Bank Regulations after the Global Financial Crisis,

Good Intentions and Unintended Evil

Jean Dermine[*]
INSEAD, Boulevard de Constance, F-77300 Fontainebleau, France
E-mail : jean.dermine@insead.edu

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Bank Regulations after the Global Financial Crisis, Good Intentions and Unintended Evil

by Jean Dermine[*]
Professor of Banking and Finance
INSEAD, Fontainebleau
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Abstract

In this essay, we analyze the impact of the capital and liquidity regulations and call attention to the fact that the banks' responses might create unintended evil: a reduced supply of bank loans, incentives to securitize assets, and adverse incentives on bank risk monitoring.

The conclusion is that privately-based mechanisms that put most creditors at risk are the best way to increase the soundness of banking markets. It is argued that interbank debt should be put at risk because banks have a comparative advantage in risk monitoring. As putting short-term interbank at risk increases the danger of sudden deposit withdrawals, a mechanism is needed to extend the maturity of short-term debt at the time of a credit-led panic.

The severity of the global crisis with large public costs incurred in bailing out banks has prompted a chorus of "Never Again". Bank corporate governance, regulation and supervision had failed in several countries, a view reinforced by the fact that banking crises seem to be a recurrent phenomenon. This succession of financial crises has inspired the call for a review of bank regulation and supervision around the world. The new regulations concern primarily bank capital, liquidity, compensation and corporate structure. In this article, we provide a critical assessment of the regulations on capital and liquidity, taking into account the imperative need to preserve the economic functions performed by banks.

The paper is structured as follows. In the first section, we evaluate the Basel III regulation on capital and argue that one needs to take into account both static and dynamic impacts. A critical analysis of the role of 'bail-in' securities such as contingent convertible bonds (*co-cos*) in bank capital is provided. In the second section, we evaluate the Basel III regulations on liquidity, the 'liquidity coverage' ratio and the 'net stable funding' ratio. Finally, we argue that privately-based mechanisms are required to enhance the development of sound banking markets. Not only 'bail in' bonds but also interbank debt should be put at risk because banks have a comparative advantage in risk monitoring. As putting short-term interbank at risk increases the danger of a bank run, a mechanism is needed to extend the maturity of short-term debt at the time of a credit-led panic.

Section 1. Basel III Capital Regulation

Following the default of the German Bank Herstatt in 1974, the Basel Committee of Banking Supervision developed a minimum capital regulation standard for international banks: from the 8% Cooke ratio of Basel I agreed to in 1988, to the Market Risk Amendment of 1996, Basel II in 2004, Basel 2.5 in 2009, and Basel III in 2010. The periodic revision and refinement of the Basel capital regulation reflects the great difficulty in defining a capital adequacy ratio. One indication that equity is perceived as very expensive by banks is the continuous lobbying to reduce the equity component. The Basel I and II accord capital included a Tier 1-Tier 2 system with a minimum Tier 1 of 4% which included equity and a Tier 2 with subordinated debt (minimum maturity of 5 years) among other instruments. A distinction existed between *going-concern* capital (equity absorbs losses while the bank is solvent) and *gone-concern* capital (subordinated debt holders bear losses only when the bank is put into formal bankruptcy proceedings). An additional sign that debt was perceived as cheaper than equity was the lobbying for inclusion into bank capital of hybrid Tier 1 securities. These are coupon-paying bonds with restrictions on payments when a bank report

losses. Finally, when a capital standard was introduced in 1996 to cover market risk, bank capital was allowed to include a Tier 3 component, consisting of subordinated debt with a shorter minimum maturity of two years. Two complementary explanations are given for this preference for debt finance: A higher cost of equity caused by several economic reasons to be discussed later or the attempt by banks to exploit a distortion in the system, the nearly-free guarantee given by States to debt holders of too-big-to-fail banks.

In our assessment of the Basel III capital regulation, we call attention to the need to distinguish a static analysis from a dynamic one that takes into account the banks' responses to the regulation.

Consider a bank with assets (loans) funded with retail or corporate customers' deposits, interbank debt, bonds, and equity. In case the bank's assets fall in value, the question arises as to which parties will shoulder the loss. The perspective is static concerning the distribution of losses among several parties.

Customers' deposits and interbank debt are often fully insured. Depositors are protected to prevent bank runs[1] or because they are considered 'uninformed'. Interbank deposits are protected for two reasons: first, due to the complex and opaque nature of transactions, often with close-out netting agreements, a panic and a bank run on solvent banks could start if there is a slight risk that interbank depositors could face a loss; second, the insolvency of a bank could create a domino effect leading to systemic risk.

When the objective of regulators is to avoid bank runs, bank closures with negative spillovers on the economy and/or to reduce the likelihood of costly government interventions, the response seems obvious: more severe regulation on bank capital and, in particular, its equity component (Hellwig, 2010). A recent case is the ruling by the European Banking Authority (EBA, 2011) according to which European banks had to meet a 9% Core Equity Tier 1 ratio by June 2012. Empirical studies provide support for the stabilizing effect of bank capital. A positive relation beween banks's capital ratios observed before the crisis and realized stock returns during the crisis is observed by Demigurc et al. (2010) for a sample of international banks, and a positive impact of bank capital on the probability of survival is identified by Berger and Bouwmann (2012) for the U.S. banking industry. But if a higher bank equity level helps absorb bank losses and protect the franchise, one needs to account for the banks'

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[1]The run on the British Northern Rock in 2007 started when depositors realized that only 90% of the deposit balance was insured (Hamalainen et al. 2012).

responses to higher capital ratios, in terms of loan pricing, securitization, risk-taking and risk-monitoring. In the following section, we provide a critical assessment of the Basel II and III capital regulations from both static and dynamic perspectives.

Basel II and III Capital Regulations, a Critical Review

An adequate capital regulation must ensure that capital is large enough to absorb losses in case of severe events. As Basel III is an add-on to Basel II, let us first start with an analysis of the Basel II regulation (Basel Committee, 2004) with a focus on credit risk.

The Basel II capital rule states that:

Capital $\geq$ 8% x Risk-Weighted Assets.

