisis could have been avoided simply by holding MBS and CDO to maturity.[10] All uncertainties about sensitivity to mortgage default risk are cleared upon termination of each tranche's cash flow. But liquidity of these securities is exactly what made mortgage securitizations so attractive to induce more leverage and maturity transformation than the system could stand. Excessive reliance on this liquidity was the very source of the systemic externality, and therefore regulation should have countered it. CA requirements did the opposite. Not only did they fail to prevent banks from abusing abundant liquidity in good times; they also precipitated them in a scramble for scarce cash in bad times. This paradox of financial regulation applies to other related features. Ratings similarly make innovative financial products a blessing in good times and a curse in bad times. They are a 'must-buy' as long as they offer better risk/return combinations than other assets, but as soon as they are downgraded, institutional investors must sell them and banks are forced to recapitalize or deleverage due more demanding CA requirements (Sy 2009). The effects of fair-value accounting go in the same direction. Financial assets are valued at their market prices instead of at their historical cost. Marking-to-market frees resources for increasing leverage in good times (appreciations accrue to the regulatory capital) and it strangles banks in bad times (depreciations are booked against regulatory capital). In the current regulatory debate, this issue is known as pro-cyclicality of financial regulation (Hellwig 2008). Notice that circumvention of CA requirements is not necessary to determine this perverse situation. The pro-cyclical design of CA requirements was sufficient for banks to book less and less capital against subprime mortgage risk (Calomiris 2009). Besides, regulation allowed banks to operate with unconstrained leverage through off-balance sheet vehicles.

A thorough discussion of asymmetries and pro-cyclicality in regulation of CA is outside the scope of the present work. However, with a special view to countering the recurrent dynamics of uncertainty and externalities in financial innovation, a few points are in order. First, regulation should not incentivize marketing of financial assets as a way to reduce the burden of capital adequacy (or of any other regulation serving the same purpose). At the same time, restricting marketing of new financial products between professional investors would undermine financial innovation. One solution identified in the literature is allowing different operations for intermediaries subject to different

[8] Banks had to save their vehicles from bankruptcy since, after the first wave of panic, they had become unable to roll over their short-term liabilities.
[9] Due to debt overhang problem (Myers 1977)
[10] Hellwig's remark in this regard.

regulatory burdens (De La Torre and Ize 2009; Avgouleas 2009). Banks would have exclusive access to market borrowing and to the governments' safety net, but under a very strict discipline of leverage allowing for no regulatory arbitrage. This would simultaneously mark out the boundaries of systemic risk and protect banks from it, by limiting their involvement in financial innovation. On the contrary, non-banks would face no limits in financial innovation (and no CA requirements), provided they can only borrow from banks. In this way, "systemic externalities would be evenly internalized across all possible paths of financial intermediation" (De La Torre and Ize 2009). Non-banks would freely deal with uncertainty, leverage, and their consequences on profits and solvency. However, their funding would be intermediated by banks, making sure that the leverage of the system does not exceeds certain limits.

Second, the triggers of CA requirements should anticipate, not follow, the swings between market reliance on innovation and fear of the unknown. This is very difficult since such swings are inherently unpredictable. And yet, experience tells that they are preceded by certain circumstances. For instance, asset bubbles usually occur in periods of low interest rates, especially under expectations that they will stay low in the future (a flat yield curve). In these situations, regulation could require banks to book a higher proportion of capital against their assets, thereby building up a real buffer for the event of asset prices downturn, when the extra capital requirements would be lifted (Calomiris 2009). Of course, we cannot be sure it is a bubble until it bursts (Posner 2009). This solution is therefore exposed to the risk of false positives. However, situations of steadily low interest rates make also easier for banks to raise equity capital when they believe that attractiveness of their investments is driven by fundamentals. For this reason, this solution is preferable to linking CA requirements to the size of CDS spreads (Hart and Zingales 2009). Although CDS tend to be more reliable than ratings for market discipline (market makers put their money where their mouth is), they would not help build up capital buffers for they are as pro-cyclical as any other market parameter.

