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# **The Shadow Banking System - An Analysis of FSB proposed Regulation on Money Market Funds in respect to Financial Stability**

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*To Almut*  
*My Spiritual Lender of Last Resort*

# Deutsche Zusammenfassung

In den vergangenen Jahren haben Finanzinnovationen und Entwicklungen im Bankensektor die Art und Weise, wie Firmen und Einzelpersonen liquide Mittel investieren und Kredite aufnehmen, stark geändert. Zunächst konnten traditionelle Geschäftsbanken (d. h. Einlagekreditinstitute) als dominierender Anbieter von Krediten an Haushalte und Firmen angesehen werden. Hierbei nutzen Banken die Vielzahl kurzfristiger Depositen ihrer Einleger, um langfristige Investitionsprojekte zu ermöglichen. Diese traditionelle Finanzintermediation hat sich in den vergangenen Jahrzehnten durch den Einfluss von Regulierung, Wettbewerb und Innovationen stark gewandelt (siehe hierzu Pozsar, 2008; Rosen, 2009 und Blair, 2010).

Veränderte Regulierung und Innovationen im Finanzsektor haben den Wettbewerbsvorteil der Banken geschmälert und somit zum Wachstum des Schattenbankensektors auf rund 71 Billionen Dollar beigetragen. Schattenbanken erweitern den traditionellen Intermediationsprozess mit einer Vielzahl von Akteuren und Aktivitäten, welche in ihrer Interaktion miteinander die Intermediationsaufgabe der traditionellen Bank übernehmen.

Das Schattenbankensystem sollte in dieser Rolle als Erweiterung des traditionellen Bankensystems wahrgenommen werden, in welchem sich traditionelles und innovatives Bankwesen vereinen. Der Begriff Schattenbankensystem umfasst im weitesten Sinne eine Reihe von Entitäten, wie beispielsweise Finance Companies, Fonds, Banken und Zweckgesellschaften und komplexe Instrumente wie Asset Backed Securities (ABS), Asset Backed Commercial Papers (ABCP) und Repogeschäfte (kurzfristig besicherte Kredite). Generell haben sich multiple Beziehungen zwischen den einzelnen Entitäten entwickelt. Jede einzelne dieser Entitäten nimmt eine bestimmte Rolle in der Intermediationskette der Schattenbanken ein. Anders als traditionelle Banken können Schattenbanken im Rahmen ihrer Intermediationsaufgabe nicht auf offizielle Garantien und andere garantierte Schutzmechanismen, wie den Einlagensicherungsfond oder die Teilnahme an Offenmarktgeschäften der Europäischen Zentralbank zurückgreifen.

Bisher war die bestehende Regulierung von Banken und anderen Finanzmarktakteuren, wie beispielsweise Fonds, sehr stark auf Verbraucherschutz ausgerichtet. Im Zuge der Finanzkrise 2008 und 2009 wurde jedoch der Bedarf nach Regelungen, die sich auch auf Finanzmarktstabilität richten, deutlich. Die traditionelle Bankenregulierung



der Baseler Akkorde, als auch in der supranationalen sowie nationalen Umsetzung, setzt mit ihren Neuerungen im Nachgang der Finanzkrise auf neue Eigenkapital- und Liquiditätsrichtlinien, die Banken zu weniger riskanten Geschäften und größerer Liquiditätsvorsorge zwingen und so den Verbraucher zu schützen. Institute des Schattenbankensektors gelten allgemein als nicht oder nur wenig reguliert. Dennoch zeigt sich, dass Teile des Sektors bereits einer umfangreichen Regulierung unterliegen. Im Rahmen der Überlegungen hinsichtlich größerer Stabilität im globalen Finanzsystem nahmen die G20 auch die Überwachung und Regulierung des Schattenbankensektors auf die Agenda. Der Finanzstabilitätsrat (FSB) wurde von den G20 ermächtigt, potentielle Regulierungsansätze zu entwickeln, um so die Risiken, die Stabilität und Vitalität des Finanzsystems gefährden, zu adressieren.

Der Zusammenbruch des globalen Finanzsystems und im Besonderen des Schattenbankensystems äußerte sich vor allem durch Verwerfungen im Verbriefungssektor, Absatzprobleme von verbrieften Produkten (d. h. ABS) und den Abzug von Anteilen und Einlagen bei Geldmarktfonds sowie Banken. Vor allem bei Geldmarktfonds wurde deutlich, wie abhängig das reibungslose Funktionieren und die Finanzierung des Schattenbankensystems von einem stabilen Geldmarktfondsektor ist.

Die vorliegende Arbeit beabsichtigt die Regulierungsempfehlungen, die sich auf Stabilisierung von Geldmarktfonds und die damit verbundenen Finanzierung des Schattenbankensystems beziehen, zu strukturieren und hinsichtlich ihrer Umsetzbarkeit und ökonomischen Auswirkungen zu bewerten. Um die entsprechenden Bedingungen für eine kritische Bewertung zu schaffen, wird das Schattenbankensystem im ersten Schritt, in **Kapitel 2**, der vorliegenden Arbeit definiert. Es wird deutlich, dass eine adäquate Definition die Größe, Art und den Umfang des Schattenbankensystems stark beeinflusst. Abhängig von der zugrundeliegenden Definition wird der Kreis der Entitäten für die Größenberechnung des Systems entsprechend abgegrenzt. Eine allgemein akzeptierte Definition bildet somit die Grundlage für weitere Überlegungen zur deskriptiven Analyse und der Evaluation der potentiellen Regulierungsvorschriften.

Die Arbeit stützt sich auf einen Definitionsansatz des FSB, welcher das Schattenbankensystem als System von Entitäten und Aktivitäten innerhalb sowie außerhalb des regulierten Bankensektors, welche Kreditintermediation durchführen. Generell kann die Gesamtheit der Schattenbanken als System bezeichnet werden, bei welchem eine Reihe von Entitäten und Aktivitäten in Kombination den Intermediationsprozess einer einzigen Bank durchführen und hierbei keiner oder nur geringer Regulierung unterliegen. Hinsichtlich einer passenden Definition sollten sowohl Entitäten als auch Aktivitäten einbezogen werden, da auch Aktivitäten die durch Finanzinstitutionen ausgeführt werden, die Stabilität des Finanzsystems maßgeblich beeinflussen können.

Zunächst ermöglicht eine deskriptive Analyse von Entitäten und Aktivitäten das Schattenbankensystem in drei Bereiche zu unterteilen – Kreditvergabe, Kreditpooling und Verbriefung sowie die Finanzierung des Schattenbankensystems. Der Kreditvergabeprozess

wird vor allem durch traditionelle Banken und Schattenbanken im engeren Sinne durchgeführt. Somit werden effiziente Investitionsprojekte realisiert. Sie refinanzieren diese Kreditvergabe durch den Verkauf von Teilen des Kreditportfolios, Depositen (Banken) und kurzfristig bereicherte Kredite (Schattenbanken im engeren Sinne). Im nächsten Schritt kaufen Zweckgesellschaften, die von Banken und Schattenbanken im engeren Sinne verkauften, Kredite auf und wandeln diese in handelbare, liquide Aktiva um (Verbriefung in ABS und ABCP). Institutionelle Investoren, welche die Finanzierung des Schattenbankensystems ermöglichen, stehen am Ende dieser Schattenbankenintermediationskette. Sie kaufen die in Form von ABS und ABCP verbrieften Kreditportfolien auf und bieten Refinanzierung mittels Repos. Die Analyse der verschiedenen Entitäten und Aktivitäten ermöglicht umfangreiche Informationen über die quantitative Zusammensetzung, die Entwicklung und die Bedeutung der einzelnen Komponenten und des gesamten Systems zu erhalten.

Das Wissen hinsichtlich der Beziehungen und Stellung der einzelnen Akteure zueinander und auch der Beziehung zwischen traditionellen Banken und Schattenbankensystem, ermöglicht eine Aussage darüber, welche regulierenden Maßnahmen das Wachstum und das Verhalten der einzelnen Akteure positiv als auch negativ beeinflussen können. Die quantitative Analyse erlaubt es, einen stilisierten Sektor abzuleiten. Diese deskriptive Analyse des Schattenbankensystems und Beschreibung des stilisierten Sektors bildet die Grundlage für das Szenario eines modern-type Bank-Runs in Kapitel drei.

Zu Beginn des **dritten Kapitels** werden die Risiken, die sowohl im traditionellen als auch im Schattenbankensystem bestehen, aufgezeigt. Risiken wie Prozyklizität, Interkonnektivität von Entitäten, das Risiko eines (modern-type) Bank-Run und Fire-Sale Risiken bestehen sowohl im traditionellen Bankensektor als auch im Schattenbankensektor und können die Gefahr eines Zusammenbruchs eines Finanzintermediärs und damit einhergehend den Zusammenbruch der Finanzmarktstabilität verstärken.

Vor allem die direkten und indirekten Verbindungen zwischen verschiedenen Akteuren des traditionellen und des Schattenbankensystems können Probleme eines Instituts auf andere Akteure übertragen und so die Gesamtstabilität beeinflussen. Das Szenario in Kapitel drei zeigt die bestehenden Verbindungen zwischen Schattenbanken und Banken sowie mögliche Problempunkte der Schattenbankintermediationskette auf. Durch die Identifikation dieser verschiedenen kritischen Punkte, deren Auslösen bis zu einem Zusammenbruch des gesamten Systems führen kann, ist es möglich, gezielte Regulierungsmaßnahmen (diese Punkte betreffend) zu überprüfen und zu evaluieren. Durch die Szenarioanalyse wird deutlich, wie wichtig die stabile und funktionierende Finanzierung des Schattenbankensystems durch Geldmarktfonds ist und welche Auswirkungen Unregelmäßigkeiten und Funktionsstörungen im Finanzierungsprozess auch auf den traditionellen Bankensektor haben können.

Aufgrund der Erkenntnisse aus Kapitel drei werden in **Kapitel 4** die Empfehlungen zur Regulierung von Schattenbanken durch das Finanzstabilitätsgremium (FSB) untersucht,

die darauf abzielen, die Stabilisierung des Finanzierungsmechanismus zu unterstützen und zu sichern. Dies beinhaltet Regelungen, die auf die Stabilisierung von Geldmarktfonds abzielen und Maßnahmen, die die Qualität des Verbriefungsprozesses und die Stabilität von besicherten Repogeschäften erhöhen.

Zur Stabilisierung von Geldmarktfonds hat der FSB in erster Linie Regulierungsansätze erarbeitet, die sich vorwiegend auf die Regulierung des Investitionsportfolios der Fonds (aktivseitige Regulierung) und die Begrenzung und Aussetzung von Auszahlungen bei Rückzahlungsforderungen von Investoren (passivseitige Regulierung) beziehen. Bei der Regulierung des Investitionsportfolios ist jedoch zu beachten, dass eine Regulierung der Aktivseite die Fonds eventuellen Wettbewerbsnachteilen aussetzt. Weiterhin können auch Regelungen, die eine Angleichung der verschiedenen Fondsportfolien nach sich zieht, zu sogenannten Klumpenrisiken führen. Maßnahmen, die Auszahlungsforderungen von Kunden verzögern oder aussetzen, können eher als wahrscheinlich und umsetzbar angesehen werden. Hier möchte man den plötzlichen Abzug von Fondsanteilen verhindern und so auch die Finanzierungsfähigkeit des Fonds aufrecht erhalten. Weiterhin kann auch ein Wechsel in der Bewertungsmethode von Fondanteilen zu einer Marktbewertung als stabilisierend erachtet werden. Investoren ist es so möglich, die inhärent bestehenden Risiken zu antizipieren, indem sie den Werteverlauf des Anteils beobachten können und trotz eventueller kurzfristiger Verluste im Fond investiert bleiben.

Die Arbeit diskutiert auch die Möglichkeit, Geldmarktfonds potentiell den Zugang zu Zentralbanktransaktionen und somit Liquidität im Notfall zu ermöglichen. Sollte es Geldmarktfonds möglich sein, an Offenmarktgeschäften teilzunehmen und auf zusätzliche Liquidität zurückzugreifen, um entsprechende Zahlungsforderungen bedienen zu können, wäre die Finanzierung des Schattenbankensektors im Falle von plötzlichen Auszahlungsanforderungen gesichert. Eine solche Möglichkeit müsste aber durch verschiedene Gesetzesänderungsverfahren auf europäischer Ebene umgesetzt werden. Weiterhin wurde im vierten Kapitel die Stabilisierung des Repomarktes sowie die Sicherung der Qualität des Verbriefungsprozesses und der verbrieften Wertpapiere thematisiert. Im Repo-Segment setzen die Regulierungsvorschläge in erste Linie bei Transparenz und Standardisierung an. Die Festsetzung von Hair-cuts von Repogeschäften, d. h. Abschlägen auf den Wert der Sicherheit, sollte jedoch als kritisch betrachtet werden. Nach Überlegungen stellt diese Regulierungsmaßnahme einen Eingriff in den Preissetzungsmechanismus der Märkte dar und kann unter anderem Transaktionen beschränken und somit zu Liquiditätsbedarf führen. Ein qualitativ hochwertiger Verbriefungsprozess und Informationen hinsichtlich der Qualität von verbrieften Portfolien, sichert im Falle von Marktverwerfungen eine stabile Wertentwicklung von verbrieften Wertpapieren und reduziert das Risiko von Fire Sales. Zur Signalisierung der Qualität wurden auf europäischer und auch amerikanischer Ebene bereits regulatorische Selbstbehalte eingeführt. Jedoch sind diese Selbstbehalte bisher fix mit mindestens fünf Prozent angesetzt. Es ist zu bemängeln, dass diese festen fünf Prozent in keinsten Weise auf die Charakteristika des Originators, des verbrieften Portfolios und weiteren Marktgegebenheiten eingeht.