Risk-Weighted Assets (RWA) cover credit, market and operational risks and the definition of capital is similar to that of Basel I with Tier 1 and Tier 2 components.

The Basel II capital regulation is based on a loan-loss formula developed by O. Vasicek (1987). For reasons of space, we focus on the main intuition. The inputs needed to apply the formula are calculated by each bank. They include the probability of default (PD) of its clients and the losses that would be incurred in case of default (LGD). The Basel II formula calibrates the measure of risk-weighted assets (RWA) that ensures that a bank capital of 8% x RWA covers loan losses with 99.9% confidence.

When the Basel II capital formula was developed in 2004, there was immediately a question as to whether the default rate figure derived from the formula would meet real, observed loss data in a severe recession. Few empirical studies on loan losses in severe recessions were readily available and a statistical framework was used to develop the capital regulation. Following the 2007-2009 global banking crisis, one could imagine that regulators would have used the empirical data on losses observed during the crisis to adjust the formula. Surprisingly, this has not been done. In fact, the Basel III framework (Basel Committee, 2010) builds on the same mathematics as Basel II. Behavioral specialists would refer to this as an example of an anchoring bias (Hammond et al., 1998). It was very difficult to move away from the capital formula developed in 2004.

As stated above, the Vasicek formula was calibrated to ensure that a capital of 8% x RWA would cover loan losses with a 99.9% confidence. The more stringent Basel III capital regulation imposes a capital ratio close to 12%.[2]

Basel III Capital ≥ 12% x RWA = 1.5 x (8% x RWA) = 1.5 x Basel II Capital.

The Basel III formula implies that bank capital will cover the Basel II 99.9% confidence losses grossed up by a common factor of 50%. This factor will apply to loans of all PD categories.

A first criticism of Basel III is its simplistic design. Only a miracle could ensure that this common 50% increase will match reality. At a minimum, one would like to compare how the loss-rate derived from the formula compares to actual losses observed during the recent 2007-2009 recession.

A second and more recent criticism of the Basel II and III framework is that it is too complicated (Haldane, 2012 and Hoenig 2012). As some banks might be tempted to game the system in using too low estimates of probability of default or loss-given-default, there is a need for a bank supervisor to control thousands of parameters, an impossible task. A call is made for a simple and easily comparable leverage ratio defined as equity over unweighted balance sheet assets. This would be accompanied by stress testing. Stress testing, scenario based, involves the estimate of loan losses under severe economic conditions.

Stress testing and the Basel II or III formula have the same objective: an evaluation of loan losses in a severe recession. It is an empirical matter as to whether a statistical base framework (Basel II, III) is superior or not to subjecting a bank to stress testing scenarios. With regards to the debate on the complexity of Basel II and III, it should be pointed out that stress testing is also a complex exercise. A bottom-up stress exercise involves a large number of calculations, subjecting a large loan portfolio to economic shocks with assumptions as how loan losses would develop in a large recession. As for the need for an additional "leverage ratio", Dermine (2012) uses an other argument than simplicity and comparability. When the evaluation of bank's assets (or loan losses) is imperfect and subject to random noise, a leverage ratio reduces significantly the risk of a bank run for banks having a loan portfolio with low PDs. The intuition is as follows. According to Basel II or III, a portfolio of safe

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[2]Due to flexibility related to a countercyclical buffer, the Basel III capital regulation moves from 10.5% of RWA in a severe recession to possibly 13% in period of strong economic expansion.

loans will command a very low level of capital (as was observed at the start of the crisis). When a loss is realized, the imperfect information on the bank's assets can lead depositors to run as they assign a positive probability of insolvency of the bank. The leverage ratio, a minimum level of equity, is necessary to cover the imperfect information on asset valuation. According to this argument, the leverage ratio should not be uniform around the world, but should take into account the degree of imperfect information in valuing banks' assets.

Capital adequacy is important not only to ensure sufficient capital to maintain bank solvency, but also to ensure that capital regulation is not excessive. Jackson (1999) documented the various ways in which the excessive Basel I capital regulation led to securitization. For example, if, as it is widely suspected, Basel III capital for safe assets (such as trade finance) is too large, it creates incentives to securitize loans to circumvent the costly regulation. Capital regulation will be self-defeating, banks divesting safe assets. There would be a revival of the originate-to-distribute model which was widely perceived a main source of the financial crisis. Or, if capital is excessive, it might lead to inefficiently higher interest rates on bank loans to small-and medium-size enterprises which do not have access to corporate bond markets.

However, the argument that a too stringent equity regulation leads to securitization, higher margins on loans and inefficient banking needs an additional element: the reason as to why equity is more costly than debt. Indeed, if this was not the case, a too stringent capital regulation would not matter.

Bank Equity: Is it more Expensive?

Since Modigliani-Miller (1958), the relative cost of equity and debt finance has been the object of many studies (Tirole, 2007). The arbitrage argument of Modigliani-Miller is powerful. Since the value of all claims (debt plus equity) on the assets of a bank must equal to the (invariant) value of the assets, a change in the mix of claims cannot affect the total value of claims. Building on Modigliani and Miller's famous irrelevance theorem, some (Admati et al., 2010) have argued that a change in a bank's capital structure would not affect significantly the cost of funding loans. Miles et al. (2011) builds on that argument to call for a much higher capital ratio. Others (Bolton- Samama, 2011) express doubt about the neutrality of a bank financial structure. Casual observations such as the marked preference of European banks to reduce RWA rather than issue equity to meet the stringent 9% Core Equity Tier 1 ratio or the drop in price of 50% of the share of UniCredit observed in January 2012 at the occasion of a € 7.5 bn capital increase raise questions about the neutrality of equity funding.

Since Modigliani-Miller, several authors have discussed various reasons as to why an increase in equity could reduce value and raise the cost of funding. They include the corporate tax argument, asymmetric information on the asset quality of the bank, a debt overhang or a fixed-price deposit insurance, an undervalued bank stock price due to other market imperfections (such as investors cash constraints), and the elasticity of the demand curve for new bank stocks.

