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The regulation of repo markets: Incorporating public interest through a stronger role of civil society

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White Paper No. 25

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Matthias Thiemann and Marius Birk

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Executive Summary

Regulatory failures, which came to the fore after the financial crisis of 2007-2009, lead to the question of why some activities by financial institutions were not regulated prior to the crisis of 2007, even though regulators knew about certain dangers to financial stability (Thiemann 2014)? We suggest that regulators face a particular political-economic situation, whenever they want to intervene in seemingly well-functioning markets. Before bubbles burst, they face fierce criticisms of lobbyists that raise concerns over the financing situation of states and enterprises alike. Facing such a situation, regulators might become too forbearing, either because of regulatory capture, caused by a Home Field Advantage¹ of lobbyists (Barth et al. 2012: 7-8) or because of indecisiveness, caused by "limited information and penalties [which] regulators may face for making mistakes"² (Bisias et al. 2012: 12-13). Thus, regulators are trapped within a difficult political environment, which makes it hard for them to do their job right.

This problem is aggravated by the fact that financial regulation is highly technical, excluding the public at large from the discussion. And yet there is strong public interest that it is done in the public and not the private interest. In this policy note we argue for the important role NGOs can play in the regulatory process, pursuing an alliance with academics and regulators alike to push for more stringent regulation where shortcomings and contradictions are detected. Generally speaking the discrepancy between the knowledge of shortcomings and the neglect of action are starting points of interventions for NGOs. We argue that it is not enough to notice shortcomings: instead NGOs can use these shortcomings to re-politicize the regulatory agenda and thus help regulators to complete their work.

In this paper, the example of regulatory shortcomings on the repo-market serves as our example to show how NGOs can influence the regulatory process. The repo-market, although centrally involved in the last crisis, still awaits stringent regulation. At the same time, the regulatory cycle seems to come to an end, boding ill for future crises which will be amplified by this market. In this situation, NGOs are needed to make regulators act upon their knowledge and to tighten their regulations. If financial capitalism is considered to be an invention not yet fully developed (Schiller 2012: 7), NGOs can support the process of adjusting this invention, by giving the public at large a greater voice in order to create financial stability and thereby general public welfare.

¹ Home Field Advantage: As regulators are surrounded by members of the financial community, instead of the general public (Barth et al. 2012: 8), the public is unable to interact with regulators: either because of the lack of knowledge or even simpler, because the public does not "interact with regulators on a daily basis" (*ibid.*).

² More precisely, regulators suffer from an asymmetrical condition, in which "regulators expect to be punished (...) for acting too soon" (Bisias et. al. 2012: 13) or "puts the regulator in the role of cleaning up a mess created by others" (*ibid.*).

1. Introduction

The tumultuous events of the recent financial crisis, which led to a median accumulated output loss of 25% of GDP in advanced OECD countries (Woll 2014) spelled out once more the importance of a stable and well-functioning financial system for growth and general welfare. “Financial stability is a public good” (Cao 2012: 6) and the maintenance of financial stability is of paramount importance. It also showed the importance of timely regulatory intervention which unfortunately most of the time was not forthcoming. As the G20 Leaders put it, the crisis was caused “largely through a failure in financial regulation and oversight” (G20 2014a: 1). Yet, this failure was only partially created by a lack of an understanding of risks. It was also caused by a lack of action.

As Charles Goodhart has put it, “virtually all of the major central banks and international financial institutions had been warning about the underpricing of risk and excessive leveraging by 2006-07 and the Bank for International Settlements (BIS) had been warning about it for years” (Goodhart 2009: 30). But, if regulators had an understanding of the systemic risks that were building up, what prevented them from acting to mitigate these? Regulatory and cognitive capture (Barth et al 2012, Buijter 2012, Baker 2010, Geithner 2014) go a long way in accounting for the lack of regulatory intervention before the crisis. An often underappreciated factor in regulatory inaction that facilitates this capture is the difficult task for regulators to intervene in financial markets during upswings, where interventions have to be justified in front of an industry and the interested public on the basis of risks which have not yet materialized. Those which stand to benefit from earlier interventions, namely the public at large, do not understand the technical details of regulation and thus do not support regulators in their interventions (Culpepper 2011).

In this paper, we address this fatal information asymmetry with respect to the repo-market, a market which was at the heart of the financial crisis of 2007 (Gorton and Metrick 2010) and still endangers financial stability (ESRB Annual Report 2013: 32f.; OFR Report 2013: 14). This market, which over the course of the last decade has become crucial for the refinancing of the financial system, lies at the heart of shadow banking (FSB 2012, Gorton 2010) and poses grave systemic risks.

The first objective of this paper is to review the academic insights into the risks relating to the repo markets and to compare these to the state of current regulatory initiatives of the Financial Stability Board with respect to the repo-market. Next to our research goal of understanding how academic work and current regulation compare, we also want to contribute to a better understanding of the repo market itself, as “the opaqueness and complexity of finance prevented – and prevents – the public and its elected officials from obtaining informed, expert, and independent assessments of financial regulation” (Barth et al. 2012: 10). This is especially true for repo-markets, in which “one of

the main risks ... relates to the opacity of data" (ESRB Annual Report 2013: 31). We do so because we consider that such lack of transparency contains the seed of regulatory failure, similar to the conditions before the crisis of 2007, where regulators knew about the unfolding danger within the system; but were unable to act. Finally, our goal is to ask how the public at large may intervene in the ongoing regulatory process and communicate their interests and concerns in order to create regulations that better represent the interests of the public at large.

The social welfare perspective in economics indicates that negative externalities are the main rationale for financial regulation as the activities by individual market participants may affect other market participants negatively (cf. Geneva Report 2009: 22-23). These negative externalities arise because individual market participants do not take into account the costs of their actions on other market participants, for instance, when they overexpose themselves to risk (*ibid.*: 22). Regulation is thus justified in case individual activities of market participants can negatively spillover to other market participants. Although this rationale is plausible, those advocating regulation have to be aware of the fact that regulation itself is costly, too (Danielsson 2013: 237) and that the regulation process itself can lead to regulatory failure. While economists have been right to subject regulatory intervention to cost-benefit analyses, in this paper we will err on the side of calling for regulatory interventions where negative externalities exist. The fact that too little knowledge exists for proper cost-benefit calculations and, especially the large costs of the recent crisis, in our view, justify this expansive stance.³

The paper proceeds as follows: We first outline the economic substance of repo-transactions in section 2 (The Repo Market) and the benefits they provide to buyers and sellers in section 3 (The Benefits of Repos). In section 4 (The Danger of the Repo Instrument and its Impact during the Crisis), we then discuss the negative externalities expanding repo-markets may impose on market actors other than those involved in the transaction, justifying regulatory interventions. These externalities are then related to the burgeoning research on financial cycles and systemic risks which illustrate the role repo-markets play in the cyclical build-up of systemic risks. In section 5 (The Regulation of the Repo Markets – The FSB addresses Shadow Banking), we summarize briefly the current regulation proposals of the FSB, while we afterwards assess these current proposals in section 6 (Shortcomings in the Regulation). In section 7 (Overcoming Shortcomings in the Current Regulatory Proposals) we outline the need for intervention of the public at large in the regulatory process and identify NGOs as suitable carriers of this sustained attention. We propose an agenda for NGOs, which, in conjunction

³ For a more in-depth argument, see Aldegwy and Thiemann 2015.

with academics and critical regulators, should push regulatory initiatives to complete the regulation of the repo-market. This is finally done in section 8 (ANIME for Repos).