Im Rahmen der gesamten Analyse wird deutlich, dass ein integrativer Ansatz der alle Akteure und Instrumente und deren Zusammenwirken umfasst, empfehlenswert ist. Eine einseitige und unabhängige Regulierung von einzelnen Sektoren des Systems kann unerwünschte Aus-, Neben- und Wechselwirkungen hervorrufen. Ein komplettes Verbot von Aktivitäten und Entitäten, die als Teil des Schattenbanksystems betrachtet werden, ist nicht als sinnvoll zu erachten, da hierdurch weitere Regulierungsarbitrage entstehen kann. Weiterhin ist das Schattenbanksystem als wichtiger Teil, d. h. als Erweiterung, des traditionellen Bankensystems anzusehen, welches wichtige Aufgaben, die nicht im traditionellen Bankensystem wahrgenommen werden, übernimmt. Potentielle Regulierung sollte daher stark auf Transparenz und Standardisierung ausgerichtet sein, um die komplexen Strukturen des Schattenbanksystems erfassen zu können und potentielle Problemfelder frühzeitig zu erkennen und bewältigen zu können.

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# Abbreviations

<b>ABCP</b>	Asset Backed Commercial Paper
<b>ABS</b>	Asset Backed Security
<b>AFME</b>	Association for Financial Markets in Europe
<b>AIFMD</b>	Directive on Alternative Investment Fund Managers
<b>BCBS</b>	Basel Committee of Banking Supervision
<b>CBO</b>	Collateralized Bond Obligation
<b>CCP</b>	Central Clearing Counterparty
<b>CD</b>	certificate of Deposit
<b>CDO</b>	Collateralized Debt Obligation
<b>CERS</b>	Committee of European Securities Regulators
<b>CET1</b>	Common Equity Tier 1
<b>CFO</b>	Collateralized Fund Obligation
<b>CIS</b>	Collective Investment Scheme
<b>CLO</b>	Collateralized Loan Obligation
<b>CMB</b>	commercial Mortgage Backed Security
<b>cNAV</b>	constant Net Asset Value
<b>CP</b>	Commercial Paper
<b>CRA</b>	Credit Rating Agency
<b>CRD</b>	Capital Requirements Directive
<b>CRR</b>	Capital Requirements Regulation
<b>CRT</b>	Credit Risk Transfer
<b>DD</b>	Diamond and Dybvig
<b>DFA</b>	Dodd-Frank Wall Street Reform and Consumer Protection Act
<b>ECB</b>	European Central Bank
<b>EFAMA</b>	European Federation of Investment Funds and Companies
<b>EMIR</b>	European Market Infrastructure Regulation
<b>ESCB</b>	European System of Central Banks
<b>ESMA</b>	European Securities Market Association
<b>EU</b>	European Union
<b>FCIC</b>	Financial Crisis Inquiry Commission
<b>FED</b>	Federal Reserve Bank
<b>FLP</b>	First Loss Piece

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<b>FSB</b>	Financial Stability Board
<b>FSOC</b>	Financial Stability Oversight Council
<b>G20</b>	Group of 20
<b>GDP</b>	Gross Domestic Product
<b>GMAC</b>	General Motors Acceptance Corporation
<b>ICF</b>	Integrated Capital Framework
<b>IMMFA</b>	Institutional Money Market Fund Association
<b>IOSCO</b>	International Organization of Securities Commissions
<b>IRB</b>	Internal Ratings-based Approach
<b>LCR</b>	Liquidity Coverage Ratio
<b>LTRO</b>	Long-term Refinancing Operation
<b>MBR</b>	Minimum-Balance at Risk
<b>MBS</b>	Mortgage Backed Security
<b>MFI</b>	Monetary Financial Institution
<b>MMF</b>	Money Market Funds
<b>MRO</b>	Main Refinancing Operation
<b>NBFI</b>	Non-Bank Financial Intermediaries
<b>NCB</b>	National Central Bank
<b>NFW</b>	Net Financial Wealth
<b>NPR</b>	Notice of Proposed Rule Making
<b>NSFR</b>	Net Stable Funding Ratio
<b>OBSE</b>	Off Balance Sheet Entity
<b>OFI</b>	Other Financial Institutions
<b>OTC</b>	Over-the-counter Transactions
<b>ROA</b>	Return on Assets
<b>ROE</b>	Return on Equity
<b>repo</b>	Repurchase Agreement
<b>RMBS</b>	residential Mortgage Backed Security
<b>SEC</b>	Securities and Exchange Commission
<b>SIFI</b>	Systemically Important Institution
<b>SIFMA</b>	Securities Industry and Market Association
<b>SPV</b>	Special Purpose Vehicle
<b>TR</b>	Transaction Register
<b>UCITS</b>	Undertakings for Collective Investments in Transferable Securities Directive
<b>US</b>	United States
<b>vNAV</b>	variable Net Asset Value
<b>WS</b>	Workstream

# Symbols

$B_f$	Debt Instruments issued by Firms
$B_i$	Debt Instruments issued by MMFs (Shares)
$B_o$	Debt Instruments issued by OBSEs
$B^b$	Debt Instruments purchased by Banks
$B^s$	Debt Instruments purchased by Shadow Banks
$B_i^b$	Debt Instruments issued by MMFs and purchased by Banks
$B_i^s$	Debt Instruments issued by MMFs and purchased by Shadow Banks
$B_i^f$	Debt Instruments issued by MMFs and purchased by Firms
$B_i^h$	Debt Instruments issued by MMFs and purchased by Households
$B_o^b$	Debt Instruments issued by OBSE and purchased by Banks
$B_o^i$	Debt Instruments issued by OBSEs and purchased by the MMF
$B_o^s$	Debt Instruments issued by OBSEs and purchased by Shadow Banks
$C$	Capital and Surplus
$C_b$	Capital and Surplus Bank
$C_f$	Capital and Surplus Firm
$C_s$	Capital and Surplus Shadow Bank
$CP$	Commercial Paper
$D$	Deposits
$D^f$	Deposits Firm
$D^h$	Deposits Household
$D^i$	Deposits Institutional Investors (MMFs)
$D^s$	Deposits Shadow Banks
$E$	Excess Reserves
$F$	Notational Amount of Loan
$H$	Housing
$K_c$	Loans issued by the Central Bank (Loan Receivables to Commercial Banks)
$K^d$	Interbank Loans issued by other Banks
$K^s$	Interbank Loans supplied to other Banks
$L$	Loans
$L_b$	Loans issued by Banks
$L^f$	Loans supplied to Firms

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$L^h$	Loans supplied to Households
$L^o$	Loans supplied to the OBSE (Credit Back up Line)
$L^s$	Loans supplied to Shadow Banks
$-L_b^o$	Loans issued by Banks and purchased by the OBSE (True Sale)
$-L_s^o$	Loans issued by Shadow Banks and purchased by OBSE (True Sale)
$L^s$	Loans supplied to Shadow Banks
$L_s$	Loans issued by Shadow Banks
$L_s^f$	Loans issued by the Shadow Bank and used by Firms
$L_s^h$	Loans issued by the Shadow Bank and used by Households
$NFW$	Net Financial Wealth
$PC$	Physical Capital
$r$	required Reserve Rate
$repo^b$	repo issued by the Central Bank or Institutional Investor and purchased by Banks
$repo_c$	repos issued by the Central Bank
$repo_i$	repos issued by the Institutional Investor (MMFs)
$repo^s$	repo issued by the Central bank or Institutional Investor and purchased by Shadow Banks
$T$	Timeperiod
$V$	Value of the Collateral
$Y_t$	Value of the Collateral in $t$ (Purchase Price)
$Y(t+n)$	Value of the Collateral in $t+n$ (Repurchase Price)

# Chapter 1

## Introduction

### 1.1 Motivation

Financial innovations and development in banking have changed the way businesses and individuals borrow and invest money. Traditionally, commercial banks (i.e., depository institutions) were the dominant suppliers of credit to firms and households. Banks use short-term deposits to issue long-term loans. This intermediation process occurs on the balance sheet. Issued loans are held as an investment in a diversified portfolio. However, traditional banking has evolved due to regulation, competition and innovation (see e.g., Pozsar, 2008; Rosen, 2009 and Blair, 2010). A series of regulatory changes and innovations eroded the competitive advantage of banks and led to the growth of the shadow banking system. The system of non-bank financial intermediaries (NBFI; i.e., shadow banks) has grown rapidly in recent decades (Clement, 2010) up to a roughly size of about Dollar 71 trillion. Supported by regulatory gaps, policy decisions and by a growing market of assets under management, the system and shadow banking related markets reached their first peak in 2007 (Financial Crisis Inquiry Commission, 2010). The involvement of this hybrid aggregate of institutions and functions in the financial system has increased significantly over time. The shadow banking system should be considered to be a part of a banking system that evolved out of the traditional banking system, and which combines traditional and innovative banking. The shadow banking system comprises institutions, such as finance companies; several managed funds; a complex array of instruments, such as Asset Backed Securities and repurchase agreements; and structures and markets that replicate core banking activities. Overall, a complex chain of multiple relations between a numbers of institutions has evolved. Each of these institutions perform a different part of the intermediation process (see Pozsar *et al.* , 2010). So far, regulation has focused on protecting investors rather than on the safety and soundness of the financial institutions, and financial stability. These institutions are therefore barely regulated, have few reporting obligations and need to meet only a few legal standards. They do not benefit from safety nets such as deposit insurance or

official guarantees. There are a number of arguments for launching prudential regulation for the shadow banking sector: (1) the risks associated with circumventing existing rules and the accumulation of high levels of debt, (2) the growing size of the shadow banking system and its associated impact on the real economy and (3) risk stemming from the interconnection and interdependency of banks and shadow banks.

The breakdown of the financial system and, in particular, the shadow banking system in 2008 and 2009 could be observed in the disruption of the securitization market, sales problems associated with securitized funding and “breaking the buck” within the asset management market segment of Money Market Funds (MMF). All these instruments and sub-segments indicated a crisis of the shadow banking system. This is also emphasized by Perry Mehrling<sup>1</sup> in his speech at the 16th International Banking Conference on Shadow Banking in Chicago, 2013. New efforts reforming the regulation of capital markets by the Group of 20 (G20) concern, overall, the enhancement of financial system stability. This includes, primarily, the strengthening of both the quality and quantity of regulatory capital and liquidity to absorb losses and to react to risks within the financial system. With the G20 Summit in Cannes 2011, the Financial Stability Board (FSB) was assigned to work on potential shadow banking regulation in order to address risks that threaten the overall stability and vitality of the financial system.

The present paper aims to structure and organize this proposed policy. To create proper conditions to evaluate potential regulation, a comprehensive overview of the shadow banking system and a detailed, generally accepted definition is first provided. Those information help to decide if further regulatory actions would have a quantitative impact, and in which manner those actions might influence the whole system and other entities. Furthermore, it also helps to prevent possible gaps within regulation.

The borders of the shadow banking sector must first be outlined. Several regulatory authorities and researchers have defined the system. Here, it became apparent that the definition determines the size and range of the whole system, as well as individual entities and activities within the system. The present paper applies an approach to a definition that combines the entities and activities of the shadow banking system; it therefore adopts the definition given by the FSB, which appears to be the most suitable definition that covers the aspects of the shadow banking system. The FSB defines shadow banking in a broader approach as “a **system of credit intermediation** that involves **entities and activities outside the regular banking system**”. In narrowing the focus, the activities and entities conducted by shadow banks give rise to **i) systemic risk** concerns, in particular by maturity/liquidity transformation, leverage and lawed credit risk transfer (CRT), and/or **ii) regulatory arbitrage** concerns (Financial Stability Board, 2011a, p. 3).

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<sup>1</sup>Perry Mehrling is an American economist and one of the leading researchers in the field of shadow banking.

The literature has shown that there is no consistent framework of the system's structure, and no system-wide overview (a comprehensive overview of the literature and research on the shadow banking sector and its sub-segments is given in the following section of this introductory Chapter). A number of questions arise as to how the individual entities of the system are connected and which activities are carried out; through which balance sheet positions and exposures entities are connected with each other and what these interlinkages create; how sub-sectors of the shadow banking system evolved compared to each other; and how this co-evolution influenced the whole system.

Individual entities have been explored and examined with reference to their development and involvement in the financial crisis of 2008 and 2009. Securitization was one of these issues, and was examined in a wide range of publications (see Cerrato, 2010; European Central Bank, 2011a, Gorton & Metrick, 2009; Shin, 2009 and Schwarcz, 2009). The management of assets in funds and especially MMFs was also studied (see Afonso *et al.*, 2010; Bengtsson, 2013; Birdthistle, 2010; Wermers, 2012 and Witmer, 2012). However, to date, the research in this area lacks an integrated overview. The present paper structures the shadow banking system in different sub-systems, and allocates entities and activities into these sub-systems. The shadow banking sector and the development of single entities and activities within these sub-systems is described quantitatively. Individual behavior patterns of individual entities are derived to answer the question of what objectives these entities have to operate both as separate entities and as part of a larger system.

In the course of this paper a stylized sector is compiled and individual components of the sector and the entities' balance sheets are depicted in Chapter 2. Chapter 2 provides a comprehensive overview of the individual entities' characteristics and their quantitative development. This serves as the basis for an analysis of a run scenario of an MMF. The scenario analysis in Chapter 3 will highlight the risks inherent in the traditional and shadow banking system that amplify the failure of individual institutions, and that could thereby lead to a failure of financial stability and the insolvency of multiple entities within the financial system. As MMFs serve as an important funding source for the whole shadow banking system, liquidity problems are transmitted through interconnections within the financial system. Funds can be seen as first target of consequences by the financial crisis, meaning a modern-type bank run. Liquidity demand through redemption requests is relayed and slides to other entities which consequently creates a funding gap.

