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Regulation of banking and banks governance: when liquidity drives financial behaviour

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Abstract: This paper presents a dynamic approach to liquidity based on uncertainty as conceptualised by Knight, developed in a theory of long-term expectations by Keynes, and applied to banking by Minsky. This perspective reveals that banks perform maturity transformation and create monetary liabilities by overcoming uncertainty about the future based on generally accepted conventions of safety. When uncertainty returns to the forefront, acceptance of private money is compromised and a liquidity crisis may ensue. On this basis, the paper illustrates how banking should be regulated ex-ante and supported ex-post by central banks in order to reduce financial instability. Regulation and the safety net should be complemented by corporate governance committing bank managers to long-term horizons. Rules on managerial remuneration are insufficient for this purpose. Insulating bankers from market pressure for high-risk, high-returns strategies should be allowed too.

Keywords: uncertainty; liquidity; lender of last resort; corporate governance; short-termism; private benefits of control.

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1 Introduction

Liquidity is a recurrent issue in the debate on the global financial crisis. There is a broad understanding that only a combination of factors could explain such turmoil. Whatever opinion one may have on financial crises, the drying up of liquidity is normally a part of the story. This matches our instinctive reaction to financial turmoil, which is making our

positions 'liquid' whatever that means. A comprehensive theory of liquidity would be most useful to understand financial crises, particularly what can make these so disastrous for the global economy, and to devise policies aimed at containing illiquidity. Based on asymmetric information, a few attempts have been made to include liquidity in financial economics (see Holmström and Tirole, 2011).

This paper seeks to make a little progress in the study of liquidity departing from asymmetric information problems and pointing instead at how financial decision-making deals with *uncertainty* about the future. I define finance as a transfer of resources to the future and uncertainty as lack of precise knowledge on how this future will look like. Rational actors, including professional investors, routinely take financial decisions under uncertainty about contingencies that will affect their payoffs. Uncertainty differs from risk because it is immeasurable; that is, it concerns situations that cannot be assigned a probability (Knight, 1921). The question is, then, how is rational finance possible in the presence of uncertainty?

According to Keynes (1936), actors deal with uncertainty *as if* they were dealing with measurable risks based on 'conventions' about the likelihood of future contingencies. These conventions provide rational economic actors with a sense of safety because they allow trading long-term assets for certain amounts of cash. Liquidity is compromised when the unfolding of events denies reliability to the underlying conventions, for instance because adverse contingencies that had been conventionally disregarded actually occur and nobody knows how to price the risk that they will occur again. Actors then seek to disengage from the future until new conventions are developed that allow dealing with the new state of the world. Investors avoid committing to an uncertain future by demanding more liquidity than can be obtained on secondary markets for debt. As a result, the price of financial assets previously considered 'safe' plummets relative to cash and cash-equivalents; interest rates rise and a financial crisis may ensue.

This paper revisits the Keynesian perspective on liquidity problems with the purpose to derive implications for the regulation of banking and the corporate governance of banks. Embedded in the notion of liquidity is the idea of a systemic externality: lending cash allows a capitalist economy to flourish; hoarding cash may make it collapse. While the presence of externalities implies that public intervention could improve welfare, uncertainty may cast doubts on the ability of regulation to control the generation of liquidity and its contraction. However, even without crediting policymakers with superior forecasting skills, authoritative economists (Caballero, 2010) and legal scholars (Posner, 2010) increasingly advocate the study of uncertainty for better understanding economics and economic policy. This paper argues that banks play a special role in overcoming uncertainty because they finance long-term projects with short-term liabilities that are accepted as money. The incentive for banks to engage in this process, known as maturity transformation, is profit measured as returns to equity. Most corporate governance decisions are based on these returns. The problem is that both banking and its corporate governance may be not in line with the interest of society when it comes to liquidity. Liquidity generation in the form of monetary liabilities may be either excessive or insufficient, particularly in the presence of swings in uncertainty.

Because liquidity allows financing valuable projects by overcoming uncertainty about the future, it is not intuitive how there could be too much of it. However, today's liquidity enables financial institutions to profit from increasing leverage, which magnifies the impact of tomorrow's illiquidity not only on individual institutions, but also on the solvency of the entire financial system (Adrian and Shin, 2010). Banks can issue virtually

unlimited amounts of short-term liabilities when liquid long-term assets back them up. Call these collateral. The sudden illiquidity of collateral, for instance AAA bonds, undermines the banks' ability to deliver cash on demand as they promise and triggers a downward spiral of collateral values via fire sales (Shleifer and Vishny, 2011). The severity of the problem depends on how much leverage was enabled in the first place. Because assets may be collateralised more than once and the same collateral may guarantee multiple liabilities, liquidity and leverage are two mutually reinforcing factors of financial instability. Maturity transformation is central to this process. Therefore, this paper will focus on banking, neglecting other important determinants of liquidity prior to the global financial crisis, such as ratings of structured debt of and the savings glut from emerging markets (Roubini and Mihm, 2010).