It must be observed that many of these costs are private but not social costs. Indeed the tax deductibility of interest on debt is a transfer from government to the firm.[3] A reduction in risk of a fixed-term bank debt or a reduced deposit insurance liability due to higher capital ratio involves respectively a transfer from bank shareholder to debt holders (the debt overhang, Myers, 1977) or to the deposit insurer. Issuing shares when bank equity is undervalued is a transfer from existing to new shareholders. Undervaluation could be due to liquidity constraints that create limit to arbitrage. Another reason is asymmetric information between investors and the bank about asset quality (Myers and Majluf, 1984). An issue of shares leads to a drop in share price because investors are concerned that a bank chooses to issue shares only when they are overvalued.[4]

The distinction between private and social costs is useful to analyze the net impact of an increase in equity in a static fashion. However in a dynamic perspective, private costs may induce social costs as banks reduce their supply of loans or securitize assets.

Some empirical observations lead us to believe that equity is expensive. In Belgium, where the cost of equity is tax-deductible ('intérêt notionnels') or in Kuwait where banks from Gulf Cooperation Council (GCC) countries are tax-exempt, one observes a high level of bank leverage. Some will argue that even in the absence of a corporate tax advantage, leverage is motivated by the wish to exploit the benefits of fixed price deposit insurance and too-big-to-

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[3]To restore tax neutrality between bank debt and equity, some have proposed the elimination of the tax-deductibility of interest on debt. This would not work in banking as contrary to non-financial firms, equity and debt of banks are an input used to manufacture loans. If the return on bank assets is taxed, while the cost of inputs (funding) is not tax deductible, this would increase significantly interest rates on bank loans. The opposite in making the cost of equity tax-deductible would be highly desirable, but politically difficult to implement.

[4]This argument is used by those who recommend not only enforcing higher capital ratios but forcing a capital increase. If a capital increase is enforced by regulators, it might

fail implicit guarantee. Securitization provides an interesting example which does not suffer from the existence of a tax bias or deposit insurance. Special purpose vehicles are used to securitize loans, a pool of assets being funded by tranches with different seniority: senior tranches, mezzanine and equity tranches. Equity and mezzanine tranches absorb the first loan losses, protecting the senior notes. As securitisation vehicles (the 'shadow' banks) are tax-neutral and involve no deposit insurance, one should, according to the Modigliani-Miller theory, observe significant financing with equity tranches. This would help to stabilize the securitisation vehicle, reducing the risk of a deadly run on senior short-term notes. However, the facts are quite different. Securitisation vehicles have used as small equity tranches as possible. This was caused by a lack of available equity funding at a reasonable cost. Increasing the size of equity tranches would have raised significantly the cost of equity.

Two empirical studies have evaluated the impact of leverage on the banks' equity risk premium, one in the United Kingdom (Miles et al. 2012) and one in the United States (Kashyap et al. 2010). These studies allow to quantify the impact of leverage on loan pricing. We simulate in Appendix 1, the break-even margin on a 1-Year maturity loan when the capital ratio is moved from 8% to 12%. Two cases are considered: a fixed bank equity risk premium of 5% and a risk premium that increases with leverage applying the empirical formula estimated by Miles et al. (2012). The increase in break-even spread of 23 bps and 25 bps respectively is large enough to incentivize banks to securitize loans.[5]

Given the empirical uncertainty surrounding the actual impact of a reduction in leverage on the cost of bank equity, on the interest charged on loans, and on the availability of credit, one needs to avoid excessive capital regulations. And, as is discussed in the next section, the Basel regulation on liquidity will further increase the marginal cost of bank loans. The call to avoid excessive regulation is even more pressing in the current severe recession. Bank regulators have, in part, responded to this concern by allowing 'bail- in' securities to play the role of loss-absorbing capital.

An Alternative to Equity: 'Bail-in' Securities and Contingent Convertible Bonds

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suffer less from the asymmetric information bias because the decision is taken by the regulator, not by management.

[5]Kashyap et al. (2010) report simulated increase of break-even loan spreads of a similar magnitude for large US financial institutions. They argue that some form of capital regulations should be applied on shadow banking structures to prevent regulatory arbitrage.

To reduce the amount of costly equity while preserving bank soundness, some have proposed the use of 'bail in' securities and contingent convertible bonds (Flannery, 2002; Bolton and Samama, 2011). A resolution authority has the right to enforce losses on 'bail in' bonds before the state of bankruptcy (through haircut reduction of value or conversion into equity). Contingent convertible bonds (*co-cos*) are bonds that convert automatically when a leverage threshold is breached. The use of loss-absorbing bonds is allowed in Basel III in which the countercyclical buffer of 2.5% can be met by fully loss-absorbing capital. The UK Independent Commission on Banking (ICB, 2011) proposes an equity requirement for the commercial bank entity of a minimum 10% of RWA augmented by loss-absorbing 'bail in' bonds of 7%. In Switzerland, the systemic UBS and Credit Suisse will have to meet an equity requirement of 10% augmented by a 9% contingent convertible bonds cushion.

To allow 'bail-in' bonds to absorb losses on a going concern basis, a Special Resolution Regime (SRR) needs to be in place. It allows an authority to intervene before the insolvency stage to handle the distress situation. Special Resolution Regimes have been created recently in the United Kingdom, Germany, and United States. A European Union proposal is under discussion (European Commission, 2012). Part of the debate is whether the 'bail-in' loss-absorbing attribute should be applied to all bank creditors, meeting regular seniority order (with the exception of insured deposits) or whether it should be limited to special well-identified 'bail-in' bonds, therefore protecting interbank creditors. This important issue is discussed below.

Contingent convertible bonds do not require an SSR as they would automatically convert into equity before the bankruptcy stage once a trigger, such as a minimum capital ratio, is activated. Otherwise, these bonds would behave like debt with a tax-deductible coupon and repayment at maturity. The discussion of market participants on their merits as an alternative to equity is a further indicator of the perceived high cost of equity.

As is all too often the case, good intentions create unintended evil. The debate on the merits of special 'bail-in' bonds or *co-cos* focuses on the allocation of incurred losses, an essentially static perspective. We argue that dynamic considerations should not be ignored.