Risks stemming from activities within the banking system and the shadow banking system, as well as from the interconnections between these mutually dependent systems, will also be described in Chapter 3. These risks comprise procyclicality, the possibility of a bank run and interconnection of entities. Furthermore, the strict regulation of the banking sector and differences in national and international regulation create a risk of regulatory arbitrage. Risks could occur within either the traditional banking system or the shadow banking system. A traditional bank run (as defined by Diamond & Dybvig,



1983) can emerge in the form of modern-type bank runs on MMFs. Bank runs can have profound effects, as the shadow banking system and, especially, MMFs do not have access to governmental guarantees or liquidity to absorb losses. Also, the interconnection of shadow banks and banks could amplify risks, as the nature of these interconnections are not understood well enough to assess their impact. The use of innovative instruments as securitization also creates the risk of a defective CRT. Increased asymmetric information and disillusioned expectations about the development of the assets' value within the CRT process both influence the effectiveness of transmission channels, as well as the funding of the system and the value concept of collaterals. The scenario analysis offers answers to the questions of how different risks within financial markets affect the shadow banking and the traditional banking system at different stages of the intermediation and funding process. Which risks emerge through the interaction of banks and shadow banks? And do interconnections of both systems amplify the transmission of risks and are, hence, a potential target for regulation?

Information about the institutional setup of the shadow banking system given in Chapter 2, along with the analysis of the risks inherent in the overall financial system and the transmission of risks throughout the system provided in Chapter 3 will be the basis for the critical discussion of proposed regulation and new regulatory approaches in Chapter 4. In analyzing the scenario of a run and the individual risks inherent in the system, potential regulatory gaps become apparent. The discussion of proposed regulation has the goal of clarifying, which regulatory demands are incidental and which regulatory arrangements appear useful in mitigating risk and stabilizing the shadow banking system. Regarding MMFs and wholesale funding in general, asset managers play a major role within the funding process of the shadow banking system. The encompassing scenario model reveals interconnections, possible ways of transmission and further dependencies that could transfer negative effects throughout the whole financial system. The scenario and further regulatory issues mainly approach the structure of MMFs, their valuation practice and missing access to central bank liquidity. Furthermore, the importance of a well-performing securitization process for shadow banking funding becomes apparent, with a need to protect these securitized instruments against impairment. A stabilization of the repo funding market is also addressed by several regulatory issues. Repurchase Agreement (repo) transactions need to be standardized and markdowns on collateral value (haircuts) capped to stabilize funding and ensure the functioning of the intermediation process.

The integrated framework and comprehensive overview compiled in Chapter 2 can be used to answer additional questions. The outline of the interconnections among entities and the quantitative importance of single institutions may support the answer help the author to answer questions concerning shadow banking's impact on monetary policy. As central bank policy no longer just refers to price stability, different questions regarding monetary policy and transmission arise. The ability to provide credit to the real sector and to extend the traditional credit lending process has an impact on the credit channel

of monetary policy. The model of the shadow banking system and associated behavioral assumptions can provide a basis for further (macro) economic research in order to achieve a deeper understanding of the effects and impact of shadow banking on both the financial system and monetary policy.

## 1.2 Literature Review

During the last few decades an array of literature concerning shadow banking has emerged. The term NBFIs became more prominent due to its significant growth as an object of research (see McCulley, 2007 and Clement, 2010). Thorn (1958), Ettin (1964) and Patinkin (1961) made contributions to understanding the issue of NBFIs as a non-regulated financial intermediary, as well as their influence on monetary policy. McCulley (2007) was the first to use the term shadow banking, describing highly leveraged and unregulated financial institutions that do not benefit from a safety net or from other official guarantees. In the course of the 2008–2009 crisis a number of studies addressed various issues of the shadow banking system, including general development, structure, transmission mechanisms and risks and regulation. To date, the literature has shown that there is no consistent framework to the system's structure, as well as no system-wide oversight. In a number of studies, individual entities have been viewed and examined in reference to their development and involvement within the financial crisis.

Adrian & Shin (2009) and Farhi & Cintra (2009) as well as Financial Crisis Inquiry Commission (2010), Pozsar (2008) and Pozsar *et al.* (2010) provided a first overview of the institutions and instruments engaged in the shadow banking system. Pozsar *et al.* (2010) and Pozsar (2008) were the first to catalogue the types of shadow banks, mapping and describing the shadow banking system as a daisy chain of financial intermediaries that conduct credit intermediation. However, they do not provide a comprehensive quantitative overview that gives information about the overall development and size of the whole shadow banking system. They present the shadow banking system as a network of risk originators, securitization vehicles and risk bearers connected through different financial instruments, and provide an initial structural overview. The map of the shadow banking network is a complex framework fitted to the United States (US) market. This rather complex framework is very detailed and contains a wide range of entities. The purpose of the present paper is to facilitate and map the shadow banking system to derive statements about inherent risks due to interconnections, as well as starting points for prudent regulation. This map could also be used as a general, globally applicable template. The Financial Crisis Inquiry Commission (2010) also describes the nature and scope of the shadow banking system, offering a definition of the system and an overview of important institutions and instruments. However, there is no explanation on the interconnections or on how the institutions interact with each other. Furthermore, the Financial Crisis

Inquiry Commission (FCIC) piece only discusses select components of the shadow banking system (institutions and instruments) independently, and not as a system. Farhi & Cintra (2009) discuss the interaction among different financial intermediaries within the shadow banking system; however, this paper has a more descriptive character, focusing on how the system evolved over time and which drivers led to growth. It lacks an integrated framework with which to describe how the participants of the system interact. The FCIC paper also offers few recommendations concerning improved regulation and supervision.

Based on this overview, it is apparent that the literature in this area lacks an integrated framework that also provides quantitative information, based on the study of both the impact of individual sub-sectors and the whole system. A generally accepted definition of shadow banking also needs to be introduced. The first part of the present paper will address these gaps as well as provide information about size and development of the shadow banking system. Pozsar *et al.* (2010), Acharya & Richardson (2009), Financial Crisis Inquiry Commission (2010) and Farhi & Cintra (2009) introduce a general definition of the shadow banking system. However these definitions do not seem to cover all aspects of the wide range of shadow banking. Studying different definitions and the entities included in a particular definition demonstrates the importance of a proper definition to determine both the size of the shadow banking system and regulatory demand. Some definitions include different entities as part of the shadow banking system, changing what should be under particular forms of control. The Financial Stability Board (2011a) has drafted a comprehensive definition that addresses potential shadow banking entities and activities. This implies that not just entities, but also activities should be observed and examined. The FSB defines shadow banking as “a **system of credit intermediation** that involves **entities and activities outside the regular banking system**”. In narrowing the focus, the activities and entities conducted by shadow banks give rise to **i) systemic risk** concerns, in particular by maturity/liquidity transformation, leverage and lawed credit risk transfer (CRT), and/or **ii) regulatory arbitrage** concerns (Financial Stability Board, 2011a, p. 3). Based on this definition, such activities as repurchase agreement transactions, securities lending and securitization will be examined with an eye to their size and development. In the following section, the present paper will draw on the afore-mentioned comprehensive definition by the FSB, concentrating on potential shadow banking entities and activities.

There is a large body of literature concentrating on the events of the most recent financial crisis, as well as on the role of the shadow banks or markets and the instruments that can be identified as being part of or related to the shadow banking system. Many analyses of the financial crisis highlighted the growth of the shadow banking sector and its collapse during the crisis. This also comprises the FSB monitoring report of 2012a and 2013b. Blair (2010) examines the development of the shadow banking system and financial innovations from a more legal perspective. She points out that regulators have been confronted with the growth of this new financial sector and mentions key drivers

of development. However, although main institutions of the system are explored, these institutions are not combined into a framework. Adrian & Shin (2009) compare the shadow banking system and the market based financial system with the bank based financial sector. The authors highlight the growth of the system and point out some implications for further regulation. However, the system is only described, and lacks a framework for the interactions among shadow banking intermediaries. Rosen (2009) provides information about the evolution of the US financial system, which has shifted from traditional banking to shadow banking. The author also focuses on the role of the shadow banking system in the increasing interconnectedness and leverage of financial intermediaries, and argues that the financial crisis was a logical outcome. Stein (2010) provides a short overview of the securitization process, which is depicted as a major part of the shadow banking system; this overview includes how the securitization process was developed at the time of the crisis and how it is conducted within the shadow banking system. Stein also mentions individual participants of the shadow banking system. Although these participants are not combined into an integrated framework, the article does offer some regulatory approaches to securitization and suggests some ideas for future regulation. Fuchita (2011) suggests ways to regulate shadow bank intermediaries and to enlarge the safety net. To sum, the existing literature to date concentrates on descriptive analysis: how the system and main important parts developed before and during the crisis, and what are important aspects that led to the growth of certain parts of the financial system.

Gorton & Metrick (2010c) document the development of the shadow banking system over the last three decades. The article describes important features of the sector, such as securitization, repurchase agreements and MMFs, and the interconnection of these within the shadow banking system. As with the previously discussed literature, the authors describe important features of the system, and a simple framework with the basic structure of the system is shown, but they do not cover all participants and instruments. This paper does also propose some initial principles for regulation and how to implement them.

The regulation of shadow banking is generally conducted by the FSB, as assigned by the G20. The European Commission and US authorities conduct parallel regulatory processes. The process for identifying regulatory gaps and following regulatory proposals can be found in Financial Stability Board (2011b), Financial Stability Board (2011a) and European Commission (2012). Particular issues and risks associated with shadow bank activities are handled in separate Workstreams; these Workstreams comprise MMF stability and funding of shadow banks, securitized funding and repo contracts, securitization and other shadow banking issues. Some of the afore-mentioned authors addressed some initial questions regarding general aspects of shadow banking regulation (see Gorton & Metrick, 2010b; Blair, 2010). Traditional banking regulation is incorporated into the shadow banking regulation process, since, due to the interconnection between banks and shadow banks, the regulation of banks could influence shadow banking regulation in

both way – negatively and positively. Banking regulation initiated by the Basel Committee of Banking Supervision (BCBS) can be found in various publications of the BCBS: BCBS, 2010 and BCBS, 2010/2011, as well as a comprehensive overview by Deutsche Bundesbank (2011). So far there has been no comprehensive statement about the impact of banking regulation on shadow banking entities and regulation. The present paper will make statements on interconnections and possible transmission channels between banks and shadow banks.

In the following section, the literature concerning different shadow banking sub-systems will be outlined and briefly analyzed. Money Market Funds are special types of asset managers and a crucial funding source of both the shadow banking and the banking systems. Due to their specific characteristics, MMFs have become more important for regulators. First, their short-term liability side is characterized as deposit-like. Second, due to their crucial role in funding the shadow banking system, they could endanger the overall stability of the financial system if they become inoperative as a funding source. Finally, unlike banks, MMFs are not able to draw upon deposit insurance or other official guarantees. In addition to the official and regulatory literature on MMF regulation proposals published by the International Organization of Securities Commissions (IOSCO) (see IOSCO, 2012c; IOSCO, 2012d and IOSCO, 2012e) several pieces have focused on the MMF characteristics that cause runs on assets under management and threaten financial stability. Wermers (2012) studied the investor flow both into and out of MMFs, particularly during the period of the financial crisis, showing that big institutional investors tend to run in the event of a crisis. These runs can then spread across various MMF sectors. The paper does not, however, provide recommendations on what to do in the event of a run, or on how runs can transmit liquidity problems throughout the financial system to other financial institutions and banks. The possibility of runs is addressed by academic literature, including HSBC (2011b), Rosengren (2012) and Bengtsson (2013). One aspect that has been identified as contributing to runs is the different valuation of fund shares by constant Net Asset Value (cNAV) and variable Net Asset Value (vNAV) funds. It is argued by Birdthistle (2010) and Gordon & Gandia (2012) that a valuation under amortized cost valuation both causes and amplifies runs. Regulators, such as the FSB and the Securities and Exchange Commission (SEC) have adopted this issue and discuss possible action alternatives. The HSBC (2011b) Bengtsson (2013) argue that runs cannot be fully eliminated by any action taken or valuation method change. Most papers concentrate on one specific regulatory proposal. Birdthistle (2010) concentrates solely on cNAV and vNAV valuation, and suggests an overall shift to vNAV funds. Rosengren (2012) addresses the sponsoring of funds, and the associated risks and signals sent to the market. The present paper will offer possible alternatives, with the goal of preventing runs and stabilizing the MMF sector. If different actions are undertaken, this will create different conditions, and taking one proposed action could make another impossible, or create unintended effects. It is therefore important to concentrate on the

aggregate impact of proposed regulatory alternatives within the intermediation chain or the transmission process.

As the present paper mainly analyses the proposed reforms of the MMF sector, this might also include prior regulatory undertakings, especially by US authorities. The MMF sector has been subject to fundamental regulatory reform by US regulators in the form of the amended Rule 2a-7 of the Investment Company Act of 1940, who reacted to the global financial distress and the breakdown of the Reserve Primary Fund in 2008. They addressed the risk of modern-type bank runs and the subsequent contagion prior to FSB proposals. The 2010 reforms were discussed in a number of works including PwC (2012), Sullivan & Cromwell LLP (2012) and Scharfstein (2012). In order to reduce the risk of bank runs, American regulators made it almost mandatory to move from cNAV to vNAV valuation within the US area (also addressed by HSBC, 2011b). Regulators also presented strict quantitative rules for asset-side management. The FSB framework lacks such quantitative rules. However, the afore-mentioned regulations and academic literature concentrate on the US, and do not cover the global MMF industry, interaction with other shadow banking entities or other regulatory proposals. The present paper will examine both the overlap and differences in US and FSB regulations.

Repo transactions have been the subject of academic literature in recent years. However, after the financial crisis of 2008 and 2009, the literature focused more on stability issues surrounding repo transactions, especially as they are a major funding source for the shadow banking sector. Short-term funding in the form of repo contracts plays a crucial role in the functioning of the intermediation chain. In addition to deposits and interbank loans, banks use short-term credit contracts to refinance the asset side of their balance sheet; shadow banks are even more reliant on repo contracts. Asset managers provide funding to banks and shadow banks through repo contracts. As global assets under management experienced exponential growth (see Gorton & Metrick, 2010c) institutional investors used repo contracts to safely store liquid resources while still earning interest. Consequently, repo contracts experienced a huge growth (see Krishnamurthy *et al.*, 2011). The literature discussed below aims to understand the crucial role of repos within the shadow banking system.