I said banking, not banks, because securitisation of financial assets allows other financial intermediaries to engage in maturity transformation (so-called 'shadow banking'). Banking evolves to capture profit opportunities from maturity transformation, and in doing so, it injects new uncertainty in the system. Because the evolution of banking is known only in hindsight, we must live with unpredictable financial crises. An alternative would be to prohibit maturity transformation altogether. However, this would increase the amount of 'dead capital' unavailable for financing long-term investments (Caballero and Kurlat, 2009; Dewatripont et al., 2010).

If we cannot eliminate uncertainty, regulation can still contain its adverse consequences on financial instability. In order to discipline maturity transformation, banking should be defined functionally with respect to the liabilities that certain intermediaries manage to get accepted as money. The purpose of defining banking functionally is to constrain the endogenous *growth* of the balance sheet of financial intermediaries that promise to deliver cash on demand. This regulatory strategy may contain the explosion of liquidity in good times, but cannot stop its contraction when uncertainty kicks in. To this purpose, central banks must be committed to back up privately created money. Central banks have been doing this since their inception, but historically only the commitment to do so ex-ante has prevented systemic crises (Gorton, 2010). This public insurance, which is reminiscent of deposit insurance although it would be implemented as lending of last resort, should be crafted in such a way as to set a credible floor to collateral values without fuelling moral hazard of institutions levering on that collateral.

If financial intermediation must rely so much on public intervention to avoid systemic externalities, the question arises whether the corporate governance of financial institutions should be regulated too. If one follows the principal-agent model (Jensen and Meckling, 1976) and the rational expectations approach (Fama, 1970) to corporate governance, it is not obvious why this should be the case. This theory predicts that if regulation makes banks internalise systemic externalities, shareholders will bear the full consequences of risk-taking via the stock price. Therefore, shareholders will design corporate governance to make sure that managers' incentives are aligned with the interest of society.

Mainstream theory, however, does not account for liquidity crises. Although the impact of corporate governance on the recent financial crisis is ambiguous both theoretically and empirically (e.g. Bratton and Wachter, 2010; Beltratti and Stulz, 2012), the uncertainty perspective indicates at least one potential channel influencing banks' propensity to hoard or to lend cash differently from what would be optimal for the society. This is, as Keynes (1936) noted, the liquidity of stock markets. The liquidity of stock markets can induce managers and, perhaps surprisingly, controlling shareholders

too to cater to the short-termism of professional investors both when they demand excessive returns (underestimating uncertainty) and when they discount returns by excessive liquidity premiums (overestimating uncertainty). Thus, the corporate governance of banks should be insulated from stock market pressures not only by mandating longer-term managerial remuneration, but also by allowing managers to contract for tenure and controlling shareholders to exit at a premium if they so wish.

2 Banking and liquidity in the presence of uncertainty

Although there is no universal definition of liquidity, the notion of liquidity points to the ability to turn a given asset into cash. There are two ways to perform this: one is to sell the asset in a secondary market; the other is to raise funds posting the asset as collateral. These two ways are known respectively as 'market liquidity' and 'funding liquidity' (Brunnermeier, 2009).

Why should a person holding a certain asset choose to switch to cash? This person may fear three things. One, an unexpected reduction of cash flow. Two, that the asset may fetch less than it is worth if sold abruptly in the market. Three, that borrowing against the asset is reduced by a 'haircut' imposed by the lender on the market value of the asset. While the last two circumstances correspond to the market liquidity and the funding liquidity described above, the first is something else. It is the rationale of precautionary demand for money illustrated in Keynes's *General Theory of Employment, Interest, and Money* (1936).

The precautionary motive to hold money plays a key role in Keynes's 'liquidity preference'. As Keynes clarified, people's desire to hold idle balances of money is "a barometer of the degree of our distrust of our calculations and conventions concerning the future" (Keynes, 1937, p.216). In other words, the precautionary demand of money depends on uncertainty. According to Keynes, uncertainty is the ultimate reason why people want liquidity, i.e. decide to hold money as 'store of wealth' in the face of alternatives yielding interest, utility or profit.

In the spirit of Knight (1921), Keynes argued that most future contingencies in the real world are inherently uncertain because they cannot be assigned a probability. The interesting question, however, is how uncertainty is overcome. In a capitalist economy, people must make decisions on whether to accumulate wealth for the future (or to borrow against expectations of future wealth) with only a very vague idea on what the future will look like. They are able to do so preserving their sense of being rational, which relieves them from anxiety, because they rely on a convention implicitly agreed upon with the other members of society. Conventional judgements under uncertain knowledge are based on the assumption that "the existing state of affairs will continue indefinitely" (Keynes, 1936, p.99). This allows drawing probabilities on future events based on the distributions of similar past events.

Real-life decisions by economic actors rely widely on such conventions. Ratings of debt are a case in point. Any standard supporting probability distributions about uncertain events (e.g. illness or unemployment) works in the same way. So long as the underlying convention holds, the future is handled as a collection of manageable risks and the residual uncertainty is disregarded. In this situation, the demand of idle money is reduced both because the future looks predictable and because interest-bearing assets can be turned into cash at a low cost if needed.