2. The Repo Market

The market for Sale and Repurchase Agreements (abbreviation: repo market) is a central element in the bank-non-bank nexus which has become (in-)famous as the shadow banking system (FSB 2014a). In this market, loans that last from one night to up to one year are granted against collateral, typically government bonds or notes. Customers in the repo market include banks (the largest fraction), institutional money managers, insurance companies, hedge funds, and non-financial corporations that actively manage their cash flows. While there are also repo brokers, dealers and multilateral clearing houses, bilateral clearing in Europe remains common, which means that information about the market is incomplete and obscure contracts remain predominant.⁴

A Classical Repo Transaction⁵

In a classical repo transaction, two sides enter into a contract in which the seller sells a security, while simultaneously agreeing to re-purchase the security at a specified future date and price. The buyer of the security transfers cash to the seller, which is returned after the termination of the trade. The difference between the selling price and the re-purchasing price is the “repo-rate” associated with the contract. It reflects the interest rate of this financing instrument. Furthermore, it is usual that the lender will ask for more collateral than the value of the extended loan, to reduce the risk of loss, in case of default. The difference between the value of the collateral and the loan being extended, is called the “haircut”, which is based on the perceived riskiness of the borrower and the assets he offers as collateral.

From a legal point of view, the seller keeps the economic benefits of the asset, although the legal title is transferred to the buyer. Thus, the seller can face the risk that the security suffers in value during the transaction, while the buyer is not affected. The buyer possesses the security during the transaction, which shall protect him in case the seller defaults. Though a repo is often considered to be a secured loan, from a legal point of view it is an outright sale of assets (Choudhry 2010: 341). This

⁴ ICMA European Repo Market Survey 2014: In June 2014, the European Repo Council (ERC) of the International Capital Market Association (ICMA) conducted the 27th in its series of semi-annual surveys of the repo market in Europe. The latest survey asked a sample of financial institutions in Europe for the value of their repo contracts that were still outstanding at close of business on June 11, 2014. Replies were received from 65 offices of 61 financial groups, mainly banks: The total value of the repo contracts outstanding on the books of the 65 institutions who participated in the latest survey was EUR 5,782 billion. The share of tri-party repo continued to improve, reaching 10.2%.

⁵ Based upon Choudhry 2010: Chapters 5 and 13.

is important, as in case of the default of the seller, the buyer is entitled to use the security in order to make good on potential losses, instead of returning the security to the insolvent seller. This is the so-called 'safe harbor' clause, which exempts collateral of repos from bankruptcy proceedings.

Collateral Chains and Repo Transactions:

Independent of the safe harbor clause, the buyer can also re-use the collateral during the transaction without a defaulting seller. By doing so, the security is used in a transaction to a third party, thereby creating collateral chains across the markets. The buyer only has to return an equivalent security to the seller from the first transaction. When the buyer sells a repo-security to a third party, the collateral from the first transaction is used to receive a credit. For example,⁶ a US Treasury Bond is used by a hedge fund to get finance from a prime broker. The prime broker uses the same collateral to pay an OTC derivative position to a bank. In the end, the bank passes the US Treasury Bond to a money market fund. As the same US Treasury Bond was used several times, a collateral chain was created, whereby the available amount of credit was extended only by means of one security. From a monetary policy perspective, collateral chains can be seen as the lubrication in the global financial markets (Cf. Singh 2013: 3), as these chains increase the liquidity. In case the chains are too short, overall funding costs rise, even to the real economy (Cf. Singh and Stella 2012).

Figure 1: A typical collateral chain

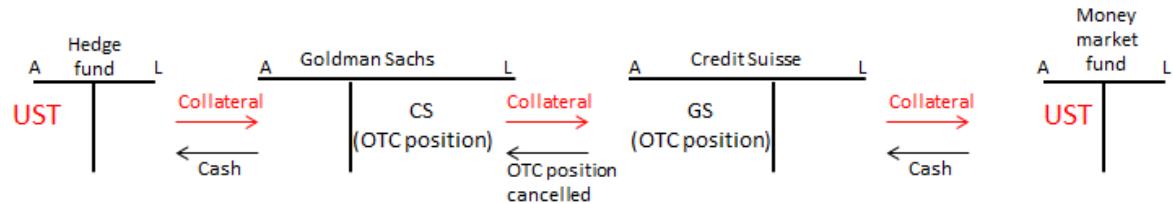


Figure by Singh and Stella 2012.

3. The Benefits of Repos⁷

Generally speaking, the primary benefit of repos resides in their use as a funding instrument. But repo instruments also have distinct benefits for buyers and sellers which we identify in the following: The funding a seller is able to receive through a repo transaction allows him to finance himself at very competitive interest rates, often better than the conditions of a secured loan, which is especially important when the seller is not a bank and has no access to the interbank market. The repo

⁶ The example is based on Singh and Stella 2012.

⁷ Based upon Choudhry 2010: Chapter 6.

transaction then enables the seller to finance longer-term assets with short term debt instruments. By playing the maturity curve, he is able to realize a profit. The seller is able to do so, without liquidating his securities, instead he just sells them for a limited amount of time. At the same time, the buyer can invest his excess money reserves in a way that reduces credit risk, due to the legal transfer of the pledged security. Furthermore, he can use the thus obtained asset to obtain financing himself or to engage in speculative operations.⁸

From a more general economic point of view, a key benefit of repo-markets is the expansion of credit available to market participants. However, this credit extension differs from a usual loan, as repo instruments are considered to trade at par, meaning that they are convertible into cash (Poszar 2014:9). Thus, a repo instrument can be considered to be like money (*ibid.*). It is this money-like attribute of repo instruments that not only creates funding liquidity for the seller – because of the cash the seller receives –, but also creates market liquidity – because of the transfer of the collateral, which in case of a default stays with the buyer. For security broker dealers, which are the primary source of market liquidity in securities markets, the repo-market is the primary source of funding, as it allows them to refinance their security books without owning additional capital (Mehrling 2011: 98-99). In short, the repo-market allows an increase of funding and market liquidity that is essential to understand this distinct expansion of credit.

4. The Danger of the Repo Instrument and its Impact during the Crisis

One concern regarding the repo market is that it appears to reinforce crisis dynamics (Perotti 2010, Gorton 2010). On the one hand, volatile haircuts and runs in the repo-market have been seen to amplify unfolding crises, as the events of 2007 and 2008 demonstrated (Gorton 2010). On the other hand, the unstable expansion of credit in good times sows the seeds of even greater distress when market actors realize they were overly optimistic in their granting of credit. This optimism is supported by the legal feature of safe harbor, leading to a decline in due diligence. In the following, we will explain these negative aspects of the repo-market, which the recent academic literature has discussed in order to provide clarity on the need for regulation.

