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Adjusting Regulation to Systemic Risk in Banking and Financial Markets

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Abstract:

In this paper we propose a small set of new rules for banking and financial markets designed to address systemic risk. Regulatory capital requirements should not be calibrated to the risks an individual bank is taking, since risk measurement itself is biased. Capital requirements should be substantially increased, at least as a backup of wholesale liabilities in contrast to depositary debt; higher capital requirements will lower the risk premium banks must pay to investors, the cost of capital will go down; a credit crunch, therefore, is not to be expected. Derivatives trading and reselling of securitized risky assets add a high degree of complexity and unpredictability to the system. It proved illusory that well informed counterparties might be able to reasonably assess the risks of complex securities. We propose to reintroduce negative legal enforcement, which has been effective at least partly until 2002 in Germany; if contractual obligations from complex derivatives are no more be legally enforceable the market of these instruments would dry up. We also propose that central banks use increased reserve requirements for bank to deflate asset bubbles. Finally we argue that national governments should attract the capital of patient investors through enhanced national regulation.

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The problems

When the Basel Committee of Banking Supervision announced enhanced capital requirements for banks in September ECB-President Jean-Claude Trichet celebrated them as a “fundamental strengthening of global capital standards” with a “substantial contribution” to long term financial stability². Yet, skeptics might counter that increasing the minimum common equity requirement from 2% to 4,5% by 2015 and starting the “observation period” for the introduction of a new funding ratio of banks in 2012 is a far way from “fundamental strengthening”.

Rather, the new regulatory framework, known as the Basle III accord, is designed as not to disturb the social functions of banks providing liquidity and deposit services as well as reallocating risk and, thereby, facilitating economic growth. Written in this spirit the new accord barely addresses the high social costs of additional risks created or induced by the financial markets. It still poorly addresses systemic risks, market insufficiencies and asset inflation. It still relies mainly on backing up the balance sheet of individual banks by capital requirements finely attuned to the risks the banks are taking. But this kind of regulation does not reduce the risk of system wide distress.

Basle III, also, does not address the problem of complex financial instruments and the distribution of risk away from the originator. Derivatives and the securitization of credits can be useful to diversify the balance sheet of an individual bank but they increase system wide risk.

Another area still open for regulatory improvement is risk measurement: The measurement of risks itself adds to the fragility of the system. Confronted with a lack of statistical time series for the new financial instruments banks and rating agencies rely on mathematical models that create the illusion of risk control but whose basic assumptions fail in times of distress.

In summary, the Basel III agreement, documents a regulatory deadlock. Global measures are least common denominators in character; and governments themselves mostly refrain from purely national measures since they are afraid of the economic consequences of “regulatory arbitrage”, the argument that capital flows to least regulated countries.

² (BIS, 12. September 2010)

The proposed solutions

We propose a small set of legislative and regulatory measures beyond Basle III in order to stabilize banking and financial markets to some extent.

1. **Derivatives trading:** To protect private investors, firms and banks against excessive risk taking through complex and opaque securities, negative legal enforcement should be applied for instruments not approved by regulation and supervision authorities. Contracts resulting from trade of these instruments are, then, defined as incomplete; claims are not legally enforceable. In Germany, this practice has been fully abandoned as a law only as late as 2002.
2. **Capital requirements:**
 - (a) The regulatory capital of financial institutions should no more be fine tuned to the risks banks are taking.
 - (b) Depending on the liability structure it should be substantially higher than under the current and planned Basle regime (Basle II and III). Liabilities from within the financial sector (wholesale market) should be backed up with much more capital than debt from outside (deposits). The former capital requirement should be in the range of 30 percent to buffer up dangerous maturity mismatches which primarily take place in the money market part of debt. As a result, banks with poor access to deposits will need more capital.
 - (c) Regulation should adopt a top-runner principle. Institutions fulfilling a small number of easy to assess criteria for less risky business conduct (fulfilled by the most stable banks) should be favored. This can be through tax exemptions for dividend payouts to long term shareholders, through lower interest rates at the discount window of central banks or lower asset based reserve requirements (see point 3. below). Examples of easy to assess criteria are the number of subsidiaries of a bank as a measure of complexity and remuneration policies as a measure of basic incentives.
3. **Asset inflation:** Banks should back up assets assessed by the central banks to develop bubble like behavior with additional reserves of secure and highly liquid assets. These new reserve requirements automatically add a counter cyclical element to regulation.
4. **National regulation:** The argument of “regulatory arbitrage” is overestimated. At least major economies should exploit the first mover advantage and use enhanced regulation as an argument to attract capital of risk adverse investors.