Conventions that allow the future to be treated and contracted upon as a set of probability distributions have an important downside: they are fragile. When the world turns out to be different from expected, the convention supporting the previous view of the world may be no longer recognised. Conventions may fail instantly, but they are never instantly replaced. While individuals are busy redoing their calculations on how to handle the future in probabilistic terms, they are facing bare Knighting uncertainty. The most rational strategy in this circumstance is to disengage from the future assuming that it will be as bad as it can be. Whenever economic actors are unable to overcome uncertainty in a conventional manner, they 'prefer' liquidity to satisfy their want of safety.

The consequences of liquidity preference for finance are manifold. First, financial assets must offer a 'liquidity premium' for parting with cash. The size of this premium varies with the levels of *perceived* uncertainty (Runde, 1994). This implies that the interest rate (price) of illiquid assets is higher (lower) the larger the uncertainty and people's propensity to hoard cash instead of spending or lending it. Liquidity premiums are a major cause of unemployment in Keynesian economics (Keynes, 1937). Second, in order to keep liquidity premiums low, we need to accept short-termism of secondary markets and the persistence of disequilibrium that this involves. The problem with such secondary markets is that prices of debt and equity tend to drop exactly when liquidity premiums rise and vice-versa. This exacerbates the slumps and the booms determined by uncertainty and disregard thereof. A third consequence of liquidity preference is the existence of banks as provider of stores of wealth, which in turn depends on financial intermediaries' credible commitments to exchange their liabilities for cash. This implication, absent from Keynes's framework, was developed by his acolyte Hyman Minsky (1975, 1986).

Minsky's financial instability hypothesis has been a popular approach to the global financial crisis (Roubini and Mihm, 2010). Minsky contended that the finance of capitalist economies endogenously evolves towards financial crises. There are three models of asset financing, in decreasing order of robustness: (1) *Hedge finance*: the expected cash flow from the asset matches the repayment schedule of debt; (2) *Speculative finance*: the expected cash flow is sufficient to repay debt interests, not the principal (which needs be refinanced); (3) *Ponzi finance*: the expected cash flow is insufficient to repay interests, so debt must increase. Despite uncertainty, capitalism proceeds under the Keynesian assumption that the current state of affairs will continue indefinitely, which in turn validates a gradual move from hedge, to speculative and to Ponzi finance until a debt crisis occur. This crisis will depend on some difficulty to refinance existing debt, which will bring uncertainty to the forefront, raise interest rates, make refinancing more difficult, and so forth.

The gist of Minsky's thought, however, is the role of banks in the above process. Banks are specialised "merchants of debt" (Minsky, 1986, p.279). They profit from accepting private debt of different maturities and 'selling' it as monetary liabilities. Maturity transformation makes banks the quintessence of speculative finance: banks fund long-term debt by rolling over short-term liabilities. Banking substitutes profits from maturity transformation to liquidity premiums. This substitution is in principle efficient because it allows more, potentially valuable investments to be financed. Yet this circumstance incentivises banks to satisfy *any* demand of financing, possibly according to a Ponzi model, by increasing the size of their balance sheet. This is possible because increasingly larger amounts of liquid liabilities can be issued against the bank's "margins of safety" (equity, cash reserves, and assets cash flows) (Minsky, 1986, p.266).

Proportionally decreasing margins of safety depend not only on borrowers' and investors' confidence in liquidity, but also on shareholders' pressure for higher profits in the corporate governance of banks. Banking, which is otherwise necessary to overcome uncertainty in a capitalist economy, becomes then an endogenous destabiliser of the system. Banks may increase leverage by generating liquidity so long as their assets are good collateral for cash promises. This holds true on condition that there is no perceived uncertainty on debt values. Uncertainty determines a shortage of collateral for short-term promises, both because liquidity premiums rise (asset prices fall) and because the supply of stores of wealth shrinks. Banking contributes to the severity of financial crises via its monetary liabilities. In situations of illiquidity, these liabilities are the more unsustainable the higher the leverage they have enabled in the first place.

3 Efficient banking regulation

Regulators cannot predict how exactly banks will engage in creation of private money. But they know that banks will do it and why. Banks maximise profits in two ways (Heremans and Pacces, 2012): by increasing the maturity mismatch between long-term assets and cheaper short-term liabilities; and by increasing the size of their balance sheet. Over time, holders of short-term liabilities allow banks to carry out more maturity transformation and to issue more debt given their equity. This happens under two loose conditions: a period of financial stability that is supposed to 'continue indefinitely'; a financial innovation that, in the conventional absence of uncertainty, supports promises to deliver cash today against an arbitrarily long horizon of future cash flows. Securitisation and the financial tranquility of the beginning of this century fulfilled these conditions before the global financial crisis. However, this example does not tell anything about how it will happen again, save that it can happen again under the same conditions.