Gorton & Metrick (2010c) emphasizes the role of repos in the financial crisis. They describe the run on the shadow banking system and the shortage of funding as a run on repo, much akin to runs on deposits. However, as an integrative intermediation process is introduced in this present work, the run on repo can be seen as an aftereffect. Originally, investors in the private sector withdraw their investments, in the form of MMF shares. As a consequence, MMFs did not renew repo contracts to meet previous redemption requests by the private sector. This lack of investment in repo contracts can be considered a run by institutional investors, and as an outcome of the run on bank deposits and MMF shares (see Gorton & Metrick, 2010a; Gorton & Metrick, 2010b; Gorton & Metrick, 2010c, and Adrian & Shin, 2010).

Krishnamurthy *et al.* (2011) aimed to provide new data on the repo lending contracts of MMFs. However, Krishnamurthy *et al.* (2011) was not able to produce further insight on the drivers of growing repo lending and the run on those repos. The present paper argues that the run on repos, as posited by Gorton & Metrick (2010c), was not the central or original driver of the financial crisis, but rather that runs on repos are a follow-up to the modern-type bank run on institutional investors.

Dang *et al.* (2011) provide an overview of why haircuts or margins exist and how they are calculated. Haircuts gave evidence of the rise of the crisis. Gorton & Metrick (2010c) provide evidence of the dramatic increase of haircuts with the crisis. The procyclicality of margins, haircuts and characteristics can be considered to be major issues in regulation proposed with the goal of stabilizing and supporting repo markets. To constrain risk-taking and the build-up of leverage, a number of papers have discussed the minimum margin requirements, as well as other possible policy options (see Gai & Kapadia, 2011; Goodhart *et al.* , 2011; Brumm *et al.* , 2011; Stein, 2011 and Gorton & Metrick, 2010b). Biais *et al.* (2011) analyze the possibility of using central clearing to standardize and harmonize repo markets.

The literature on securitization has so far focused on market development, growth and involvement within the financial crisis. Problematic areas that led to the financial crisis or that amplified negative developments have been detected and analyzed. Altunbas *et al.* (2009) reviews the securitization activities within the Euro area and points out the banks' capacity to supply new credit to the private sector. However, they also point to the severe impact on banks' risk positions, as well as possible negative developments or impacts on financial stability. Caprio *et al.* (2009) identify the roots and causes of the financial crisis as a breakdown of incentives in securitization. Wrong incentives lead to a defective CRT, and could destabilize the financial system. Caprio *et al.* (2009) argue for reform in securitization transparency and accountability within the securitization process. Further insight into analyzing and describing the securitization process, along with potential problems that may arise, can be found in Erber (2008), Franke (2005), Gorton & Metrick (2012), Rosen (2010) and Shin (2009).

As the growth of the global securitization market was accompanied and influenced by the exponential growth of assets under management and the demand for high-quality collateral to be used in those short-term lending transactions (see DeMarzo, 2005), regulatory proposals should focus on activities that raise the quality of securitized products that serve as collateral in securitized lending. Regulatory actions should also strengthen the awareness of screening and monitoring processes. These actions mainly include the standardization of securitization and risk-retention regulation. A number of academic papers have examined the regulatory aspects of securitization. Main focus was the assurance of payments to the investors, funding of the securitization process and stability of the overall financial system; this includes securitization as major financial innovation.

The present paper will evaluate proposed regulation concerning risk retention, mainly focusing on the differences between various risk-retention strategies. The main question that arises applies to the sustainability and stabilizing function of retention: how could current regulation be complemented to ensure a positive and stabilizing impact? Almost all of the literature concerning risk retention approves the introduction of risk-retention rates to incentivize the monitoring and screening of securitization quality (see Kiff & Kisser, 2011; Kiff & Kisser, 2010; Malekan & Dionne, 2012; Fender & Mitchell, 2009b and Fender & Mitchell, 2009a). However, it is argued by the above-mentioned papers that an optimal retention rate should not be fixed, and depends on different parameters. The approaches to risk retention made by the FSB, the US and European regulators are connected with the existing literature and other proposed regulations to study impact and effects of applied risk retention.

Generally, the present study aims to provide a comprehensive overview of the shadow banking system, regarding the quantity, proportionality and development of activities and entities. The meaning of different sub-sections of the shadow banking system is also shown. Together with the existing literature, the present study sums up all of the regulatory proposals concerning the shadow banking system and financial system stability. Important issues concerning the scenario analysis of a modern-type bank run on MMFs are highlighted and viewed critically. To date, regulatory proposals have been only looked at in isolation; no one has compared individual proposals to analyze consequences, spillover effects and interdependencies. Which options might have stabilizing or even destabilizing effects in combination with other regulatory proposals?



## Chapter 2

# Definition and Development of the Shadow Banking System

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### 2.1 Theory of Traditional Financial Intermediation

To illustrate the differences between the traditional and the shadow banking systems, and to define the term shadow banking it is important to first describe the (traditional) intermediation process. Within a national economy individuals may have higher capital demand for consumption and investment projects than their initial endowment allows. In the following sections, these participants are labeled capital-seeking parties. In contrast, market participants with payment surplus are the (original) lenders of capital to the capital-seeking parties.

On a non-unionized capital market, credit contacts are negotiated individually and without a common framework. In the case of an organized capital market, lenders and borrowers trade within a market framework, but still directly, without a third party involved. There are a number of sources of friction that influence this contractual relationship. First, there might be asymmetric information available about lenders and borrowers, as neither party is able to monitor or screen each other in a professional way. Next, lot-size problems between capital lenders and borrowers may appear if different volumes are offered than are requested. Divergences about contractual maturity could also arise. Without the intermediary action of a third party, investors are locked into long-term investment projects, which preclude other investment opportunities. At the same time, capital borrowers could be exposed to situations of liquidity shortfall. Within an individual contract, both parties are restricted in screening and monitoring risk appetite (i.e., risk problems), the initial situation, and further market developments, as large-scale screening and monitoring by individual participants entails high costs and

complex techniques. To sum, these problems do not present insurmountable obstacles, but do have considerable costs (see Claus & Smith, 1999). Agents between lenders and capital-seeking parties are labeled financial intermediaries and offer an indirect method of allocation (for information on the general intermediation process see Obst & Hinder, 2000, p. 15; Hartmann-Wendels *et al.*, 2004, p. 127-147 and 2-11; Bitz & Stark, 2008, p. 1 and Gischer *et al.*, 2005, p. 7). Financial intermediaries make rational decisions concerning the disposition of funds and the assignment of savings to investment projects (i.e., capital allocation). The wide allocation function can be divided into information, funding, transformation, and control functions and generally causes higher capital productivity and enhances control over risk. Intermediaries are tasked with providing sufficient information about risks, opportunities, and alternative investment projects, and with facilitating appropriate financial resources (the information and allocation function of intermediaries is discussed in Diamond, 1984; Mayer, 1988; Hellwig, 1991 and Edwards & Fisher, 1994).



FIGURE 2.1: Stylized Traditional Intermediation Chain (Author's drawing based on Gorton & Metrick, 2010b, p. 45)

With the implementation of a financial intermediary, possible problems can be minimized or even eliminated, minimizing costs. The intermediation function mediates between contracting parties, and is an efficient way of allocating resources, i.e., clearing investment requests and financing needs, as well as providing information. The intermediation process has an enhanced relevance to the national economy, as it enables parties seeking capital to connect with lenders of capital through a financial intermediary, allowing investment projects to be realized. However, there is no immediate benefit from mere intermediation; the economic gain results only if transaction costs are reduced by intermediation, as compared to other arrangements. In addition to offering direct negotiation, intermediaries have comprehensive and professional opportunities to screen and monitor market participants, as well as to assess risks and command cost advantages.

The post-Keynesian approach to macroeconomic intermediation does not require the pre-existence of deposits to fund credit institutions within the traditional intermediation process. Rather, deposits are generated through credit lending as banks' money-creation process. McLeay *et al.* (2014) explain that the common intermediation approach is popularly misunderstood as banks simply acting as intermediaries rather than as money creators. Deposits are created by the savings decisions of households; in a modern economy, money is created by banks through credit lending.

The intermediation process itself is characterized by the following factors: maturity and liquidity transformation (i.e., receiving short-term, liquid funds to serve long-term, relatively illiquid investment projects), leverage, and CRT (i.e., transferring credit risks to other parties; Kodres, 2013). To conduct this intermediation, banks and other financial intermediaries collect deposits from the public and grant credit to capital-seeking parties, channeling funds from the general public to investment projects and allocating resources properly. Deposits collected from the private sector are generally liquid and available to depositors at short notice, and are provided to the financial intermediary for a short time horizon. Investment projects realized with those deposits are generally long-term and illiquid. In these cases, intermediaries provide a liquidity and maturity transformation, and the intermediation task is characterized by the first two factors mentioned above. Financial intermediaries are able to mismatch these maturities and deposit liquidities from short-term assets and long-term investments, as it is assumed that not all depositors or other market participants holding short-term claims against financial intermediaries will withdraw at the same time. However, this transformation process makes financial intermediaries vulnerable to runs, thereby impacting the overall financial system (see Claus & Smith, 1999, p. 8). The funding of intermediation activities is mainly financed by short-term debt instruments such as repurchase agreements and others, and deposits, constituting the leverage aspect of intermediation. In order to transfer risks off of their own balance sheet, intermediaries (in the traditional intermediation process, mainly banks) sell loans to other financial entities. This CRT could be thought of as the first connection and manifestation of the shadow banking system in the financial intermediation process. The well functioning of the intermediation process can influence the functioning of the financial system and its overall stability. Therefore, it is crucial to understand the traditional intermediation process and the functioning of the traditional financial system. This understanding must follow the shadow banking intermediation process, as well as the interconnection of both intermediary procedures.

## **2.2 Definition concepts relating to Shadow Banking**

The shadow banking system has developed rapidly in recent decades, and the traditional intermediation process has been extended through shadow banking entities into an intermediation chain. To understand further implications, it is important to know which part of the financial system can be defined as shadow banking and how to delineate between traditional and shadow banking entities. “The difficulty starts with definition” (Turner, 2012, p.3). Like traditional banks, shadow banks or NBFIs intermediate between borrowers and lenders of financial resources. They operate parallel to the formal banking system and provide credit, liquidity, and money-like financial instruments with a limited regulatory structure, which governs banks and other depository institutions that offer central bank liquidity or public sector guarantees. These NBFIs are highly leveraged

in comparison by the formal banking system. Major parts of the shadow banking system borrow short in rollover debt markets (securities lending and repurchase agreement transactions), and invest in longer-term and illiquid assets (Acharya *et al.*, 2010b, p. 319; Acharya *et al.*, 2010a, p. 2-3 and Blair, 2010, p. 3). The interactions among different intermediaries and the use of several instruments form an intricate system. An initial definition, made by the FCIC, broadly encompasses broker-dealers (i.e., investment banks), insurance companies (including monolines), financial companies, managed funds (such as hedge funds, money market funds, and various off-balance-sheet entities and other vehicles that aggregate and hold financial assets). (Acharya & Richardson, 2009, p. 117 and Financial Crisis Inquiry Commission, 2010, p. 7 and 23). Off Balance Sheet Entities (OBSEs) or Special Purpose Vehicles (SPVs), in the context of this analysis, are not classified as financial intermediaries, since they do not intermediate directly between borrowers and lenders; OBSEs that transform loans into tradable securities are, in fact, more of an auxiliary construction for the purpose of securitization. As the name SPV implies, these vehicles are set up for the sole purpose of loan sale and securitization.

Several instruments linked to the shadow banking system should be mentioned. Shadow banks issue loans to the private sector. However, unlike traditional depository institutions, shadow banks do not fund loans by accepting deposits. Special OBSEs raise funds through the issuance of financial market debt instruments backed by a pool of assets, like ABSs, Mortgage Backed Securities (MBSs), Collateralized Debt Obligation (CDO), and short-term Asset Backed Commercial Papers (ABCPs). Furthermore, managed funds and other institutional investors that hold securitized assets in their portfolios receive liquid resources from households and businesses in exchange for deposit-like fund shares. They design portfolios consisting of different financial market debt instruments and store remaining resources in repurchase agreement transactions. Again, taking a closer look at the post-Keynesian intermediation process, credit lending generates deposits or other deposit-like instruments, which serve as funding sources for the whole system. Regulatory authorities and central banks are challenged by the task of properly defining shadow banking, in order to implement efficient regulation. So far, there does not exist a clear and commonly agreed upon definition of what can be understood as shadow banking, or how to differentiate the NBFIs system. This is also a result of the varying definitions and regulatory standards of the traditional financial system in each jurisdiction. Regulatory bodies agree that there is a parallel financial sector, but not on precisely what it is, how to define it, and which entities and activities are part of it. As shadow banking markets will continue to emerge, a flexible, forward-looking perspective is crucial; regulators must stay ahead of changes to cover new instruments and entities. As shadow banking constitutes a system of multiple entities that cooperate in an intermediation chain, rather than one single entity, an appropriate definition has to capture the whole chain of intermediation. The individual entities of the system are differently shaped by various jurisdictions; therefore, definition and subsequent regulation need to apply to the economic substance or activities, rather than the overt form

or entity. In addition, the definition has to capture a global picture, given that parts of the shadow banking intermediation chain can be located in different jurisdictions (see Kocjan *et al.*, 2012 and Financial Stability Board, 2011a). The first crucial problem of shadow banking regulation becomes apparent: an elaborated definition is fundamental for further regulation, as it is essential to know what exactly needs to be regulated and which entities should be covered by regulation. Furthermore, a comprehensive definition is needed for the monitoring and screening of institutions that may pose major risks to financial stability and to the overall financial system.