Haircuts, Capital and Runs

In a market-based financial system like ours, financial institutions mark their balance sheets to market, which makes them react to price changes and measured risk (Geneva Report 2009: 16). In case of a sharp price decline, which can be called loss spiral (*ibid.*), financial institutions react to a

⁸ Such as short-selling it in case he believes that the price of the security will fall.

falling asset price by selling assets in order to avoid an eroding of their own equity cushion (*ibid.*: 16-17). The *loss spiral* mechanism is thus essential in order to understand the impact of the negative price movement on balance sheets – as well as the financial institutions' reaction to it (Geneva Report 2009: 16-18), which is clearly illustrated by the following example:⁹

A bank X buys € 100 million worth of assets, financing it with € 10 million of its own capital and borrowing € 90 million. If the price of the assets declines to € 95 million, the price movement wipes out € 5 million of the bank's own capital. In case of the bank X wanting to keep its leverage ratio at 10, the bank has to reduce the overall position to € 50 million, therefore it has to sell € 45 million worth of assets.

In short, a price decline forces financial institutions to adjust their balance sheets, as losses in the market value of the assets can threaten the solvency. This mechanism can be amplified through the *haircut spiral*, which forces the financial institutions to reduce their leverage ratios (cf. Geneva Report 2009: 18). The following example¹⁰ clarifies this issue:

Imagine a market participant that refinances his liabilities through repo transactions. In this example, the haircut is 2%, meaning that the seller of the security can borrow 98 dollars for 100 dollars worth of securities pledged¹¹. Thus, the borrower has to come up with 2 dollars of own capital with a maximum permissible leverage (ratio of assets to equity) of 50.¹² However, if it comes to a price decline, triggered by a loss spiral, market participants are more risk averse, and thus might raise the haircut to, for example, 4 %. Then the maximum permissible leverage contracts to 25. In this case the borrower must either try to raise more own capital or sell assets. By selling more assets, the primary loss spiral gets reinforced, as the supply of assets increases, while simultaneously, the market participants are less prepared to take risk, due to the increased volatility.

Concluding, the major concern for financial stability in repo markets is that haircuts that counterparties demand, in order to accept collateral and make the loan, are pro-cyclical, “tending to be compressed in the upswing of a cycle as financial institutions become increasingly exuberant” (Gai et al. 2011: 455) and tending to become very large in moments of crisis, leading to liquidity shortfalls of all those institutions relying on the repo-market for financing. In a moment of crisis, often

⁹ Example from Brunnermeier from 2008: 22-23.

¹⁰ Example from Geneva Report 2009: 20.

¹¹ We assume that the repo-rate here is zero, which is a reasonable assumption, given current low interest rates.

¹² With 10 dollars of own capital, a haircut of 2% and securities worth 100 dollars, I can borrow 5 times 98 dollars. But as the market price of the assets is 100 dollars, the leverage ratio is calculated in the following way: 5 times 100 dollars = 500 dollars; thus the leverage ratio is 500 dollars to 10 dollars own capital = 50.

characterized by declines of asset prices, counterparties of repo transactions will increase haircuts on new repo-loans, offering less cash to the borrowers. Consequently, this puts pressure on the borrowers, leads to worsening liquidity shortages, possibly ending in bankruptcy. In case of bankruptcy, counterparties will flood the market with these assets, leading to further price declines (see below). In short, haircuts in the repo markets fluctuate together with the funding conditions (Geneva Report 2009: 20).

Particular counterparties may be forced into bankruptcy by increased haircuts, or even worse, an inability to find further repo financing due to reduced creditworthiness (cf. Adrian et al. 2013: 8).

Table 1: Repo Runs (based upon Adrian et al. 2013)

Different kinds of runs	Effect	During the crisis	Remark
Haircuts of all collateral classes increase	All borrowers have to de-lever.	A run on one or several asset classes seems to have happened in some bilateral repo markets during the crisis	Compare haircut spiral (Geneva Report).
Haircuts of particular collateral increase	Only sellers who borrowed with this particular collateral have to de-lever		
Creditors refuse to expand repo financing to particular counterparties	These counterparties lose their ability to refinance themselves with repos – threat of illiquidity.	This seems to have happened to Bear Stearns and Lehman Brothers	

Summing up, all of these mechanisms listed in the table “Repo runs” can be considered as forced deleveraging (cf. Adrian et al. 2013: 8-9).

Safe Harbor and Fire Sales

As already mentioned, repos are often considered to be a secured loan, while, from a legal point of view, they are an outright sale of assets (Cf. Choudhry 2010: 339-341). The legal title is transferred to the buyer side. In case the seller defaults, this transfer secures the buyer from losses, while it simultaneously increases the “moneyness” of repos (Pozsar 2014).

Though the transfer of the legal title might be beneficial for the individual buyer of repos, in case of default, the exemption of repos from bankruptcy proceedings can be a danger to financial stability in times of crisis. An example for this is the failure of Lehman Brothers (Perotti 2010). This critique relates to the already mentioned ‘safe harbor’ clause: Whereas common lenders have their claims frozen in case of borrower bankruptcy until the bankruptcy proceedings are finished, those to whom collateral has been pledged as part of a repo-transaction jump the queue (*ibid.*) and immediately

seize full ownership of the pledged collateral. As those parties are not interested in holding the collateral, they will sell it and because they have often received the collateral with high haircuts, they will be willing to sell them at high discounts. While those sales then have a limited impact on the institutions selling, which due to the cushion by the haircuts face no losses, such fire-sales can have devastating impacts for the asset-classes concerned and, in consequence, for other market participants.

This impact arises as the individual participant “does not take into account the price impact its own fire-sales will have on asset prices in a possible future liquidity credit crunch” (Geneva Report 2009: 22). Due to the increased sales, the security suffers a price decline, which affects the balance sheets of the other market participants (compare loss spiral). Thus, a fire sale by one institution can spill over to another institution. In the worst case, such a spill over effect can lead to a “liquidity black hole”¹³. In case of liquidity black hole, the primary price decline, “elicit(s) more selling, sending prices down a hole before they recover” (Persaud 2003: 179). In contrast, to price volatility, where the market is still able to set a new price, the price discovery mechanism is disrupted in a liquidity black hole, as the market is unable to generate a price due to a lack of buyers. The market descends into free fall and the inability of pricing is the expression of this market disruption. Because of the negative externalities produced by the fire sales, it is comprehensible that academics, for example Perotti 2013, and government authorities share the estimation that an “orderly liquidation facility” (OFR Report 2013: 14) for securitized transactions is needed.

Collateral Chains and Confidence

Collateral chains are considered to be the lubrication of the financial market, lowering the overall funding costs. Therefore collateral chains, which are too short, affect the efficiency of the financial markets negatively. Simultaneously, these chains increase the interconnectedness of the whole system, thus increase systemic risk. From a financial stability perspective, interconnectedness can transfer a shock through the whole system, as a failure of an individual institution causes spillovers to other institutions (Danielsson 2013: 5).