It would be a mistake to interpret this pattern as greed. I spoke of 'banks,' but I should rather refer to 'banking'. As Minsky (1986, p.255) argued, it is not difficult to create money; the difficulty is to get it accepted. Once a convention is established that a certain class of assets can always be exchanged for cash, anybody having access to these assets can perform maturity transformation and create money on a scale commensurate to the equity necessary to guarantee investors against underperformance of a diversified portfolio. If the assets already represent a diversified portfolio, as the output of securitisation, the equity requirements will be lower. This explains the growth of securitised banking, also known as 'shadow' banking. If we think of shadow banking as a competitor of traditional banking (Hellwig, 2009), banks could not avoid engaging in securitisation to minimise the equity requirements; shareholders would have gradually moved away from banks otherwise. In addition, by generating new collateral, shadow banking could offer investors returns higher than traditional deposits under the same conditions of withdrawal on demand. Maturity transformation could therefore increase by issuing more and riskier long-term debt (including the infamous subprime mortgages) exactly when the equity cushion of financial institutions was shrinking. Not greed, but competition drives the process (Gorton, 2010).

It is tempting to let banks bear the consequences of competing with other financial institutions on the basis of fragile conventions of safety. The problem is that uncertainty cannot be handled without such conventions. When the latter are proven wrong,

uncertainty and illiquidity flood the entire economy regardless of how conservative agents have been with their indebtedness. In other words, there are externalities and uncertainty makes them unavoidable. For this reason, monetary authorities must eventually back up the cash promises that banks are unable to meet. This has always been done, even before the creation of central banks. The private clearinghouses in the Free-Banking era are a prominent example (Gorton, 2010). The important advantage of central banks is that they can issue a kind of money endorsed by the government, which, albeit at the cost of redistributing real resources between creditors and debtors (Tirole, 2011), is acceptable under any state of nature including inflation and deflation. This costly advantage does not need to be actually used if central banks are aware of how banks create money and commit *in advance* to discounting the underlying assets on predefined terms; the size of this discount is called 'haircut' (see Gorton and Metrick, 2012). To be able to do this, central banks should know in advance with what kind of assets financial intermediaries perform maturity transformation.

This does not imply that central banks should support any kind of maturity transformation. If that was the case, moral hazard would become unmanageable. Banks could promise to deliver cash against any kind and maturity of private debt. This would undermine the credibility of central banks in backing up private money. Instead, the policy implication of this approach amounts to little more than what the Federal Reserve actually did to stop the global financial crisis. That is, understanding the classes of private debt mispriced because of illiquidity and refinancing only these as opposed to formerly liquid assets that will not deliver the promised cash flows under the current state of nature. The only difference is that this commitment should be undertaken ex-ante, not ex-post when any delay makes uncertainty worse and costlier to handle. It is a difficult exercise, but at least in principle, it can be performed in the following manner.

Central bank should institutionalise their lender of last resort function announcing periodically their willingness to discount private assets at different rates and haircuts. The rates should be fixed under a zero-profit condition for banks. The haircuts should reflect the worst-case scenario expectations about each asset's risk of default for different maturities. Based on Minsky's classification, this implies that assets supporting hedge finance should carry little, or zero, haircut. The haircuts on speculative-finance assets should be higher and based on the interest rate risk. Finally, the haircuts on Ponzi-finance assets should be as high as the difference between the expected cash flows to maturity and the current value of principal and interests. In this way, the central bank would bear almost no risk on the positions made during turmoil, provided that the latter comes to an end. For this to happen, position making by the central bank must be credible. Credibility would hold under three conditions. First, haircuts need to remain constant at the levels announced before the turmoil begins, no matter how badly funding conditions deteriorate. Second, every eligible bank should have access to discount so long as its capital is sufficient to maintain the haircuts; after that point, the bank would be bankrupt and the central banks should discount the creditors' claims on its assets under the same rule. Third, positions should not be marked to market at least until the turmoil is ended.

This solution implies two things. First, the central bank only sets a lower bound on the contraction of private money supply in the event of a crisis. Private haircuts and refinancing rates will never exceed the levels set by the central bank and they will always be lower in normal times. Second, lending of last resort is made sufficiently penalising for the banks, as they are allowed to make no profits on the discounted assets exactly when the reminder of their balance sheet is generating losses. In this perspective, the

most binding constraint on the safety of banking is that they need to have enough equity to meet the haircuts in order to avoid going bankrupt. My proposal only prevents the bank's equity from being wiped out by a spiral of rising haircuts and falling asset prices. Otherwise, it gives the central bank a call option on the bank's equity that can be exercised when the bank turns out to be invested in more troubled assets than its equity can insure.

Additional measures are needed to keep banks moral hazard under control. Under the proposed solution, banks may still carry out maturity transformation with too little equity because creditors know that their monetary liabilities will be eventually, albeit partially, honoured by the central bank. In addition, frightened investors could still 'run' and withdraw liquidity from banks up to the difference between the central bank backstop and the lower level of private market haircuts before the crisis. For these reasons, liquidity support by central banks must be coupled with regulation of bank capital. Not only does the uncertainty perspective to liquidity problems show that capital regulation is insufficient to cope with financial instability; it also indicates how capital adequacy should be designed to correct the incentives to engage in overly risky banking.

