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Faculty of Business & Social Affairs
Department of Business
Foreign Trade & International Management
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Prof. Dr. Christian Decker
Prof. Dr. Michael Gille
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Topic:

**Regulation of
Shadow Banking**

By
Florian Halimi

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Abstract

The purpose of this research is to analyze and critically evaluate the regulation of the shadow banking system. The first phase of this thesis deals with the main entities and activities involved in the shadow credit intermediation chain. The thesis then analyzes the contribution of shadow banks to the 2008 financial crisis, in order to derive the main risks stemming from these entities. Proposed regulations by the Financial Stability Board serve as the foundation for further investigation concerning the assessment of potential supervision. In conclusion, this research will provide valuable information regarding proposed regulations as well as offer alternative approaches as how to deal with shadow banks and their risks.

Keywords: shadow banking, regulation, financial crisis, financial stability board, shadow credit intermediation

JEL classification: G18, G21, G23, G28

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List of abbreviations

ABCP	Asset-Backed Commercial Paper
ABS	Asset-Backed Security
AIG	American International Group
ARM	Adjustable Rate Mortgage
BCBS	Basel Committee of Banking Supervision
BIS	Bank for International Settlements
CDO	Collateralized Debt Obligation
CP	Commercial Paper
CRA	Credit Rating Agency
CRT	Credit Risk Transfer
FSB	Financial Stability Board
FSOC	Financial Stability Oversight Council
GDP	Gross Domestic Product
IOSCO	International Organization of Securities Commissions
MMMF	Money Market Mutual Fund
NAV	Net Asset Value
OTC	Over the Counter
RPF	Reserve Primary Fund
SEC	Securities and Exchange Commission
SFT	Securities Financing Transaction
SIFI	Systemically Important Financial Institution
SPV	Special Purpose Vehicle

1 Introduction

1.1 Research problem

Financial crises can have destabilizing effects on politics and negatively influence financial conditions for millions of people all over the world (Jackson, 2013, p.1). This is why economists, politicians and financial experts try to figure out how these crises can be prevented. By analyzing the latest global financial crisis, it becomes apparent that it was not only traditional banks that contributed to this crisis, but also entities that deal with nonbank credit transactions. These entities are part of the so called “shadow banking system” (European Commission, 2014, p.1).

The Financial Stability Board (FSB) defines the shadow banking system as credit intermediation involving entities and activities outside of the regular banking system (Financial Stability Board, 2014a, p.1). Shadow banks are essentially able to provide certain functions in the credit intermediation chain more cost-efficiently than traditional banks. Nevertheless, the 2008 financial crisis has shown that the shadow banking system does not only provide benefits for the economy. The risks that are associated with this system are called systemic risks, which pose significant threat to the entire financial system (Financial Stability Board, 2011b, pp.1-2).

In the course of the financial crisis, regulatory authorities decided that they needed to take action in order to prevent a crisis of similar magnitude in the future. This is why the Basel III regulatory framework was developed. However, Basel III was mainly targeting the traditional banking system, while the shadow banking sector was barely affected by these financial regulations (Rixen, 2013, p.117). During the past few years, the G20 leaders became aware of the risks inherent in the shadow banking system and eventually mandated the FSB to develop recommendations on the regulation of this sector (Financial Stability Board, 2011b, pp.1-2).

This thesis aims at determining, whether the shadow banking system should be subject to stricter regulation. The focus will lay the role of shadow banking during the financial crisis in order to describe and critically evaluate the main risks that are associated with the shadow banking industry.

1.2 Research methodology

In this thesis, the 2008 financial crisis will be used as an example of what can happen when the shadow banking system collapses. The financial crisis serves as the empirical foundation from which the main risks of the shadow banking system are derived. Potential regulation with the aim of reducing those risks will be analyzed in detail and critically reviewed incorporating assessments of different authors.

1.3 Course of investigation

Based on the research question that has been postulated in chapter 1.1, a definition of the term “shadow banking” will be given in chapter two. Additionally, this chapter includes a comparison between the shadow banking system and the traditional banking system, in order to derive differences and similarities between those two systems. This portion provides the basis for the rest of the thesis by describing all relevant entities and activities that the shadow banking system entails.

The focus of chapter three lies on the role of shadow banking during the financial crisis in 2008. In this chapter, it will be explained how the financial crisis came about, what the main drivers were, and how the crisis was accelerated by shadow banks. Special attention will be paid to the question of how the shadow banking system collapsed, and in how far its failure had consequences for the global economy.

In chapter four, risks that occurred during the financial crisis, as well as other potential risks of shadow banking, will be analyzed. These risks raise the question of whether the shadow banking system should be supervised and regulated. Moreover, this chapter also hints at specific areas that lack regulation and encompasses different approaches to reducing those risks associated with regulatory deficiencies. At the end of chapter four, a critical assessment of proposed regulations will be given.

Chapter five includes a summary of the findings, followed by a critical review of the question whether shadow banking should be regulated. Finally, an outlook with respect to the development of the shadow banking system and its supervision will be given.

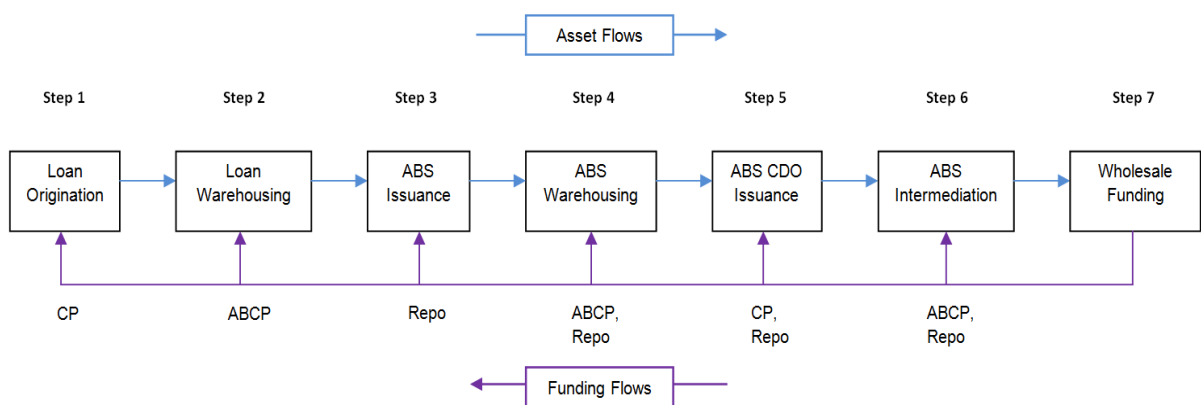
2 The Shadow Banking System

2.1 Main entities and activities of shadow banking

It is difficult to draw a clear line between regular banks and shadow banks (Luttrell et al., 2012, p.6). This is why there is a great deal of controversy about which entities and activities belong to the shadow banking system (Lysandrou et al., 2013, pp.5-6). This thesis will primarily focus on the definition given by the FSB. The FSB broadly defines the shadow banking system as “the system of credit intermediation that involves entities and activities outside the regular banking system” (Financial Stability Board, 2011b, p.1). The expression “credit intermediation” in this definition narrows down the activities of shadow banks. Credit intermediation can be described as the process of taking money from savers and lending it to borrowers. Even though it is considered to be the core activity of banks, many nonbank financial institutions make use of this function, as well (Kodres, 2013). Furthermore, the FSB focuses on “entities and activities outside the regular banking system”. This means that emphasis will be put on credit transactions that take place fully or partly outside the purview of regulatory authorities govern traditional banking transactions. (Financial Stability Board, 2011b, p.3).

There are two possibilities for how shadow banking can be conducted. In the first case, there is only one single entity that intermediates between the supplier and the borrower of funds. In the second case, multiple entities form a chain of credit intermediation (Financial Stability Board, 2011b, p.3). The following illustration depicts how a shadow credit intermediation chain may appear.

Figure 2-1: The shadow credit intermediation process



(Source: Own drawing based on Pozsar et al., 2010, p.13)

Credit intermediation in the shadow banking system is performed through a chain of nonbank financial intermediaries. The first step includes the origination of loans by finance companies (Pozsar et al., 2010, pp.11-12). A finance company is generally defined as a nondepository financial institution with the main target of extending credit to businesses and consumers. Since finance companies do not collect deposits, they are not subject to bank regulations (Carey et al., 1996, p.7). Many different types of loans can be originated by these firms, such as auto loans or mortgage loans (Pozsar et al., 2010, pp.12-13). The originator usually sells these loans to other entities. Consequently, the originator is able to remove these loans from its balance sheet, and makes use of the resulting proceeds by issuing new loans (Sabarwal, 2006, p.259).

As soon as the loans are sold to the conduit, the shadow credit intermediation process proceeds to step two, which is called “Loan Warehousing”. The process of loan warehousing is conducted by conduits (Pozsar et al., 2010, pp.12-13). Conduits are bankruptcy-remote¹ special purpose vehicles (SPVs) (Gorton et al., 2005, p.14) with the intention of buying loans, warehousing (Black et al., 2011, p.7) and repackaging them, and selling the assets as securities (Elmer, 2001, p.93). An SPV is a legal entity that is set up for a limited purpose by a sponsoring firm (Gorton et al., 2010, p.291). The sponsoring firm may be a major bank or an investment bank using the SPV to acquire specific liabilities (Bank for International Settlements, 2009, p.1). Figure 1 shows that step three includes the issuance of Asset-Backed Securities (ABSs) (Pozsar et al., 2010, pp.12-13). An ABS is a security that is created by the pooling and structuring of the aforementioned loans. The pool of underlying assets can again include different kinds of loans (Heldt, n.d.a). The cash flows of the underlying assets are sliced into various tranches with different risks, durations and other characteristics (Casu et al., 2015, p.367). The concept of tranches can be exemplified by an ABS with three different tranches. Tranches are distinguished by their seniority. Correspondingly, less senior tranches are considered to be subordinate to more senior tranches (Metzler, 2010, p.4). The most junior tranche (equity tranche) is the first tranche that begins to suffer from losses as

¹ An SPV is an entity without profits, losses, liabilities or net worth. It does not have any creditors except for the investors who buy its securities. Those investors do not have any incentive to file for bankruptcy because the SPV's only assets are those from the investors (Kothari, 2006, p.636).

soon as there are any defaults in the pool of assets. Once this tranche is exhausted (e.g. has reached a certain level of defaults in the underlying asset pool), the next tranche, called “mezzanine” tranche, begins to experience losses, and so forth (Mitchell, 2005, p.1). With regard to the cash flows, holders of the senior tranche will be repaid first, with any excess going to the mezzanine tranche and finally to the equity tranche (Metzler, 2010, pp.4-5). The following table provides an overview of the different tranches.

Table 1-1: Overview of the bond tranches

Assets	Liabilities	Waterfall	
Collateral Pool	Senior bond tranches	Cash flows ↓	Losses ↑
	Mezzanine bond tranches		
	Equity		

(Source: Jarrow, 2011, p.221)

The risks of the different tranches will be assessed by credit rating agencies² (CRAs) using widely popular rating scales (AAA “least risky”, AA, A, BBB and so forth) (Coval et al., 2008, p.3). Generally, the ABS market represents an alternative source of financing for financial businesses, as well as an investment opportunity for investors (Sabarwal, 2006, p.258). The issuance of ABS is conducted by broker-dealers (e.g. investment banks) (Pozsar et al., 2010, pp.10-12) who are focused on buying and selling securities, operating as both a broker and a dealer. When a broker-dealer company executes certain transactions on behalf of its clients, it is acting as a broker. As soon as the entity trades for its own account, it acts as a dealer in that particular transaction (Heldt, n.d.b).

² Credit rating agencies evaluate corporate as well as structured debt issues and assign them ratings with respect to their credit quality (Jarrow, 2011, p.217).

While the ABSs will be warehoused in the fourth step, the fifth step includes the pooling and structuring of these ABSs into Collateralized Debt Obligations (CDOs), which is also conducted by broker-dealers (Pozsar et al., 2010, pp.12-13). “Collateralized debt obligations are a special form of ABS in which lower-rated tranches (e.g. the BBB tranches) of several securitizations can be pooled together and again split in various ways, creating yet again tranches which may have higher ratings including AAA and AA” (Bouwman, 2015, p.209).

The sixth step of the shadow banking intermediation chain is the intermediation of ABSs which implicates maturity transformation conducted by entities such as conduits and credit hedge funds³ (Pozsar et al., 2010, p.13). Maturity transformation describes the process, in which short-term financing is used to fund long-term assets (Nakamura et al., 2013, p.68). Shadow banking entities usually make use of maturity transformation by raising funds in the short-term wholesale market with cheap short-term instruments, such as Commercial Papers (CPs). At the same time, they purchase primarily medium- and long-term assets (here: ABSs) (Lucius, 2013, p.397). CPs are sold by corporations to receive funds in order to meet short-term debt obligations. They are not backed by any corporate asset, which is why there is a high level of credit risk (Kleinhans, 2004, p.8).

Finally, the seventh step describes how the aforementioned entities and activities are being financed. The funding is conducted in wholesale funding markets (Pozsar et al., 2010, p.13). Wholesale funding is defined as the use of deposits and liabilities from financial intermediaries such as Money Market Mutual Funds (MMMFs; will be explained in chapter 3.2) (De Haan et al., 2015, p.2). These financial intermediaries fund the shadow banking system by investing in CPs, Asset-Backed Commercial Paper instruments (ABCP), short-term Repurchase Agreements (Repos) and other highly liquid securities (Pozsar et al., 2010, p.13). An ABCP is a short-term CP that is collateralized by assets. As mentioned above, conduits make money by selling securities to investors. They use the resulting proceeds in order to purchase assets. Those assets serve as collateral for the conduit’s obligations to make payments on the CP

³ Hedge funds are investment pools using a wide variety of investment techniques. They are typically organized as private partnerships that face few regulatory restrictions regarding their portfolio transactions (International Monetary Fund, 2014, p.94).

being issued (Gerding, 2014, p.406). The concept of repos includes one party that is willing to sell its securities to another party in exchange for cash, with a simultaneous agreement to repurchase the same securities on an agreed date in the future (Faulkner, 2005, pp.10-11). The total amount deposited will typically be less than the current market value of the assets used as collateral. The difference between these amounts is called “haircut”. For example, if an asset has a market value of \$100 and a bank sells it for \$80 with a repurchase agreement in the amount of \$88, the interest rate is 10% and the haircut equals 20% (Gorton et al., 2010, p.264). If the borrower defaults, the lender, who is holding the collateralized securities, is able to sell the securities on the market and obtain cash (International Capital Market Association, n.d.a). Repos are considered to be important sources of funding for nonbank entities (European Commission, 2012, p.3).