If a very large cushion of loss absorbing capital is required, there will be reduced incentives for other bank creditors (depositors- customers or banks- and even bank supervisors) to monitor the risk taken by the bank. The cost incurred in monitoring bank risk will be borne

solely by equity and the holders of loss-absorbing bonds. This might not be efficient as the question arises as to which party in the financial markets is best positioned to act as monitor.

I would argue that arm's length shareholders or bond holders might not be well informed. A much better informed group is the banks active on the interbank market. Since banks compete with one another on the loan market and/or trade derivatives with each other, banks are better informed of the risks taken by their peers (Judge, 2012). It is, of course, not perfect information, but probably better information than that available to shareholders or to bond holders. It would seem natural that the cost of monitoring bank risk should fall on the best informed parties, the bank counterparties. Note that banking is different from other industries because a class of creditors, other banks, compete and deal with banks in their product markets - loans, deposits, or derivatives. As a consequence of this information comparative advantage, it would seem wise to leave bank creditors at risk. To draw a parallel, finance theorists (Biais-Gollier, 1997) have analyzed the rationale for trade financing at a time when bank credit is available. Why do suppliers provide credit to their clients when a bank can grant a loan? The response is that suppliers have an informational advantage over other potential other creditors in lending to clients. Similarly, I would argue that banks have an informational advantage and that they should bear the risk of bank failure.

ICB proposal (2011 p. 104) proposes a two-stage level with primary and secondary 'bail- in'. A primary 'bail in' cushion of 7% pre-determined unsecured bonds with at least a maturity of one year at origin, followed by the power to enforce haircut on all other creditors, the secondary 'bail-in'. It seems that, given the likely monitoring advantage of banks, the choice of bail-in debt (bonds or interbank debt) should be left to the market. As concerns the European Commission's proposal for a directive on resolution (European Commission, 2012, p.86), it is stated that "resolution authorities shall not exercise the write down and conversion powers on liabilities with an original maturity of less than one month". This is motivated by the wish to avoid a bank run by short-term creditors before a resolution is activated.

In the current debate, an implicit assumption appears to be that bank creditors should not be put at risk to avoid domino effects leading to a systemic crisis. Complete and timely information on exposure with counterparties, transparency and risk diversification should reduce the problem of interconnectedness and the risk of a domino effect. Scott (2012) argues that interconnectedness and domino effects did not cause the financial crisis in the U.S. It was rather panic and contagion with short-term creditors running away on interbank, repo and money markets. If, as I argue, short-term interbank debt is put at risk, the danger of contagion

increases. As is discussed later in the discussion of Basel III liquidity regulations, additional tools are needed to limit the risk of contagion and runs by short-term creditors.

Basel III not only requires a higher capital ratio but also a different mix of Tier 1 and Tier 2 components as is discussed next.

Tier 1 and Tier 2 Capital

The revision of the Basel III capital ratio pays attention to the composition of capital with greater emphasis on 'going concern' capital, Core Equity Tier 1 (CET1, book value of equity reduced by intangible and revaluation reserves). In Basel III capital, at least 7% will come from Core Equity Tier 1. Progress with the definition of bank capital has been slow. A footnote to the Basel I 1988 agreement reads: "*One member country, however, maintains the view that the international definition of capital should be confined to core capital elements and indicated that it would continue to press for the definition to be reconsidered by the Committee in the years ahead*" (Basel Committee, 1988, footnote 3). The Federal Republic of Germany had to wait 25 years and a major banking crisis to finally obtain a revision of the capital definition in favor of 'going concern' capital! The emphasis on going-concern capital is indeed well founded, as one would like to reduce the likelihood of bank default.

Capital regulation could be irrelevant if the measurement of bank capital did not evaluate properly the net value of the bank. Adequate provisioning for loans losses is a requirement.

Accounting for Bank Capital: Provisioning for Loan Losses

One last comment on bank capital regulation concerns the accounting rule used to value equity.[6] In this respect, provisioning rules are important to measure correctly tangible equity, the net value of assets. There is, around the world, a rule to recognize provisions on non-

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[6]We do not discuss whether capital regulations should be based on market value of equity as opposed to the use of book value. An argument against market value data is that one economic function of banks is to lend to small-and-medium-size companies on which they have an informational advantage due to proximity or relationship (Berger et al. 1988). Arm's length shareholders might not have the same information. Adequate provisioning on performing and non-performing loans would go a long way to make book value data closer to fair value data.

performing loans, but not on performing loans.[7] In January 2011, IFRS (2011) recognized that the practice of no provisioning on performing loans might have partly contributed to the US subprime crisis. Indeed, this accounting regime creates an incentive to finance long-term, risky, high-margin loans. A positive margin and profit show up in the early years while the risk of default materializes only later (Dermine, 2009). Forward looking provisioning, referred to sometimes as dynamic provisioning, is often justified to enable banks to build up a buffer in good times that can be used in bad times (Saurina, 2009; Wezel et al., 2012). We disagree with that interpretation. As stated by IFRS, the fair value of an asset requires the discounting of future expected losses. Bank capital should be estimated with the fair value of assets and liabilities. The countercyclical buffer of Basel III can deal with the economic cycle. It is quite regrettable that a decision has been taken to postpone the IFRS ruling. Avoiding provisions not only distorts the estimate of the value of assets and of the banks' tangible equity, but also creates the wrong incentives to move into long-term, high margin risky loans.

To summarize this critical assessment of the Basel III capital regulations, four observations can be made:

1. As equity-funding is costly (at least on a private cost basis), one cannot ignore the capital requirements'dynamic impact on bank behavior in terms of curtailing the supply of loan or securitization. One should proceed with caution with a capital increase, especially in the current period of recession.

2. The creation of too large a cushion of capital or 'bail in' securities reduces the incentives for banks' counterparties to monitor risk. This is likely to lead to inefficient and more costly financing as banks are best placed to evaluate the risk of bank counterparties. Interbank debt should be put at risk. To avoid a domino effect to interconnected banks, regulation must enforce an end-of-day measurement of counterparty exposure, transparency and strict diversification of risk. As argued below, additional tools are needed to reduce contagion and a run by short-term creditors.