The problem of regulatory arbitrage cannot be overstated. The private sector will always be faster than regulators to develop innovations that allow performing maturity transformation with increasing leverage. This is an argument against the growing complication of capital adequacy regulation, as under Basel II and its Basel III overhaul. A simpler lower bound on the capital/asset ratio, which is indeed being studied as a part of the Basel III framework, is more difficult to game, particularly when the quality of bank's assets is being monitored by the central bank for lender of last resort purposes. More importantly, banking should be defined functionally as any kind of financial intermediation involving maturity transformation. Any intermediary issuing short-term liabilities should be deemed a bank unless there is no mismatch with the maturity of the assets being funded. Only the leverage of banks according to this definition should be regulated. In exchange for this, only banks would have access to lender of last resort facilities, whereas all the other intermediaries should be allowed to fail regardless of the size of their balance sheet.

Moreover, the functions of bank capital must be reinterpreted in the presence of uncertainty. A bank's capital is a buffer against unexpected loss; and it gives shareholder an incentive to avoid excessive risk-taking. The buffer function is undermined by the growth dynamics of bank's assets under the conventional view that debt can be rolled over indefinitely. Because in good times the bank profits are capitalised as retained earnings, the leverage increases while the buffer decreases in relative terms. In times of crisis, the buffer naturally shrinks with the losses and becomes effectively a haircut on the bank's debt. Because of this pro-cyclicality, capital adequacy regulation amplifies the impact of financial crises (Brunnermeier et al., 2009). However, the endogenous dynamics of bank's instability provides a solution (Minsky, 1986). Retained earnings could indeed be capitalised, but they should *not* be counted in the capital/asset restriction on a bank's balance sheet. The advantage of this solution over the countercyclical buffer included in the Basel III framework is that a cushion of safety based on retained earnings would be both specific to the individual bank and less prone to error or capture of the supervisory authority.

The obligation to build up a buffer from retained earnings should also serve incentives purposes. In principle, it prevents shareholders as a group from cashing in the profits of meeting uncertainty in good times while externalising the effects of this

uncertainty on society in bad times. However, individual shareholders do not need dividends to cash in their stock returns: they can just sell the shares. As Keynes put it, the liquidity of stock markets is a necessary evil of corporate finance. Restricting the payout ratio of banking companies, as advocated by Minsky to improve bank shareholders' incentives, may be therefore insufficient to prevent banks from embarking on excessive uncertainty: stock markets may still reward immeasurable risk-taking by shareholders and managers because, by definition, immeasurable risk-taking is not incorporated in stock prices.

This leads us to the problem of corporate governance of banks.

4 Corporate governance of banks

4.1 Does corporate governance matter for financial stability?

According to Keynes (1936, p.98), the liquidity of stock markets is unfortunate. It allows shareholders to renegotiate continuously their commitments to equity capital. Because shareholders do this mainly for reason of speculation, the corporate valuation is often detached from fundamentals and rather reflects the speculators' expectations on how investors will value the stock in the near future. These expectations are based on the assumption that the state of affairs will continue indefinitely, unless there is a specific reason to expect a change. This view denies the validity of the Efficient Capital Market Hypothesis and implies that stock prices are affected by short-termism (Bratton and Wachter, 2010). In banking, this means that the value of maturity transformation is determined by speculation on its short-term profits. Therefore, even if regulation restricts the payout ratio of banking companies to make shareholders internalise the effects of future unexpected illiquidity, the bank's equity may still be overvalued by markets because of immeasurable risk-taking. This makes corporate governance relevant for financial regulation if overvalued equity affects the decision of bank managers to engage in socially excessive maturity transformation.

It is not immediately clear why this should be the case. In principle, bankers have much to lose from embarking on uncertainty. As long as the existing conventions of safety are maintained, they will get rich. But if things go wrong, they will be personally ruined unless they have already become rich enough to diversify their wealth. In more technical terms, managers are naturally risk- (and uncertainty-) averse (Jensen, 1986). Now look at the banks' shareholders. They can always cash in their returns in a boom whereas they are bound to lose only a portion of their wealth in a bust. Therefore, shareholders are the ones who want to load on uncertainty. So they need to counter managerial risk aversion. They can do it by threatening to fire those managers who underperform relative to their competitors. In exchange for that, managers contract for a compensation scheme allowing them to cash in short-term returns and then diversify their wealth. This is the rationale of bonuses and stock option plans.

If that was the end of the story, prohibiting banks from increasing the size of their balance sheet via retained earnings, while constraining the distribution of the latter, would suffice to prevent bankers and shareholders as a group from cashing in the proceeds of uncertainty, eventually at the expenses of society. This perspective, however, neglects the impact of speculation on stock prices. Under a convention that banking debt is always liquid, speculators may still reward banks engaging in excessive maturity

transformation. This is because the impact of a liquidity crisis on the bank's equity and retained earnings will only materialise in some future state of the world unaccounted for by the existing convention. On the other hand, the existing convention bears out the immediate profits of maturity transformation. This effect is amplified when the bank can increase its ROE by levering on retained earnings and it becomes extreme in the presence of moral hazard. However, the tendency of stock markets to reward strategies disregarding future uncertainty (and its externalities to society) would hold also in the presence of efficient regulatory constraints on banking.