The shadow credit intermediation process puts different kinds of shadow banks into one network. In essence, the shadow credit intermediation process enables shadow banks to transform risky-, long-term loans, into seemingly credit-risk free-, short-term, money-like instruments. Not all shadow credit intermediation processes abide by these seven steps. There are credit intermediation chains that do not involve all of these seven steps, whereas other chains include even more steps. For example, one more step could be added to the intermediation chain, if ABS CDOs⁴ were repackaged again. Usually, poor quality of the underlying loans in the first step requires a longer intermediation chain in order to match the standard loan quality of MMMFs and other funds. If the quality of the underlying loans is high, the chain usually only implicates three to four steps (Pozsar et al., 2010, p.14). Aside from this, it is important to consider that even though the entities involved perform bank-like functions, this intermediation chain is not supervised by banking authorities (Kodres, 2013). All entities and activities involved in the shadow intermediation chain will be regarded as parts of the shadow banking system in the course of this thesis.

⁴ ABS CDOs are created when CDOs invest in certain securitization products (ABSs) (Park, 2012, p.1).

2.2 Shadow banking compared to traditional banking

There are two separate banking systems that need to be differentiated: The traditional depository banking system and the shadow banking system. The first system consists of entities that are obligated to have a banking charter. The second system is comprised of financial intermediaries that offer services that are similar to those offered by traditional banks, but do not have a banking charter. Both systems are governed by different legal regimes (Jackson, 2013, p.730). Legal constraints may be a major incentive for a regular bank to shift its activities from the traditional banking sector, to the sector of nonbank intermediation (International Monetary Fund, 2014, p.75). It has been observable that this shift has largely been driven by increasing gaps between capital and liquidity requirements on traditional banks and shadow banks (Adrian et al., 2012, p.54).

Beside the aspect of regulation, one of the most significant differences between traditional and shadow banking is the process of credit intermediation. Chapter 2.1 has shown that credit intermediation in the shadow banking system is divided into several steps, each carried out by specialized entities. On the contrary, the traditional banking intermediation process is conducted by one single entity (Gorton et al., 2010, pp.262-263). Adrian et al. (2013, pp.5-6) explain why the shadow banking system involves more institutions than the traditional banking system in the credit intermediation process. They argue that this tendency is largely driven by shadow banks' willingness to make use of economies of scale. It becomes evident that entities such as broker-dealers that are specialized in structuring and underwriting securities have a cost advantage in completing these tasks compared to nonbank originators. The reasons for this cost advantage are common components to structuring across issues, the need to establish relationships with investors, as well as cheap sources of funding.

Like all businesses, traditional banks fund themselves with a mixture of debt liabilities and equity. However, commercial banks are the only entities allowed to include deposits into their liabilities. Deposits can be withdrawn by depositors at any time, which leads to a high degree of liquidity advantage for bank customers. This particular aspect justifies very low interest rates on deposits,

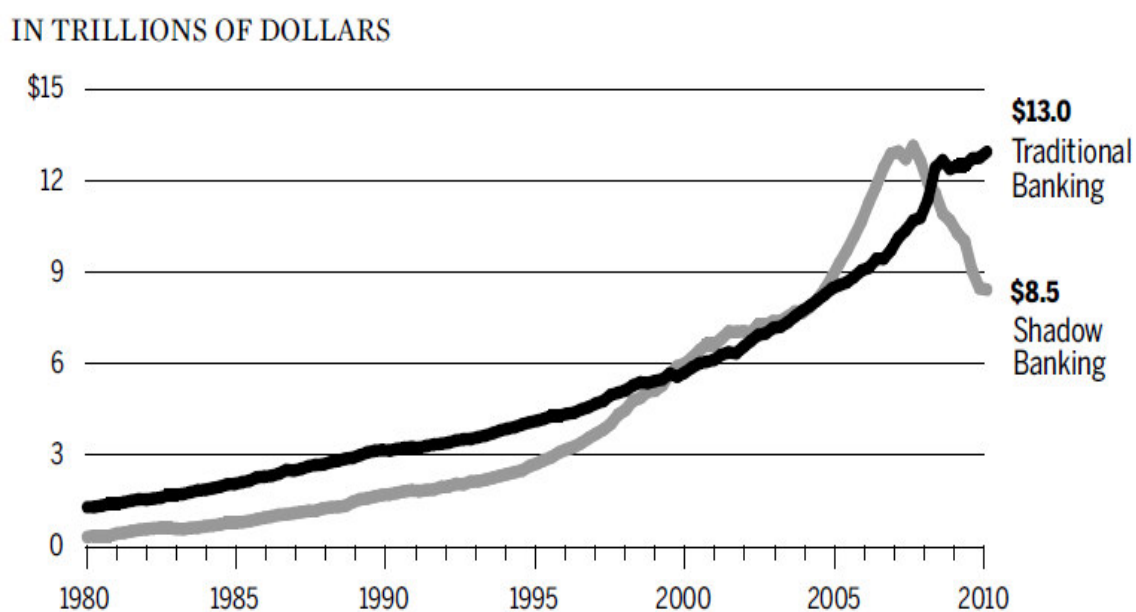
enabling banks to have access to a cheap source of funding. These deposits will be used in order to conduct maturity transformation, which means that a part of the short-term money (deposits) will be used in order to make long-term investment. This can be done due to the fact that usually only a small fraction of depositors have liquidity needs at a given time (Jackson, 2013, pp.731-732). Another important feature of traditional banks is the protection from losses that may result from the bank's inability to pay its debt when due. Every country offers implicit deposit insurance because bank crises generally put governments under pressure to rescue at least some bank stakeholders (Demirgüç-Kunt et al., 2008, p.3). That protection is applicable to the vast majority of deposits (Jackson, 2013, p.733). As mentioned in chapter 2.1, shadow banks, as opposed to traditional banks, do not make use of deposits. Instead, they heavily rely on short-term nondeposit funding instruments like repos, CP and ABCP. Since deposit insurance coverage is generally limited and nondeposit funding instruments offer higher rate of returns, institutional investors with huge capital decide in favour of the shadow banking investment opportunities. However, it is important to consider that these substitutes lack an effective deposit insurance scheme, making the shadow banking system vulnerable to contagious "bank runs" (Jackson, 2013, p.735). Bank runs occur when a large number of bank customers believe that their financial institution is, or may become, insolvent, and therefore try to withdraw their deposits all at the same time (Schöning, n.d.a). Banks runs in the shadow banking industry and their economic impact will be analyzed in detail in the course of chapter three.

The previous paragraphs outlined the main differences between the shadow and the commercial banking sector. However, the high degree of interconnectedness between these two different systems needs to be taken into consideration, as well. To begin with, regular banks are very often part of the shadow banking intermediation chain (e.g. as loan originator) or they enable shadow banking entities to access cheap financing and to conduct maturity transformation (Financial Stability Board, 2012, p.20). Furthermore, traditional banks usually invest in financial products that have been issued by shadow banking entities. Regular and shadow banks are also often exposed to common risks in the financial markets through asset holdings. Another aspect that underlines the high degree of interconnectedness is that regular banks may be

funded by entities that form part of the shadow banking system (Financial Stability Board, 2011a, pp.3-4). Traditional banks may even own some of the shadow banking entities, such as finance companies or broker-dealers. The linkages between the two systems can create risks that may impact the economy on a global scale (Financial Stability Board, 2012, p.20). The risks that may result from the interconnectedness will be further explained in chapter 3.2.

The role that the shadow banking network plays in the global economy is as important as the traditional banking credit intermediation process (Pozsar et al., 2010, p.13). This is also illustrated by the following graphic, which depicts the funding available through the traditional and the shadow banking systems.

Figure 2-2: Traditional and shadow banking systems



(Source: Financial Crisis Inquiry Commission, 2011, p.32)

It needs to be considered that the shadow banking funding includes CPs, repos, net securities loaned, liabilities of asset-backed securities issuers, and MMMF assets (Financial Crisis Inquiry Commission, 2011, p.32). Up until 2000, shadow banking was less than traditional banking. However, the nonbank financial sector surpassed or was equal to regular banking between 2000 and 2005, and then shot up to about \$13 trillion between 2007 and 2008. At that point of time, the traditional banking funding amounted to about \$10.5 trillion. After the crisis, the shadow banking system sharply decreased to \$8.5 trillion, in 2010, while traditional banking accounted for about \$13 trillion (Meyer, 2013, p.72). Gerding

makes the assumption that the repeal of the Glass-Steagall-Act⁵ in 1999 significantly facilitated the growth of the shadow banking industry (Gerding, 2014, p.435).

3 The 2008 Financial crisis

3.1 The development of the financial crisis

The financial crisis in 2008 had its origins in an increasing housing price bubble in the U.S. from mid 1990s to 2006 (Baily et al., 2008, p.7). A housing bubble is defined as a sharp increase in housing prices (Mercille, 2015, p.36). Since home prices continuously increased, many homeowners with greater equity felt more financially secure. As a result, savings were decreasing. Some homeowners went one step further, borrowing against the home equity⁶. The result was a sharp increase on household debt which rose from 80% of disposable personal income in 1993 to almost 130% by mid 2006. More than three-quarters of the increase resulted from mortgage debt linked to new home purchases as well as new debt on older houses (Financial Crisis Inquiry Commission, 2011, pp.83-84).

One of the main factors that contributed to increasing housing prices between the mid 90s and 2006 was the Federal Reserve's decision to aggressively lower short-term interest rate. This was done in order to stimulate borrowing and spending to pull the economy out of the recession in 2001. Thereby, the interest rate was cut down to 1.75%, the lowest in 40 years (Financial Crisis Inquiry Commission, 2011, p.84). Furthermore, the increase of housing prices was also driven by the expectation of individuals that future prices will increase. As housing prices were rising for a long period of time across the entire nation, U.S. citizens expected those prices to continue to increase. Another driver that helped to inflate the housing price bubble was the rise of lending to subprime borrowers (Baily et al., 2008, p.7). In the residential mortgage market, lending to subprime borrowers is characterized by relatively high credit risks, because the borrowers represent low-income and minority households. The growth of subprime lending automatically implicated a higher rate of mortgage credit

⁵ The Glass-Steagall-Act from 1932 regulated the clear distinction between commercial banking functions and investment banking functions (Schöning, n.d.b).

⁶ Borrowing against the equity of the home is a form of revolving credit in which the home serves as collateral (Government of Indiana, n.d.)

supplied to households that did not meet prime market underwriting standards (Calem et al., 2004, p.393). Subprime borrowers that have previously been excluded from the mortgage market suddenly got the opportunity to receive credit from mortgage lenders. Baily et al. point out the reasons why this was possible. First of all, lenders have created innovative Adjustable Rate Mortgages (ARMs) with low “teaser-rates”⁷ (Baily et al., 2008, p.7). An ARM is a mortgage in which the interest rate is periodically adjusted based upon the current rate of interest in the money markets. In order to protect the borrower, there may be a cap, or ceiling, above which the rate of interest is not allowed to rise (Stiastny et al., 2014, p.9). In many locations, housing prices were rising at 10 to 20 percent a year (Baily et al., 2008, p.17) and as long as this continued, borrowers were able to refinance their houses at new teaser rates and thereby keeping the mortgage payments low (Jarrow, 2011, p.215). Some lenders even let the borrowers postpone the interest payment and added it to the principal of the loan, assuming that house prices would continue to increase (Baily et al., 2008, p.7). Another factor that facilitated the growth of subprime lending was the transmission of risk. Since the originators sold these risky loans to third parties, they did not bear the risks of potential loan defaults (Jarrow, 2011, p.215).

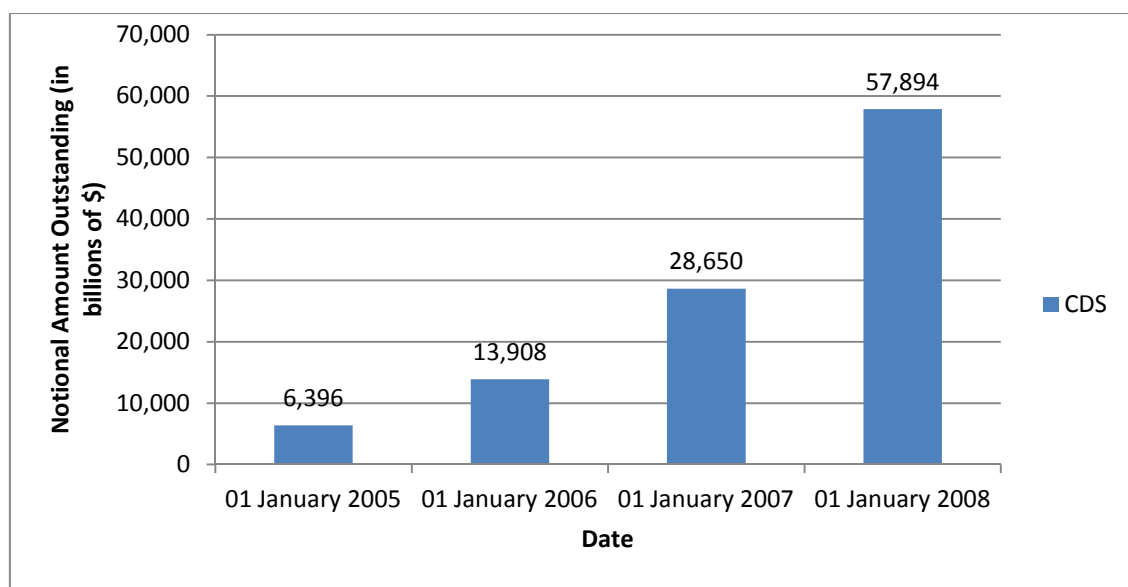
Aside from these innovations in the area of mortgage loans, there have also been other financial innovations that fostered subprime borrowing and therefore contributed to the financial crisis. These innovations were called Collateralized Debt Obligations (CDOs) (cf. chapter 2.1) as well as Credit Default Swaps (CDSs) (Baily et al., 2008, pp.7-8). In its simplest form, a CDS is one type of credit derivative (Stulz, 2009, p.2). Credit derivatives are “contingent claims with payoffs that are linked to the creditworthiness of a given firm or sovereign entity” (Longstaff et al., 2004, p.4). CDSs allow market participants to trade the risk that is associated with debt-related events. Generally, there is one party called protection buyer, who is willing to insure against the possibility of default on an issued bond⁸. The protection seller bears the risks in case the issuer of the bond defaults. A default commits the seller to purchase the bond at its face

⁷ A teaser rate describes a very low rate of interest at the beginning of a loan (Stiastny et al., 2014, p.454)

⁸ A bond represents a security issued at a fixed rate by central governments, local authorities or private companies (Hammett, 2001, p.50).

value from the protection buyer. In return for taking that risk, the seller receives a periodic fee from the buyer, which expires if the maturity date has come without a default (Longstaff et al., 2004, p.4). CDSs have the advantage that the underlying default risk of MBSs⁹ and CDOs is eliminated before they are sold to investors. Another benefit of CDSs is that they provide an enhancement of the credit rating to the issuers of MBSs and CDOs. With the help of CDSs, they are able to receive AAA ratings for their bonds, which would otherwise be considered lower-grade (Baily et al., 2008, p.32). The following diagram depicts the development of the market value of CDSs. The blue bars represent the notional amount outstanding of CDSs in the respective years.