Another motive to call for a strict and comprehensive definition—in order to get a clear picture of the object that needs to be regulated—is the interconnection of banks and shadow banks. Both bank and non-bank intermediaries are highly connected through different channels. Traditional banks can be part of the shadow banking intermediation chain or may provide liquidity support to non-banks in the form of backstop facilities. Another boundary point can be the investment in the financial products of the shadow banking system by the traditional sector, or even investment in the same or similar asset classes. Hence, traditional banks are exposed to a common concentration of risks through their asset holdings. This can heighten the risk of asset bubbles and may lead to fire sale situations, especially when entities in both sectors invest in the same assets. Clearly, banks are effected by the development of the shadow banking sector by these issues (see Financial Stability Board, 2011b). A strict definitional segregation of banks and shadow banks is needed to gain further insight into these two entities' interconnection.

Within the consultation process of Financial Stability Board (2011b), certain authors expressed the point of view that a comprehensive definition is not necessary. For instance, according to the International Banking Federation, the absence of a common definition should not prevent regulatory and/or supervisory actions, as no definition is needed to create regulation. For example, traditional banking regulation has not been prevented by the global inconsistency over what a bank is and does; there are still tight regulatory standards and supervisory oversight (International Banking Federation, 2011, p. 2). However, despite the view of the International Banking Federation, it is essential to agree on a clear definition and to distinguish what needs to be regulated in which way and concentration. It is essential to clearly circumscribe both the banking and the shadow banking sectors. Different definitions of traditional banking will influence the definition of NBFI, and various definitions differ in the scope of what they cover.

The Financial Stability Board, mandated by the G20, defines shadow banking using a two-dimensional approach as “a **system of credit intermediation** that involves **entities and activities outside the regular banking system**”. In narrowing the focus, the activities and entities conducted by shadow banks give rise to **i) systemic risk** concerns, in particular by maturity/liquidity transformation, leverage and lawed credit risk transfer (CRT), and/or **ii) regulatory arbitrage** concerns (see European Commission, 2012 and Financial Stability Board, 2011a).

Following the EU Commission Green Paper on Shadow Banking, which extended the FSB definition approach, entities outside the regulated system can be defined as NBFIs if they are involved in any of the following activities: (see European Commission, 2012): (1) perform maturity and/or liquidity transformation, (2) accept funding with deposit-like characteristics, (3) undergo CRT, or (4) use direct or indirect credit leverage. This definition encompasses entities that perform activities that constitute an important way of funding the shadow banking sector: (1) securitization, (2) securities lending, and (3) repurchase transactions (repos). This list takes an activity-based approach to definition.

Adrian & Ashcraft (2012), in contrast, use a much broader scope and define shadow banking as “banking intermediation without public liquidity or credit guarantees.” Shadow banks, in this context, “channel funding from savers to investors through a range of securitization and secured funding techniques.” Mehrling *et al.* (2013) define shadow banking concisely as “money market funding of capital market borrowing” with “no direct public backstop.”<sup>2</sup> The definition by Mehrling *et al.* (2013) focuses on activities that are funded by (short-term) capital market instruments. This definition seems simple, but also determines a crucial characteristic of the shadow banking system: money market funding. This highlights the importance of funding sources, and by extension, the importance of keeping the money market funding stable. If funding sources run dry, entities relying on that funding experience financial distress. The funding part of the shadow banking system might not be harmed in the first place; however, other entities and counterparties may be forced to liquidate assets in order to meet requests.

The FSB, in contrast, emphasizes shadow banking activities (mainly the act of credit intermediation) in creating their definition. In this way, the FSB covers a wide range of financial activities and maps a system that might be bigger than estimates under the definition by Mehrling *et al.* (2013). The European Commission also defines the shadow banking system using a functional approach, trying to capture as many potential shadow banking activities and entities as possible. These different approaches highlight the fact that the definition influences the perception of how big the system is, which activities and entities are part of the system, and what needs to be regulated. In planning global monitoring, the definition of shadow banks will determine the size of the sector. Keeping these issues in mind, regulators and authorities need to decide which definition is most efficient in ensuring the stability of the shadow banking sector and the overall financial system. The following questions also arise: should a definition cover all possible entities and activities, even though, later on, these entities and activities might be declared not important to concerns of stability and risk? Or should a definition encompass only parts that are explicitly identified as shadow banking entities?

To identify mutations or adoptions as potential concerns, and to derive and implement policy options, regulators focus on activities where certain concerns are likely to arise, notably: i) systemic risk through maturity and/or liquidity transformation; ii) leverage;

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<sup>2</sup>For further definitions see Appendix.

and iii) regulatory arbitrage, which can be used to circumvent and undermine banking regulation (e.g., CRT; Financial Stability Board, 2011b, p. 3). These factors are congruent with the essential characteristics of traditional intermediation and influence the financial system and overall financial stability. The intermediation process and possible development needs to be monitored and supervised. Consequently, a definition focused on the intermediation process and possible risks is most practical. The fact that shadow banking intermediation is characterized by the same factors of intermediation implies the importance of also screening and monitoring the shadow banking intermediation process with respect to overall stability.

According to the FSB approach, maturity and/or liquidity transformation, along with extended leverage, raise concerns about creating additional (systemic) risks within the shadow banking system, which could spread to the whole financial system through various channels of interconnections. Shadow banks typically use short-term and highly liquid non-deposit instruments (e.g., repos, ABCPs) to fund themselves via wholesale funds. Risk profiles of these instruments are somewhat unpredictable, as they are not subject to the usual banking supervision and standards, and/or are offered without official sector backstops. There does not exist government insurance for the safe return of such funds to investors in the event of market failure (Kocjan *et al.*, 2012, p. 5). Short-term funding can build up additional leverage (e.g., through re-hypothecation and securitization) and may lead to “modern-type bank runs”<sup>3</sup>. Furthermore, distinct leverage in the shadow banking system can amplify procyclicality. Activities within the system promote high leverage, particularly when asset prices are buoyant and haircuts and margins are low. But, market participants are exposed to disruptions in the financial system. This could lead to sudden deleveraging and fire sales of assets held by NBFIs and the traditional banking sector (see Financial Stability Board, 2011a, p. 4).

The shadow banking system conducts bank-like activities (i.e., broadly speaking, the intermediation task) with seemingly little or no regulatory constraints. Although many parts of the shadow banking system (e.g., MMFs, banks) are already subject to regulation, others (e.g., OBSE, finance companies) are so far unnoticed by financial authorities. Individually, these entities might not pose much risk to the financial system; however, their interplay and interconnection within the shadow banking system, along with the connection points with the traditional banking system—all without guaranteed access to central bank money or similar tools—could create the risk of a systemic failure. However, current regulation of these entities does not cover interactions of institutions and their impact on the financial system and on financial stability. Regulation of most entities has so far focused on consumer protection rather than on the financial stability of the system. Compared to banks, shadow banks might be able to obtain a funding advantage. Banks use these arbitrage effects to undermine regulation. This leads to

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<sup>3</sup>A Modern-type bank run is in this context defined as runs on run-able deposit-like instruments such as short-dated ABCPs, repos, and MMF investments (Financial Stability Board, 2011a, p. 4). The risks of a modern-type bank run through short-term funding, as well as other risks within the intermediation chain, are illustrated in the scenario modeled in Chapter 4.

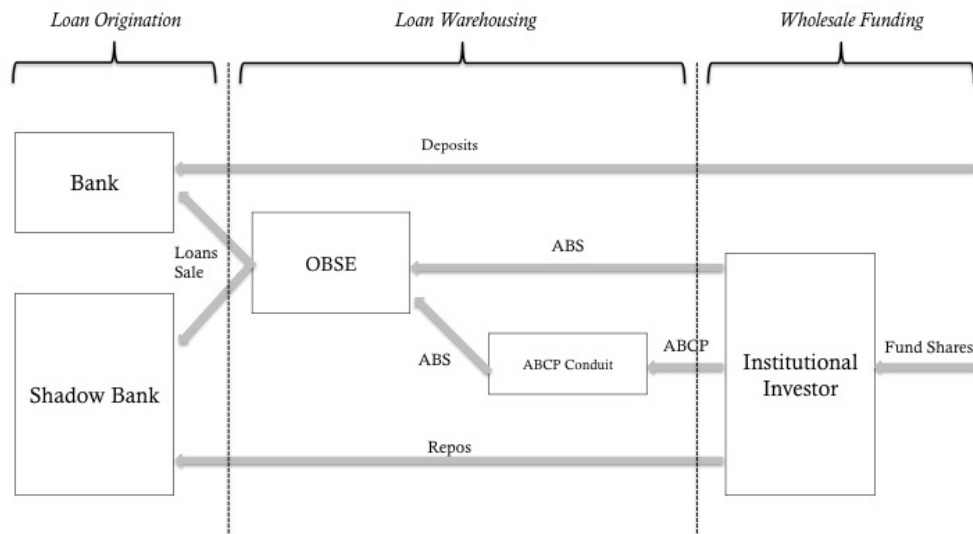


FIGURE 2.2: Stylized Shadow Banking Intermediation Chain (Author's drawing).

a build-up of additional risk and leverage, and the use of less regulated entities (e.g., OBSE) to circumvent these regulatory capital and liquidity requirements.

With regard to already regulated entities of the shadow banking intermediation chain, it should be kept in mind that there is not necessarily urgent demand for new and stricter regulation, although authorities should monitor NBFIs and create transparency. Regulation and definition need to focus more on the intermediation task and risks stemming from this process, as well as interconnections between the entities. In the following section, this work will concentrate on the definition and regulatory approaches made by the FBS.

## 2.3 Shadow Banking Intermediation Chain - Entities and Instruments

### 2.3.1 General Annotations

Traditional banking can be regarded as an integral part of the new intermediation model of shadow banking. Theoretically, the traditional intermediation process is enhanced by shadow banking entities and activities. Both the shadow banking system and the traditional banking system perform intermediation. This process is characterized by liquidity and maturity transformation, CRT, and leverage, and intermediation is split up and carried out by a number of capital market participants. The interaction of many entities conducts the same intermediation tasks as a single bank does. The afore-mentioned definitions provide a rough overview of the entities that are part of the shadow banking



system. Chapter 2 aims to deliver an accurate analysis of entities and activities, covering their quantitative size, interaction with other parts of the system, and general impact on the entire shadow banking system. Which part do these entities play within the intermediation process? For a simple consideration of the shadow banking intermediation chain, this analysis follows an approach similar to Pozsar (2008); the entities and instruments discussed below will be classified simply into the institutions and instruments involved in the issuance of loans (i.e., risk originators) and in the creation of securities (i.e., loan warehousing and ABS issuance), as well as institutions that invest in these instruments (i.e., risk bearers). Risk originators (e.g., depository institutions, finance companies, and broker-dealers) provide loans to the private sector, including businesses and consumers. Entities involved in loan warehousing and security issuance are OBSEs. Investors of instruments issued by risk originators through OBSEs are commercial banks, broker-dealers, managed funds (e.g., MMFs), and insurance companies. Some institutions may behave as risk originators or risk bearers, depending on the kind of transactions they undertake. For the purpose of the framework in the present paper, important participants and instruments as well as their development will be analyzed.

The loan origination task that enables the realization of investment projects through the traditional intermediation process is conducted by banks and shadow banks in a narrow sense (e.g., finance companies), providing loans to the private sector and hence, the real economy. Loan originators channel funds to projects in the form of granted credits. McLeay *et al.* (2014) describes the money creation process, as loan originators lend money to the private sector and so create money. Loan sales and securitization to OBSEs extends money creation. This supports the statement that the central bank determines the quantity of loans within the financial system, and the money multiplier. Loan sales enable banks to offer more loans to the market and create further money.

Maturity and liquidity transformation characterizes mainly short-term and liquid funding of primarily long-term and hard to sell, illiquid loans. In the shadow banking intermediation chain, maturity and liquidity transformation is conducted by a chain of entities, whereby liquid and short-term investments of the private sector are transferred to loans and other long-term and rather illiquid investments. Funding takes place through institutional investors, especially MMFs, that provide repos and other short-term credit to originators, and who also act as investors of short-term debt instruments that are issued for funding purposes. Furthermore, banks receive deposits and interbank loans. Institutional investors and MMFs generate funding by issuing shares to the private sector. Shadow banks in a narrow sense that conduct loan origination are not able to receive deposits and therefore depend heavily on loan sales, repos, issuance of money, and capital market instruments. The characteristic leverage or debt funding of the asset side through repos and other short-term debt transactions constitutes another important characteristic of the intermediation process.

All forms of CRT are conducted in the shadow banking system through the sale of loan portfolios to OBSEs in excessive amounts. It is assumed that both banks and shadow banks (in a narrow sense), sell originated loans to OBSEs, which convert these loans into tradable securities. These bonds are sold on a wholesale market to funds and banks, thereby funding the shadow banking system. Primarily, loans and other assets are sold for the purpose of securitization to OBSEs. The securitized assets are, for their part, sold to both the wholesale market and to originators. Originators (i.e., banks and shadow banks in a narrow sense) buy securitized assets that can be used as collateral in later transactions. Parts of the securitized portfolio are also bought by originators due to regulatory constraints such as risk retention. Funding of originators is conducted through loan sales and secured short-term loans (e.g., repo contracts) backed by retained securitized parts of the portfolio (retained portion as skin in the game). Funds buy ABSs for portfolio diversification purposes. Banks sell loans to free up capital bound by regulatory capital requirements (i.e., liquidity perspective) to fund parts of their asset portfolios. The securitization process enables banks to circumvent capital requirements (i.e., arbitrage perspective). Shadow banks (in a narrow sense) are not subject to capital requirements, and they sell their loans for refinancing purposes mainly under the liquidity aspect. Aside from short-term secured loans, securitization is the main source of funding for their asset portfolios.