3. Empirical data on loan losses observed during the recent 2007-2009 crisis should be taken into account in the design of capital regulations. Simply increasing the Basel II capital by 50% will likely lead to severe distortions.

4. Provisioning on performing loans has been delayed. This decision is hard to understand since IFRS itself recognizes that the absence of provisions on long-term assets is likely to have

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[7]Banks are allowed to create provisions on incurred but not yet reported (IBNR) losses. This is not equivalent to the complete provisioning of performing loans as IBNR has a short (usually one year) horizon.

contributed to the global crisis in creating a biased system of incentives in favor of long-term high risk loans.

The first two arguments emphasize that one must go beyond a static analysis of capital regulation with a discussion of the distribution of incurred losses, but that one also has to develop a dynamic analysis which takes into account the responses of market participants to changes in their private incentives. As history shows, capital regulation has had difficulty tracking risks, and loopholes exist. We argue below that privately-based mechanisms should be put in place to create bank soundness.

The Basel III regulatory framework for a more resilient banking system deal not only with capital but also with regulations on liquidity. This is the object of the next section.

Section 2. Basel III Liquidity Regulation

In July 2007, when Bear Stearns announced it had problems refinancing two of its structured investment vehicles, money markets froze and banks turned to government or central banks for liquidity support. In 2012 with the European sovereign crisis, banks turned to the ECB to access term-funding. To avoid repeated recourse to public funding, the Basel Committee (2010, 2013) has announced two liquidity regulations to ensure self-sufficiency with liquidity: the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSRF):

$$LCR = \frac{High\ Quality\ Liquid\ Assets}{Cash\ Outflow\ over\ 30\ Days(stress)} \geq 100\%$$

$$NSFR = \frac{Available\ stable\ funds\ over\ 1\ year}{Required\ stable\ funds\ over\ 1\ year} \geq 100\%$$

with required stable funding = (assets + off balance sheet position) x required stable funding (RSF) and RSF = part of assets that cannot be monetised (sold) or used as collateral in a liquidity shock lasting one year.

Let us first comment on the liquidity coverage ratio.

Liquidity Coverage Ratio
Banks will have built a contingency portfolio of high-quality liquid assets to cover cash outflows in a situation of stress lasting thirty days. Twenty-five years ago, the author heard

from a large American bank in New York that it had an internal stress liquidity rule according to which it had to be able to survive on its own for a minimum of 3 days in a crisis. The logic of the 3-day interval was that if the bank was solvent, the public authorities would get their act together over 3 days to provide liquidity to solvent banks, acting as a classic lender-of-last-resort. And if the bank was not solvent, a longer time interval would not help. In the UK before the crisis, the Financial Services Authority was computing a stress of five days for sterling-denominated deposits (FSA, 2011). One wonders whether the move to a 30-day stress test is not an over-reaction. Indeed, either the bank is solvent and a lender-of- last-resort's responsibility is to fund the bank in a period of panic. Or, the bank is insolvent, and a 30-day liquidity buffer will be of no help.

Again, one should not ignore the dynamic response to regulation. A large liquidity buffer funded with long-term securities raises the marginal cost of funds leading to higher loan rates or to securitization. The liquidity premium paid on long-term funding is due to imperfections in the capital markets and an absence of complete pledgeability of a bank's future income (Holmström and Tirole, 2011). One should ensure that the liquidity coverage ratio does not impede the maturity transformation role of banks. If indeed the banking industry needs liquid assets to cover aggregate liquidity needs driven by macroeconomic conditions (Rochet, 2008), liquidity needs arising from a panic should be dealt with by a lender-of-last resort.

Due to lobbying pressures of the industry, the Basel III liquidity regulation has been loosened in January 2013. The full implementation date has been moved from 2015 to 2019 and the pool of assets qualifying as unencumbered high-quality liquid assets has been enlarged to include not only *level 1* assets such as central bank reserves and government bonds but also *level 2* assets (with a haircut) such as corporate bonds, highly-rated residential mortgage-backed securities and equities. However, the calculation of the expected net cash outflows is still designed under a severe stress scenario.

Net Stable Funding Ratio

This second liquidity ratio to be applied in 2018 requires that positions that will be held in a bank for more than a year must be matched by sources of funds with maturity exceeding one year. To analyze the impact of the NSFR ratio, let us consider two examples:

2-year asset	6-month debt

This position will pass the liquidity coverage ratio test, but not the net stable funding ratio. The interpretation is that if a liquidity crisis lasts 6 months, the bank would not be able to refinance its debt at maturity. A one-year NSRF ensures that the bank would face no liquidity problems over 12 months in the case of a persistent liquidity crisis. Let us look at a second example:

9-month asset	6-month debt

This position would meet both the liquidity coverage ratio and the net stable funding ratio. However, one recognizes that if a crisis lasts 6 months, the bank would not be able to refinance itself. So, it would seem that if the intention of regulators is to ensure funding of bank over a 12-month horizon, the NSFR would not contribute to meet that objective when an asset has a maturity of less than 1 year. Rather than applying the NSFR, one should implement a dynamic liquidity coverage ratio (DLCR) which ensures that for each of the coming twelve months, there are enough liquid assets to cover a cash outflow lasting 30 days. Again, these scenarios should not cover the possibility of bank panics which should be dealt with by the lender of last resort. The application of the current NSFR would create a bias to finance assets with a maturity of less than 1 year (eventually with an implicit roll-over clause).

A question arises over the relevant length of the horizon to measure liquidity risk. Should it be one year assumed in NSRF? In principle, the horizon should be given by the length of time needed by a bank to adjust the maturity profile of its funding structure. In this respect, a distinction could be made between countries and banks that have access to more liquid markets. A one-size-fits-all regulation is unlikely to be optimal.