Background and Analysis

Under the current and planned Basle accord capital serves to buffer an individual bank's balance sheet. And – even under the planned reform known as Basle III – this regulatory capital will still be adjusted to the risks the banks presumably are taking.

For several reasons this leaves ample space for system wide risk. First, many banks are so heavily interconnected that very small disturbances somewhere within the financial network can propagate on a much smaller time scale than the mean time it takes for a bank to accommodate its balance sheet structure by raising new capital or liquidating assets at reasonable prices³. The major institutions in the financial network are, in fact, super spreaders: They have so many connections to other banks that it takes, in average, only little more than one point to point transaction to reach any other bank in the world starting from one arbitrary bank⁴. Calibrating the capital of a bank to the risk on its balance sheet cannot take into account this contamination risk.

Secondly, the diffusion of small market shocks (e.g. caused by a slight departure of one bank's measured losses from the expected ones) is accelerated by the extensive use of derivatives instruments. Actually, it is their reason of existence to eliminate speed bumps between different regions of the financial system⁵. Under the efficient market hypothesis they increase the stability of the system since their use quickly eliminates any arbitrage and misallocation of risk.

In reality, derivatives securities have a strong tendency to increase volatility. One reason is that their pricing is based on a risk assessment and whether there is an arbitrage opportunity or not is in itself an assumption based on experience or model calculations. These assumptions may prove wrong. This means that derivatives designed to exploit arbitrage opportunities (e.g. interest rate gaps) might not necessarily lead to an equilibrium or steady state of the market. This holds true even if they indeed eliminate the arbitrage opportunity⁶. Even in this case the market can be far away from equilibrium, because the expectations of all market participants being aligned still may prove wrong (or at least need continuous readjustment to reality).

³ After the collapse of Lehman Brothers it took days to infect major banks in various countries. But it takes several months or even years until these bailed out banks are or will be able to recapitalize themselves in the market. So, disturbances roughly spread 100 times faster than major banks can react. When banks try to recapitalize earlier they would have to do so with discounted prices.

⁴ See (Haldane, 2009). Note that the “topology” of the financial network with a number of highly connected super spreaders is not risky by itself but only because of the high speed of distribution of disturbances. Effective speed bumps like a Financial Transaction Tax could, to some extent, mitigate this effect. Most investigations of network effects on financial and other systems (e.g. biological or social) to date do not focus on interactions and their dynamics. This leaves ample space for future research (Newman, 2003).

⁵ See e.g. (Merton & Bodie, 2005)

⁶ See (McCauley, 2003)

This happened in the financial crisis of 2007–2009. The expectations of all relevant market participants about the US real estate market were aligned – but proved wrong.

In times of crises, when the unexpected happens the nicely behaving probability distributions assumed to price derivatives correctly are bad approximations to real risks. The markets, then, either freeze as did the interbank market in the aftermath of the Lehman-collapse; or the markets try to find a new equilibrium through heavily trading derivatives and counter-derivatives, bets and counter-bets; this heavy trade will result in high volatility and wild and unpredictable fluctuations. In the first case the steady state is socially unwanted; in the second case the market is far away from any steady state. Calibrating bank capital to actual risks becomes an awful proposition in either case: If there is no trade at all, assets cannot be priced; if the market is too volatile market prices are irrelevant.

These considerations are quite theoretical in nature for the traditional business of banks taking deposits and lending loans to a limited number of firms they know well. Experience and extensive time series tell these banks reasonably well how to buffer up unexpected defaults. The full power of uncertainty enters the scene when too many risks are distributed away from the originator with tremendous speed.

In this case it can be dangerous to calibrate regulatory capital to expected risks. Since the real trouble results from unexpected risks (the unknown unknowns) this calibration creates an illusion of risk control. Ex-post the financial crisis of 2007–2009 was a safe bet even as early as 2005. But prior to the outbreak of the financial crisis the money market freezing after the collapse of Lehman Brothers was an unknown unknown; and to bet against the US real estate market was a safe way to lose money.

The lesson is that calibration of capital to expected risks fails exactly when capital as a buffer is urgently needed, when the uncertain happens.