Off-balance sheet entities are entities in charge of buying loans and converting them to tradable securities. They are a crucial part of the securitization process. Off-balance sheet entities also transfer payment streams. In the context of this paper, OBSEs are a simplified element that conducts securitization of loans into ABSs (the details will be explained later on in section 2.3.3). Institutional investors (such as funds and, especially, MMFs) constitute the end of the intermediation chain and offer an interest-earning alternative for investors in the private sector, including households and firms and others. Money Market Funds appear as wholesale investors, providing funding to the shadow banking system. Wholesale investors played also a major role concerning the development of the securitization market. The growth of the securitization market is also triggered by the demand side, which constitutes the connection with the growth of the asset management market. There has been an exponential increase in the assets under management, as those institutional investors are not subject to deposit insurance and do not have access to safe, short-term, interest-earning investments. Two parts of the financial system find common ground: one side needs to store huge excess liquidity, and the other side needs funding. This leads to a growth of the repurchase agreement market, where institutional investors can store liquid resources safely, backed by collateral. These transactions are considered to be investments that are highly safe, liquid, and redeemable on short notice. This increased use of collateralized transactions led to an increased demand for high-level collateral (i.e., collateral mining), which can be posited as a driver of securitization (Gorton, 2010 and Gorton & Metrick, 2010c). The total balance significantly exceeds the total of insured deposits (see Greenwood *et al.*

, 2013 and Pozsar, 2011). Funds hold diversified portfolios of repos to other financial intermediaries, company shares and company equity, OBSE-issued bonds (i.e., ABSs), and other financial securities. Money Market Fund shares are considered by financial investors (households and companies) to be liquid, secure, highly rated, and equivalent to safe deposits, as they are redeemable on a daily basis, just like bank deposits.

Compared to the traditional intermediation process, which has only a single financial intermediary, the intermediation chain can be disrupted at different stages. This could result in unrealized investment projects and lead to severe negative influences on the real economy. It is therefore important to know (1) which entities belong to this chain and what their tasks are within the intermediation process; (2) which problems emanate from those entities, especially through interconnections; and (3) where and how adequate regulation should be set up. Different problem areas along the intermediation chain are made clear in the scenario outlined in Chapter 3. In the following section, entities belonging to the intermediation chain will be analyzed regarding their position within the intermediation process, market development, and growth. They will be brought into a comprehensive framework that aims to depict relations between individual entities through their activities and exposures.

## **2.3.2 Loan Origination**

### **2.3.2.1 Depository institutions**

The group of depository institutions or Monetary Financial Institutions (MFIs) comprises credit institutions and all other financial institutions whose business is to receive deposits and/or close substitutes for deposits from entities, as well as, for their own benefit, to grant credit and/or invest in securities (European Central Bank, 2004, p. 115 and Cohen, 2004, p. 48). Deposits are often payable on demand and issued to a large number of different businesses and individuals in the private sector. Primarily, these funds are used for loans to the private sector. The post-Keynesian approach of generating deposits has to be kept in mind. Depositor institutions issue loans to the real sector, which in turn store their deposits generated through loan issuance at those depository institutions. In the US banking system, the definition of depository institutions includes commercial banks, saving institutions, and credit unions. Commercial banks account for about 80 to 90% of the total assets of depository institutions in the United States. Therefore, only commercial banks will be taken into account in the present paper. In the Euro Area, the MFIs group includes credit institutions, central banks, MMFs, and other institutions<sup>4</sup>. For the following section, only credit institutions will be taken into account.

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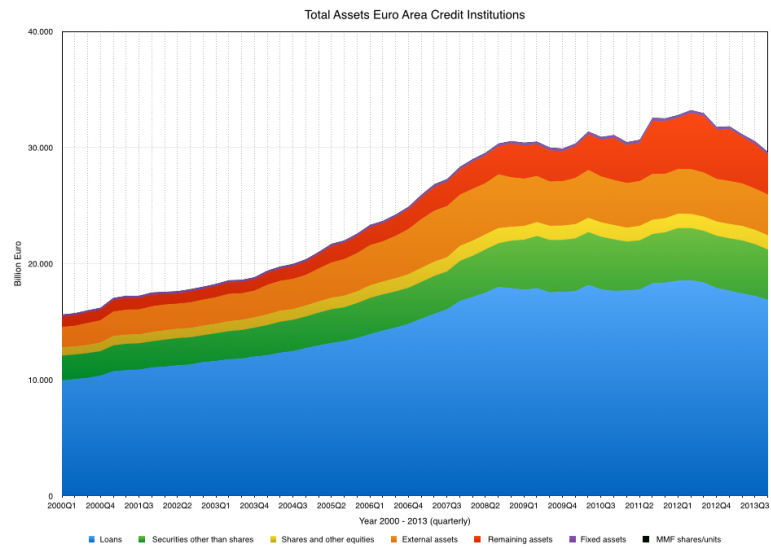
<sup>4</sup>See also [http://www.ecb.int/stats/pdf/money/mfi/mfi\\_definitions.pdf](http://www.ecb.int/stats/pdf/money/mfi/mfi_definitions.pdf)

Mainly, depository institutions issue loans to households, businesses, and other customers, which together comprise the real sector). Furthermore, they invest parts of their funds in debt instruments as well as in mutual fund shares. Currently, total assets of Euro Area credit institutions amount to Euro 29.613 billion (Quarter IV; Year 2013). The level of assets grew constantly from 2000 until the fourth quarter of 2008, up to a value of Euro 30.556 billion. This was followed by a decline to Euro 29.911 billion in Quarter IV 2009. The observed credit institutions issue 60 to 65 % of their assets as credit to households, firms, and other capital market participants (see Figure 2.3). The same observation can generally be made for the US commercial banking sector. Total assets of US commercial banks amounted to Dollar 12.092 billion in May 2009, followed by a decline, which hit a low point in March 2010 at Dollar 11.631 billion. Currently, total assets amount to Dollar 14.190 billion. Until the end of 2008, US commercial banks issued 80 to 85% of their assets as loans to the private sector, which had been reduced to about 70% by 2013. From 2009 until 2013 banks performed regrouping from credit issuance to cash assets, which can be assumed to be more liquid. This allows banks to prepare for sudden liquidity needs due to withdrawal. Loan issuance amounts are now up to 70% off overall assets (see Figure 2.4). Also observable is the decline of interbank loans beginning at the end of 2008. This point of time denotes the bankruptcy of the investment bank Lehman Brother that resulted in a loss of confidence in short-term lending markets. In the course of the Lehman Brothers' insolvency, the interbank market experienced stagnation and rising interest rates in interbank loans, leading to declining interbank loan amounts.

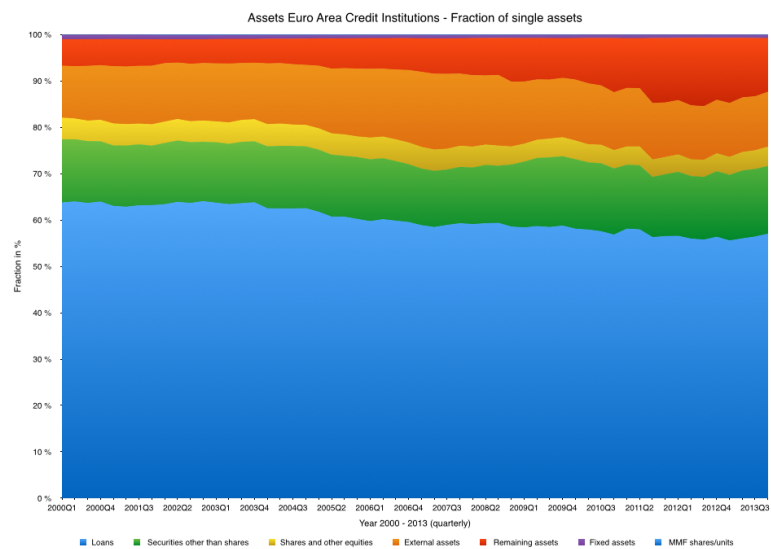
Deposits dominate the liability side of depository institutions. Credit institutions in the Euro Area fund 50% of their assets through deposits on the liability side (see Figure 2.5). During the crisis of 2008 and 2009, there had been no significant decrease in depository funding. United States commercial banks receive funding through deposits up to an amount of 70% of the total liabilities. Figure 2.6(b) shows a sudden decline in deposits or withdrawal by the private sector at the end of 2008. This sudden decline in deposits was compensated with net due related to foreign offices, meaning cash reserves from other countries. Furthermore, credit institutions and commercial banks also fund themselves through the issuance of financial market instruments, capital and reserves, and borrowings like interbank loans.

### **2.3.2.2 Broker-dealer (investment banks)**

Investment banking includes a rather heterogeneous set of activities, which can be classified as follows: (1) traditional investment banking, (2) trading and brokerage, and (3) asset management. Traditional investment banking can include advisory work, assisting in transactions such as mergers and acquisitions, or debt restructuring; as well as underwriting services, such as assisting in raising capital on financial markets. Trading and brokerage includes the purchase, sale, and brokerage of securities, either for one's

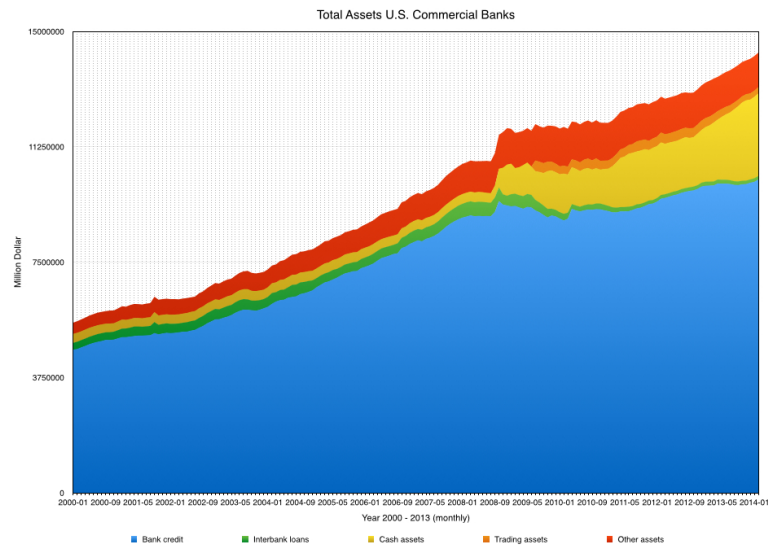


(a)

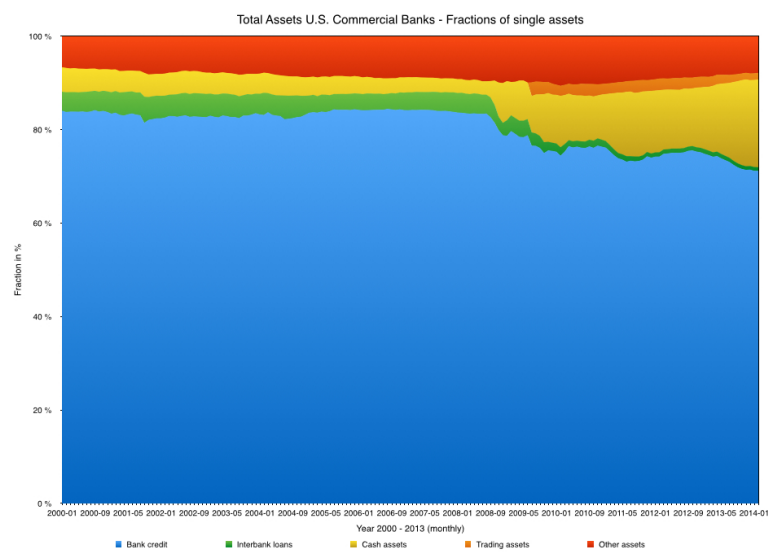


(b)

FIGURE 2.3: Total Assets Credit Institutions Euro Area. Level of total assets (a) and fraction of single assets (European Central Bank Statistical Warehouse; <http://sdw.ecb.europa.eu/browse.do?node=bbn3506> Date of Download: 06. June 2014).

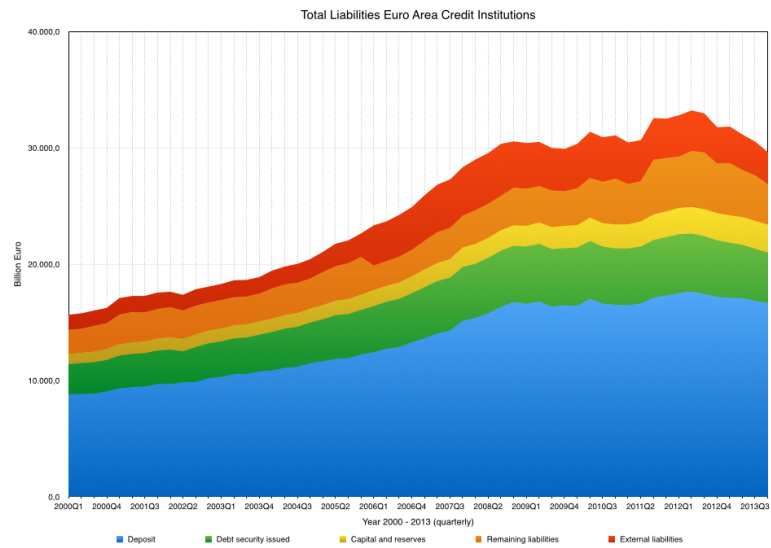


(a)

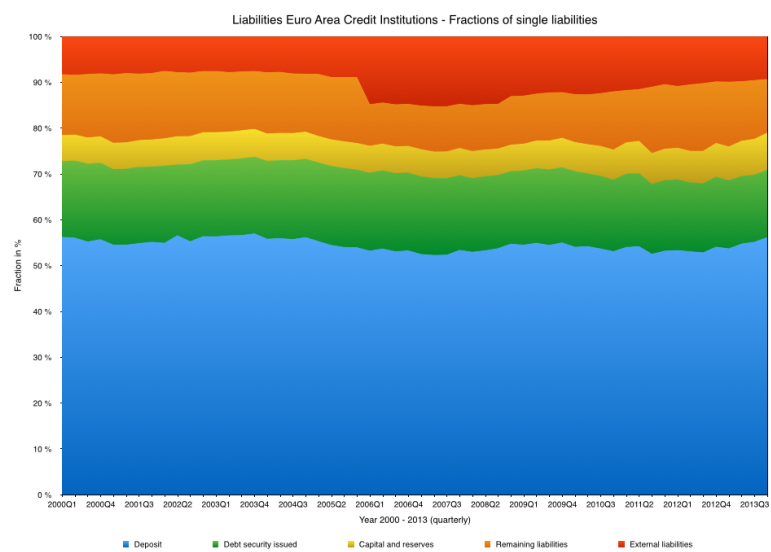


(b)

FIGURE 2.4: Total Assets U.S. Commercial Banks. Level of total assets (a) and fraction of single assets (Board of Governors of the Federal Reserve System Data Download Program; <http://www.federalreserve.gov/datadownload/Choose.aspx?rel=H8>; Table H.8; Date of Download: 06. June 2014).