The first danger of these collateral chains is that in case a market participant within the chain is unable to return the collateral, the other market participants have to come up with equivalent collateral. Imagine the already mentioned example in which one US Treasury Bond was used several times. In case the last user of the collateral is unable to return it, the second to last has to find an equivalent. In case he is unable to do so too, the primary failure may be an indication of a general

¹³ Compare for liquidity black holes in general: Persaud 2003.

credit deterioration (Choudhry 2010: 354). While at the beginning the chain was created with the re-use of one collateral, which expanded the amount of credit, the chain disintegrates not only because one fails to return the collateral, but also because the market participants start to distrust each other, which leads to the second danger.

The second danger is that the existence of collateral chain depends on market participants' willingness to view these securities as having the ability to be converted into cash. Thus, this security multiplier is "very much a creature of the market" (Singh and Stella 2012). In case market participants consider an initial failure by a buyer to deliver a security to be a sign of general deterioration of the market environment, then other market participants may lose their funding source, as buyers may distrust this security and its ability to be converted into cash. The single security, which was part of a credit expansion for several market participants, loses its ability to create money, thus the credit cannot be rolled over. But as the single security served as funding to all of the market participants within the chain, the reduced funding shock can be transmitted to all of them. As the security turns less liquid or even illiquid, market participants find it more difficult or even impossible to raise cash. They need to find new sources of funding (with another security) or need to sell assets at fire sale prices. Thus, a failure to deliver always runs the risk of being considered to point to a general deterioration or market liquidity. Market participants may become risk adverse and, in consequence, unwilling to be on the buyer side of a repo.

Concluding: Booms and Busts – Repos and Systemic Risk

It is not surprising that repo-markets gained so much importance before the crisis, as "there was so much debt to be financed" (Stigum and Oresceni 2007: 531). However, not only were repo-markets at the heart of the financial crisis of 2007, they endanger financial stability to this day. Thus, the question about the benefits of the repo instrument in relation to financial stability needs to be posed. After we have identified certain risks regarding the repo instrument and its use, we now want to describe more generally how the repo instrument contributes to the build up of systemic risk. Against this backdrop, we finally argue that the repo-markets create negative externalities, which justify their regulation.

Systemic risk can be defined as a risk that "arises from the interlinkages present in the financial system, where the failure of an individual institution may cause spillovers and even cascading failures, amplified by the inherent pro-cyclicality" (Danielsson 2013: 5). In short, systemic risk arises through interconnectedness and pro-cyclical amplification. In order to understand why a repo transaction and its benefits in general fluctuate together with the funding conditions in the market,

we need to categorize the described dangers of repo instruments within the definition of systemic risk.

A good place to start is that financial booms cause financial busts (Borio 2012: 8). Such a perspective allows identifying the pro-cyclicality of risk, which is one characteristic of systemic risk. With regard to the repo instrument, haircuts as well as collateral chains tend to be pro-cyclical. It is the possibility of low haircuts as well as long collateral chains, which enables the market participants to be highly leveraged, in times of booms. Thereby, market participants face the risk that, in case of an exogenous shock, the haircuts increase and collateral chains disintegrate. As a consequence, market participants have to find new funding sources or can sell their assets at fire sale prices.

The second risk relates to contagion through collateral chains. Though we agree that collateral chains support the efficiency of the financial markets (cf. Singh and Stella 2012), we also agree that these chains “foster contagion” (ESRB Annual Report 2013: 31). Collateral chains increase systemic risk, as market participants become more interconnected through the re-use of the securities. However, as already mentioned, this ability only depends on the confidence of the market participants that the security is convertible into cash. In contrast to traditional money creation, where the role of the government is a distinct feature (Singh and Stella 2012) (compare deposit insurance and Lender of Last Resort), the creation of money through repo instruments depends on the market participants and their willingness to accept collaterals. Thus, the fundament of the collateral chains is weaker, compared to the fundament of traditional money creation. Thus, the benefits, created through the interconnectedness go hand in hand with an increase in systemic risk, which can undermine these benefits if the chains get too long.

Third, the safe harbor clause and its repercussions during the failure of Lehman Brothers were at the heart of the financial crisis (Perotti 2013). From the point of view of financial stability, safe harbor creates incentives for those granting loans not to properly engage in due diligence as they feel safe in case of default. Thus, safe harbor sets wrong incentives and by doing so, leads to a misallocation of credit. In case of defaults, fire sales ensue, creating loss spirals and spill over effects.

By stepping back and considering these three distinct dangers, we can see how all of them relate to the inherent risk that repo financing becomes unavailable when large parts of the financial system are under stress (Acharya and Öncü 2011: 320). Thus, the repo-market faces an inherent systemic risk of illiquidity (*ibid.*), which develops in booms (haircuts are low, collateral chains expand, extension of loans is easy - risk seems low) and comes to the fore when the available amount of funding contracts. When liquidity, the “Achilles heel of finance” (Nesvetailova 2008: 90), deteriorates, market participants, which financed themselves with repo instruments while the

liquidity conditions appeared robust, face the situation in which the cash commitments remain – the repo was used for financing – but the cash inflows are reduced – higher haircuts and less collateral chains. This imbalance of cash commitments and flows creates the threat of illiquidity, which then can easily turn into insolvency. In case of a reduction of liquidity, threatened market participants would try to avoid their own illiquidity through fire sales, which is reasonable for individual market participants. But such a fire sale by one participant may spill over to other market participants, thereby creating negative externalities, which disturb the proper function of the financial markets and justify government intervention.

Therefore the repo instrument and its ability to expand credit contributes to the risk of a liquidity illusion in markets, meaning that liquidity is underpriced, thereby contributing to an underestimation of liquidity risk. (CGFS 2001: 2). According to the IMF, credit intermediation by asset managers is facing this type of liquidity illusion at the moment, as they depend on liquidity inflows, which boost one dimension of liquidity (assets can be traded cheaply), while simultaneously depth and breadth of market liquidity have deteriorated (IMF 2014: 31). The IMF notices that we seem to approach a new peak of the financial cycle and that “market and liquidity risks have increased to levels that could compromise financial stability if left unaddressed” (IMF 2014: viii).¹⁴

At this point, we now step back from the academic debate in order to carefully evaluate the impact of the current proposed regulations for the repo-market with regard to their benefits and dangers. In a more theoretical language, we investigate if the planned government interventions in the repo markets address negative externalities, which are created by the use of the repo instrument sufficiently¹⁵ so that these negative externalities no longer undermine the benefits of the repo instruments.

5. The Regulation of the Repo Markets – The FSB addresses Shadow Banking

In preparation for the Brisbane G20 Summit in November 2014, the chairman of the FSB announced that the “the job of agreeing measures to fix the fault lines that caused the crisis is now substantially complete” (FSB 2014a: 1). Thus, one is led to believe that repo-markets and their reinforcing systemic impact upon refinancing conditions are now under control. Yet, as we will try to show, the job on repo-markets remains essentially incomplete. After a short overview of the regulation by the FSB relating to the repo-market, we will try to identify shortcomings within this regulation. We then

¹⁴ For further evaluations that repo agreements reinforce crises due to their systemic impact upon refinancing conditions: ESRB Annual Report 2013, esp. p. 31; OFR Report 2013: 14).