Figure 3-1: CDS notional amount outstanding



(Source: Own drawing based on Stulz, 2010, p.80)

It becomes apparent that the notional amount outstanding of CDSs has grown rapidly from January 2005 (6,396) to January 2008 (57,894), which equals an increase of 805% within three years (Stulz, 2010, p.80). These CDS transactions have not been overseen by regulatory entities, because they took place in Over the Counter (OTC) markets. In OTC transactions, no one else except for the two parties involved knows the terms of the contract (Baily et al., 2008, p.32). The OTC derivative markets enabled participants to build up risky positions outside the purview of regulatory authorities (Tumpel-Gugerell, 2013,

⁹ Mortgage Backed Securities (MBSs) are debt obligations representing claims from pools of mortgage loans (including subprime mortgage loans) (Securities and Exchange Commission, 2010b).

pp.522-523). Moreover, it needs to be considered that there was no guarantee that in the case of a default, the seller of the CDS protection will have enough funds in order to make the full payment to the buyer (Baily et al., 2008, p.32). For example, the insurance company American International Group (AIG) was one of the major sellers of default protection in the CDS market. Its failure was primarily caused by the losses on CDS referencing subprime mortgage securitizations that came about mainly due to the multitude of defaults on subprime mortgages. As the U.S. housing market suffered from those losses, the CDS liabilities of AIG became increasingly large and eventually led to a drop in the company's rating. Drops in its rating obligated AIG to post more collateral until it could not afford to pay for the collateral anymore (Stulz, 2010, pp.80-83). The ultimate result was the bailout of AIG by the U.S. Federal government at a cost of \$182 billion (Morrison, 2015, p.130).

Another factor contributing to the development of the financial crisis have been CRAs' poor models to estimate default risks (Jarrow, 2011, p.218). For example, high ratings were incorrectly assigned to financial instruments including MBSs that contained subprime mortgages and thereby hiding the real risk of these securities (Bayar, 2014, p.51). Moreover, there is a distinctive incentive conflict because rating agencies are generally paid by the entities that issue the debt (Jarrow, 2011, p.218). Therefore, CRAs are incentivized to offer the highest ratings, instead of delivering the most accurate ones, in order to attract business (United States Senate, 2011, p.273). These are the reasons why structured debt was incorrectly rated by the CRAs prior to the crisis resulting in excess demand for subprime mortgage credit derivatives. Consequently, many investment funds were having riskier portfolios than the ratings of the bonds actually indicated. Most of these financial institutions did not possess enough capital in order to cover the losses eventually realized in their loan portfolios. This can be seen as one of the major reasons for the failure of these financial institutions (Jarrow, 2011, pp.218-219).

Generally, securitization has been considered to be a positive innovation for credit markets due to the following reasons: It lowers the costs of lending for all by distributing risks to investors and it facilitates credit extension to borrowers who otherwise would be excluded from the credit market. Nevertheless, this market has become opaque and complex towards the beginning of the financial

crisis. Highly leveraged institutions were trading technical computer models that indicated complex structures. The fact that the underlying models were rarely fully understood by the entities that traded them and the lack of public information about them triggered a massive panic in the financial system (Baily et al., 2008, p.27).

3.2 Role of shadow banking during the financial crisis

The shadow banking system played an important role in the subprime crisis (Lysandrou et al., 2013, p.3). Gorton et al. (2010, p.280) assert that the financial crisis was mainly centred in different types of short-term debt such as MMMF shares and repos. These two shadow banking short-term debt instruments and their impact on the financial crisis will be analyzed in the following.

MMMFs generally seek to maintain a net asset value (NAV) of \$1 per share which enables these mutual funds to compete against insured demand deposits. Even though they promise to pay \$1 per share, they are not explicitly insured which makes them prone to bank runs (Gorton et al., 2010, pp.269-270). MMMF investors are able to redeem their shares upon request and such withdrawals are essentially costless (Jackson, 2013, p.734). The example of the MMMF “Reserve Primary Fund” (RPF) demonstrates how MMMFs and the risk of runs on these entities played essential roles during the 2008 financial crisis. On the 15th of September in 2008, the fourth largest U.S. investment bank Lehman Brothers filed for bankruptcy (Herring et al., 2015, pp.98-99). At that point of time, RPF’s investment in Lehman’s debt securities amounted to \$785 million (Dwyer et al., 2009, p.23). Due to the failure of Lehman, many RPF shareholders were concerned about their investments and therefore simultaneously issued redemption requests. As a reaction to the run on the fund, the RPF tried to sell off their assets in order to meet the redemption requests. However, this was not possible because the credit market was barely functioning at that point. One day after Lehman’s failure, RPF was not able to pay off all the redemption requests, its value fell under \$1 per share and the fund eventually failed. Its failure triggered a panic amongst investors of every other major MMMF (Jackson, 2013, p.736). According to the Investment Company Institute, investors withdrew approximately \$300 billion from prime MMMFs during the week of September 15, 2008 (Brennan, 2009, p.62). The

collective failure of the MMMFs in turn had an impact on the rest of the financial system. MMMFs are funding financial, as well as nonfinancial corporations such as GE and Ford by buying CPs from them. As MMMFs failed, those corporations were having troubles to fund their day-to-day operations, because they could not find enough buyers for their CPs (Jackson, 2013, pp.736-737). It becomes obvious that MMMFs represent shadow banks that pose systemic risks by being vulnerable to runs. (Financial Stability Board, 2011b, p.20). Garnier et al. (2013, p.432) define systemic risk as “the risk that a large number of components of an interconnected financial system fail within a short time thus leading to the overall failure of the financial system”. The run on MMMFs could only be stopped by the U.S. government that introduced guarantees, emergency loans and capital infusions (Jackson, 2013, pp.736-737). According to former U.S. Treasury Secretary Henry Paulson, the U.S. government’s intervention was necessary in order to prevent businesses from “slash[ing] their inventories and cut[ting] back operations ... [resulting in] massive job cuts spreading throughout an already suffering economy” (Paulson, 2010, p.228, text in squared brackets are own amendments).

Equivalently, repos are not insured by the government either which means that the lender is dependent on the value of the underlying collateral. The previous chapter has already shown that subprime mortgages were often securitized prior to the crisis. The problem that resulted from the increased number of securities containing subprime mortgages was that repo depositors did not know where the risks actually were and which securitized bank would be more likely to fail. Even though a repo is collateralized, a default would mean that the lender needs to sell the asset on the market, not knowing whether he would be able to recover the collateral value (Gorton et al., 2009, pp.4-7). There was a growing uncertainty observable regarding the liquidity of the markets on which the collateral would eventually be sold (Düwel, 2013, p.5). Investors reacted by increasing haircuts (Gorton et al., 2010, p.279). The main function of haircuts on collateral is to hedge the risk that the cash resulting from the liquidation of collateral securities may turn out to be less than the quoted market value of those securities. In other words, “by applying haircuts, the quoted current market value of a security is translated into a probable future liquidation value” (Comotto, 2013, p.14). The following example describes what happened during

the crisis when investors began to increase haircuts. The example includes a bond worth \$100, completely financed in the repo market with a zero haircut. Introducing a 20% haircut on the same bond would mean that the borrower needs to finance \$20 in some other way. An increase in a repo haircut can also be regarded as a withdrawal from the issuing bank, which means that in this particular case \$20 have been withdrawn. If there is no other entity that is willing to fund the bank with new security issuance or a loan, the bank will need to sell its assets. This is what happened during the crisis when investors increased haircuts. Withdrawals in the form of increased haircuts caused deleveraging; eventually leading to a spread of the subprime crisis to other asset classes. In summary, Gorton et al. argue that the core problem of the financial crisis lied in the banking panic, structurally comparable to previous panics involving regular banks with demand deposits. Nevertheless, this crisis concerned another form of banks, namely shadow banks (Gorton et al., 2010, pp.279-280).

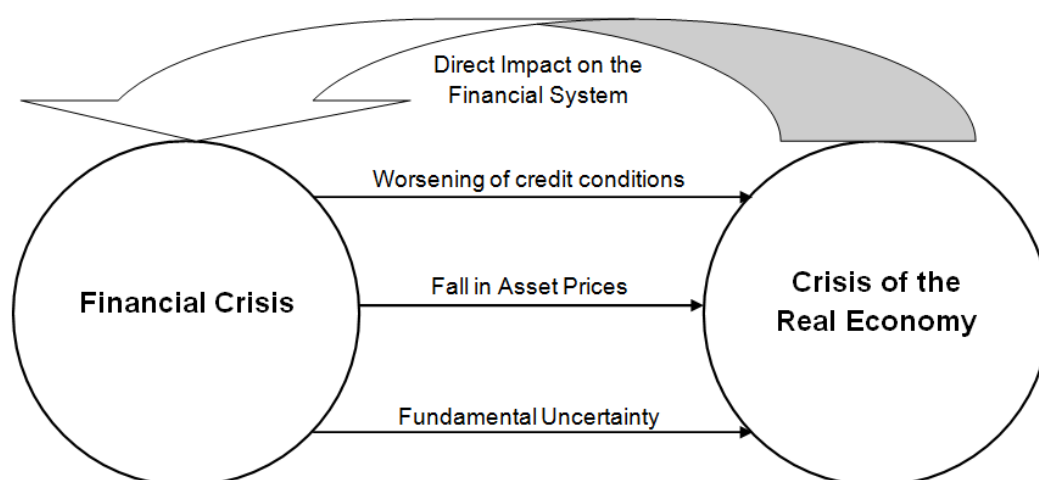
Additionally, the shadow banks' interconnectedness with the traditional banking system introduced an added level of complexity to the financial crisis (Ciro, 2012, p.85). The shadow banking industry enabled traditional banks to reduce capital requirements by taking off assets from their balance sheets. This was possible due to the process of securitization. However, the risks that were taken from banks' balance sheets did not disappear but returned to the extended banking system itself. Complex securities and associated derivatives contributed to an increase of systemic risk (Mohan, 2009, p.12). In summary, shadow banks have been responsible for transmitting large risks to conventional markets by acting as transmission channels for toxic subprime MBSs and CDOs (Ciro, 2012, p.85).

3.3 Consequences of the crisis

Financial crises can have significant implications for both the economic and the social well-being of people and countries. During the crisis between 2007 and 2009, a substantial deterioration in economic growth was globally observable. This was measured by the average gross domestic product (GDP) growth rate. Lack of demand and weak economic activity had significant impact on the labour market conditions around the world. There has been a distinctive rise in the global rate of unemployment. This phenomenon has especially been

observable in high- and upper-middle income countries in regions like North America and Western Europe (Ötoker-Robe et al., 2013, pp.3-7). In addition to that, companies were having trouble to receive credits from banks and investments needed to be cut (Boland, 2009, pp.173-174). The reduced investments have shrunken companies' profits which made the credit situation even worse. Furthermore, many companies were struggling to repay existing credits to banks (Dill et al., 2009, pp.206-207). The vicious cycle of financial and real economy crises is illustrated in figure 3-2.

Figure 3-2: Vicious cycle of financial and real economy



(Source: Own drawing based on Dill et al., 2009, p.207)

It becomes evident that the U.S. as the state of origin of the toxic subprime MBSs and CDOs had to have suffered serious economic losses from the crisis. By mid-2007, the housing market got into serious troubles. The falling prices triggered a number of consequences, especially concerning U.S. homeowners. From 2006 to the first quarter of 2009, 5.5 million foreclosures have been observed across the U.S. (Barth et al., 2010, p.97). On September 20, 2010, the National Bureau of Economic Research officially declared that the recession was over, marking the longest slump since the Great Depression¹⁰ (Rosenberg, 2012, pp.496-497). The results of the recession were a declining real estate market, a near bankrupt American automobile industry as well as many investors that had lost billions of dollars in financial assets (Fauver, 2011,

¹⁰ The Great Depression in the early 1930s was a worldwide economic crisis that was considered to be the longest and deepest of all depressions ever since (Albers et al., 2015, p.1).

pp.22-23). During the recession, 7.3 million jobs in the U.S. have been eliminated, 4.1% of economic output was cut and American citizens lost 21% of their net worth (Rosenberg, 2012, p.497).

Until this point, the focus was primarily put on the U.S. shadow banking industry and its consequences. However, one should not neglect the fact that there have been runs on European shadow banks as well. Some European MMMFs have invested in the aforementioned toxic assets from the U.S. and the investors had only little chance to determine which funds had and which have not. This made investors feel uncertain about their money, eventually leading to a run on European shadow banks as well. In the third quarter of 2007, MMMF investors in Europe withdrew €29 billion from the funds (Bengtsson, 2013, pp.4-6). In summary, McCabe states that “other money fund investors were put at risk as concerns about the funds’ vulnerabilities prompted a vicious cycle of redemptions, efforts by MM[M]Fs to sell assets, declines in prices for money market instruments, and the possibility of capital losses that motivated further redemptions” (McCabe, 2010, p.1).