Another lesson is that in the case of ever more innovative financial instruments accurate risk measurement is practically impossible. “To illustrate, consider an investor conducting due diligence on a set of financial claims. (...) How many pages of documentation would a diligent investor need to read to understand these products? (...) For simpler products, this is just about feasible – for example, around 200 pages, on average, for an RMBS investor. But an investor in a CDO2 would need to read in excess of 1 billion pages to understand fully the ingredients. With a PhD in mathematics under one arm and a Diploma in speed-reading under the other, this task would have tried the patience of even the most diligent investor.”⁷

⁷ (Haldane, 2009)

This example shows that it is an illusion that well informed private investors, firms or banks can safely play with modern complex financial instruments. The idea that well informed counterparties need no protection from law is flawed. Trading these instruments is gambling and should – again – be subject to negative legal enforcement as we propose⁸. In Germany this has been effective at least in parts until 2002⁹ – and with great success. Derivatives markets exploded in Germany only after the law was cancelled.

Reintroducing this law and adopting it in other countries as well would be useful also for other reasons. So, the profitability of derivatives trading creates new demand of the financial markets for risk – risk being viewed as the commodity necessary to manufacture derivatives¹⁰.

This new demand for risk, also, is potentially dangerous because financial markets invented instruments to effectively remove the information about risks from their balance sheets. These instruments are, again, derivatives like Credit Default Swaps (CDS); and the slicing, bundling and reselling of risky assets via securitization. As a consequence, risk has been distributed ever farther away from its originator. Adjusting capital requirements to the visible risks of individual banks necessarily underestimates the fragility of the banking system. Any individual bank securing its risks through derivatives and securitization might look perfectly diversified. Yet in reality, risk cannot be defined away, it simply spreads over major parts of the financial sector. In other words: Any individual bank is perfectly diversified but all banks diversify effectively in the same way. Prior to the financial crisis of 2007–2009 too many banks behaved like little Lehman Brothers.

A high demand for risk combined with the possibility to hide it from the balance sheet and, thirdly, a homogenous distribution of risks throughout the financial system – these three components add up to a deadly triple.

We illustrate the first part of this triple by an example¹¹. Most bankers argue that capital is costly compared to debt (money market or deposits). Capital has a high fixed price in their mind, and they will logically choose this expensive capital as effectively as possible. On

⁸ See (Uexküll, 2009) for a discussion of negative legal enforcement.

⁹ The two relevant paragraphs of the German law were §762 BGB (“Spieleinwand”) and §764 (“Differenzeinwand”). In short, speculation was treated like gambling as “unworthy to be protected” (“schutzunwürdig”). Contractual claims could not be legally enforced. Through a series of Financial Markets Promoting Acts this practice was abandoned. Speculation was more and more interpreted as being part of the usual business conduct. And protection through negative legal enforcement was replaced by high standards of transparency. The key argument was that well informed investors need no protection. Our argument is, instead, that there is no way to well inform any investor about the risks of complex and opaque financial instruments.

¹⁰ As noted by (Minsky, 2008 (1986)); „The fundamental banking activity is accepting, that is, guaranteeing that some party is creditworthy.” (p 256) In other words, the fundamental activity is to accept risk and earning a profit out of it. The same holds for derivatives.

¹¹ We follow (Boot, 2001) in this example.

the other hand, the price of capital depends on the risks it is exposed to – so, there is not *one* price; the return on equity a high risk taking bank has to deliver should be higher than that of a more prudent bank¹².

What is correct? Is capital expensive or not? In reality it is – because high capital prices and excessive risk taking create a self fulfilling prophecy: The market anticipates that any idle capital will be put in use by a bank quickly and in a risky way; therefore the market logically charges high capital prices and expects high returns on equity. This, in turn, justifies the banker´s belief that capital prices are fixed and high.

This spiral creates an ever increasing demand for assets promising high returns. These assets are typically risky and can be found either in the real economy, inducing ever faster and more risky economic growth¹³; or these risky assets are created by the financial markets themselves by constructing ever more complex risky securities.

When the deadly triple is at work, fine tuning capital to the risks visible on the balance sheet of a bank increases systemic risk. This kind of regulation creates additional incentives to undergo risky business.