Speculation can affect bankers' behaviour in two ways. The first is the impact of (large) shareholders who do not participate in speculation but whose portfolio returns are affected by it. They can replace an underperforming management. The second channel is pay-per-performance. This gives bankers themselves an incentive to behave like speculators, cashing in the short-term profits of meeting uncertainty while leaving the shareholders in the cold when uncertainty turns out badly. The first hypothesis implies that managers' incentives are effectively aligned with the interest of long-term investors and thus the quality of governance, for how we understand it, has no bearing on financial instability. Bankers engaging in excessive maturity transformation with excessive leverage would be simply acting in the best interest of their (short-termist) shareholders. The problem would be rather how to insulate management from shareholder influence. On the contrary, under the second hypothesis, corporate governance is the core problem because bankers engage in more immeasurable risk-taking than shareholders would want given banking regulation. Because this strategy imposes prospective losses on shareholders and society only in order to increase managerial remuneration, managers and their pay should be simply made more accountable to shareholders.

4.2 Managerial opportunism vs. shareholders influence

The hypothesis of managerial opportunism has received more credit in the policy debate (Posner, 2010; Roubini and Mihm, 2010). This is understandable, as it seems that bankers have been the only winners of the global financial crisis. They could take home substantial bonuses and gains from stock options just before the losses of the banks they had managed hit shareholders, taxpayers, and the society at large (Bebchuk et al., 2010). However, what bankers actually cashed in does not say much about their incentives to take more immeasurable risk than would be optimal for shareholders. What matters is whether they cashed in *as much as they could*, because only this circumstance could validate the suspicion that bankers knew better than shareholders what was going to happen. This proposition is not borne out by the empirical evidence (Fahlenbrach and Stulz, 2011). Bankers seem rather to have increasingly and voluntarily tied their destiny to that of shareholders, as they reinvested (and lost) significant parts of their remuneration in the banks' stock. The proposals (Bhagat and Romano, 2009; Bebchuk and Spamann, 2010) to backload bankers' remuneration and to increase shareholders' voice in its determination, both of which were ultimately adopted by the US Dodd-Frank Act, are difficult to reconcile with this evidence. It looks like such measures will either increase the cost of bank management or decrease its quality, without affecting banks' stability (Kaplan, 2009).

The hypothesis that bankers' incentives were instead aligned with the interest of shareholders enjoys more empirical support. The bankers whose incentives were better aligned with shareholders' interest performed worse in the crisis. This conclusion is

supported on several grounds. Managerial ownership (Fahlenbrach and Stulz, 2011), the number of independent directors (Adams, 2012), and a standard index of shareholder-friendliness (Beltratti and Stulz, 2012), are all negatively associated with bank performance *during* the crisis. However, the same indicators of incentive alignment are positively associated with bank performance *before* the crisis. It seems then that shareholders fell in love with the profits of securitised banking, but they had to regret them when the crisis hit (Bratton and Wachter, 2010).

It is hard to see how this outcome could be improved by supplying bankers with longer-term incentives. Although there have been authoritative proposals in this direction (Bebchuk and Fried, 2010), one should take into account that even the banks normally credited with a long-term orientation have failed in the global financial crisis. There is no evidence that banks with concentrated ownership in continental Europe have outperformed those with diffuse ownership in the USA and the UK (Beltratti and Stulz, 2012); and some studies even show the opposite (Gropp and Köhler, 2010).

It is thus tempting to conclude that corporate governance had nothing to do with the global financial crisis. This seems to be the only plausible conclusion under the standard view of corporate governance according to which managers (the agents) are supposed to act in the best interest of shareholders (the principal) however far this interest is from that of society at large. The problem should be exclusively concerned with banking regulation. However, assume that in the aftermath of a financial crisis a credible safety net is established together with an incentive-compatible banking regulation, for instance along the lines sketched out in the previous section. Under this assumption, shareholders should care to maximise profits minus the expected losses from illiquidity that won't be avoided by the safety net. In other words, for the moment I assume there is no moral hazard. The question then would be the following: if regulation manages to have banking externalities internalised by banks' shareholders, can the corporate governance of banks undermine this result?

The answer is a qualified yes, which implies that corporate governance may matter for financial stability. In the absence of moral hazard, initially one would expect shareholders to require bank managers to share in the prospective losses from illiquidity even if these materialise after they are gone. Bankers will likely ask something in exchange of such a clawback provision. This can be either a higher fixed compensation or tenure, in the absence of which the best bankers would rather go work somewhere else, for instance for a hedge fund. The reason why tenure matters for bankers is that the norm of prudent banking only holds in the aftermath of a crisis. Eventually, this norm will be replaced by another convention, namely that creating money from long-term debt in some new fashion is again 'safe.' This convention will in turn induce shareholders to overlook future losses from illiquidity. At that point, an untenured manager would be exposed to short-termist pressure independently of any clawback provision. The manager will have to take some immeasurable risk or be replaced by somebody else willing to do it. Because either way the clawback would make the manager bear prospective losses from illiquidity, she would rather keep her job and manage to the bullish market. This effect is avoided if bankers accepting the clawback provisions are tenured or can be compensated for the value of their tenure, for instance with a golden parachute (Almazan and Suarez, 2003).