¹⁵ This logic of justification is similar to the justification used in the Geneva Report on the World Economy: The Fundamental Principles of Financial Regulation 2009.

argue that in order to eliminate the shortcomings in the long run, a new alliance between the public at large, critical scientists, regulators and (or) authorities is needed, in order to prevent regulatory failure in this domain.

The FSB's regulatory framework for haircuts in the repo-market

In August 2013, the FSB published their “policy recommendations for addressing financial stability risks in relation to securities lending and repos” (FSB 2014b: 1). After two QISs, the FSB finalized its regulatory framework for haircuts on non-centrally cleared securities financing transaction costs in 2014. This framework consist of 1) qualitative standards for methodologies used by the market participants to calculate haircuts and 2) numerical haircut floors, which apply for non-centrally cleared securities financing transaction in which financing against collateral other than government securities is provided to non-banks (FSB 2014b: 4). Furthermore the FSB recommends 3) expanding the numerical haircut floors to non-bank-to-non-bank transactions.

1) Qualitative standards: (FSB 2014b: 4-6)

In order to “limit the potential procyclical fluctuation in haircuts” (FSB 2014b: 4), the FSB developed new qualitative standards, which shall be incorporated into regulatory standards for methodologies. Most important, the calculation tries to cover potential declines in collateral values during liquidation in case the benign market conditions change. The liquidation horizon shall be conservative, meaning that it reflects the influence of reduced liquidity, when trying to liquidate assets in a deteriorated market condition. The haircut is calibrated by using long historical data, which includes at least one stress period. Next to the fluctuation in the value of the assets, the new methodologies take into account the risk of liquidating large concentrated positions and the risk that the collateral value and the counterparty are positively correlated in case of default.

2) Numerical haircut floor: (FSB 2014b: 8-9)

The numerical haircut floors will only apply to non-centrally cleared securities financing transactions, in which financing against collateral other than government securities is provided to non-banks. Again, the regulation aims to reduce the excessive build up of leverage and thus serves as a backstop. In the table “Numerical Backstop Haircut Floors 2014”, we list these numerical haircut floors.

Table 2: Numerical Backstop Haircut Floors 2014

Residual maturity of collateral	Sovereign	Corporate and other issuers	Securitized Products
≤ 1 year debt securities and FRNs	0%	0.5%	1%
> 1 year, ≤ 5 years debt securities	0%	1.5%	4%
> 5 years debt securities	0%	3%	6%
>10 years debt securities	0%	4%	7%
Main index equities		6%	
Other equities		10%	

3) Expanding the numerical haircut floor: (FSB 2014b: 27-29)

The FSB “believes” (FSB 2014b: 27) that expanding the numerical haircut floor to non-centrally cleared secured transactions between non-bank-to-non-bank reduces the pro-cyclicality, regulatory arbitrage and maintains a level-playing field. By the end of 2016, this shall be introduced.

6. Shortcomings in the Regulation

Safe harbor

While we already mentioned that academics and government authorities share the estimation that an “orderly liquidation facility” (OFR Report 2013: 14) for securitized transactions is needed to reduce the remaining risk, the FSB has had a rather particular way of dealing with this issue: First, the FSB identified in 2012 that the “safe harbor status of repos may in fact increase systemic risk” (FSB 2012: 25). It then goes on to state that the policy proposals to deal with those issues, “while theoretically viable in addressing some financial stability issues, can involve substantial practical difficulties, particularly the need for fundamental changes in bankruptcy law, and therefore should not be prioritised for further work at this stage” (FSB 2012: 25).

Put simply, the FSB admits that the considerations and options developed to deal with this problem make sense theoretically, but points out that their implementation might be too difficult. The FSB stopped to further pursue the idea of altering the standard safe harbor clause. In the regulatory framework from 2014 the issue of safe harbor is removed from the agenda of the FSB. This defeat is an important drawback for any attempt to reduce the dangers that emanate from the repo-market to the financial system as a whole. It reflects the fact that the “moneyness” of repos (Pozsar 2014) that allows an expansion of credit in good times is highly valued by bankers and politicians alike.

Though this danger is well-known, the problem of safe harbor remains unresolved, thereby creating a risk, which posed and still poses a danger to financial stability. This point is most striking, especially because, as Víctor Constâncio points out, „without these forms [so-called bankruptcy-remote privileges for lenders secured on financial collateral] of implicit public support, the repo market would not have expanded the way it did“ (ECB 2014).

Collateral chains and Re-use

A point, which is on the agenda of the FSB, but in a very vague way, is the problem concerning the re-use of collateral in the repo-market. Currently, collateral-receivers can re-use the collateral in a transaction to a third party, thereby creating collateral chains across the market.¹⁶ Víctor Constâncio considers that these “activities of re-hypothecation and re-use of securities amplified the creation of chains of inside liquidity and higher leverage with negative consequences” (ECB 2014). He welcomes that the FSB has established a working group which takes these issues into account. Especially, because there are current signs that banks and hedge funds have problems to return collateral on time (Wiwo 2014), thereby endangering such collateral chains.

In this paper we do not argue in favor of a certain length, but we argue that a balance between collateral chains, which endanger the financial stability, and collateral chains, which support the efficiency of the market, needs to be found. An important difference is that contractual stipulations that permit the re-use of collateral contain the possibility of potentially unlimited collateral chains, as the ownership of collateral is transferred and there is no limitation on what a buyer can do with an asset. If, on the other hand, the ownership is not transferred, buyers of a repo-contract are granted the right to repledge the asset according to contractual stipulations. This opens the legal possibility of limiting the renewed use of collateral in further transactions (e.g. imposing a reduction of 10% on the collateral, each time it is repledged), thus making it possible to make collateral chains finite. In this context it is important that the G20 has tasked the FSB to “prepare its final findings on the possible harmonisation of regulatory approaches to re-hypothecation of client assets and review of possible financial stability issues related to collateral re-use” by end of 2015 (G20 2014b: 1). This means that the FSB is tasked to evaluate the systemic risks emerging from collateral chains and the possibility of limiting them, but that no decision if such limitations should be imposed has been taken yet.

¹⁶ Compare for the difference between re-use and re-hypothecation: <http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/frequently-asked-questions-on-repo/10-what-is-rehypothecation-of-collateral/>

Minimum Haircuts

Another critical point relates to the minimum numerical haircut floor to dampen the pro-cyclical effect repo-contracts have upon the financial systems.

First of all, the current proposal only applies „to non-centrally cleared securities financing transactions in which financing against collateral other than government securities is provided [by banks] to non-banks“ (FSB 2014b: 4). This scope of the framework was criticized by economist Daniela Gabor in 2013, who maintains that the scope of the measures “[only] amounts to 8.7% of the repo universe” (Gabor 2013: 17). This quote clarifies that the immediate impact of current measures will be limited. But, if the scope of regulation is expanded, they could actually alter present dynamics in the repo-market.

The FSB itself demands that the current proposal should be expanded to non-bank-to-non-bank transactions by the end of 2017, in order to avoid regulatory arbitrage opportunities (FSB 2014b: 17). Against the above, this recommendation is a step into the right direction. Though the FSB justifies its decision of excluding bank-to-bank transactions, because they are “subject to adequate capital and liquidity regulation” (FSB 2014b: 4), the question that needs to be raised is if the new liquidity regulations in the Basel Accord really do have the capacity to limit the cyclical liquidity in the repo-market? If research shows that this is not the case, an expansion of the minimum numerical haircut floor to these transactions is needed.