Not only shadow banks but also regular banks in Europe have invested in financial products stemming from the U.S. shadow banking system. U.S. mortgage-backed securities have especially been popular during the run-up of the credit crisis. Correspondingly, many European banks were facing large subprime exposure. In Germany for example, small regional state banks like Landesbank Sachsen and WestLB were acquired or transformed into commercial banks with billions of euros guaranteed by other local banks and by their respective state governments (Goddard et al., 2009, pp.365-367). During the year of 2008, the interbank markets experienced an unprecedented surge of increased interest rates and risk premiums. Experts define the 15th of September, 2008 as the peak of the financial crisis due to the bankruptcy of the investment bank Lehman Brothers and the consequences followed by this event. After the announcement of its failure, trust towards the stability of the financial system was enormously shrinking because a bank that was generally considered as “too big to fail”¹¹ was not rescued by the U.S. government.

¹¹ The concept of “too big to fail” describes that the failure of certain firms would cause widespread disruptions in financial markets that are difficult to keep under control (Labonte, 2014, p.1).

Growing mutual distrust among financial institutions as well as a high degree of uncertainty about the riskiness of certain assets in their own and other banks' balance sheets have led to reduced bank lending to private entities worldwide (Quiring et al., 2013, pp.18-19).

4 Regulation of the shadow banking system

4.1 Risks of shadow banking

In 2011, the FSB narrowed down four key systemic risk factors of the shadow banking system in order to effectively monitor nonbank financial firms' activities. The four key risk factors are: Maturity transformation, liquidity transformation, credit risk transfer and leverage (Financial Stability Board, 2011b, pp.10-12).

Chapter 2.1 has already shown that maturity transformation is considered to be the essence of securitization. How risky maturity transformation in the shadow banking system can be, shows the example of Lehman Brothers. Lehman has heavily invested in real estate-related assets. Since the housing market started to deteriorate in 2006, there have been growing concerns in the market regarding Lehman's balance sheet. Lehman funded those long-term assets with the help of short-term loans like repos. As long as the lenders were having faith in Lehman's ability to pay them back the next day, the bank could constantly fund its operations. However, Lehman's funding eventually dried up because lenders were too concerned about the investment bank's ability to repay its debt (Kwon, 2015). The systemic effects of Lehman's failure have already been described in chapter 3.3. Similarly to maturity transformations, liquidity transformations make banks prone to runs as well and describes the issuing of liquid liabilities (e.g. repos) to finance illiquid assets (e.g. real estate-related assets) (Financial Stability Board, 2011a, p.3).

The third key systemic risk factor is the transfer of credit risk. Credit risk transfer (CRT) allows banks and other lenders to transfer risks to other entities and enables them to disperse those risks across the financial system (Bank for International Settlements, 2008, p.1). During the process of securitization, shadow banks conduct CRT by tranching cash flows from different types of loans into an equity, mezzanine and safe long-term "AAA" security (Claessens et al., 2012, p.7). One of the major problems associated with CRT positions (like

for example ABS CDO tranches) is the high degree of complexity. Only a small amount of uncertainty about expected losses creates a large amount of uncertainty regarding the valuation of the different tranches. This is what happened in mid 2007 at the beginning of the crisis. Many firms felt uncertain about the value of their positions due to their inability of developing a model that calculates expected losses and default rates for CDO tranches, leading to increased turmoil in the global financial sector (Bank for International Settlements, 2008, p.17). Another issue with respect to CRT is that in many cases entities are trying to transfer credit risks, but at the same time acquire other risks. This problem can be illustrated with the example of nonbank financial entities that insure or guarantee structured financial products (e.g. in form of CDSs). As mentioned in chapter 3.1, guarantees on structured products significantly contributed to the development of the financial crisis. Due to large losses on structured finance business, the entities that provided these guarantees or insurances have been unable to compensate for the resulting losses when due, which exacerbated the financial crisis (Financial Stability Board, 2013b, pp.9-10). When banks purchase credit protection, they transfer the original credit risk. However the original credit risk will automatically be replaced by counterparty credit risk (Financial Stability Board, 2011b, pp.11-12). The example of AIG in chapter 3.1 demonstrated the risks that this form of “imperfect CRT” implicates. Its bailout by the U.S. government was mainly motivated by the fear of systemic risk entailed by a potential default. Authorities were confronted with the issue that AIG’s default would have caused further defaults among other holders of AIG CDSs (Allen et al., 2010, p.78).

The fourth and last key risk factor that the FSB mentions is the aspect of “leverage”. During the time before the crisis between 2002 and 2005, low interest rates motivated many banks to take on more debts and thereby increased leverage (Thomas, 2011, p.80). However, traditional banks are generally subject to regulatory capital requirements. That means that there is a maximum limit of leverage for them (Plantin, 2014, p.1). Since shadow banks reside outside the purview of regulatory authorities, traditional banks make use of shadow banking entities in order to increase leverage and circumvent capital requirements (Financial Stability Board, 2011a, p.5). The biggest advantage of leverage is the opportunity to earn extraordinary profits. However, the

downsides of leverage need to be taken into consideration as well. The financial crisis revealed some of the most important risks associated with leverage. Falling housing prices and the resulting drop in value of mortgage-related securities led to a major loss of capital in both the traditional and the shadow banking systems. Highly leveraged shadow banks had to reduce assets more aggressively than less-leveraged traditional banks (Thomas, 2011, p.80). The FSB asserts that a high degree of leverage within the shadow banking system can also amplify procyclicality¹² (Financial Stability Board, 2011a, p.4). The financial crisis revealed the risks of procyclicality in the shadow banking system when shadow banks accelerated asset prices and credit prior to the crisis during surges in confidence, but then highly contributed to drops in asset prices and credit by creating credit channels that were vulnerable to sudden loss of confidence (runs) (Financial Stability Board, 2013c, p.ii).

It is not only the degree of leverage itself that poses systemic risk. Certain methods that enable leverage may contribute to uncertainty in the financial market, as well. One possible approach for shadow banks to build up leverage is to make use of rehypothecation (Financial Stability Board, 2011a, pp.3-4). Rehypothecation is defined as “a technique mainly used to make it possible for a collateral taker to take extra economic advantage of the assets taken as collateral by deploying them for other purposes” (Huang, 2010, p.64). In other words, the underlying collateral can be used in several transactions and thereby creating complex webs of counterparty links (UK Joint Committee, 2010, p.51). The example of Lehman Brothers’ failure during the financial crisis has demonstrated the risks of rehypothecation in the shadow banking industry. Over one hundred hedge funds have not been able to get the full amount of collateral back from the investment bank. Lehman could not pay back the collateral to the hedge funds because it has rehypothecated the assets to other counterparties (Aikman, 2010, pp.149-150). After Lehman’s bankruptcy, prime brokers have been demanding more cash instead of securities as collateral. This is the reason why there has been a significant decline of rehypothecation transactions from 2007 until the end of 2009 (Singh, 2010, p.116). A reduction of

¹² In the context of banking, procyclicality describes the phenomenon that a relatively high growth of banking activities can be observed during the upward phase of the economic cycle, while downturns are characterized by strong risk aversion which reduces the supply of credit (Althanasoglou et al., 2011, p.5).

rehypothecation may lead to a systemic shortage of collateral, ultimately leading to a funding problem for prime brokers (Kodachi et al., 2010, p.58). The FSB states that if clients are not well informed about the extent to which their assets have been rehypothecated, financial stability risks may increase. Another factor that makes the method of rehypothecation risky is the uncertainty about the treatment in case of resolution or bankruptcy (Financial Stability Board, 2014b, p.7).

4.2 Approaches to risk reduction

After the global financial crisis, the Basel Committee introduced new reforms that were supposed to strengthen global capital and liquidity rules with the aim of promoting a stable and well functioning financial system. Furthermore, these reforms should help to absorb shocks stemming from financial as well as economic stress and thereby protecting the real economy from the risk of spillover effects from the financial sector (Bank for International Settlements, 2010, pp.1-2). Those reforms are called “Basel III” and commit banks to hold more capital in order to increase their ability to cope with crises (Stiastny et al., 2014, p.43). Nevertheless, the reforms primarily target the traditional banking sector instead of the shadow banking sector. This may create additional incentives for regular banks to move financing to the unregulated shadow banking industry (Vento et al., 2013, p.109). This form of regulatory arbitrage¹³ has already been observed within the banking industry after the first implementation of reforms to increase banks’ minimum capital requirement (Plantin, 2014, p.2). These findings inevitably lead to the question whether the focus of regulatory measures should rather be on the shadow banking industry. The previous chapter outlined the main risks of the shadow banking system. Those risks motivated institutions and financial experts to come up with suggestions regarding the regulation of this system (Financial Stability Board, 2011b, p.1).

As mentioned before, one of these institutions is the FSB. On the 29th of August 2013, the FSB released an overview of policy recommendations concerning the shadow banking industry. Thereby, the members of the FSB worked out five proposals that are supposed to enhance the stability of the financial system.

¹³ Regulatory arbitrage generally refers to firms that take advantage of loopholes in regulatory systems in order to circumvent certain regulations (Financial Stability Board, 2011 a, p.3).

The first area of regulation deals with the mitigation of risks in regular banks' interactions with shadow banking entities (Financial Stability Board, 2013a, p.1). In order to develop policy recommendations regarding this subject, the FSB cooperated with the Basel Committee of Banking Supervision (BCBS). Recommendations with respect to this area include risk-sensitive capital requirements for banks' investments in the equity of funds (Financial Stability Board, 2014b, p.3). The calculations about the required minimum capital are supposed to involve both the risk of the fund's underlying investment and its leverage (Bank for International Settlements, 2013, p.1). Another recommendation regarding the mitigation of regular banks' interactions with shadow banks is the establishment of a supervisory framework for measuring and controlling banks' large exposures (Financial Stability Board, 2014b, p.3). This framework is supposed to protect banks from large losses that may result from the default of a single counterparty. Banks are supposed to limit the size of large exposures in relation to their capital. Their equity investments in all types of funds, including off-balance sheet exposures, should be affected by this framework (Bank for International Settlements, 2014, pp.1-2). The BCBS plans to fully implement this framework by the 1st of January 2019 (Financial Stability Board, 2014b, p.3).

The second area that is targeted by the FSB is the aspect of reducing the susceptibility of MMMFs to runs. This area of research is supported by the International Organization of Securities Commissions (IOSCO) which has published final recommendations with respect to the regulation and management of MMMFs across jurisdictions. Based upon the recommendations of the IOSCO, the Securities and Exchange Commission¹⁴ (SEC) has modified the rules that specifically govern U.S. MMMFs. The main goal was to address the risk of investor runs while at the same time preserving the typical benefits of MMMFs (Financial Stability Board, 2014b, p.4). U.S. MMMFs have been so far allowed to price and transact at a stable \$1 NAV per share by valuing their investments at amortized costs instead of market prices. However, the examples of the RPF and other MMMFs that failed during the financial crisis have shown that deviations in value do occur and put investors' money at risk. The new rules by the SEC provide that prime MMMFs with institutional investors

¹⁴ The Securities and Exchange Commission is a regulatory authority in the U.S. that is responsible for regulating and monitoring the security industry (Sellhorn, n.d.).

(the funds that experienced a run during the financial crisis) transact at a floating NAV instead of a stable NAV (Securities and Exchange Commission, 2013, pp.135-138). Selling and redeeming shares at a floating price implicates day to day fluctuations to reflect changes in the NAV of the fund's investment portfolio holdings (Fischer et al., 2011, p.1). For non-government MMMFs with retail investors, liquidity fees and redemption gates have been introduced in order to manage redemption pressures during periods of stress. Those can be triggered once the fund's weekly liquidity level falls below a designated threshold (Securities and Exchange Commission, 2013, pp.1-2).

The third topic addressed by the FSB is the target of improving transparency. The process of securitization has become increasingly opaque (cf. chapter 2.1); hiding growing amounts of leverage and maturity mismatches (Financial Stability Board, 2014b, p.5). In order to restore the confidence of investors in the security market, the IOSCO issued final policy recommendation in November 2012 (International Organization of Securities Commission, 2012, p.10). The IOSCO recommends all jurisdictions to enhance transparency and disclosure for securitization products so that investors are able to make informed investment decisions. Therefore, standardized templates for detailed reporting by asset classes are supposed to be developed in cooperation with the BCBS and regional jurisdictions. Moreover, essential information to assess a securitization product's performance, modelling tools, as well as documents and data with respect to the creditworthiness of a given securitization product should be distributed to investors (International Organization of Securities Commission, 2012, pp.48-50). The increased level of information provided to investors should also help to reduce the reliance on credit rating agencies (International Organization of Securities Commission, 2012, p.10).