Tenure and golden parachutes may efficiently protect bankers from stock market speculation because they commit shareholders to refraining from putting pressure on managers to achieve short-term results. Of course, this solution allows managers to

extract higher private benefits of control. I leave the general discussion on whether this is good or bad for corporate governance for another time. Intuitively, extraction of private benefits should be less harmful in banking than in other businesses because managers' inclination to enjoy free cash flows (Jensen, 1986) turns out to be beneficial for society in a liquidity crisis. The crucial point, however, is that this solution needs to be supported by regulation.

First, the clawback provisions cannot be left to shareholders' choice as in the previous example in which moral hazard was simply assumed away. Shareholders may well endorse clawbacks in the aftermath of a financial crisis, but their commitment would not be robust to changes in the stock market's expectations. Clawbacks will disappear from the market as soon as speculators return bullish about the profit potential of banking. Because stock markets can be short-termist, clawbacks must be imposed by regulation. However, the rationale here is not to align managerial incentives with shareholders' interest, but rather to draw a wedge between these.

Secondly, regulation should support bankers' tenure. This is not in line with the general attitude of policymakers, who rather support shareholder empowerment *vis à vis* the management. This should change with the purpose to enable long-term commitments by shareholders. Shareholders should have free choice about whether to give bankers tenure, and for how long, or rather pay them a higher salary in return for the mandatory clawback. Regulation should just be enabling on this point, namely neither mandate nor prohibit bankers' tenure.

Thirdly, regulation should allow golden parachutes freely, instead of restricting them as it is inclined to do. Particularly, any amount contracted for replacing a manager before her term is expired should not fall within the scope of the clawback provision unless the latter has been already triggered. Shareholders who, under pressure by speculators, want a new management to take more immeasurable risk should pay for that upfront. Conversely, shareholders who already suffered losses because of the current management's embarking on too much uncertainty should be able to claim back the bankers' gains whether they decide to replace them or not.

4.3 The controlling shareholder case

A similar approach – namely, insulation of bank control from stock market speculation – should inform the regulation of banks having a controlling shareholder. Clawbacks would not be necessary in this context. Differently from a manager on a pay-per-performance scheme, a controlling shareholder naturally bears the long-term consequences of her actions, including the choice to take immeasurable risk. A controlling shareholder cannot exit her investment unless she gives up control, so at least in principle she should be insensitive to speculation. The question is why banks with a controlling shareholder have performed as bad, and possibly worse, than banks under managerial control?

It will probably take a few more years of research to answer this question. One plausible conjecture is that controlling shareholders are *not* as insensitive to speculation as standard theory suggests. The investment of a controlling shareholder has an opportunity cost, which is given by the return on the same investment as a diversified portfolio. This opportunity cost increases when the bank's stock returns decrease relative to alternative investments, which is the case when speculation induces other banks and firms in general to take more risk. A good reason for a controlling shareholder to forego these higher returns is private benefits of control. The empirical evidence does not

immediately support this hypothesis: proxies for the presence of private benefits of control have no significant impact on bank risk-taking before the crisis. However, this applies only to indicators of *measurable* risk, which surprisingly, are associated with worse pre-crisis returns and better post-crisis performance (Beltratti and Stulz, 2012). According to the uncertainty approach developed in this paper, the stock market rewards *immeasurable* risk-taking by the bank in the buildup of a crisis. The data do not refute this hypothesis. If the hypothesis is true, controlling shareholders could have foregone the market reward of immeasurable risk-taking only if they were able to appropriate likewise immeasurable private benefits of control. Elsewhere (Pacces, 2009) I have characterised these as idiosyncratic private benefits of control, including the individual satisfaction of controlling a successful enterprise supported by the ability to claim a control premium in exchange for this satisfaction. Safeguarding these benefits can be a good reason for controlling shareholders to be insensitive to speculation and short-termism.

In one empirical analysis discussed earlier (Beltratti and Stulz, 2012), proxies of outside shareholder control (which is conventionally considered 'good' governance) are positively associated with the pre-crisis stock returns, but negatively associated with the post-crisis performance of banks. Now, consider the position of a controlling shareholder who wants to steer clear from a conventional policy of high indebtedness and extreme maturity transformation, but has to deal with outside investors empowered by 'good' corporate governance. Such a controlling shareholder would have to fight constantly with a board that is strong by assumption; she would eventually lose support by her financiers; and she would be most probably derided by her peers. This situation would hardly compensate the money lost under her unconventional view of the uncertainty ahead. For one, she might be wrong in choosing the debt to steer clear from or in predicting a systemic crisis that will not happen any soon. Even if she is eventually right, she will not regain the support of shareholders and financiers who opposed her. As Keynes (1936, p.102) put it, "it is better for reputation to fail conventionally than to succeed unconventionally". The anecdotal evidence on hedge fund controllers who shorted the subprime business confirms this hypothesis. All they earned was ingratitude and withdrawals from the investors they had just made rich (Lewis, 2010).