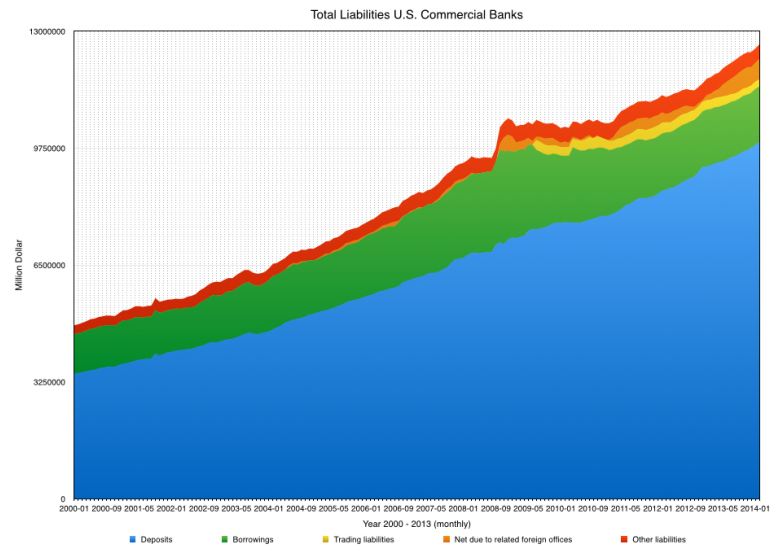


(a)

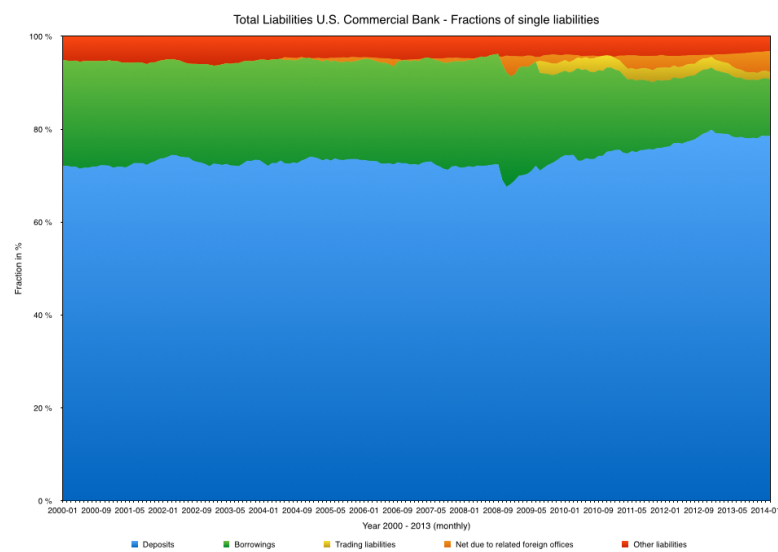


(b)

FIGURE 2.5: Total Liabilities Credit Institutions Euro Area. Level of total liabilities (a) and fraction of single liabilities (European Central Bank Statistical Warehouse; <http://sdw.ecb.europa.eu/browse.do?node=bbn3506> Date of Download: 06. June 2014).



(a)



(b)

FIGURE 2.6: Total Liabilities U.S. Commercial Banks. Level of total liabilities (a) and fraction of single liabilities (Board of Governors of the Federal Reserve System Data Download Program; <http://www.federalreserve.gov/datadownload/Choose.aspx?rel=H8> Date of Download: 06. June 2014).



own account (proprietary trading) or the accounts of others (brokerage). Lastly, asset management and securities services imply the management of investors' money, using traditional (i.e., open-end mutual funds) and alternative investment strategies (i.e., real estate funds, hedge funds, etc.) (Iannotta, 2010, p. 1-2 and Morrison & Wilhelm, 2008, p. 21 f.).

Investment banks mediate between sellers and buyers of securities. They sell issued securities to raise money that corporations need (Fleuriet, 2008, p. 34). Investment and commercial banking can be performed by one bank, referred to as universal banking. In the past, universal banking was prohibited in some jurisdictions (e.g., the US). The Banking Act of 1933 (Glass-Steagall Act) was enacted to prevent commercial banks from engaging in investment bank activities. The Financial Modernization Act of 1999 (Gramm-Leach-Bliley Act) repealed the existing separation between investment and commercial banks (Iannotta, 2010, p. 6; for further insight, see Barth *et al.*, 2000 and Barth *et al.*, 2008). Since 2011, depository institutions and, especially, broker-dealers are subject to the Volcker Rule (included in Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act; DFA)), which prohibits insured depository from proprietary trading and restricts investment in hedge and private equity funds<sup>5</sup>.

Broker-dealer balance sheets differ strongly from those of conventional depository institutions. Unlike depository institutions, investment banks or broker-dealers do not take deposits as their main funding source. Their importance in the supply of loans has increased with securitization. By the 1960s, broker-dealers got a number of companies to finance themselves through the issuance of commercial paper (CPs). Later on, securitization was one of the first activities for which broker-dealers competed with commercial banks. On the asset side of the balance sheet, investment banks hold 25% of credit market instruments, such as CP, ABS, equity and shares, and different kinds of bonds (e.g., corporate bonds and municipal bonds). About 50% of the asset side is made up of miscellaneous assets, including loans. About 20% of the liability side is owed by a parent or funded through direct investment (i.e., miscellaneous liabilities). A further 50% of the broker-dealer balance sheet is funded through security credit due from commercial banks, households, and the rest of the world, and 20% is funded through repurchase agreements (Board of Governors of the Federal Reserve System, 2011, L.128).

### 2.3.2.3 Finance Companies

Finance companies are either independent financial firms (i.e., consumer and commercial finance companies, leasing companies and factors) or captive financing subsidiaries of non-financial corporations (e.g., Capital One, Ally Finance (former General Motors Acceptance Corporation; GMAC)) (Carey *et al.*, 1998, p. 848). Stated statistics refer to American data, as the institutional type of finance company exists almost solely in

<sup>5</sup>See <http://www.sifma.org/issues/regulatory-reform/volcker-rule/overview/>

the US, where these companies, along with depository institutions, are important suppliers of credit to businesses and consumers (Financial Crisis Inquiry Commission, 2010, p. 28). However, unlike banks, finance companies do not take deposits. Instead, they must raise funds by issuing commercial papers and other short- and medium-term debt instruments to finance their loans (Tucker, 2010, p. 3). Finance companies raise large amounts through the issuance of debt instruments and lend credits in smaller amounts to borrowers. Depository institutions, in comparison, collect deposits in small amounts and make large loans. As finance companies do not receive deposits, they are not subject to bank regulation and therefore have no access to a discount window or deposit insurance. There are no regulation constraints concerning the assets finance companies hold or how they raise funds. They are therefore better able to provide customized loans than banking institutions (Mishkin & Eakins, 2008, W-2 and Dynan *et al.*, 2002, p. 7)<sup>6</sup>.

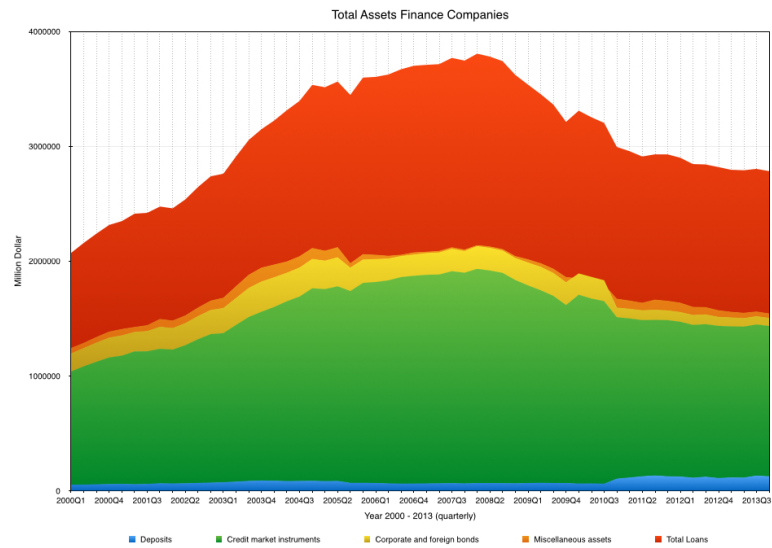
The issuance of short- and medium-term debt instruments represents an important source of funding. The proportion amounts to more than 60% of all funding sources. They also obtain funds by borrowing from banks (about 5 to 10%) and the parent company (about 15%) (i.e., captive finance company). Finance companies operate from a narrow equity base. The proportion of capital, surplus, and undivided profits together amount to less than 10%. About 65 to 75% of finance companies' assets are issued as loans, such as real estate, business loans, or consumer loans. Furthermore, finance companies invest about 25% in other assets, such as debt instruments (see Figure 2.7). The issuance of consumer loans peaked in the first quarter of 2008. After a decline until 2009 (Quarter III), issuance went up again. Real estate loans experienced a sharp decline until the time of writing. Business loans remained almost stable throughout the years 2000–2013, although there were some deviations (see Figure 2.8).

#### 2.3.2.4 Stylized Loan Originator

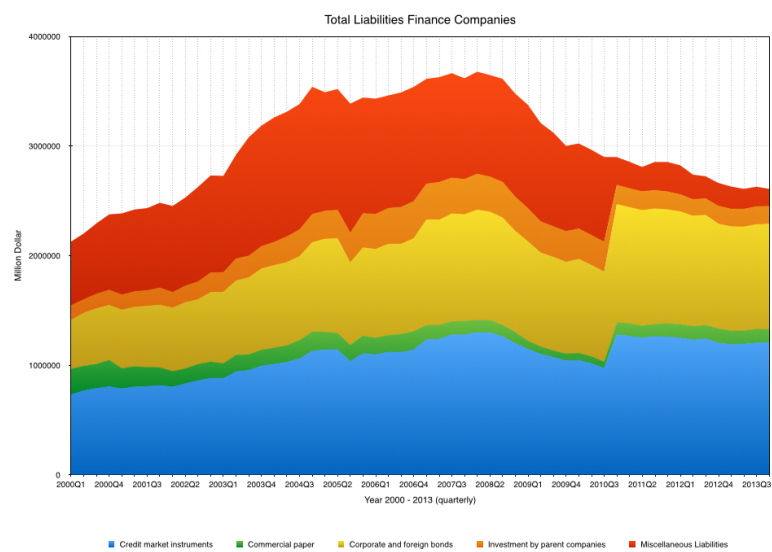
For the purpose of the analysis in the present paper, two kinds of loan originators are assumed: (1) banks, as the part of the system with central bank liquidity access and governmental guarantees and (2) shadow banks (in the narrow sense), as the part of the system dependent on market funding.

**Banks with central bank access** are assumed to have the following assets: required reserves  $rD$ , where  $D$  are the deposits of the non-bank sector and  $r$  is the required reserve rate; loans  $L_b$  supplied to the private sector (households and firms  $L_b = L_b^h + L_b^f$ ); loans  $L^s$  supplied to shadow banks in a narrow sense (broker-dealer and finance companies); loans issued to other banks (interbank loans)  $K^s$ ; debt instruments issued by OBSEs  $B_o^b$  and institutional investors  $B_i^b$ ; and excess reserves  $E$ . Furthermore, banks grant credit enhancement in the form of credit lines to OBSEs  $L^o$ . As contingent liabilities,

<sup>6</sup>See <http://wps.aw.com/wps/media/objects/2095/2146070/CH26.pdf>



(a)



(b)

FIGURE 2.7: Balance sheet U.S. Finance Companies. Total assets finance companies (a) and total liabilities (b) (Board of Governors of the Federal Reserve System Data Download Program; <http://www.federalreserve.gov/datadownload/Choose.aspx?rel=G20>; Date of Download: 06. June 2014).