One can understand the wish of central banks to avoid biases in short-term funding created by the too-big-to-fail doctrine. An alternative is to leave the choice of maturity structure to banks and to rely on private market mechanisms to deal with excess. Very much as has been done for bank capital and the creation of 'bail in' bonds to deal with losses and solvency issues, a special resolution regime (or a bankruptcy court) would have the right to lengthen the maturity of debt in case of liquidity problems, the lender-of-last-resort dealing exclusively with panics. In such a system, banks would have incentives to manage their funding structure. As stated above, we favor resolution regimes that would put interbank debt at risk and leave the market to decide on their optimal use of 'bail in' bonds. Scott (2012) argues that this increases the likelihood of contagion and panic as short-term creditors will have incentives to

withdraw funds when there is a slight probability of a resolution. If one wishes to leave short-term funding at risk, be it on the interbank market, repo markets or securitized markets, one needs imperatively a tool to limit the risk of contagion and walk-out by short-term creditors. The lender-of-last-resort can intervene but at a risk of creating moral hazard. An additional tool would be the ability to force conversion of short-term funding into longer-term securities, that is, closing the door before the withdrawal wave develops.[8]

It is imperative to deal with the contagion risk due to short-term funding, be it on the interbank, repo or money markets if one wants to reduce the risk of a financial crisis. A choice must be made between two structures. In the first one, the risk of default of short-term bank debt is eliminated with seniority clauses, a large loss-absorbing cushion of bail-in bonds and equity, co-insurance by the banking industry and ultimately by a State guarantee. As was argued above, this is likely to be costly as arm's length bond holders and shareholders are less informed. The alternative structure is to leave short-term debt at risk while providing liquidity support of the lender-of-last-resort in a pure panic case or the legal means to enforce a conversion into long-term debt when the run originates from credit risk and assets' losses, the case in a credit-led panic.

Finally, it should be recognized that tampering with the maturity of bank funding might have other effects than an inadequate transformation of maturity, an increase in the cost of monitoring bank risk. Indeed, theory (Myers and Rajan, 2002) shows that one reason for short-term financing is to give investors the ability to withdraw funds if the company starts to change its riskiness. If investors are not given this opportunity, they might charge a higher cost of funds or lend less to banks that are able to change the riskiness of their assets.

To summarize: a traditional and essential function of banks is to perform maturity transformation. In addition, short maturity debt can create the incentives to avoid risk shifting. As this essential bank activity creates the risk of a bank run, one needs public (lender-of-last-resort) or private arrangement to ensure liquidity to solvent institutions. In our opinion, the Basel III liquidity rules severely restrict the liquidity transformation role of banks.

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[8]'Corralitos' (the closing of a bank's doors) have been used in Latin American countries to stop runs on banks.

Section 3. Bank Regulatory Architecture

Bank regulation on capital and liquidity should have two objectives: 1. to ensure that the probability of a financial crisis is small, avoiding the very large macroeconomic and social costs and 2. and to ensure an adequate allocation of funds in the economy with a proper recognition of costs. Moral hazard must be reduced as the costs to taxpayers in case of a bank default are not incorporated in decisions of leverage or risk-taking. We have argued that the current Basel III regulations on capital and liquidity may not achieve these two objectives. With regards to capital regulation, an arbitrary grossing up of 50% over the Basel II regulation leads to excessive capital for safe assets with as consequences too high loan margins or incentives to securitize.   Shifting bank loans to shadow banking might not improve the stability of the financial system as the subprime crisis has shown (Gorton, 2009). Excessive liquidity regulations will hamper the important role of maturity transformation, again leading to incentives to securitize. In short, we have argued that one must go beyond the static benefits (higher capital cushion to absorb losses and higher liquidity buffer to match cash outflows) to analyze the dynamic implications of regulations.

Is there an alternative architecture that would allow to meet some of the criticisms discussed here. As we have argued (Dermine-Schoenmaker, 2011), there are two ways to increase soundness in global banking: the independence and accountability of banking supervisors and an end to the too-big-to-fail doctrine. Independence should be granted to banking supervisors in the same way as it has been granted to Central Banks to run monetary policy. Freed from a Ministry of Finance and the short-term bias inherent in politics, accountable banks supervisors might do a better job. In this respect, one observes current changes in regulatory structure in several countries (such as Belgium and United Kingdom) which are moving banking supervision back to the independent central banks. And there is a plan in the eurozone to move bank supervision to the European Central Bank. Bank supervision will benefit from its independence. More importantly, the too-big-to-fail doctrine should end. One needs to increase private discipline and accountability. As discussed above, creditors need to be put at risk, including interbank creditors which have a comparative information advantage on the interbank market. An exception would be small depositors. As systemic institutions are vital for the proper functioning of the economy, one needs to design a special resolution regime that allows for the benefits of market discipline, while limiting the costs resulting from financial distress.

To reduce the cost of distress of banks facing a restructuring, two features must be met. The

first is that the bank should be closed for only a few days (during a weekend) as depositors and borrowers need to access their funds rapidly and as lending must continue. Special resolution regimes which intervene before the bankruptcy point should facilitate the issue of swiftness. In such a system, small deposits can still be protected by a deposit insurance system. To limit the liability of the deposit insurance system, insured deposits would be senior to all other debt.

To avoid domino effects across interconnected banks, credible information on counterparty risk must be available on the spot. As banks are supposed to monitor risks, it would sound legitimate to require rapid information on their counterparty exposure. In short, all banks should be able to meet the resolution acid test: they can be put into restructuring. If it is not feasible, then the structure of the financial institution must be changed. With bank debt at risk, there will be much more pressure from private financial markets to monitor bank risk. As stated above, putting short-term interbank at risk increases the danger of a panic and a bank run. In the same way as 'bail- in' securities are designed to absorb losses in case of solvency problems, a similar legal mechanism is needed to lengthen maturities in the case of liquidity crises.

The good news is that the global banking crisis has led to the creation of special resolution regimes in several countries, such as the United States, the United Kingdom, and Germany. If they appear able to deal with local institutions, they still would face a problem with global firms having activities located abroad in different juridictions (Attinger, 2011; IIF, 2012). To facilitate the resolution of large international firms, the Financial Stability Board (FSB, 2011) has proposed a list of attributes that national resolution regimes should meet. But FSB can only recognize that subsidiaries being handled by local legal juridictions, one would need cooperation of resolution authorities at a time of bank distress.9 As to market participants, they want transparent rules on the allocation of haircuts and debt/equity swaps in each single subsidiary and on the application of close-out rules in the case of resolution. To facilitate the resolution process in the European Union, it might be useful to revive the development of *Societas Europeae* in the banking sector. With this corporate structure which allows a company to operate abroad with branches, the single resolution regime of the home country of the parent company would then apply to the entire group. It would therefore seem helpful to break the legal and fiscal barriers that have prevented the creation of the *Societas Europeae* in the European banking sector (Dermine, 2003).