One way for a bank's controller to oppose the conventional safety of immeasurable risk-taking is to threaten appropriation of immeasurable private benefits of control. For this strategy to be credible, the controlling shareholder must be always in the position to leave *for an arbitrarily large control premium*. It is often believed that in this situation control hardly ever changes hand (Becht et al., 2007). But this conclusion is unwarranted when the opportunity costs of control are factored in. The incumbent controller cannot credibly ask more than the stock valuation under her unconventional view of uncertainty, which would be by definition lower than a conventional valuation based on more immeasurable risk-taking. So the control transaction will eventually take place depending on the relative robustness of the incumbent's and the insurgent's expectations. Of course, we do not know ex-ante which expectations (the optimist's or the pessimist's) are right, but this does not matter. What matters is that insurgents and incumbents pay and receive the price for what they believe in. The only condition for such a control transaction not to result in higher externalities of banking is that, however the takeover is implemented, retained earnings can increase neither the size of the bank's balance sheet nor its payout ratio, as argued in the previous section.

Unfortunately, takeover regulation often stands in the way of such transactions placing restrictions on the controller's ability to claim a control premium. One prominent example is the European Takeover Directive, whose mandatory bid prevents controlling shareholders larger than 30% (in most EU jurisdications) from selling their shares at a premium over non-controlling stock. Such restrictions should be removed or at least waived for banks. This would match allowing bank managers to contract for tenure and golden parachutes in dispersed ownership structures. If we consider that clawbacks aim to make bank managers behave more like blockholders than like speculators (Bratton and Wachter, 2010), the logic of lifting both kinds of restrictions is identical: to avoid that bankers become victims of speculators under each ownership structure. Paradoxically, restrictions on control premiums are present in Europe, where the majority of banks have concentrated ownership, whereas the Dodd-Frank Act has introduced 'say-on-pay' restrictions on golden parachutes in the USA, where virtually all banks have dispersed ownership. As I have argued, this is a mistake. All restrictions on the ability of controlling shareholders and managers to sell bank control for a premium should be lifted. Shareholders who want bankers to take more immeasurable risk should pay for that upfront.

5 Concluding remarks

I have presented an alternative approach to liquidity crises based on uncertainty as conceptualised by Knight (1921), developed in a theory of long-term expectations by Keynes (1936), and applied to banking by Minsky (1986). This perspective reveals that banks perform maturity transformation by conventionally disregarding uncertainty about future liquidity conditions, which eventually undermines acceptance of the private money they create and triggers a liquidity crisis. This approach explains the behaviour of banks and how they should be regulated and supported by central banks in order to reduce financial instability. Compared to other, formalised models of uncertainty in financial crises (e.g. Caballero and Simsek, 2012), the dynamic approach of this paper fills one important gap in the theoretical literature. Not only does it tell why banks hoard cash in bad times; it also describes the dynamics of uncertainty in good times, when private substitutes for cash are created in the first place increasing maturity transformation via the size of banks' balance sheets. Formalisation of the complex dynamics of construction and subsequent dismissal of conventions to handle uncertainty, first identified by Keynes, is an issue for future research.

It may be asked why banks should be allowed to create private money at all. Under different behavioural assumptions, one recent model (Gennaioli et al., 2012) shows that the supply of private money is inefficient because it generates false substitutes of safe cash. This thesis stands in sharp contrast with evolutionary theories of banking (Minsky, 1986; Gorton, 2010), which show that also historically the creation of bank money is endogenous to competition and growth. The present study endorses the view, accepted by Keynes too, that the private supply of liquidity is an unavoidable consequence of capitalism. Besides, as the European crisis of sovereign debt demonstrates, there are no 'true' or 'false' substitutes of cash under structural conditions of uncertainty. Still, this paper shares the conclusion of others (e.g. Stein, 2012) that private incentives lead to excessive supply of bank money because of externalities. Hence, the ability of financial intermediaries to engage in maturity transformation should be constrained by regulation.

At the same time, monetary authorities should monitor and back up private money because failure to do so undermines financial stability as well as the effectiveness of banking capital regulation.

In the presence of uncertainty, the corporate governance of banks may also undermine the ability of capital regulation to control risk-taking. Differently from the prevailing view, the reason is not that corporate governance fails to align managerial incentives with the interest of shareholders. On the contrary, regulation of banks governance should drive a wedge between these. Solutions aimed at committing managers to a long-term horizon (like mandatory clawbacks of bankers' pay) should therefore be complemented by the possibility to insulate managers from shareholders' influence. However clawbacks or concentrated ownership structures foster long-term orientations in bank management, bankers will have ultimately to cater to the short-termism of stock markets; unless they have tenure and the possibility to trade it for compensation of their private benefits of control. In this case, short-termist shareholders would have to pay upfront for replacing a prudent management, embarking in more immeasurable risk-taking, and possibly externalising part of the consequences to society. Therefore, in order for the corporate governance of banks to support financial stability, regulatory restrictions on golden parachutes and control premiums should be removed.

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