Our final argument against the Basle II or III type regulation is the pro-cyclicity of capital requirements in general. If the assumptions underlying the calculation of capital requirements work well for a certain period of time simple market logic will force the market participants to use ever smaller cushions of safety since cushions exceeding the anticipated average losses are costly and these anticipated losses go down in good times (when the assumptions work well). At some point in time these cushions will necessarily become too small leading to a sudden decrease of prices¹⁴.

In bad times, when asset prices decline and banks are forced to deleverage, market prices might well fall below the discounted present values of returns. Triggered by capital requirements this deleveraging can cause solvency problems in the first place¹⁵.

One proposed solution is dynamic provisioning of bank capital. In good times banks should increase their capital base; in bad times the requirements are lifted to some extent.

¹² This is the logic of the celebrated Modigliani-Miller Theorem of finance stating that concerning shareholder value the way refinancing of a firm whether through capital or debt is irrelevant. See (Modigliani & Miller, 1958)

¹³ This is one way how the financial system induces risk and growth in parts of the economy. As an example take mergers and acquisitions (M&A). While there is abundant statistics revealing that mergers do not, in average, create additional shareholder value they are pursued regularly. The major drivers for M&A-activity are: Increased opportunities for speculation through increased stock volatility (including new opportunities for management bonuses); and fees earned by investment banks managing the mergers. Investment banks also profit from demergers. Mergers and demergers are risky activities induced by financial markets and institutions as well as by financial markets oriented management.

¹⁴ (Minsky, 2008 (1986))

¹⁵ (Hellwig, 2010)

The problem with this solution is that it still relies on fine tuning bank capital – in this case to macroeconomic developments. But any fine tuning is ultimately based on prior measurements. And there is no way to measure the unknown unknown before it happens.

This is the reason why we propose asset based reserve requirements (ABRR) instead. The central bank should force financial institutions to hold higher liquid reserves (central bank money or government bonds) for assets assessed by the central bank to develop bubble-like behavior¹⁶. These additional reserves would act like a tax on specific asset classes – leaving the market of other assets untouched in contrary to enhanced capital requirements. If the central bank reacts in time to asset inflation, this measure will be counter cyclical by definition.¹⁷ In case a bubble bursts, banks will hold more safe and liquid assets than necessary. Increasing capital requirements, instead, results in forcing banks to increase their capital base exactly when capital is most difficult to acquire.

Capital requirements themselves should be designed to increase overall system stability instead of the stability of an individual institution. The regulatory (in contrast to the economic) capital should not be finely attuned to the risks visible on an individual banks´ balance sheet.¹⁸

Higher capital standards still are pro cyclical but a deleveraging multiplier of five or even three (corresponding to capital requirements of 20 or 30 percent of the unweighted balance sheet) instead of thirty to fifty will substantially reduce insolvency worries within interbank markets.

To be consistent, money market and deposit liabilities should be treated separately under a reformed capital requirements regime. The substitution of capital and money market debt is fairly elastic; which is not the case for depository debt. It is mainly the capital protecting money market debt which is to be increased substantially. In order to reduce systemic risk, banks with a low share of deposits need much more capital than banks refinancing their assets mainly through customer savings. This would efficiently address the problem of maturity mismatch since the maturity structure of deposits is temporally much more stable and less sensitive to interest rate changes compared to money market funds¹⁹.

¹⁶ See (Palley, 2004) for an overview of the concept of ABRR. For a discussion of ABRR see also (Biskamp, 2009) and (Singer, 2009).

¹⁷ See (Holz, 2007) for a method how to assess the occurrence of asset inflation in time.

¹⁸ See (Hellwig, 2010) for a similar proposal.

¹⁹ For a discussion of maturity mismatch see (Brunnermeier, Crockett, Goodhart, Persaud, & Shin, 2009)

In total, our proposal suggests the following main constraints on a bank's balance sheet:

- Regulatory capital to protect deposits only slightly above the current range.
- Regulatory capital to protect money market debt in the range of 30 percent.
- Liquid reserves for deposits slightly above the current level.
- Liquid reserves for certain assets classes (ABRR). The level of these reserves is set pro-actively by the central bank to address asset inflation.

There are strong reservations against higher capital requirements among major banks and political decision makers. Bank capital is seen as being expensive; higher requirements, therefore, would lead to scarce credit. As we argued above, the argument that bank capital is expensive is a self fulfilling prophecy²⁰.