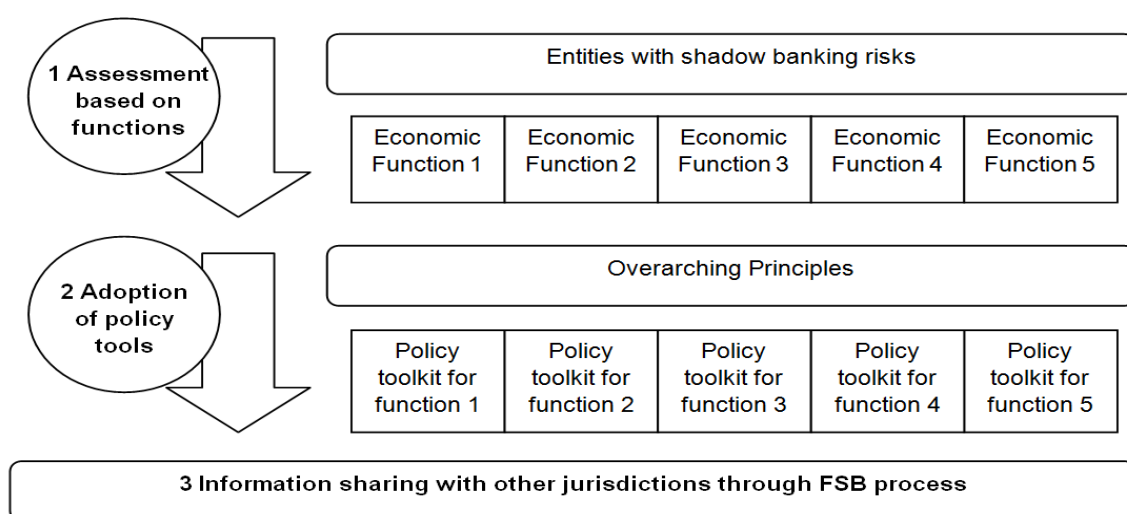
The fourth area is about dampening procyclicality and other financial stability risks in securities financing transactions (SFTs). SFTs include securities lending¹⁵ and repos, which represent central transactions for financial intermediaries' activities (Financial Stability Board, 2014b, p.5). However, these activities can also be used by shadow banking entities in order to build up

¹⁵ Securities lending is considered to be very similar to repo with differences regarding the motives of the counterparties as well as the collateral being used (International Capital Market Association, n.d.b).

excessive leverage (European Commission, 2012, p.12). In order to reduce the risks inherited in SFTs, the FSB has developed a list of policy recommendations. These recommendations include a comprehensive visibility into risky trends and developments in the securities financing markets. Augmented data collection is supposed to capture more granular and timely information on securities lending and repo exposures. Therefore, trade-level flow data for repo markets and snapshots of outstanding balances for repo and securities lending markets are supposed to be collected (Financial Stability Board, 2013c, pp.7-9). In addition to that, minimum regulatory standards for collateral valuation and management should be implemented. Participants should also be obligated to have contingency plans. These plans need to implicate a strategy for collateral management following a default of their largest counterparty and should evaluate the capabilities to properly liquidate the collateral in times of market stress (Financial Stability Board, 2013c, pp.16-17).

The fifth and last area of regulation deals with assessing and mitigating risks posed by other shadow banking entities and activities. Since shadow banking entities and activities may take diverse forms and evolve over time, the FSB has developed a three step policy framework that supports the detection and assessment of sources of financial stability risks from shadow banks (Financial Stability Board, 2014b, p.7).

Figure 4-1: Overview of policy framework for other shadow banking entities



(Source: Own drawing based on Financial Stability Board, 2013b, p.5)

In the first step, the FSB classifies other shadow banking entities with the help of economic functions. Economic functions, as an integral part of the assessment of nonbank financial entities, allow authorities to carry out valuations based on activities instead of legal forms or names. Furthermore, these functions also support the process of capturing new structures and innovations that create shadow banking risks (Financial Stability Board, 2013b, p.6). Four overarching principles give authorities a framework for the supervision of nonbank financial entities: “Authorities should define, and keep up to date, the regulatory perimeter”, “Authorities should collect information needed to assess the extent of risks posed by shadow banking”, “Authorities should enhance disclosure by other shadow banking entities as necessary as to help market participants understand the extent of shadow banking risks posed by such entities” and “Authorities should assess their nonbank financial entities based on the economic functions and take necessary actions drawing on tools from the policy toolkit” (Financial Stability Board, 2013b, pp.13-14). The appendix provides an overview of the economic functions and their respective policy toolkits. The last step of the policy framework indicates a process where the information is shared with other jurisdictions. The information shared is supposed to explain which nonbank financial entities are identified as being involved in which economic function. Furthermore, the respective authority should declare which policy tool was adopted and how (Financial Stability Board, 2013b, pp.22-23). International policy cooperation is considered to be important in order to cope with risks that endanger the global financial stability. Those risks are more likely to increase when regulations are only implemented by a few countries, because this may lead to spillovers and increased risk in others (International Monetary Fund, 2014, p.89).

4.3 Assessment of potential regulation

Despite the aforementioned risks of the shadow banking system, one should not forget the economic advantages of this system and critically evaluate the impact of regulations on shadow banks. One of the FSB proposals that has been heavily criticized was the implementation of floating NAV for institutional prime MMMFs. Experts believe that the floating NAV approach may eliminate the viability of prime MMMFs as an investment option (Fisch, 2014, p.5). The Investment Company Institute argues that “floating the NAV would undermine

MMFs' convenience and simplicity and confront investors with new accounting, tax and legal hurdles whose resolution is uncertain" (Brennan, 2009, p.107). For example, legal constraints forbid municipalities, insurance companies and other state regulated entities to invest in floating NAV funds (Brennan, 2009, p.109). The ultimate result would be a shrinking short-term credit market in the future (Fisch, 2014, p.5). Additionally, it is not certain whether a floating NAV fund is safe from runs (Witmer, 2012, p.2). Gordon et al. state that the main reasons for a run on MMMFs are investors' uncertainty about principal repayment and the dilemma of being the first to withdraw their money from the fund in order to increase the chances of full recovery. Generally, when the current redemption price is higher than the underlying NAV, withdrawals from the funds become rational. In the case of stable NAV, this may within a range of \$1 and \$0.995, but it is also true for floating NAVs. During a crisis that increases the default risk of MMMFs' assets, the NAV of the current day may lag behind and indicate a value that does not reflect the underlying NAV. Concerns about the value of the underlying assets render investors uncertain and eventually trigger a run on a floating NAV fund (Gordon et al., 2014, pp.325-327).

The proposal of introducing redemption fees and gates has also been criticized by some financial experts. The Commissioner Kara M. Stein from the SEC states that especially gates are inappropriate for addressing the risk of runs. Stein argues that, as soon as a fund approaches the threshold for the imposition of a gate, investors will have a strong incentive to redeem their investments ahead of others in order to avoid the uncertainty of losing access to their money. Moreover, gates can have negative impacts on the financial system as a whole. Once a gate is imposed in one fund, investors in other MMMFs may fear that their funds will also start to disable redemptions (Stein, 2014). Another problem pertaining gates and fees is that they are generally triggered by a decline of the fund's liquidity. Thus, they are not necessarily linked to the quality of the fund's underlying assets. For example, fees and gates could also be triggered by simultaneous withdrawals from few large investors, which means that clients do not only have to consider the soundness of the fund, but also the behaviour of their fellow investors (Fisch, 2014, p.39).

Another aspect that has been critically evaluated by experts is the FSB's general target to enhance transparency in the shadow banking system. During the annual lecture of the Bank for International Settlement (BIS) in 2014, Jaime Caruana, general manager of the BIS, addresses the problem of complexity and information failure in the shadow banking system: "We'll never come up with the silver bullet, because the shadow banking covers a large, diverse, and ever-changing set of activities" (Caruana, 2014, p.4). With the help of the "three step policy framework", the FSB tries to overcome the issue of complexity by continuously assessing sources of financial stability risks posed by shadow banks (cf. chapter 4.2). However, Schwarcz¹⁶ argues that the high degree of complexity in the shadow banking system makes it impossible for authorities to efficiently monitor its activities (Schwarcz, 2012b, p.632). It is important to consider that it is not the relevance of transparency that is put into question by Schwarcz. Instead, he asserts that the complexity of shadow banking limits its comprehensibility and this is what prevents transparent insight for investors (Schwarcz, 2013, p.6). Moreover, he states that a certain amount of information failure in the shadow banking network is inevitable due to high complexity and low transparency (Schwarcz, 2012b, p.633).

The biggest obstacle to regulating shadow banking is creating regulations that are able to specifically target systemic risks (Schwarcz, 2008, p.213). Generally, shadow banks make panic amongst market participants more likely and these types of panics increase the likelihood that systemic risk will be high. This likelihood can barely be reduced with the help of regulations because it is not possible to identify all causes of panics (Schwarcz, 2012b, p.638). Even if all causes were identified, panics would not be eliminated because investors do not always think and behave rationally (Schwarcz, 2010 p.497). Another approach would be to regulate the factors that have an impact on the growth of the shadow banking industry (Schwarcz, 2012b, p.638). The two main factors that have enabled this industry to rapidly expand over the past few decades were regulatory arbitrage and improvements in technology (Claessen et al., 2012, p.6). Enhanced technology made it possible for shadow banks to significantly reduce their costs (Duca, 2014, p.9). However, the focus of this

¹⁶ Steven L. Schwarcz is a professor of law & business at Duke University and founding director of Duke's interdisciplinary Global Capital Markets Center (Duke Law School, Steven L. Schwarcz).

thesis will lie on regulatory arbitrage. There are two possibilities as to how regulatory arbitrage can be limited: By regulating traditional banking to a lower extent or by regulating shadow banking to a higher extent. From a political perspective, it does not appear to be feasible to regulate traditional banks less (Schwarcz, 2012b, pp.638-639) and an analysis of this option would go beyond the scope of this thesis. As this paper has shown before, the trend goes towards stricter regulation of shadow banks. Nevertheless, many economists stress the importance of economic efficiency when dealing with regulatory issues (Schwarcz, 2010, p.496). In other words, “efforts to increase the regulation of shadow banks must grapple with the question of whether the regulation optimally minimizes the risk of systemic harm while preserving shadow banking’s efficiency” (Schwarcz, 2012b, p.640). Regulation entails two major risks to the efficiency of shadow banking: The loss of economic welfare caused by a decreasing number of transactions and the dynamic costs of regulation limiting innovation. Schwarcz argues that regulations negatively influence the efficiency of markets and can be counterproductive if markets naturally adjust to information that caused their failure (Schwarcz, 2008, p.209). In this context, the economic efficiency of limiting financial leverage with the help of certain capital requirements (also part of the FSB proposals as shown in the appendix) has been put into question (Schwarcz, 2012b, p.640). It needs to be considered that there is no uniform degree of leverage that is optimal for every single company. Any regulation that tries to derive the appropriate maximum amount of leverage for shadow banks would have to be highly differentiated and complex (Schwarcz, 2008, p.224). Regulations that impose the same degree of leverage on all nonbank financial institutions would have negative effects on their ability to operate efficiently and impede economic growth (Schwarcz, 2008, p.240).

Another concern with respect to the regulation of shadow banking deals with the “boundary problem”. The boundary problem describes that regulation generally puts those within the regulated sector at a disadvantage, relative to those outside. This causes substitution flows towards the unregulated (Goodhart, 2008, p.48). For example, in the United States, the Dodd-Frank Wall Street

Reform and Consumer Protection Act¹⁷ deals with the definition, supervision and resolution of Systemically Important Financial Institutions (SIFIs), which are referred to as “non-bank financial companies’ with systemic significance” (Lastra, 2011, p.210). Pursuant to § 113 (1) (a), the Financial Stability Oversight Council¹⁸ (FSOC) may determine that a SIFI should be supervised by the Federal Reserve System, if “material financial distress at the U.S. nonbank financial company, or the nature, scope, size, scale, concentration, interconnectedness, or mix of the activities of the U.S. nonbank financial company, could pose a threat to the financial stability of the United States” (Securities and Exchange Commission, 2010a, p.4173-23). In order to successfully implement regulatory controls on nonbank financial institutions that are systemically relevant, a clear definition of and different criteria for SIFIs are needed. However, once regulatory authorities produce such a definition and establish a clear boundary, institutions will start to position themselves on one side or another of that boundary, whichever may seem more advantageous (Goodhart et al., 2010, p.712). This is again creating new opportunities for regulatory arbitrage in the shadow banking system (Schwarcz, 2012b, p.640).

In his analysis about the regulation of shadow banking, Schwarcz takes a different approach regarding the way authorities should deal with the risks of shadow banks. Instead of directly regulating shadow banks, he argues that authorities should rather focus on protecting the markets against the systemic consequences that could result from shadow banking. This can be done by limiting the transmission of systemic risk resulting from this sector (Schwarcz, 2012b, p.640). This approach stems from the chaos theory which reveals that failures are almost inevitable in complex systems. Therefore, the stability of complex systems, such as the financial system, is highly dependent on the ability to limit the consequences of such failures (Schwarcz, 2009, pp.247-248). Breaking the transmission of systemic failures would mean that all transmission mechanisms need to be identified. Even though this is not possible, it would be helpful to analyze the previous financial crises and derive the main mechanisms

¹⁷ The Dodd-Frank Wall Street Reform and Consumer Protection Act was signed into federal law in 2010 and aimed at stabilizing the financial market after the 2008 financial crisis (Schöning, n.d.c).

¹⁸ The FSOC is responsible for the supervision of the stability of the U.S. financial system. The main tasks of the council are: Identifying risks with respect to the U.S. financial stability, responding to those risks and promoting market discipline (U.S. Department of the Treasury, 2013).

that occurred in the past (Schwarcz, 2012a, p.827). Moreover, Schwarcz assumes that financial markets can also be protected from systemic shocks by issuing liquidity guarantees for systemically important firms and markets as well as by privatizing the sources of these liquidity guarantees (Schwarcz, 2012b, p.641). Central banks especially have traditionally used liquidity in order to prevent financial firms from defaulting. Ensuring liquidity to stabilize systemically important shadow banks would adopt this idea. Nevertheless, there is a significant difference between these two approaches. In contrast to the solution of central banks as the lender of last resort, this alternative approach would privatize the source of liquidity by taxing the respective shadow banks to create a “systemic risk fund”. Since their own money would be at risk, these institutions would be motivated to monitor each other’s risky behaviour (Schwarcz, 2012a, pp.829-831). The Deposit Insurance Fund of the FDIC applies the same strategy. Member banks contribute to the DIF in order to protect the depositors of insured banks and to resolve failed banks (Federal Deposit Insurance Corporation, 2015). For example, if the price of securities falls below the intrinsic value of the underlying assets due to panic in the market, the market liquidity provider could provide liquidity by investing in those securities and therefore prevent the market from collapsing and from endangering other financial markets (Schwarcz, 2009, pp.248-249). Such a market liquidity provider could have restricted the scope and lessened the impact of the subprime mortgage crisis (Schwarcz, 2009, p.251).

Goodhart (2008, p.53) summarizes the general problem of regulating the shadow banking industry as follows:

“The more effective regulation is, the greater the incentive to find ways around it. With time and considerable money at stake, those within the regulatory boundary will find way around any new regulation. The obvious danger is that the resultant dialectic between the regulator and the regulated will lead to increasing complexity, as the regulated find loop-holes which the regulators then move (slowly) to close.”