Third, in principle, regulation should allow managing CA requirements with more discretion by the supervisory authorities. This would fit the circumstance that externalities generated by financial innovation are unpredictable. However, this raises difficult issues of accountability of agencies that, with reason, are normally independent of the political power. A compromise solution could be making marking-to-market less binding for regulatory purposes. Fair value accounting becomes meaningless when markets stop functioning. In this situation, both creditors and regulators are interested in giving banks slack until market functioning is restored. Marking-to-market prevents this forbearance by triggering automatic 'margin calls,' on both regulatory and private capital, which may inefficiently drive a bank to bankruptcy. As illustrated by Epstein and Henderson (2009), waiving these mechanisms would expose both financiers and regulators to litigation from their stakeholders. Historical accounting has a number of disadvantages over fair value accounting, but one important advantage. It cannot trigger any automatism since historical costs provide no information on creditworthiness. It is worth noting that historical costs cannot be misleading either, at least not for market professionals who know that they are uninformative. Yet regulators could well use historical costs for forbearance with CA requirements when this option is allowed by the legal system. The same applies to creditors with their contracts. Without prejudice of the informative role of marking-to market, this solution would prevent accounting from unnecessarily amplifying panics (Epstein and Henderson 2009).

Uncertainty fuels swings between confidence and distrust in regulatory techniques as well. It would be interesting to explore this dynamics in a political economy perspective, but this is better left to another paper. The financial crisis has led to a profound rethinking of market discipline of banks, which has been one major aspect of regulation of banks for decades. As I mentioned, market discipline is supposed to work through monitoring by shareholders and uninsured creditors. The former should make sure that managers maximize the value of residual claims on the bank's assets, whereas the latter should avoid that managers take excessive risks in investing the funds they borrow. The pursuit of both goals is more difficult in banking due to the moral hazard implications of the governments' safety net. What the financial crisis seems to show is that market discipline did not work exactly because of that. The high degree of alignment of managerial incentives with shareholder interest motivated them to take leveraged bets on securitized mortgages in the quest for higher profits. Uninsured creditors failed to constrain this strategy because they trusted that governments would not let major banks go under. In the foregoing analysis, I have expressed my reservations that this can be the whole story. Albeit present (and somewhat unavoidable given the regulatory framework of banks), moral hazard never eliminated market discipline. Market discipline, however, cannot be expected to cope with the uncertainty of financial innovation and, even more so, with the externalities it generates.

Markets need time to learn how to price innovation. Market discipline provides banks and bank managers with strong incentives to accelerate the process in order to give reassuring signals to their financiers (both shareholders and creditors). The profits of both banks and bankers depend on those signals: the former via stock market performance (which also enhances the creditworthiness of the firm); the latter via executive pay or direct ownership of stock. Yet the occurrence of unforeseen contingencies has asymmetric effects on individuals and institutions due to separation of ownership and control. When the market mechanisms that supported those profits prove flawed, uncertainty rebounds on the institutions but spares their managers inasmuch as they already got their reward. Regulation may not worry of this effect as far as it depends on a failure in private contracting. But the institutions in question – banks – are the ultimate source of exposure of financial systems to negative externalities. Differently from other industries, markets cannot just turn elsewhere when banks are in trouble. They stop working altogether, thereby depriving the real economy of liquidity and credit. Since malfunctioning in the corporate governance of banks increases the potential externalities of financial innovation, this is a matter of concern for regulators.

Short of the growing discomfort of the public opinion with 'excessive' executive pay both inside and outside banking, rethinking the mechanisms of bankers' remuneration makes sense from an economic perspective. Only in principle though, because the grounds of regulatory intervention along the lines currently being debated are, at best, shaky. Regulators plan to mandate for bank executives backload of stock-based compensation, say-on-pay by shareholders, and outright limits on performance pay. Backload is supported by authoritative commentators (e.g. Posner 2009) on grounds that it limits managerial short-termism. However, Bebchuk and Spamann (2009) correctly contend that this would not suffice to counter managerial incentives to take leveraged bets on risky investments. The reason, they argue, is that all remuneration schemes that align managerial incentives with shareholder value are based on asymmetry between downside risk and upside potential. Differently from non-financial firms, this induces

excessive risk taking by banks (because of moral hazard by creditors) and it results in significant losses of social welfare (because of the systemic implications of excessive risk taking). Bottom line: bankers' remuneration should not be just dependent on shareholder value, but it should also be linked to the wealth of other stakeholders (creditors and governments as preferred shareholders).

This perspective is an excellent synthesis of corporate governance with what we already knew about banks and the side effects of their regulation. However, it misses the whole point of uncertainty in financial innovation, which – as I have tried to show – is perhaps the main lesson of this crisis. Regulation should worry of this issue at least as much as it cares of addressing old problems with new tools. Another circumstance suggests caution in rethinking the corporate governance of banks in a stakeholder perspective. So far, this field has been almost entirely neglected by students of corporate governance. There are few exceptions, which unsurprisingly are now engaged in analyzing how the specificities of separation between ownership and control of banks affect risk taking. The first results of empirical analyses do not bear out the general view that levels and structure of bank executives' compensation have been one major determinant of the financial crisis.