In theory, while the required return on bank equity is higher than the return on debt, this required return depends on the amount of equity a bank holds. Higher equity will reduce the risk premium; bank shares become a safer investment requiring less return²¹. Thus, the effect of higher capital requirements should be balanced by a lower premium. There should be no negative net effect on bank lending.

In practice, there is a problem with this line of argument: Since major banks are effectively guaranteed to be bailed out their capital is much less risky than it would be without. Governments acted as shareholders of the last resort during the financial crisis.

This kind of market distortion can be effectively eliminated within the scope of our proposals. Since with this regime in place, there is a transparent route to liquidating an insolvent bank. In case of insolvency the new reserves can be liquidated to cover, at least in part, deposit liabilities. Deposit insurance will cover the rest. Money market debt, which had been exempt from state guarantees prior to the crisis, should be officially guaranteed to be taken over by central banks at some discounted price in exchange for the remaining bank assets. In this way the central bank as a lender of the last resort ensures soundly working interbank markets. The moral hazard resulting from this guarantee should at least partly be limited by equity holders whose power is enhanced through higher capital requirements; these owners loose all in case of insolvency and liquidation. There is no need for governments to adopt the role of a shareholder of the last resort.

²⁰ There is one exception: For banks with poor access to capital markets (cooperatives; thrifts) capital is indeed scarce. These banks typically rely on deposits as liabilities while our proposal mainly addresses wholesale debt.

²¹ Assuming efficient (money market) debt and capital markets it is irrelevant for the banks' shareholder value whether the institution is refinancing through equity or (money market) debt. This is the statement of the Modigliani-Miller Theorem. As pointed out by (Hellwig, 2010) the assumptions under which this theorem is valid are the same that are required to validate the internal risk rating models of banks. So, bankers claiming that credits sold to firms will need to be more expensive under higher capital requirements implicitly question their own market and credit risk models and, therefore, also the validity of their own internal capital assessment.

With the same line of arguments the problem of regulatory arbitrage can be solved at least in part. The statement that capital will flow to least regulated regions is common in the literature of financial regulation²². But governments underestimate their own power in economic policy making and overestimate the power of business and finance. In contrast to mainstream belief national governments are able to reverse the spiral towards ever weaker regulation and initiate a global competition for the most effective and socially productive regulation.

Major business can outplay national governments by relocating physical capital globally but this relocation is not frictionless, it is costly. Financial capital, in contrast, can move at practically no cost. But capital seeks rents in relation to risk of financial losses. Prudent regulation of labour and capital markets creates a safer environment for innovation and investment. Therefore the risk premium to be paid by investors in these markets is lower than the premium to be paid to investors in less regulated markets. Strong rules attract more patient investors while weak rules attract hot financial capital expecting high returns. It is true that governments can simulate a safe environment for investors by combining weak rules with implicit or overt state guarantees. But the costs of these guarantees ultimately rest on the shoulders of taxpayers. If one country succeeds in attracting patient investors through more prudent regulation and less state guarantees, then other countries will likely follow because their taxpayers might revolt against the high costs of state guarantees. At least this is possible, i.e. there is an increasing uncertainty about future economic policy. This uncertainty is a risk associated with an investment in the remainder of weaker regulated economies. Therefore they will need to pay an even higher risk premium to speculative investors of hot money. This, in turn, increases the competitive advantage of more prudently regulated economies.

There are a few examples of governments successfully attracting more prudent investors through improved regulation. Most notably, in the early 90ies Chile introduced “speed bumps”: Foreign investors had to put aside a portion of their investment as a reserve at the central bank. They received interest on these reserves only when they stayed invested in Chile for more several months. The resulting decrease of short term investments was overcompensated by an increase of long term investments.

As in Chile, it will always take some time, to convince markets that investments become safer through enhanced regulation and that financial institutions subject to the new regime deliver safe returns. It will take time – but this is the reason, why contrary to the mainstream belief²³ there is a first mover advantage for major economies to strengthen regulation instead of waiting for a global consensus.

²² See e.g. (Brunnermeier, Crockett, Goodhart, Persaud, & Shin, 2009). For an extensive list of ways how banks use regulatory arbitrage to minimize their capital base see (Kashyap, Stein, & Hanson, 2010).

²³ See e.g. (Brunnermeier, Crockett, Goodhart, Persaud, & Shin, 2009)

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