Next to the scope of the framework, the currently proposed minimum haircut floors seem to be too low. While the FSB proudly proclaims that “the levels of numerical haircuts floors have been raised” (FSB 2014b: 2), from what was suggested in 2013, there is still a decrease from the initial proposition in 2012 to 2014 (s. table “Numerical Backstop Haircut Floors” below, Gabor 2013).

Table 3: Numerical Backstop Haircut Floors 2012-2014

Residual of maturity collateral	2012			2013			2014		
	Sovereign	Corporate and other issuers	Securitized Products	Sovereign	Corporate and other issuers	Securitized Products	Sovereign	Corporate and other issuers	Securitized Products
≤ 1 year debt securities, and FRNs	0.25%	0.5%	1%	0%	0.5%	1%	0%	0.5%	1%
> 1 year, ≤ 5 years debt securities	1%	2%	4%	0%	1%	2%	0%	1.5%	4%
> 5 years debt securities	2%	4%	8%	0%	2%	4%	0%	3%	6%
>10 years debt securities							0%	4%	7%
Main index equities	7.5%			4%			6%		
Other equities	12.5%			7.5%			10%		

Initially, the FSB sought to compute prudent haircuts, imposing them upon the system. In the final methodology, it decided instead to impose a minimum haircut which is substantially below the calculation of “prudent haircut practices” according to Basel methodology (FSB 2014b: 24f). The important question in this respect is the pay-off from limiting volatility during the financial cycle to be achieved via minimum haircuts and easy refinancing conditions in the repo-market. The findings of the FSB pose the question why prudent haircut practices should not be chosen for the minimum haircut. This question needs to be raised, opening a debate which otherwise may be hidden under seemingly difficult technical questions.

Data

In order to provide the chance of a proper monitoring process, regulators, such as the FSB, need more data than are currently available. The deplorable state of affairs is well summed up in the following quote from the Global Shadow Banking Report 2014 of the FSB: “In advanced economies, shadow banking is likely to grow further as a result of stricter regulation on banks and their balance sheet repair efforts as well as the low interest rate environment. A thorough assessment of the effects on systemic risks is hampered by large data gaps” (FSB 2014c: 38).

This data gap also applies to the repo-market, where the current size is only estimated to be about 6 trillion in Europe (Bundesbank 2013: 65) and to be about 10 trillion in the US (*ibid.*: 70). This

shortcoming is well known and criticized also by the European Systemic Risk Board: “One of the main risks associated with SFTs relates to the opacity of data” (ESRB Annual Report 2013: 31).

Therefore, a main concern should be to overcome this shortcoming, thus pushing governments world-wide to support initiatives, which seek to produce more data. For example, as Poszar suggests, a new accounting framework needs to be created which traces, among other terms, flow of collateral. (Poszar 2014) Another initiative is to create a “global legal entity identifier system” (abbreviation: GLEIS). This initiative tries to „provide a globally unique identification of all legal entities and other organizations operating on the financial market” (Bafin 2014). The aim is to retrieve information of all market participants and their activities, information which is currently unavailable for global financial markets (*ibid.*). Having such a legal identifier will lay the foundation for closing the huge data gaps deplored by the IMF (IMF 2014) and FSB alike (FSB 2014c). However, this initiative requires substantial financing and it is important that such financing is provided, and not cut once the regulatory cycle of attention is diminishing. Furthermore, the G20 has tasked the FSB “to complete its work on the standards and processes for the global securities financing data collection and aggregation” (G20 2014b) by the end of 2015, after which “the required operational arrangements will be considered (...) with a timeline for the implementation of the data collection”, also to be provided by the end of 2015 (*ibid.*).

7. Overcoming Shortcomings in the Current Regulatory Proposals

Based upon our findings relating to the repo-market and the shortcomings of the current regulatory proposals by the FSB, we argue that the regulatory process needs support from NGOs [non-governmental organization], in order to create regulations that more fully address this market’s potential for negative externalities. Such a “new era of hybrid private-public enforcement” (Braithwaite 2008: 63) can also help to mitigate the “cyclical nature of regulatory capitalism” (Braithwaite 2008: 32), where attention to regulatory reforms is high after a crisis, but then quickly wanes. To counter the negative tendencies of this issue-attention cycle, where the attention by the public is scarce (*ibid.*: 32), NGOs, in collaboration with critical regulators and academic think tanks alike, should intervene in the regulatory process, in order to not only disclose contradictions between scientific knowledge and regulatory action, but also to heighten the awareness of these problems in the process of policy making.

This active role seems all the more necessary, as recent statements by the FSB indicate that the regulatory cycle has passed its peak with the Brisbane G20 Summit in November 2014, where the chairman of the FSB announced that the “the job of agreeing measures to fix the fault lines that caused the crisis is now substantially complete” (FSB 2014a: 1). The regulatory cycle that was started

at the height of 2008 thus seems to come to an end, while regulatory results are not yet satisfying. NGOs are needed to keep the attention high regarding these unresolved tensions. In what follows, we introduce a conception of regulatory action as a five stage process (agenda-setting, negotiation, implementation, monitoring and enforcement (abbreviation ANIME, s. Abbott and Snidal 2009: 46), asking how the public at large may intervene in each of these stages in order to create regulations that better represent its interests.

Agenda Setting

How can civil society ensure that policies undesired by industry stay on the agenda? Civil society advocates should identify critical analyses and evaluations of financial innovation by the regulatory community and hold regulators accountable, if there is a lack of action. It would be best if this was not mainly undertaken by individual NGOs; rather pooling resources and expertise seems to be a meaningful path forward. NGOs could support think tanks, financial advocacy groups, and academics, to undertake these tasks, as well as do some work themselves.

Negotiation of legislation

Regarding measures, which are under negotiation, it is important to note that the financial industry is not a hegemonic block, but, instead, often divided. Advocates for the public interest should form pro-change alliances with those parts of the financial industry which would stand to benefit from such measures. Research shows that pro-change alliances that include industry and civil society are more likely to succeed and therefore the creation of “unconventional” alliances is a tool worth considering.

Drafting rules for implementation

In the implementation phase, regulators issue “exposure drafts” and seek input from interested parties on the impact of the proposed rules on the industry and on the public interest. It is important that at this point voices of civil society and think tanks are heard, reminding the regulators of the initial goals that the legislature meant to achieve in the negotiation period, and the current shortcomings with respect to these goals.

Monitoring and Enforcement

An effective system is needed for monitoring compliance with the new rules and enforcing these rules. Put simply, we argue that the implementation without sufficient monitoring by regulators and the public can create conditions in which regulators intervene too late, because they don't have

sufficient tools for monitoring developments in financial markets and possible evasive actions. Therefore, more and better data on market developments is needed.