Correspondingly, there are diverse reasons to believe that financial regulation will never be able to prevent crises from occurring. As the quotation above clearly outlines, it is very likely that market players will always find new regulatory gaps that enable arbitrage. Regulatory authorities will always lag behind because they can only implement corrections after the crisis has occurred (Rixen, 2013, p.117).

5 Conclusion

5.1 Summary

Shadow banks conduct core banking functions outside the purview of regulatory authorities. Thereby, a chain of credit intermediation is created that connects diverse shadow banks with each other as well as with traditional banking entities. Especially the interconnectedness between the shadow and the traditional banking system creates large potential for systemic risks.

The shadow banking system highly contributed to the development of the crisis and demonstrated how dangerous its activities can be for the world economy. Highly complex financial products were traded between entities that rarely fully understood what was behind these products. A massive panic in the financial system was triggered and eventually led to runs on shadow banks. The example of RPF has shown that it takes only few mistakes to cause extraordinary economic downturns on a global scale.

Based upon the events during the financial crisis, the FSB has defined the main risks associated with shadow banking and developed policy recommendations that are supposed enhance the oversight and regulation of shadow banking activities. The effectiveness of proposed approaches and regulations has been put into question by diverse financial experts. One alternative approach is to reduce the efforts of regulating shadow banks and instead lay the focus on reducing the impact of financial crisis by introducing a systemic risk fund.

It becomes evident that direct regulation of shadow banking will not prevent future financial crises. Past experience has shown that shadow banks are specialized in finding regulatory loopholes in the system in order to maximize profits. That does not mean that it is pointless trying to gather information and therefore increase transparency in this sector. Nevertheless, the focus of regulatory authorities should rather be on reducing the impact of financial crises. Privatizing the lender of last resort may not only discourage shadow banks from engaging in financially risky transactions, but it would also protect regular taxpayers from being held responsible for the behaviour of shadow banking entities.

5.2 Critical acclaim

This thesis mainly focuses on the definition of shadow banks given by the FSB. However, many different authors have published diverse definitions of the shadow banking system. Therefore, it may be that some entities that have been defined as shadow banks in this context may not form part of the shadow banking sector in other contexts. Another limitation of this thesis is that strong focus is put on the 2008 financial crisis in order to derive the risks of shadow banks. However, there may be new trends in the area of shadow banking nowadays that let regulatory authorities face new challenges. In addition to that, there is no evidence that the approach by Steven L. Schwarcz in chapter 4.3, namely to privatize the source of liquidity for shadow banks, actually reduces the impact of financial crises. It is very likely that the entities affected would again find regulatory gaps in order to avoid any payments to such a fund. Further investigation would be needed in order to appropriately assess the potential impact of a systemic risk fund.

5.3 Outlook

Regulatory authorities are constantly trying to restrict shadow banking entities and their activities. However, they will face the problem that the people working for these entities will always find new ways to circumvent regulations in order to exploit any opportunity in the financial marketplace. This is why it is very likely that the 2008 financial crisis was not the last one. The forthcoming financial crises will let authorities realize that trying to prevent these crises by introducing stricter regulation on shadow banking entities is not efficient. Regulatory arbitrage will create a never-ending spiral of rulemaking. Regulators will have to replace their purely unilateral regulation approaches and come up with innovative solutions. However, the successful implementation of such measures will be very complex and will take a lot of time and work.

List of references

- Adrian, Tobias; Ashcraft, Adam B.: Shadow Banking Regulation (Staff Report No: 559/2012), 2012, Federal Reserve Bank of New York, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2043153> [Accessed 19 May 2015].
- Adrian, Tobias; Ashcraft, Adam B.; Cetorelli, Nicola: Shadow Bank Monitoring (Staff Report No: 638/2013), 2013, Federal Reserve Bank of New York, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2334918> [Accessed 10 June 2015].
- Aikman, Jonathan S.: When Prime Brokers Fail: The Unheeded Risk to Hedge Funds, Banks, and the Financial Industry, Hoboken (John Wiley & Sons), 2010.
- Albers, Thilo; Uebele, Martin: The Global Impact of the Great Depression (Economic History Working Papers No: 218/2015), 2015, London School of Economics and Political Science, Available at: <<http://www.lse.ac.uk/economicHistory/workingPapers/economicHistory/home.aspx>> [Accessed 20 July 2015].
- Allen, Franklin; Yago, Glenn: Financing the Future: Market-Based Innovations for Growth, Upper Saddle River (Pearson Education, Inc.), 2010, Available at: <<https://books.google.de/books?id=pPK9Qdy1LtsC&pg=PA14&dq=Financing+the+Future&hl=de&sa=X&ved=0CDQQ6AEwA2oVChMlvO-myeT4xglViogsCh11gww#v=onepage&q=Financing%20the%20Future&f=false>> [Accessed 14 July 2015].
- Athanasoglou, Panayiotis P.; Daniilidis, Ioannis: Procyclicality in the banking industry: causes, consequences and response (Working Paper No: 139/2011), 2011, Bank of Greece, Available at: <http://www.bankofgreece.gr/Pages/en/Publications/PapersDetail.aspx?List_ID={7e6b3766-bd04-4a45-af1b-c033a426bd8b}&Item_ID=2127> [Accessed 20 July 2015].
- Baily, Martin Neil; Litan, Robert E.; Johnson, Matthew S.: The Origins of the Financial Crisis (Fixing Finance Series 3/2008), Initiative on Business and Public Policy at Brookings, 2008, Available at: <<http://www.brookings.edu/research/papers/2008/11/origins-crisis-baily-litan>> [Accessed 25 May 2015].
- Bank for International Settlements: Credit Risk Transfer – Developments from 2005 to 2007, 2008, Available at: <<http://www.bis.org/publ/joint18.htm>> [Accessed 8 July 2015].
- Bank for International Settlements: Report on Special Purpose Entities, 2009, Available at: <<http://www.bis.org/publ/joint23.htm>> [Accessed 22 May 2015].
- Bank for International Settlements: Basel III: A global regulatory framework for more resilient banks and banking systems, 2010, Available at: <<http://www.bis.org/publ/bcbs189.htm>> [Accessed 10 July 2015].
- Bank for International Settlements: Capital requirements for banks' equity investments in funds, 2013, Available at: <<http://www.bis.org/publ/bcbs266.htm>> [Accessed 6 July 2015].
- Bank for International Settlements: Supervisory framework for measuring and controlling large exposures, 2014, Available at: <<http://www.bis.org/publ/bcbs283.htm>> [Accessed 7 July 2015].
- Barth, James R. et al.: The Financial Crisis: How Did We Get Here and Where Do We Go Next? New Evidence on How the Crisis Spread Among Financial Institutions, in: Lessons from the Financial Crisis: Causes, Consequences, and Our Economic Future (Kolb, Robert W., ed.), Hoboken (John Wiley & Sons, Inc.), 2010.
- Bayar, Yilmaz: Recent Financial Crises and Regulations on the Credit Rating Agencies, in: Research in World Economy 5 (2014) 1, pp.49-58, Available at: <<http://www.sciedu.ca/journal/index.php/rwe/article/view/4334>> [Accessed 26 June 2015].
- Bengtsson, Elias: Shadow Banking and Financial Stability: European Money Market Funds in the Global Financial Crisis, in: Journal of International Money and Finance 32 (2013), pp.579-594, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1772746> [Accessed 6 July 2015].
- Black, Lamont et al.: Differences Across Originators in CMBS Loan Underwriting, Board of Governors of the Federal Reserve System, 2011, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1786755> [Accessed 17 May 2015].

- Boland, Tobias: Die Auswirkungen der Finanzkrise auf die Unternehmensfinanzierung und das Kreditvergabeverhalten deutscher Banken, in: Der Werdegang der Krise: Von der Subprime- zur Finanzkrise (Elschen, Rainer; Lieven, Theo, eds.), Wiesbaden (Gabler), 2009, Available at: <http://link.springer.com/chapter/10.1007%2F978-3-8349-8547-7_8> [Accessed 5 July 2015].
- Bouwman, Christa H.S.: Liquidity: How Banks Create It and How It Should Be Regulated, in: The Oxford Handbook of Banking (Berger, Allen N.; Molyneux, Philip; Wilson, John O.S., eds.), Oxford (Oxford University Press), 2015.
- Brennan, John J.: Report of the Money Market Working Group, 2009, Investment Company Institute, Available at: <https://www.ici.org/mmwg_resources> [Accessed 28 June 2015].
- Calem, Paul S.; Gillen, Kevin; Wachter, Susan: The Neighborhood Distribution of Subprime Mortgage Lending, in: Journal of Real Estate Finance and Economics 29 (2004) 4, pp.393-410, Available at: <<http://link.springer.com/article/10.1023%2FB%3AREAL.0000044020.67401.51>> [Accessed 19 June 2015].
- Carey, Mark; Post, Mitch; Sharpe, Steven A.: Does Corporate Lending by Banks and Finance Companies Differ? Evidence on Specialization in Private Debt Contracting, 1996, Federal Reserve Board, Available at: <https://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CCEQFjAAahUKewiuztmNtl3HAhWljwKHxNACLE&url=http%3A%2F%2Fwww.federalreserve.gov%2Fpubs%2Ffeds%2F1996%2F199625%2F199625pap.pdf&ei=sAC_Ve6xBoudsgH5gKOICw&usq=AFQjCNfjQsfUVevk-plfR5Zp5Fz7IF6Y7w> [Accessed 20 May 2015].
- Caruana, Jaime "Financial regulation, complexity and innovation", 2014, Available at: <<http://www.bis.org/speeches/sp140604.htm>> [Accessed 20 July 2015].
- Casu, Barbara; Sarkisyan, Anna: Securitization, in: The Oxford Handbook of Banking (Berger, Allen N.; Molyneux, Philip; Wilson, John O.S., eds.), Oxford (Oxford University Press), 2015.
- Ciro, Tony: The Global Financial Crisis: Triggers, Responses and Aftermath, Farnham (Ashgate Publishing Limited), 2012.
- Claessens, Stijn et al.: Shadow Banking: Economics and Policy (Standard Document Number: 12/12), 2012, International Monetary Fund, Available at: <<https://www.imf.org/external/pubs/cat/longres.aspx?sk=40132.0>> [Accessed 8 July 2015].
- Comotto, Richard: Shadow Banking – Minimum Haircuts on Collateral (IP/A/ICON/NT/2012-29), 2013, European Parliament – Economic and Scientific Policy, Available at: <http://www.europarl.europa.eu/thinktank/de/document.html?reference=IPOL-ECON_NT%282013%29507462> [Accessed 2 July 2015].
- Coval, Joshua D.; Jurek, Jakub W.; Stafford, Erik: The Economics of Structured Finance (Working Paper No: 09-060), 2008, Harvard Business School, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1287363> [Accessed 28 May 2015].
- De Haan, Leo; van den End, Jan Willem; Vermeulen, Philip: Lenders on the storm of wholesale funding shocks: Saved by the central bank? (Working Paper No: 456), De Nederlandsche Bank, 2015, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2553114> [Accessed 30 May 2015].
- Demirgüç-Kunt, Asli; Kane, Edward; Laeven, Luc: Deposit Insurance Design and Implementation: Policy Lessons from Research and Practice, in: Deposit Insurance around the World: Issues of Design and Implementation (Demirgüç-Kunt, Asli; Kane, Edward; Laeven, Luc, eds.), Washington D.C. (The World Bank), 2008.
- Dill, Arthur; Lieven, Theo: Folgen der Krise für die internationale Realwirtschaft, in: Der Werdegang der Krise: Von der Subprime- zur Finanzkrise (Elschen, Rainer; Lieven, Theo, eds.), Wiesbaden (Gabler), 2009, Available at: <https://books.google.de/books?id=BT0jBAAQBAJ&pg=PA168&dq=der+werdegang+der+finanzkrise&hl=de&sa=X&ved=0CCYQ6AEwAWoVChMII6HM7M_4xgIVRZMsCh0YawCw#v=onepage&q=der%20werdegang%20der%20finanzkrise&f=false> [Accessed 5 July 2015].
- Duca, John V.: What Drives the Shadow Banking System in the Short and Long Run? (Working Paper No: 1401), 2014, Federal Reserve Bank of Dallas, Available at: <<http://www.dallasfed.org/assets/documents/research/papers/2014/wp1401.pdf>> [Accessed 21 July 2015].

Duke Law School “Steven L. Schwarcz”, n.d., Available at: <<https://law.duke.edu/fac/schwarcz/>> [Accessed 24 July 2015].

Düwel, Cornelia: Repo funding and internal capital markets in the financial crisis (Discussion Paper No: 16/2013), 2013, Deutsche Bundesbank, Available at: <[http://www.bundesbank.de/Redaktion/EN/Downloads/Publications/Discussion_Paper_1/2013/2013_04_29_dkp_16.html?view=render\[Druckversion\]](http://www.bundesbank.de/Redaktion/EN/Downloads/Publications/Discussion_Paper_1/2013/2013_04_29_dkp_16.html?view=render[Druckversion])> [Accessed 1 July 2015].

Dwyer, Gerald P.; Paula Tkac: The Financial Crisis of 2008 in Fixed Income Markets (Working Paper No: 2009-20), 2009, Federal Reserve Bank of Atlanta, Available at: <https://www.frbatlanta.org/research/publications/wp/2009/09_20.aspx> [Accessed 24 June 2015].

Elmer, Peter J.: The Structure, Economics, and Risk of Conduits, in: Accessing Capital Markets through Securitization (Fabozzi, Frank J., ed.), New Hope (Frank J. Fabozzi Associates), 2001.

European Commission: EU Green Paper Shadow Banking, 2012, Available at: <http://ec.europa.eu/finance/general-policy/shadow-banking/index_en.htm#maincontentSec3> [Accessed 2 June 2015].

European Commission: Regulation of the European parliament and of the council on reporting and transparency of securities financing transactions, 2014, Available at: <<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014PC0040>> [Accessed 12 March 2015].

Faulkner, Mark C.: An Introduction to Securities Lending, in: Securities Finance: Securities Lending and Repurchase Agreements (Fabozzi, Frank J.; Mann, Steven V., eds.), New Jersey (John Wiley & Sons, Inc.), 2005.