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[9]The FDIC and the Bank of England (2012) have recently proposed a a 'single-point-of-entry' at the top holding company level or most significant entity and a process managed by the home country resolution authority.

If well-functioning resolution mechanisms succeed in imposing cost on private creditors, eliminating moral hazard and raising the incentives to assess and monitor risk, one can wonder if regulations on capital and liquidity are still necessary. The justification must be that the first resolution intervention on a bank of significant size could create a shock in the banking market with negative externality on the economy. As this is likely to be the case in opaque banking markets, the necessity of both resolution regimes and regulations seem warranted. But these regulations should be much less stringent if a large part of the current moral hazard has been eliminated.

Conclusions

Following up on the large private and social costs incurred during the global crisis, the Basel Committee has significantly increased the regulations on capital and liquidity.

We have argued in the paper that an analysis of the static effects of regulations must be complemented with an evaluation of the dynamic impact which takes into account the response of players, that excessive regulations should not hinder the development of useful banking services, and that putting private creditors at risk is the best way to build a sound banking system.

With regards to specific regulations, one observes that the new Basel III capital rule on credit risk implies a common grossing up of 50% of the Basel II rule. This is very likely to lead to excess capital for safe activity and large incentives for securitization and shadow banking.

With regards to liquidity rules, it appears that the 30-day liquidity coverage ratio is excessive and that a lender-of-last-resort should lend to solvent banks in case of panics. Liquidity regulations should only cover calls for cash driven by economic activity. This will facilitate the useful maturity transformation role of banks.

Putting private creditors at risk is the best way to reduce moral hazard and incentives to reach a too-big-to-fail status. A rapid handling of a bank's insolvency requires the creation of special resolution regimes. As history has shown repeatedly over the last 30 years, capital or liquidity regulations will not anticipate new sources of risk or extreme events (black swans). This gives another reason to develop resolution/bankruptcy mechanisms. With regards to the identification of 'bail-in' creditors which would be exposed to a haircut or debt-equity swaps,

we have argued that exposure to credit risk should be left to those creditors who have the best information on counterparty risk. As banks compete with one another on the interbank market, they too should be exposed to risk. Therefore, the proposal is to leave all creditors (with the exception of small insured depositors) at risk. The argument that a domino effect will affect interconnected financial firms is, in our opinion, not valid if banks are forced to limit and diversify their counterparty exposure and if credible information on positions on a distressed bank is rapidly available. As, under this regime, short-term interbank depositors will have incentives to run when they fear an insolvency, the special resolution authority should have the right to lengthen the maturity of short-term debt. Debt would be converted into equity to deal with an insolvency and debt maturity would be lengthen to solve liquidity problems.

Putting private debt at risk will create accountability and risk monitoring. In our opinion, it is the only way to put an end to the too-big-to-fail doctrine with its bias for large size, excessive leverage and risk-taking.

Appendix 1: Capital Regulation and Loan Pricing

Consider a loan of 100 funded by interbank debt of 92, subordinated debt of 2.67 and equity 5.33. According to Basel rule, the use of subordinated debt is limited to 50% of equity. Assume a fixed interbank market rate of 3%, a fixed cost of subordinated debt of 3.75%, a corporate tax rate of 30% and ignore the cost of credit risk (expected loss) and operating expenses. For the equity risk premium, we consider two cases:

Case I: fixed equity risk premium of 5%
Case II: equity risk premium given by Miles et al. (2011, p. 17) empirical formula estimated from a sample of British banks,
     Market risk premium = 5% and Beta = 1.07 + [0.03 x (Assets/Equity)].

In Case I, the break-even rate R on a 1-year maturity loan is given by the following relation:

$$Equity = 5.33 = \frac{(1-0.3)x(Rx100 - 3\% \ x92 - 3.75\% \ x2.67) + 100 - 92 - 2.67}{1.08}$$

The break-even loan rate R is equal to 3.47% and the loan break-even spread is equal to:
 R - interbank market rate = 3.47% - 3% = 0.47%.

Table 1 below reports the loan break-even spread when the capital regulation is moved from 8% to 12% for the two risk premium cases: a fixed equity risk premium of 5%, and a risk premium which increases with leverage.

Table 1

Break-Even Credit Spreads on Bank Loans

This table illustrates the impact on the interest margin on loans of an increase in capital ratio from 8% to 12%. Two cases are considered. In the first case, the bank equity risk premium is fixed at 5%. In the second case, the CAPM market premium is 5% and the beta of bank shares is a function of leverage, following the empirical formula estimated by Miles *et al.* (2011): Beta = 1.07 + 0.03 x (Assets/Equity).

	Capital Ratio	
	8%	**12%**
Fixed Bank Equity Risk Premium (5%)	0.47%	0.70%
Variable Equity Risk Premium (Miles *et al.*, 2011)	0.71%	0.96%

For a change of Capital ratio from 8% to 12%, one observes an increase in the break-even loan spread of 23 basis points in the fixed equity risk premium case and 25 basis points when one applies the variable risk premium formula of Miles et al. (2011).

The increase in bank loan spread has assumed the cost of debt constant. It is therefore an upper-bound of the impact of a change in capital structure on loan spreads as increasing equity would reduce the risk of default and the cost of debt. However, since an 8% Basel II capital ratio covers risk with 99.9% confidence, the change in credit risk spread when one moves to a 12% capital ratio is extremely small. The upper-bond estimates reported in Table 1 are thus good estimate of the complete impact.

References

Admati Anat R., Peter M. DeMarzo, Martin F. Hellwig and Paul Pleiderer (2010): "Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity is Not Expensive", Stanford GSB Research paper N° 2063, 1-56.