In summary, NGOs need to monitor the work of regulators, in order to avoid situations where scientists or regulators identify unfolding dangers but regulators leave them unresolved. The monitoring process of NGOs detects such discrepancies and seeks to problematize them, with the aim of either enforcing the law or changing it. This knowledge is the starting point of agenda-setting. NGOs should also hold regulators accountable if there is a lack of action given a diagnosed danger. Such action is needed, as we will show below for the case of the repo-market.

8. ANIME for repos

Agenda Setting – ‘Safe Harbor’

Against the backdrop of the safe harbor clause, which exempts collateral from repos from bankruptcy proceedings, the role of the NGO in the regulatory process is easily described: Using scientific insights, e.g. by Perotti (2010) and comments from government agencies, that an “orderly liquidation facility “is needed (OFR Report 2013: 14), NGOs should seek to put the issue of safe harbor back on the *agenda*, thereby refusing to accept inaction by the FSB.

Negotiation of legislation – Collateral Chains and the Scope of Minimum Haircut

The FSB will “prepare its final findings on the possible harmonisation of regulatory approaches to re-hypothecation of client assets and review of possible financial stability issues related to collateral re-use” by end of 2015 (G20 2014b: 1). NGOs should push for limitations in the capacity to repledge assets, as too long collateral chains do represent risks for the financial system.

Another point, in which NGOs could support the FSB, is the expansion of the scope of minimum haircuts. At the moment, the FSB only applies a minimum haircut floor to non-centrally cleared transactions provided by banks to non-banks and recommends applying it to non-centrally cleared transactions provided by non-banks to non-banks. A good alliance between NGOs and the financial industry in this case could be between the already regulated part of bipartite repo-transactions (in particular banks) and the NGOs, as the regulated part of the financial system suffers a competitive disadvantage as long as other parties are not covered by the regulation.

Implementation –Higher Haircuts

NGOs should request an increase in the minimum haircut floors that are currently being proposed. Initially, the FSB sought to compute prudent haircuts, imposing them upon the system. In the final methodology, it decided instead to impose a minimum haircut which is substantially below the

calculation of “prudent haircut practices” according to Basel methodology (FSB 2014b: 24f.). The important question in this respect is the pay-off from limiting volatility during the financial cycle to be achieved via minimum haircuts on the one hand, and easy refinancing conditions in the repo-market, on the other. NGOs need to ask why prudent hair-cut practices should not represent the minimum haircut, pushing requirements up again.

Monitoring – Data

In order to provide the chance of a proper monitoring process, regulators and scientists alike need more data than the ones currently available. In short, initiatives for data collection, such as GLEIS or a new accounting framework (Pozsar 2014: Flow of Collateral) should be supported by NGOs, thereby boosting the attention of the media and/or public. This would be more than useful, as it would help to establish the fundament for monitoring the repo market in general. Without the needed data, the monitoring process can be hardly done.

Enforcement – Funding for Regulation

The impact of regulation is decided by the capacity for enforcement. The proposed regulations by the FSB, and its extensions suggested in this paper, require sufficient manpower, in order to be enforced. In this process, it is remarkable that funding for regulators has not accelerated together with the amount of tasks assigned. According to its last report on enhanced supervision, the FSB states “some countries lack full budgetary independence, which hinders the ability of supervisory authorities to obtain and allocate resources according to supervisory priorities.” (FSB 2014d: 7). Based upon the Financial Sector Assessment Program by the International Monetary Fund, the FSB concludes that „significant weaknesses continue to exist, particularly with regard to official mandates, resources and independence“ (*ibid.*). Given the new tasks that are about to start, the financial resources need to be provided. Civil society should push for this aspect of financial regulation, which is less attractive in terms of public relations, but is really essential for financial regulation to work. Regulators are an important and natural ally in this respect. In the table below we summarize the different themes for intervention for Civil Society and the stage at which they currently are.

Table 4: The Role of Civil Society in the Current Regulation of Repo Markets

Action	Instrument
Agenda Setting	<i>Safe Harbor</i>
Negotiation	<i>Re-hypothecation and the Scope of Minimum Haircut</i>
Implementation	<i>Higher Haircuts</i>
Monitoring	<i>Data</i>
Enforcement	<i>Funding for Regulation</i>

References:

Adrian, Tobias; Begalle, Brian; Copeland, Adam and Antoine Martin. 2013. „Repo and Securities Lending.“ Federal Reserve Bank of New York Staff Reports.

Abbott, Kenneth and Snidal, Duncan. 2009. “The Governance Triangle: Regulatory Standards, Institutions and the Shadow of the State“, in Walter Mattli and Ngaire Woods (eds.) *In Whose Benefit? Explaining Regulatory Change in Global Politics*. Princeton University Press.

Acharya, Viral V. and Öncü, T. Sabri. 2011: “The Repurchase Agreement (Repo) Market,” in Acharya et. al. (eds.): *Regulating Wall Street: The Dodd-Frank Act and the New Architecture of Global Finance*. Hoboken, New Jersey: John Wiley and Sons.

Aldegwy, Mohamed and Thiemann, Matthias. 2015. “Understanding the Shift from Micro to Macro-Prudential Regulation: A Discourse Analysis,” in: *Die Innenwelt der Ökonomie: Wissen, Macht und Performativität in der Wirtschaftswissenschaft*. (In preparation)

Bafin. 2014: „Legal Entity Identifier: Towards a new global market infrastructure.“ Available at: http://www.bafin.de/SharedDocs/Veroeffentlichungen/EN/Fachartikel/2014/fa_bj_1408_legal_entity_identifier_%20en.html

Barth, James R.; Caprio Jr., Gerard and Levine, Ross. 2012: *Guardians of Finance: Making Regulators Work for Us*. Cambridge, MA: MIT Press.

Baker, A. 2010. “Restraining Regulatory Capture? Anglo-America, Crisis Politics and Trajectories of Change in Global Financial Governance,” *International Affairs* 86(3) 3: 647–63, May.

Buiter, W. H. 2012. “The Role of Central Banks in Financial Stability: How Has It Changed?” CEPR Discussion Paper.

Bisias et. al. 2012. “Survey of Systemic Risk Analytics“. Office of Financial Research. Available at: http://www.treasury.gov/initiatives/wsr/ofr/Documents/OFRwp0001_BisiasFloodLoValavanis_ASurveyOfSystemicRiskAnalytics.pdf

Borio, Claudio. 2012. “The financial cycle and macroeconomics: What have we learnt?” BIS Working Papers.

Braithwaite, John. 2008: *Regulatory Capitalism: How it works, ideas for making it work better*. Cheltenham, UK; Northhampton, MA, USA: Edward Elgar Publishing Ltd.

Brunnermeier, Markus. 2008. "Deciphering the Liquidity and Credit Crunch 2007-08", Cambridge: NBER Papers.

Bundesbank. 2013. Monatsbericht Dezember 2013. Available at: http://www.bundesbank.de/Redaktion/DE/Downloads/Veroeffentlichungen/Monatsberichte/2013/2013_12_monatsbericht.pdf?__blob=publicationFile

Cao, Jin 2012. *Banking Regulation and the Financial Crisis*. London and New York: Routledge.

Choudhry, Moorad. 2010. *The Repo Handbook*. Oxford: Butterworth Heinemann.