One study (Adams 2009) found no clear-cut evidence that managers of banks earn more than managers of non-financial firms, when the differences in firm size are controlled for. If anything, it seems that only CEOs of *non-bank* financial firms enjoy particularly high levels of remuneration. Even more puzzling is the circumstances that directors of banks entering the US government bailout program were more independent and had lower pays than the others. This suggests that directors of the firms most severely hit by the crisis had lower-powered incentives instead of being more motivated to maximize shareholder value at the expenses of creditors and taxpayers. Another study (Laeven and Levine 2007) found that the levels of banks' risk taking are not just dependent on the ownership interest of those who are in control. Among other things, the positive effect of ownership on risk taking is offset by the circumstance that the controlling shareholder is a senior manager of the bank. Controllers who have their human capital tied with managing the bank take less risk no matter of their equity stake. Although it is not easy to make sense of all these findings, they suggest that putting management on high-powered incentives to maximize shareholder value can be as good as bad for banks and their stability, depending on other circumstances. Let me focus on one of them, which is particularly related to how managers handle the uncertainties of financial innovation: tenure.

One uncontroversial advantage of tenure, which is well known to academics, is that it allows you to take your time for cashing in the proceeds of your most uncertain activities. On the contrary, without tenure, you are accountable to your principals on a regular basis, and this prevents you from pursuing any long-term strategy that is not in their interest or understanding. Untenured managers are naturally inclined to short-termism because their salary depends on being reappointed (or not ousted), which in turn requires that shareholders be happy with the return they receive on the investment. Tenured managers have incentives to take more long-term strategies, but they may fail to maximize shareholder value by extracting private benefits of control. The whole debate on corporate governance is centered on this tradeoff. For some time, performance-based compensation seemed to have squared the circle – at least in theory, for the practice has always exhibited significant conflicts of interest (Bebchuk and Fried 2004). With the appropriate vesting mechanisms and severance payments, stock options

plans could protect management from the adverse consequences of loss of office while aligning their incentives with the interest of shareholders. The logic of this arrangement is entirely based on optimal risk bearing. Managerial investments are less diversified than those of shareholders, and thus management should be protected from downside risk and motivated by high upside potential. This is no less true for banks than for non-financial firms. The problem is that, in both situations, this logic neglects the role of uncertainty and entrepreneurship in corporate governance (Pacces 2007).

Financial markets normally refuse to value innovations whose odds are highly uncertain, and thus shareholders can neither reward nor punish managers for dealing with them. But when uncertainty is attached to events considered too unlikely to materialize – as the total drain of liquidity of asset-backed securities – financial markets will simply disregard it. In this situation, managers do not have a choice. If they refuse to be involved in an innovative business in spite of the easy money that it generates, they would be replaced by others willing to do it. On the contrary, if they go for it, their remuneration scheme would still protect them from the downside risk (short of reputational concerns, which are less relevant in situations of mass illusion, being fired for underperformance or because of bankruptcy makes little difference for a manager). This perverse combination of incentives is avoided when managers are tenured, and thus they can afford to depart from the herd – which entrepreneurs typically do. As I have showed elsewhere (Pacces 2009), tenure of corporate control allows for alternative rewarding of managerial investments under uncertainty, in the form of private benefits of control. Cashing in of these benefits is postponed until financial markets are fully able to appreciate the consequences of innovation and they can compensate it in the form of a control premium. Since this compensation is lost in case of bankruptcy, one such mechanism tends to induce a long-term perspective in marketing financial innovations. This is exactly what the market for mortgage securitizations would have needed.

In conclusion, it is true that the externalities of this financial crisis have been nurtured by malfunctioning in the corporate governance of banks. However, this does not depend on the pursuit of shareholder value or on executive remuneration being too closely linked to it. Banks managed by controlling shareholders, which cannot be deemed less concerned with shareholder value than managers on stock options plans, performed much better in this crisis. This suggests that tenure of corporate control is both privately optimal and socially efficient for banks' dealing with uncertainty. A misguided notion of managerial discipline by stock markets – supported, among others, by banking regulators – have induced banks executives to seek immediate realization of high earnings, thereby amplifying the externalities of investing in uncertain assets on the financial system. In this perspective, how to coordinate pay-per-performance with deferred compensation of bank managers in the form of private benefits of control is an interesting issue for future research.

CONCLUSIONS

[To be added]

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