Attinger B.J. (2011): "Crisis Management and Bank Resolution. Quo Vadis, Europe?", European Central Bank Legal WP # 13, 1- 52.

Basel Committee on Banking Supervision (1988): "International Convergence of Capital Measurement and Capital Standards", July (updated 1998).

Basel Committee on Banking Supervision (2004): "International Convergence of Capital Measurement and Capital Standards" (comprehensive version published in June 2006), Bank for International Settlements, Basel.

Basel Committee on Banking Supervision (2010):"Basel III: A Global Regulatory Framework for More resilient Banks and Banking Systems", updated June 2011, 1-69.

Basel Committee on Banking Supervision (2013): " Basel III: The Liquidity Coverage Ratio and Liquidity Risk Monitoring Tools", January, 1- 69.

Berger A.N. and C.H.S. Bouwman (2012): "How Does Capital Affect Bank Performance During the Financial Crises?", Journal of Financial Economics, forthcoming.

Biais B. and C. Gollier (1997): "Trade Credit and Credit Rationing", The Review of Financial Studies, vol. 10, N° 4, 903-937.

Bolton P. and F. Samama (2011): "Capital Access Bonds: Contingent Capital with an Option to Convert", Economic Policy, 1- 46, forthcoming.

Demigurc-Kunt A., E. Detragiache E. and O. Merrouche (2010): "Bank Capital, Lessons from the Financial Crisis", IMF Working Paper WP/10/286, 1-35.

Dermine J. (2009): Bank Valuation and Value-based Management, Mc-Graw Hill, NY.

Dermine J. (2012): "Basel II, Probability of Bank Run and the Leverage Ratio", mimeo.

Dermine J. and D. Schoenmaker (2010): "In Banking, is Small Beautiful?" (Journal of) Financial Markets, Institutions and Instruments, Vol. 19 (1), 1-19.

European Commission (2012): "Proposals for a Directive of the European Parliament and of the Council Establishing a Framework for the Recovery and Resolution of Credit Institutions", COM(2012) 280/3, 1-171.

Federal Deposit Insurance Corporation and Bank of England (2012): "Resolving Globally Active, Systemically Important Financial Institutions, December, 1-15.

Financial Services Authority (2011): "The Failure of Royal Bank of Scotland", London.

Financial Stability Board (2011): "Key Attributes of Effective Resolution Regimes for Financial Institutions, October, 1- 43.

Flannery M. J. (2002): "No Pain, No Gain? Effective Market Discipline Via Reverse Convertible debenture". Available at SSRN:http://ssrn.com/abstract=352762).

Gorton G. (2009): "The Subprime Panic", European Financial Management, 15 (1), 10-46.

Haldane A.G. (2012): "The Dog and the Frisbee", Federal Reserve Bank of Kansas City's 36th Economic Policy Symposium, The Changing Policy Landscape, Jackson Hole, Wyoming.

Hamalainen P., A. Pop, M. Hall and B. Howcroft (2012): "Did the Market Signal Impending Problems at Northern Rock? An Analysis of Four Financial Instruments", European Financial Management, 18 (1), 68-87.

Hammond John, Ralph Keeney and Howard Raiffa (1998): "The Hidden Traps in Decision Making", Harvard Business Review, September-October, 3-13

Hellwig M. (2010): "Capital Regulation after the Crisis: Business as Usual?", Max Planck Institute, 2010/31, 1-20.

Hoenig T.M. (2012): "Back to Basics: A Better Alternative to Basel Capital Rules", delivered to The American Banker Regulatory Symposium, Washington D.C.

Holmström B. and J. Tirole (2011): Inside and Outside Liquidity, MIT Press, Cambridge.

IFRS (2011): "Financial Instruments: Impairment", supplement to ED/2009/12, January, 1-81.

Independent Commission on Banking (ICB) (2011): Final Report- Recommendations, September, 1-358.

Institute of International Finance (2012): "Making Resolution Robust", Washington D.C., 1-59.

Jackson P. (1999): "Capital Requirement and Bank Behaviour: The Impact of the Basle Accord", BCBS Working Paper # 1, 1-64.

Judge K. (2012): "Interbank Discipline", UCLA Law Review, forthcoming.

Kashyap A.K., J.C. Stein and S. Hanson (2010): "An Analysis of the Impact of "Substantially Heightened" Capital Requirements on Large Financial Institutions", Working Paper, 1-46.

Miles D., J. Yang and G. Marcheggiano (2012): "Optimal Bank Capital", <u>The Economic Journal</u>, Vol 122 (565), forthcoming.

Modigliani, F. and M. H. Miller (1958): "The Cost of Capital, Corporation Finance and the Theory of Investment", <u>American Economic Review</u>, 48, 261-297.

Myers S.S. (1977): "The Determinants of Corporate Borrowing", <u>Journal of Financial Economics</u>, 5 (2), 147-175.

Myers S.C. and N. Majluf (1984) : "Corporate Financing and Investment Decisions When Firms Have Information that Investors Do not Have"", <u>Journal of Financial Economics</u>, 13 (2), 187-2011.

Myers S.C. and R. Rajan (1998): "The Paradox of Liquidity", <u>Quarterly Journal of Economics</u>, 113 (3), 733-771.

Rochet JC (2008): "La Réglementation de la Liquidité et le Prêteur en Dernier Ressort", <u>Revue de Stabilité Financière</u>, 11, 47-55.

Saurina J. (2009): "Dynamic Provisioning, The Experience of Spain", World Bank Public Policy Journal, available at http://rru.worldbank.org/documents/CrisisResponse/Note7.pdf, 1-6.

Scott Hal S. (2012): "Interconnectedness and Contagion", available at http://ssrn.com/abstract=2178475 ,1-293.

Tirole J. (2006): <u>The Theory of Corporate Finance</u>, Princeton University Press.

Vasicek O. A.(1987): "Probability of Loss on Loan Portfolio", Working Paper, KMV Corporation, 1- 4.

Wezel T., J.A. Chan-Lau and F. Columba (2012): Dynamic Loan Loss Provisioning: Simulations on Effectiveness and Guide to Implementation, IMF WP 12/110, 1-58.