Fauver, Robert C.: Crisis, Response and Innovation in America and Abroad, in: Global Financial Crisis: Global Impact and Solutions (Savona, Paolo; Kirton, John J.; Oldani, Chiara, eds.), Farnham (Ashgate Publishing Limited), 2011, Available at: <https://books.google.de/books?id=K9yhAgAAQBAJ&pg=PR4&dq=Global+Financial+Crisis:+Global+Impact+and+Solutions&hl=de&sa=X&ved=0CCKQ6AEwAGoVChMlp7bJ_tP4xgIVSQgsCh1q0gc-#v=onepage&q=Global%20Financial%20Crisis%3A%20Global%20Impact%20and%20Solution&f=false> [Accessed 5 July 2015].

Federal Deposit Insurance Corporation “The Deposit Insurance Fund”, 2015, Available at: <<https://www.fdic.gov/deposit/insurance>> [Accessed 23 July 2015].

Financial Crisis Inquiry Commission: Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States, 2011, Available at: <<http://www.gpo.gov/fdsys/pkg/GPO-FCIC/content-detail.html>> [Accessed 13 June 2015].

Financial Stability Board: Shadow Banking: Scoping the Issues, 2011a, Available at: <<http://www.financialstabilityboard.org/2011/04/shadow-banking-scoping-the-issues/>> [Accessed 12 June 2015].

Financial Stability Board: Shadow Banking: Strengthening Oversight and Regulation, 2011b, Available at: <http://www.financialstabilityboard.org/2011/10/r_1111027a/> [Accessed 9 March 2015].

Financial Stability Board: Global Shadow Banking Monitoring Report, 2012, Available at: <http://www.financialstabilityboard.org/2012/11/r_121118c/> [Accessed 12 June 2015].

Financial Stability Board: An Overview of Policy Recommendations, 2013a, Available at: <http://www.financialstabilityboard.org/2013/08/r_130829a/> [Accessed 15 July 2015].

Financial Stability Board: Policy Framework for Strengthening Oversight and Regulation of Shadow Banking Entities, 2013b, Available at: <http://www.financialstabilityboard.org/2013/08/r_130829c/> [Accessed 14 July 2015].

Financial Stability Board: Policy Framework for Addressing Shadow Banking Risks in Securities Lending and Repos, 2013c, Available at: <http://www.financialstabilityboard.org/2013/08/r_130829b/> [Accessed 15 July 2015].

Financial Stability Board: Global Shadow Banking Monitoring Report, 2014a, Available at: <<http://www.financialstabilityboard.org/2014/11/global-shadow-banking-monitoring-report-2014/>> [Accessed 13 March 2015].

Financial Stability Board: Transforming Shadow Banking into Resilient Market-Based Financing, 2014b, Available at: <<http://www.financialstabilityboard.org/2014/11/progress-report-on-transforming-shadow-banking-into-resilient-market-based-financing/>> [Accessed 11 July 2015].

Fisch, Jill E.: The Broken Buck Stops Here: Embracing Sponsor Support in Money Market Fund Reform (Working Paper No: 491), 2014, Center for Financial Studies, Available at: <<http://publikationen.uni-frankfurt.de/frontdoor/index/index/docId/35574>> [Accessed 10 July 2015].

Fischer, Jill; Roiter, Eric: A Floating NAV for Money Market Funds: Fix or Fantasy? (Research Paper No: 11-30), 2011, University of Pennsylvania Law School, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1923828> [Accessed 11 July 2015].

Garnier, Josselin; Papanicolaou, George; Yang, Tzu-Wei: Diversification in Financial Networks may Increase Systemic Risk, in: Handbook on Systemic Risk (Fouque, Jean-Pierre; Langsam, Joseph A., eds.), New York (Cambridge University Press), 2013.

Gerding, Erik F.: Law, Bubbles and Financial Regulation, Abingdon (Routledge), 2014, Available at: <<https://books.google.de/books?id=N9tJAgAAQBAJ&pg=PA2&dq=Law,+Bubbles+and+Financial+Regulations&hl=de&sa=X&ved=0CCAQ6AEwAGoVChMI7ly7h6T3xgIVSNUsCh1zweA#v=onepage&q=Law%2C%20Bubbles%20and%20Financial%20Regulations&f=false>> [Accessed 30 May 2015].

Goddard, John; Molyneux, Phil; Wilson, John O.S.: The financial crisis in Europe: evolution, policy responses and lessons for the future, in: Journal of Financial Regulation and Compliance 17 (2009) 4, pp.362-380, Available at: <<http://www.emeraldinsight.com/doi/full/10.1108/13581980911004352>> [Accessed 5 July 2015].

Goodhart, Charles: The Boundary Problem in Financial Regulation, in: National Institute Economic Review 206 (2008) 1, pp.48-55, Available at: <<http://ner.sagepub.com/content/206/1/48.abstract>> [Accessed 19 July 2015].

Goodhart, Charles; Lastra, Rosa Mariá: Border Problems, in: Journal of International Economic Law 13 (2010) 3, pp.705-718, Available at: <<http://jiel.oxfordjournals.org/content/13/3/705.full.pdf+html>> [Accessed 22 July 2015].

Gordon, Jeffrey N.; Gandia, Christopher M.: Money Market Funds Run Risk: Will Floating Net Asset Value Fix the Problem?, in: Columbia Business Law Review (2014) 2, pp.313-332, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2134995> [Accessed 17 July 2015].

Gorton, Gary; Souleles, Nicholas: Special Purpose Vehicles and Securitization (Working Paper No: 11190), 2005, National Bureau of Economic Research, Available at: <<http://www.nber.org/papers/w11190>> [Accessed 15 May 2015].

Gorton, Gary B.; Metrick, Andrew: Haircuts (Working Paper No: 15273), 2009, National Bureau of Economic Research, Available at: <<http://www.nber.org/papers/w15273>> [Accessed 1 July 2015].

Gorton, Gary; Metrick, Andrew: Regulating the Shadow Banking System, in: Brooking Papers on Economic Activity 41 (2010) 2, pp.261-312, Available at: <http://econpapers.repec.org/article/binbpeajo/v_3a41_3ay_3a2010_3ai_3a2010-02_3ap_3a261-312.htm> [Accessed 22 May 2015].

Government of Indiana "Home Equity Line of Credit", n.d., Available at: <<http://www.in.gov/dfi/2487.htm>> [Accessed 15 July 2015].

Hammett, Mike: Bond, in: Dictionary of International Trade Finance Terms (Clark, John O.E., ed.), Canterbury (Financial World Publishing), 2001, Available at: <https://www.google.de/search?q=dictionary+of+international+trade+finance+terms+editor&ie=utf-8&oe=utf8&gws_rd=cr&ei=Zbm4VaH_FlqgsAHYk7TIBw#q=dictionary+of+international+trade+finance+terms+author> [Accessed 3 July 2015].

Heldt, Cordula "Asset Backed Securities", n.d.a, Available at: <<http://wirtschaftslexikon.gabler.de/Definition/asset-backed-securities-abs.html>> [Accessed 22 May 2015].

- Heldt, Cordula "Broker", n.d.b, Available at: <http://wirtschaftslexikon.gabler.de/Definition/broker.html> [Accessed 5 June 2015].
- Herring, Richard J.; Carmassi, Jacopo: Complexity and Systemic Risk: What's Changed since the Crisis?, in: *The Oxford Handbook of Banking* (Berger, Allen N.; Molyneux, Philip; Wilson, John O.S., eds.), Oxford (Oxford University Press), 2015.
- Huang, Jiabin: *The Law and Regulation of Central Counterparties*, Oxford (Hart Publishing Ltd), 2010, Available at: <https://books.google.de/books?id=TxXcBAAAQBAJ&pg=PP1&dq=The+Law+and+Regulation+of+Central+Counterparties&hl=de&sa=X&ved=0CCMQ6AEwAGoVChMI2PGi5z4xgIVS4wsCh3lrQRq#v=onepage&q=The%20Law%20and%20Regulation%20of%20Central%20Counterparties&f=false> [Accessed 16 July 2015].
- International Capital Market Association "What is a repo", n.d.a, Available at: <http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/frequently-asked-questions-on-repo/1-what-is-a-repo/> [Accessed 2 June 2015].
- International Capital Market Association "What is the difference between repo and securities lending?", n.d.b, Available at: <http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/frequently-asked-questions-on-repo/14-what-is-the-difference-between-repo-and-securities-lending/> [Accessed 20 July 2015].
- International Monetary Fund: *Risk Taking, Liquidity and Shadow Banking: Curbing Excess While Promoting Growth*, 2014, Available at: <http://www.imf.org/external/pubs/ft/gfsr/2014/02/> [Accessed 6 June 2015].
- International Organization of Securities Commission: *Global Developments in Securitisation Regulation*, 2012, Available at: <http://centerforfinancialstability.org/wp/?p=825> [Accessed 17 July 2015].
- Jackson, Benjamin F.: *Danger Lurking in the Shadows: Why Regulators Lack the Authority to Effectively Fight Contagion in the Shadow Banking System*, in: *Harvard Law Review* 127 (2013) 2, pp.729-750, Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2437258 [Accessed 11 March 2015].
- Jarrow, Robert A.: *The Role of ABS, CDS and CDOs in the Credit Crisis and the Economy*, in: *Rethinking the Financial Crisis* (Blinder, Alan S.; Lo, Andrew W.; Solow, Robert M., eds.), New York (The Russell Sage Foundation), 2011, Available at: <https://books.google.de/books?id=jD-LAgAAQBAJ&pg=PA233&dq=rethinking+the+financial+crisis+jarrow&hl=de&sa=X&ved=0CCkQ6AEwAGoVChMI3oLliriBxwIVRLIUCH1TTwUU#v=onepage&q=the%20role%20of%20abs%20cdo&f=false> [Accessed 26 Max 2015].
- Kleinhans, Jutta: *Commercial Paper als Instrument der Unternehmensfinanzierung*, diploma thesis, Fachhochschule Aachen, 2004, Available at: <https://books.google.de/books?id=JQ58AQAQBAJ&pg=PA33&dq=Commercial+Paper+als+Instrument+der+Unternehmensfinanzierung&hl=de&sa=X&ved=0CDMQ6AEwAGoVChMIhYPdsKOxwIVA2sUCh2wsQqX#v=onepage&q=Commercial%20Paper%20als%20Instrument%20der%20Unternehmensfinanzierung&f=false> [Accessed 2 July 2015].
- Kodachi, Kei; Kamiyama, Tetsuya: *Regulatory Changes and Investment Banking: Seven Questions*, in: *After the Crash: The Future of Finance* (Fuchita, Yasuyuki; Herring, Richard J.; Litan, Robert E., eds.), Baltimore (Brookings Institution Press), 2010, Available at: <https://books.google.de/books?id=RZZvjm0vsbUC&printsec=frontcover&dq=After+the+Crash:+The+Future+of+Finance&hl=de&sa=X&ved=0CCAQ6AEwAGoVChMI-9i4vH4xgIVBn8sCh10fAVp#v=onepage&q=After%20the%20Crash%3A%20The%20Future%20of%20Finance&f=false> [Accessed 13 July 2015].
- Kodres, Laura E. "What is Shadow Banking?", 2013, Available at: <http://www.imf.org/external/pubs/ft/fandd/2013/06/basics.htm> [Accessed 15 May 2015].
- Kothari, Vinod: *Securitization: The Financial Instrument of the Future*, Singapore (Wiley & Sons (Asia) Pte Ltd), 2006, Available at: <https://books.google.de/books?id=Vy00CVy5SS8C&printsec=frontcover&dq=Securitization:+The+Financial+Instrument+of+the+Future&hl=de&sa=X&ved=0CCMQ6AEwAGoVChMlifi-z7X7xgIVaf9yCh0FqgCh#v=onepage&q=Securitization%3A%20The%20Financial%20Instrument%20of%20the%20Future&f=false> [Accessed 2 June 2015].

Kwon, Yong Jin “How To Eat an Elephant: Corporate Group Structure of Systemically Important Financial Institutions, Orderly Liquidation Authority, and Single Point of Entry Resolution, 2015, Available at: <<http://www.yalelawjournal.org/note/orderly-liquidation-authority-and-single-point-of-entry-resolution>> [Accessed 17 July 2015].

Labonte, Marc: Systemically Important or “Too Big to Fail” Financial Institutions, 2014, Available at: <http://digitalcommons.ilr.cornell.edu/key_workplace/1328/> [Accessed 20 July 2015].

Lastra, Rosa Mariá: Systemic risk, SIFIs and financial stability, in: *Capital Markets Law Journal* 6 (2011) 2, pp.197-213, Available at: <<http://cmlj.oxfordjournals.org/content/6/2/197.extract>> [Accessed 22 July 2015].

Longstaff, Francis A.; Sanjay, Mithal; Neis, Eric: Corporate Yield Spreads: Default Risk or Liquidity? New Evidence from the Credit-Default Swap Market (Working Paper No: 10418), 2004, National Bureau of Economic Research, Available at: <<http://www.nber.org/papers/w10418>> [Accessed 23 June 2015].

Lucius, Otto: Regulation of Banks and the “Level Playing Field” – The Case of Shadow Banking, in: *Stability of the Financial System: Illusion or Feasible Concept?* (Dombret, Andreas; Lucius, Otto, eds.), Cheltenham (Edward Elgar Publishing Limited), 2013.

Luttrell, David; Rosenblum, Harvey; Jackson, Thies: Understanding the Risks Inherent in Shadow Banking: A Primer and Practical Lessons Learned (Staff Paper No: 18), 2012, Federal Reserve Bank of Dallas, Available at: <<https://www.econbiz.de/Record/understanding-the-risks-inherent-in-shadow-banking-a-primer-and-practical-lessons-learned-luttrell-david/10010245706>> [Accessed 2 June 2015].

Lysandrou, Photis; Nesvetailova, Anastasia: The Shadow Banking System and the Financial Crisis: A securities production function view (Working Paper No: 5), 2013, FESSUD, Available at: <<http://freepdfs.net/the-shadow-banking-system-and-the-financial-crisis-fessud/d6f44c103184747d19d4389f4771ba32/>> [Accessed 15 May 2015].

McCabe, Patrick: The Cross Section of Money Market Fund Risks and Financial Crises (Staff Working Paper No: 2010-51), 2010, Board of Governors of the Federal Reserve System, Available at: <<http://www.federalreserve.gov/pubs/feds/2010/201051/201051abs.html>> [Accessed 6 July 2015].