Committee on the Global Financial System (CGFS). 2001. "Structural Aspects of Market Liquidity from a Financial Stability Perspective." Available at: http://www.bis.org/publ/cgfs_note01.pdf

Culpepper, P. 2011. *Quiet Politics and Business Power- Corporate Control in Europe and Japan*. Cambridge: Cambridge University Press

Danielsson, Jon (2013): *Global Financial Systems: Stability and Risk*. Harlow: Pearson.

ECB 2014. „Beyond traditional banking: a new credit system coming out of the shadows.“ Available at: http://www.ecb.europa.eu/press/key/date/2014/html/sp141017_2.en.html

ESRB Annual Report 2013: Available at: <https://www.esrb.europa.eu/pub/pdf/ar/2013/esrbar2013en.pdf?0a9dd0eb7a408ee69971d7b75cb122f0>

FSB 2014a. "FSB Chair's Letter to G20 Leaders for the Brisbane Summit." Available at: <http://www.financialstabilityboard.org/2014/11/fsb-chairs-letter-to-g20-leaders-for-the-brisbane-summit/>

FSB 2014b. „Strengthening Oversight and Regulation of Shadow Banking: Regulatory framework for haircuts on non-centrally cleared securities financing transactions.“ Available at: http://www.financialstabilityboard.org/wp-content/uploads/r_141013a.pdf?page_moved=1

FSB 2014c. Global Shadow Banking Monitoring Report 2014. Available at: http://www.financialstabilityboard.org/wp-content/uploads/r_141030.pdf

FSB 2014d: "Supervisory Intensity and Effectiveness: Progress Report on Enhanced Supervision." Available at: http://www.financialstabilityboard.org/wp-content/uploads/r_140407.pdf?page_moved=1

FSB 2013: „Strengthening Oversight and Regulation of Shadow Banking: Policy Framework for Addressing Shadow Banking Risks in Securities Lending and Repos“. Available at: http://www.financialstabilityboard.org/wp-content/uploads/r_130829b.pdf?page_moved=1

FSB 2012. „Consultative Document: Strengthening Oversight and Regulation of Shadow Banking - A Policy Framework for Strengthening Oversight and Regulation of Shadow Banking Entities.“ Available at: http://www.financialstabilityboard.org/wp-content/uploads/r_121118a.pdf?page_moved=1

Gai, P., A. Haldane and S. Kapadia. 2011. "Complexity, concentration and contagion." *Journal of Monetary Economics* 58 (2011): 453–470.

Gabor, Daniela. 2013. „The political economy of repo markets.“ Available at: http://info.brot-fuer-die-welt.de/sites/default/files/blog-downloads/gabor_political_economy_of_repo_markets_0.pdf

Geithner, Timothy. 2014. *Stress Tests- Reflections on Financial Crises*. London: Random House

Geneva Report. 2009: Brunnermeier, Markus; Crocket, Andrew; Goodhart, Charles; Persaud, Avinash D.; Shin, Hyun. *The Fundamental Principles of Financial Regulation*, Geneva Reports on the World Economy, International Center for Monetary and Banking Studies and Centre for Economic Policy Research.

Goodhart, Charles A.E. 2009. *The Regulatory Response to the Financial Crisis*. Cheltenham, UK: Edward Elgar.

Gorton, Gary. 2010. *Slapped by the Invisible Hand: The Panic of 2007*. New York, NY: Oxford University Press, USA.

Gorton, Gary and Metrick, Andrew. 2010. "Securitized banking and the repo run." *Journal of Financial Economics*, 104 (2012), 425-451.

G20 2014a. „Policy Note Brisbane: Building financial regulation.“ Available at: <http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CDEQFjAB&url=http%3A%2F%2Fwww.g20.utoronto.ca%2F2014%2FResilience%2520policy%2520note.pdf&ei=cpOOVJq9FcT4ygOV2oKQAg&usg=AFQjCNGe6tld436JOh3As0og4hfxs6kYZQ&bvm=bv.81828268,d.bGQ>

G20 2014b. Updated G20 Roadmap towards Strengthened Oversight and Regulation Of Shadow Banking in 2015. Available at: http://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CCsQFjAB&url=http%3A%2F%2Fwww.g20.utoronto.ca%2F2014%2Fupdated_g20_roadmap_strengthened_oversight_regulation_2015.pdf&ei=04-NVOobbLYmqUaGYgagB&usg=AFQjCNHwqmc3_pFowS3HaGTAMFAW4qDGyQ&bvm=bv.81828268,d.d24

ICMA. "What is 'rehypothecation' of collateral?" Available at: <http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/frequently-asked-questions-on-repo/10-what-is-rehypothecation-of-collateral/>

ICMA. 2014. European repo market survey: number 27. Available at: <http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/repo/latest/>

IMF 2014: Global Financial Stability Report: Risk Taking, Liquidity, and Shadow Banking; Curbing Excess while Promoting Growth. Available at:

Mehrling, Perry. 2011. *The New Lombard Street: How the Fed became the Dealer of Last Resort*. Princeton and Oxford: Princeton University Press.

Nesvetailova, Anastasia: "Three Facets of Liquidity Illusion: Financial Innovation and the Credit Crunch." Department of International Politics City University London.

OFR-Report. 2013: Available at: http://www.treasury.gov/initiatives/ofr/about/Documents/OFR_AnnualReport2013_FINAL_12-17-2013_Accessible.pdf

Perotti, Enrico. 2010. "Systemic liquidity risk and bankruptcy exceptions." Centre for Economic Policy Research, Policy Insight 52.

Perotti, Enrico. 2013. "The roots of shadow banking." Centre for Economic Policy Research, Policy Insight 69.

Persaud, Avinash D. (ed.). 2003. *Liquidity Black Holes: Understanding, Quantifying and Managing Liquidity Risk*, London: Risk Books.

Pozsar, Zoltan. 2014. Shadow Banking: The Money View. Office of Financial Research Working Paper July 2nd 2014.

Schiller, Robert J. 2012. *Märkte für Menschen: So schaffen wir ein besseres Finanzsystem*. Bonn: Bundeszentrale für politische Bildung.

Singh, Manmohan. 2013. "The Changing Collateral Space." IMF Working Paper.

Singh, Manmohan and Stella, Peter. 2012. "The (other) deleveraging: What economists need to know about the modern money creation process." VOX, CEPR's Policy Portal.

Stiglitz, Joseph. 2011. *Im freien Fall: Vom Versagen der Märkte zur Neuordnung der Weltirtschaft*. München: Pantheon.

Stigum, Marcia and Crescenzi, Anthony. 2007. *Stigum's Money Market*. New York: McGraw-Hill.

Thiemann, Matthias. 2014. „In the Shadow of Basel: How Competitive Politics Bred the Crisis.“ *Review of International Political Economy* i-print.

WiWo 2014. „Repomarkt: Das Frühwarnsystem der Finanzwelt zeigt Stress an.“ Available at: <http://www.wiwo.de/finanzen/boerse/repo-markt-das-fruehwarnsystem-der-finanzwelt-zeigt-stress-an/10690560.html>

Woll, Cornelia. 2014. *The Power of Inaction: Bank Bailouts in Comparison*. Ithaca and London: Cornell University Press.