Mercille, Julien: The Political Economy and Media Coverage of the European Economic Crisis, Abingdon (Routledge), 2015, Available at: <<https://books.google.de/books?id=06heBAAQBAJ&pg=PA36&dq=housing+bubble+definition&hl=de&sa=X&ved=0CDwQ6AEwBGoVChMI5cuil9-DxwIVgQ4sCh0fOgAl#v=onepage&q=housing%20bubble%20definition&f=false>> [Accessed 12 June 2015].

Metzler, Adam: Model Risk and the Design of CDO Tranches, 2010, The University of Western Ontario, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1662660> [Accessed 26 May 2015].

Meyer, Annette: An IOU: Domestic/External/International Debt, Pittsburgh (Dorrance Publishing Co., Inc.), 2013, Available at: <https://books.google.de/books?id=sidwFxx3EIEC&pg=PA160&dq=An+IOU:+Domestic/external/international+Debt&hl=de&sa=X&ved=0CCMQ6AEwAGoVChMI0fTclrf3xgIVAW4UCh0_NAT8#v=onepage&q=An%20IOU%3A%20Domestic%2Fexternal%2Finternational%20Debt&f=false> [Accessed 15 June 2015].

Mitchell, Janet: Financial Intermediation Theory and Implications for the Sources of Value in Structured Finance Markets (Working Paper No: 71), 2005, The National Bank of Belgium, Available at: <<http://aei.pitt.edu/5738/>> [Accessed 26 May 2015].

Mohan, Rakesh: Emerging Contours of Financial Regulation: Challenges and Dynamics, 2009, Reserve Bank of India, Available at: <<https://www.econbiz.de/Record/emerging-contours-of-financial-regulation-challenges-and-dynamics-mohan-rakesh/10004999081>> [Accessed 1 July 2015].

Morrison, Alan D.: Universal Banking, in: *The Oxford Handbook of Banking* (Berger, Allen N.; Molyneux, Philip; Wilson, John O.S., eds.), Oxford (Oxford University Press), 2015.

- Nakamura, Alice O.; Nakamura, Leonard I.; Nakamura Masao: Building the innovation union: lessons from the 2008 financial crisis, in: *The Innovation Union in Europe: A Socio-Economic Perspective on EU Integration* (Carayannis, Elyas G.; Korres, George M., eds.), Cheltenham (Edward Elgar Publishing Limited), 2013.
- Ötoker-Robe, Inci; Podpiera, Anca Maria: *The Social Impact of Financial Crises – Evidence from the Global Financial Crisis* (Working Paper No: 6703), 2013, The World Bank, Available at: <http://econ.worldbank.org/external/default/main?pagePK=64210502&theSitePK=469372&piPK=64210520&menuPK=64166093&entityID=000158349_20131114113429> [Accessed 3 July 2015].
- Park, Sun Young: *Anatomy of ABS CDO: why do ABS CDOs Exist?*, 2012, Korea Advanced Institute of Science and Technology (KAIST), Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2246092> [Accessed 2 June 2015].
- Paulson, Henry M.: *On the Brink: Inside the Race to Stop the Collapse of the Global Financial System*, London (Headline Publishing Group), 2010.
- Plantin, Guillaume: *Shadow Banking and Bank Capital Regulation*, 2014, Toulouse School of Economics and CEPR, Available at: <https://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCcQFjAAahUK Ewjx1d2RjI7HAhXCuRQKHU43CRY&url=http%3A%2F%2Fwww.gplantin.net%2FShadowBankingAndBankCapital.pdf&ei=__y_VbHaNclZUs7upLAB&usg=AFQjCNHa1o_BnGaE_LN1asTkqjprXOsiSw&bvm=bv.99261572,d.d24&cad=rja> [Accessed 14 July 2015].
- Pozsar et al.: *Shadow Banking* (Staff Report No: 458), 2010, Federal Reserve Bank of New York, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1645337> [Accessed 13 May 2015].
- Quiring, Oliver et al.: *Lehman Brothers und die Folgen: Berichterstattung zu wirtschaftlichen Interventionen des Staates*, Wiesbaden (Springer), 2013, Available at: <<https://books.google.de/books?id=dUcfBAAQBAJ&printsec=frontcover&dq=Lehman+Brothers+und+die+Folgen&hl=de&sa=X&ved=0CCAQ6AEwAGoVChMI8vOB4IOOxwIVCV0UCh2VnQG6#v=onepage&q=Lehman%20Brothers%20und%20die%20Folgen&f=false>> [Accessed 6 July 2015].
- Rixen, Thomas: *Offshore Financial Centres, Shadow Banking and Jurisdictional Competition: Incrementalism and Feeble Re-regulation*, in: *Great Expectations, Slow Transformation: Incremental Change in Financial Governance* (Moschella, Manuela; Tsingou, Eleni, eds.), Colchester (ECPR Press), 2013, Available at: <<https://books.google.de/books?id=xoiCBAAQBAJ&pg=PA57&dq=Great+Expectations,+Slow+Transformation:+Incremental+Change+in+Financial+Governance&hl=de&sa=X&ved=0CCAQ6AEwAGoVChMI6paksab5xgIVRYcsCh0AwQe0#v=onepage&q=Great%20Expectations%2C%20Slow%20Transformation%3A%20Incremental%20Change%20in%20Financial%20Governance&f=false>> [Accessed 23 July 2015].
- Rosenberg, Jerry M.: *Recession of 2007-2012*, in: *The Concise Encyclopedia of the Great Recession 2007-2012* (Graff, Bennett, ed.), Plymouth (Scarecrow Press, Inc.), 2012.
- Sabarwal, Tarun: *Common Structures of Asset-Backed Securities and Their Risks*, in: *Corporate Ownership and Control* 4 (2006) 1, pp.258-265, Available at: <https://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCkQFjAAahUK Ewi7g7u854XHAhViv3IKHen5C6w&url=http%3A%2F%2Fpeople.ku.edu%2F~sabarwal%2Fsabarwal_abs_published.pdf&ei=z6S7VfvfHOL-ygPp86_gCg&usg=AFQjCNGbHrjx8SHX2KcwdjAamdGru9qYTww&bvm=bv.99261572,d.bGQ> [Accessed 15 May 2015].
- Schöning, Stephan “Bank Run”, n.d.a, Available at: <<http://wirtschaftslexikon.gabler.de/Definition/bank-run.html>> [Accessed 17 July 2015].
- Schöning, Stephan “Commercial Bank”, n.d.b, Available at: <<http://wirtschaftslexikon.gabler.de/Definition/commercial-bank.html>> [Accessed 13 July 2015].
- Schöning, Stephan “Dodd-Frank Act”, n.d.c, Available at: <<http://wirtschaftslexikon.gabler.de/Definition/dodd-frank-act.html>> [Accessed 24 July 2015].
- Schwarcz, Steven L.: *Systemic Risk*, in: *The Georgetown Law Journal* 97 (2008) 1, pp.193-249, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1008326> [Accessed 18 July 2015].

- Schwarcz, Steven L.: Regulating Complexity in Financial Markets, in: Washington University Law Review 87 (2009) 2, pp.211-268, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1240863> [Accessed 17 July 2015].
- Schwarcz, Steven L.: Systemic Risks and Markets, in: Lessons from the Financial Crisis: Causes, Consequences, and Our Economic Future (Kolb, Robert W., ed.), New Jersey (John Wiley & Sons, Inc.), 2010.
- Schwarcz, Steven L.: Controlling Financial Chaos, in: Wisconsin Law Review 3 (2012a), pp.815-840, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2016434> [Accessed 19 July 2015].
- Schwarcz, Steven L.: Regulating Shadow Banking, in: Review of Banking and Financial Law 31 (2012b) 1, pp.619-642, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1993185> [Accessed 17 July 2015].
- Schwarcz, Steven L.: Shadow Banking, Financial Risk, and Regulation in China and Other Developing Countries (Working Paper No: 2013/83), 2013, University of Oxford, Available at: <<http://www.globaleconomicgovernance.org/geg-wp-201383-shadow-banking-china-and-other-developing-countries>> [Accessed 18 July 2015].
- Securities and Exchange Commission: Dodd-Frank Wall Street Reform and Consumer Protection Act, 2010a, Available at: <<http://secsearch.sec.gov/search?utf8=%E2%9C%93&affiliate=secsearch&query=wall+street+reform>> [Accessed 22 July 2015].
- Securities and Exchange Commission “Mortgage-Backed Securities”, 2010b, Available at: <<http://www.sec.gov/answers/mortgagesecurities.htm>> [Accessed 15 July 2015].
- Securities and Exchange Commission: Money Market Fund Reform, 2013, Available at: <<http://www.sec.gov/News/PressRelease/Detail/PressRelease/1370542347679>> [Accessed 24 June 2015].
- Sellhorn, Thorsten “SEC”, n.d., Available at: <<http://wirtschaftslexikon.gabler.de/Definition/sec.html>> [Accessed 20 July 2015].
- Singh, Manmohan: Under-collateralisation and rehypothecation in the OTC derivatives markets (Review 14), 2010, Banque de France, Available at: <<http://www.istein.org/e-library/browse-by-sources/item/9312-under-collateralisation-and-rehypothecation-in-the-otc-derivatives-markets.html>> [Accessed 16 July 2015].
- Stein, Kara M “Statement of Commissioner Kara M. Stein“, 2014, Available at: <<http://www.sec.gov/News/PublicStmnt/Detail/PublicStmnt/1370542553868>> [Accessed 20 July 2015].
- Stiastny, Terry; Williams, G. A.: Bankruptcy Law and Mortgage Law, in: A dictionary of Finance and Banking (Law, Jonathan, ed.), Oxford (Oxford University Press), 2014, Available at: <<https://books.google.de/books?id=9ho2BQAAQBAJ&printsec=frontcover&dq=oxford+finance+and+banking&hl=de&sa=X&ved=0CCAQ6AEwAGoVChMly8LYIJeAxwIVRQksCh1sjAGG#v=onepage&q&f=false>> [Accessed 24 June 2015].
- Stulz, René M.: Credit Default Swaps and the Credit Crisis (Working Paper No: 15384), 2009, National Bureau of Economic Research, Available at: <<http://www.nber.org/papers/w15384>> [Accessed 22 June 2015].
- Stulz, René M.: Credit Default Swaps and the Credit Crisis, in: Journal of Economic Perspectives 24 (2010) 1, pp.73-92, Available at: <<https://www.aeaweb.org/articles.php?doi=10.1257/jep.24.1.73>> [Accessed 23 June 2015].
- Thomas, Lloyd B.: The Financial Crisis and Federal Reserve Policy, New York (Palgrave Macmillan), 2011, Available at: <<https://books.google.de/books?id=dVPJAAAAQBAJ&pg=PA257&dq=The+Financial+Crisis+and+Federal+Reserve+Policy&hl=de&sa=X&ved=0CDEQ6AEwAWoVChMluYfLjOb4xgIVxNwsCh1CxQom#v=onepage&q=The%20Financial%20Crisis%20and%20Federal%20Reserve%20Policy&f=false>> [Accessed 14 July 2015].
- Tumpel-Gugerell, Gertrude: Lender of Last Resort – Which Institution Could Best Fulfil this Function?, in: Stability of the Financial System: Illusion or Feasible Concept? (Dombret, Andreas; Lucius, Otto, eds.), Cheltenham (Edward Elgar Publishing Limited), 2013.

U.S. Department of the Treasury “Financial Stability Oversight Council”, 2013, Available at: <<http://www.treasury.gov/initiatives/fsoc/Pages/home.aspx>> [Accessed 24 July 2015].

UK Joint Committee: Financial Services Bill, 2010, Available at: <<http://www.parliament.uk/business/committees/committees-a-z/joint-select/draft-financial-services-bill/publications/>> [Accessed 16 July 2015].

United States Senate: Wall Street and the Financial Crisis: Anatomy of a Financial Collapse, 2011, Available at: <<http://www.documentcloud.org/documents/360204-psi-report-wall-street-amp-the-financial-crisis.html>> [Accessed 27 June 2015].

Vento, Gianfranco A.; La Ganga, Pasquale: Shadow Banking and Systemic Risk: In Search of Regulatory Solutions, in: Crisis, Risk and Stability in Financial Markets (de Guevara Radoselovics, Juan Fernández; Pastor Monsálvez, José Manuel, eds.), New York (Palgrave Macmillan), 2013.

Witmer, Jonathan: Does the Buck Stop Here? A Comparison of Withdrawals from Money Market Mutual Funds with Floating and Constant Share Prices (Working Paper No: 2012-25), 2012, Bank of Canada, Available at: <<http://www.bankofcanada.ca/2012/08/working-paper-2012-25/>> [Accessed 19 July 2015].

Appendix

Table A: Overview of the economic functions and the policy toolkits

Economic Function	Policy Toolkit
Management of collective investment vehicles with features that make them susceptible to runs	<ul style="list-style-type: none"> -Tools for managing redemption pressure (e.g. suspension of redemption) -Tools to manage liquidity risk (limits on investment in illiquid assets, liquidity buffers, Limits on asset concentration, limits on leverage, restriction on maturity of portfolio assets)
Loan provision that is dependent on short-term funding	<ul style="list-style-type: none"> -Bank prudential regulatory regimes on deposit-taking nonbank loan provider -Liquidity buffer -Leverage limits -Limits on large exposures
Intermediation of market activities that is dependent on short-term funding or on secured funding of client assets	<ul style="list-style-type: none"> -Liquidity requirements -Capital requirements -Restrictions on use of client assets
Facilitation of credit creation	<ul style="list-style-type: none"> -Restrictions on scale and scope of business -Liquidity buffers -Enhanced risk management practices -Mandatory risk-sharing between the guarantor and guaranteed
Securitization-based credit intermediation and funding of financial entities	<ul style="list-style-type: none"> -Restrictions on maturity/liquidity transformation -Restrictions on eligible collateral -Restrictions on funding from banks/other financial entities

(FSB Economic Functions, pp.14-22)

Declaration of Originality

I hereby declare that this thesis and the work reported herein was composed by and originated entirely from me. Information derived from the published and unpublished work of others has been acknowledged in the text and references are given in the list of sources.

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