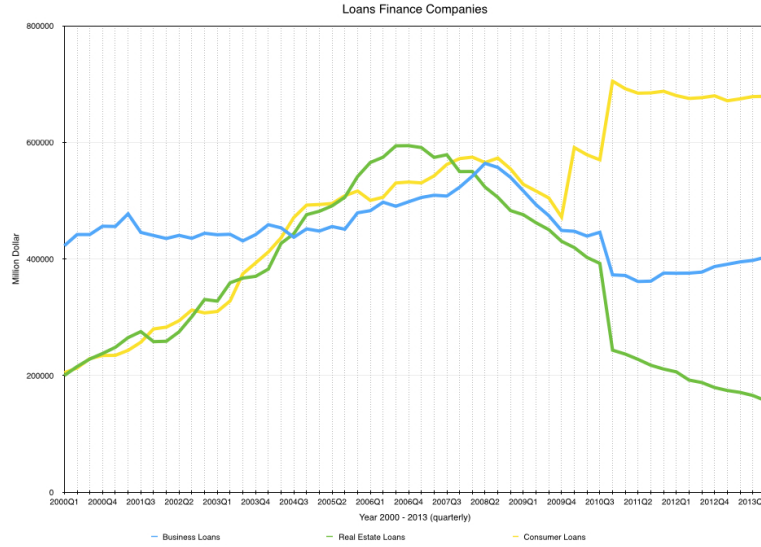


FIGURE 2.8: Loans U.S. Finance Companies. Level of loans (Board of Governors of the Federal Reserve System Data Download Program; <http://www.federalreserve.gov/datadownload/Choose.aspx?rel=G20>; Date of Download: 06. June 2014).

credit lines cannot be included and do not appear on the balance sheet. Commercial banks are also able to sell parts of their loan portfolios to OBSEs in exchange for liquid resource reserves, moving the sold loan position off the balance sheet  $-L_b^o$ . These liquid resources are used for new loan origination. Banks manage the volume and structure of their asset portfolio with an eye to liquidity and solvency. Empirical research shows that securitization is mainly driven by liquidity considerations (Cerrato, 2010). In addition to liquidity, risk reduction and regulatory arbitrage amplify securitization. This has been confirmed by Totzek (2009). Early withdrawals are reasonable for the liquidity holdings of banks to meet small sudden withdrawals and requests. Therefore,  $B$ ,  $K^s$ , and  $E$  are considered to be liquid assets, and fluctuate on short notice. Liabilities of commercial banks are deposits  $D$ , loans issued by other banks  $K^d$ , surplus and capital  $C_b$ , and  $repo^b$  issued by institutional investors or the central bank. The relationship between interbank and central bank loans is defined as follows:  $K^s + K_c = K^d$ . Banks use repos as a short-term funding source, as well as interbank loans that can be considered substitutes for repos. This relationship becomes meaningful in the scenario analysis in Chapter 4. For the sake of simplicity, required reserves held with the central bank  $rD$  and deposits  $D$  from the private sector will be consolidated as  $(1-r)D$  on the liability side of the balance sheet. The balance sheet of commercial banks reads:

$$L_b - L_b^o + L^s + B_o^b + B_i^b + K^s + E = (1-r)D + repo^b + K^d + C_b$$

**Shadow banks** (in a narrow sense) encompass broker–dealers and finance companies, and play an important role in the credit market. As they do not receive deposits or hold reserves with the central bank, shadow banks are not as regulated in their credit lending activities as traditional banks are. Shadow banks are assumed to have the following assets: loans to the private sector  $L_s$  (households and firms  $L_s = L_s^f + L_s^h$ ), debt instruments issued by OBSEs  $B_o^s$  and institutional investors  $B_i^s$ , and a limited amount of bank deposits  $D_s$ . On the liability side, shadow banks are financed by repurchase agreement transactions  $repo^s$  with institutional investors, issuance of commercial papers to institutional investors  $CP$ , loans issued by banks  $L^s$ , and surplus and capital  $C_s$ . Like banks, shadow banks (in a narrow sense) are also able to sell parts of their loan portfolios to OBSEs  $-L_s^o$  and receive liquid resources in exchange. Like banks, shadow banks sell assets or play a major role in securitization for the purpose of ensuring adequate liquidity or reducing risk on their balance sheet. Their balance sheet reads:

$$L_s - L_s^o + B_i^s + B_o^s + D^s = repo^s + CP + C_s + L^s$$

Debt instruments issued by OBSEs are mainly held as assets on the balance sheet for the purpose of signaling. Banks and shadow banks that are involved in origination buy parts of the securitized portfolio to reflect certain qualities. As part of the financial regulation and stabilization of the securitization market, institutions involved in origination are compelled to hold part of the securitized portfolio as risk retention (for further insight on retention regulation and proper CRT see Chapter 4).

### 2.3.3 Loan Warehousing and Securities Issuance (ABS)

#### 2.3.3.1 Technical details and development

While moving from traditional financing to shadow banking, there has been a rise in structured finance. Structured finance encompasses arrangements that refinance or hedge any economic activity beyond the scope of conventional forms of on-balance-sheet securities, at low agency and capital costs. Securitization and credit derivatives are the two major classes of structured finance. For the purpose of this analysis, the focus is on securitization for funding purpose (Jobst, 2005/2006, p. 2). Securitization denotes a financing process whereby illiquid assets (i.e., loans and other receivables) are pooled and transformed into liquid financial instruments (Art 4 (61) CRR - Regulation (EU) No 575/2013) and BaFin, 1997). Generally, the securitization process follows a particular pattern: The originator (e.g., bank, finance company) transfers a portfolio of assets to a special purpose vehicle (SPV; i.e., pooling of loans). The SPV in turn issues rated securities backed by this portfolio (Sachverständigenrat, 2007, p. 108). This securitization process converts loans that have been held on balance sheet into marketable securities

that are sold and traded by the SPV. Banks that sell their loans on the securitization market are able to distribute the risk associated with the assets across a wider range of investors, rather than taking on the entire risk themselves (CRT; Stein, 2010, p. 44).

Special purpose vehicles, also known as OBSEs, are legal entities created for the purpose of transferring assets (i.e., loans) off the balance sheet of the originating firm (i.e., risk originator). These special purpose entities are thinly capitalized and have no management or employees, and administrative functions are performed by a trustee. Due to constrained business activity and limited ability to incur debt, OBSEs risk having a shortfall of cash, below what they need to pay investors. Securitization transactions rely on the quality of the underlying assets. Therefore, in most transactions, it is essential to design the right legal and financial structure to receive the requested rating. This structural support is usually referred to as credit enhancement and can be provided in many different ways. The following internal and external forms of credit enhancement could be provided: overcollateralization, cash collateral account, letter of credit, credit insurance, financial guarantee insurance, and subordination. Off balance sheet entities are created as bankruptcy remote, meaning that OBSEs are created to protect the originating firm in the case of bankruptcy, as the insolvency of the originating firm has no impact in the OBSE. In case of bankruptcy in the originator, their creditors cannot seize assets of the OBSE. Furthermore, the OBSE itself cannot become legally bankrupt (for more information, see Gorton & Souleles, 2005, p. 560; Bär, 1997, p. 104; Schepers, 2006, p. 259 and Gorton & Metrick, 2010b, Deloitte und Touche GmbH Wirtschaftsprüfungsgesellschaft, 2011, p. 90).

Literature distinguishes between true sale and synthetic securitization. In a true sale transaction, the originator actually sells and transfers the legal title and the physical position of the underlying assets off the balance sheet to the SPV. The originator, in turn, receives a purchase price for the assets sold in the transaction. The off-balance-sheet entity issues securities backed by the assets purchased. This transaction allows the originator to free capital (i.e., asset swap of illiquid assets into liquid resources), thereby reducing capital requirements. With the liquid resources received, the originator can either meet liabilities or use them to issue new loans to the private sector. In a synthetic transaction, the originator transfers only the credit risk, not the legal title, to the OBSE, using credit derivatives. The physical position remains on the originator's balance sheet and no transfer of the legal title occurs (Deloitte und Touche GmbH Wirtschaftsprüfungsgesellschaft, 2011, p. 87). The sale of an asset position to an OBSE is generally a funded risk transfer; some instruments solely transfer the credit risk, but do not provide funds at the time the risk is transferred. For further considerations, this analysis will concentrate on the securitization of asset portfolios via OBSEs rather than via direct transactions or single-name transactions (Committee on the Global Financial System - Bank of International Settlement, 2003, p. 5).

Asset Backed Securities transactions are distinguished by their payment structure, i.e., how the payment flow (i.e., interest rates and amortization) is treated. In a pass-through structure, the cash flow generated by the underlying asset portfolio is pooled and distributed directly to the investor. With the investment made, the investor purchases a share of the payment flow. Regarding cash flow and risk, all investors acquire an equal position. Pay-through structures, on the other hand, give the investor a proportional claim against the asset pool. Investors receive differing interests and amortization in a subordinated structure (i.e., waterfall principle). In the most common cases, OBSEs issue tranches of securities to the market in a hierarchic structure (AAA first, followed by AA, A, BBB, BB, and so on). Payments on assets, as well as losses, are distributed in a predefined order. This results in different risk profiles (i.e., rating) of the different tranches. The equity tranche (i.e., first loss piece; FLP), with the lowest rating, is exposed to the highest credit risk. Losses are first distributed to the FLP. In contrast, the senior tranche, with the highest rating, is exposed to the lowest credit risk. Payments are allocated in the senior tranche first (Deloitte und Touche GmbH Wirtschaftsprüfungsgesellschaft, 2011, p. 86ff, for a simple model of the securitization structure Figure 2.9).

Securities issued by OBSEs in the securitization process are referred to as ABSs. They are defined as one major group of capital-market-structured finance products, and are mostly used for refinancing purpose. Asset Backed Securities is also a collective term and includes all other classes. Asset Backed Securities, in a wide sense, are classified by their maturity, underlying pool of assets, and payment structure (pass-through or pay-through). Depending on the underlying asset class, literature differentiates between ABSs in a narrow sense (i.e., traditional ABSs), MBSs, CDOs, and short-term ABCPs. The underlying asset pool of ABSs, in a narrow sense, mostly consists of trade and credit card receivables, consumer credit, and lease contracts. Mortgage-backed securities, a large part of ABSs, are ordinarily based on a pool of residential mortgages (i.e., residential mortgage backed securities; RMBSs) and commercial mortgages (i.e., commercial mortgage backed securities; CMBSs) (Deloitte und Touche GmbH Wirtschaftsprüfungsgesellschaft, 2011, p. 10 and Ricken, 2008, p. 39). CDOs are securitized loan and bond portfolios, including mezzanine tranches of securitized portfolios (i.e., collateralized loan obligations, CLO; collateralized bond obligations, CBO and collateralized fund obligations, CFO). The repeated securitization of ABS tranches is also known as re-securitization, and can be carried out several times (see Pozsar, 2008 for Matryoshka CDolls, i.e., multi-layered structured credit products; Ricken, 2008, p. 56; Jobst, 2005/2006 and Deloitte und Touche GmbH Wirtschaftsprüfungsgesellschaft, 2011). Multi-layered structured credit products and the resulting complexity are addressed by regulators. Standardization of the securitization process and products is supposed to reduce complexity while optimizing functionality and transparency for investors in assessment and valuation.

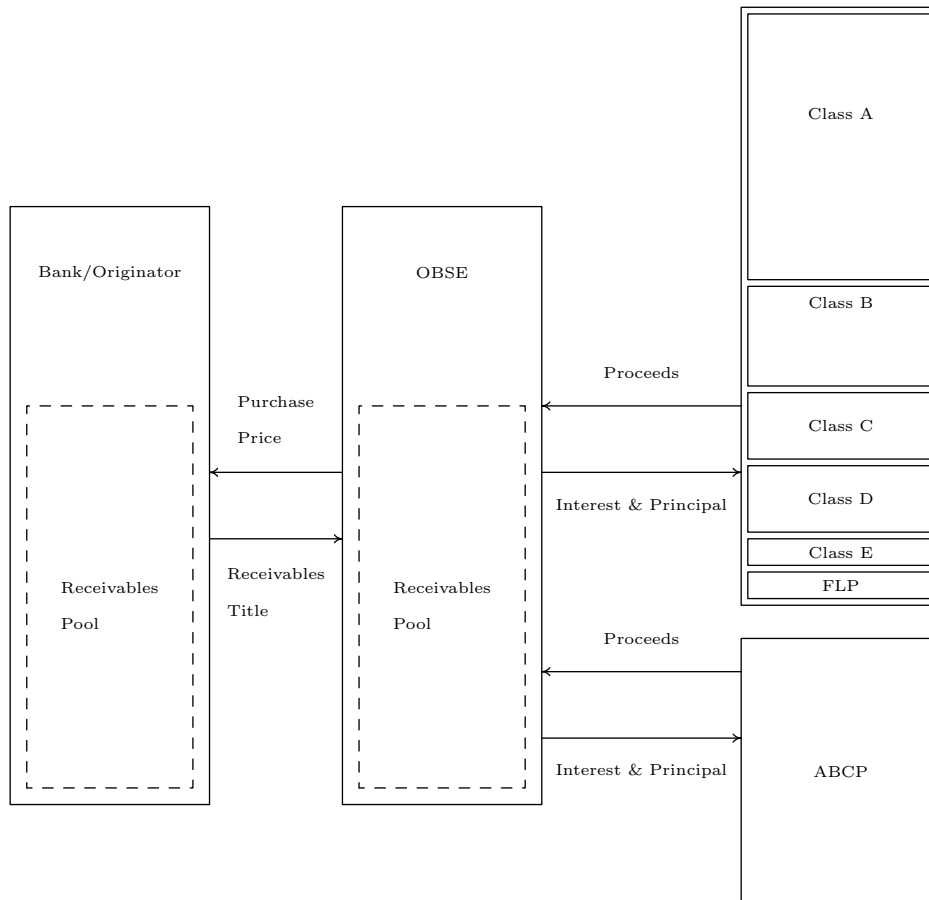


FIGURE 2.9: Simple securitization structure of Asset Backed Securities and Asset Backed Commercial Papers with OBSEs (FLP = First Loss Piece). Author's drawing based on Deloitte und Touche GmbH Wirtschaftsprüfungsgesellschaft, 2011, p. 108 and 111.

Asset Backed Securities are classified by their defined time to maturity into term transactions (e.g., traditional ABSs, MBSs, and CDOs) and short-term ABCP-programs. Asset Backed Commercial Papers constitute a short term, not-market-listed debt instrument, backed by collateral. Depending on their time to maturity, OBSEs are also classified into OBSEs for term transactions and ABCP conduits. Term transactions have a minimum time to maturity of two years, and therefore receive a long-term rating for any individual tranche (Ricken, 2008, p. 40 and Deloitte und Touche GmbH Wirtschaftsprüfungsgesellschaft, 2011, p. 91). Short-term ABCPs are normally used to refinance long-term assets. Therefore, ABCP programs and associated conduits are set up permanently to issue revolving ABCPs. In general, OBSEs for term transactions are set up as single-seller entities. Asset Backed Commercial Papers conduits are



OBSEs that finance the purchase of receivables, primarily through issuing short-term debt instruments. These conduits are generally built as multi-seller conduits. Usually, ABCP conduits form a holding structure, where one OBSE purchases assets from many originators, while another OBSE issues the short-term debt instruments. There are a number of securitization program types and combinations of credit and liquidity support mechanisms (Ricken, 2008, p. 40–41; for more specific details on ABCP conduit types, see DBRS, 2009, p. 8–11 and Moody’s Investor Services, 2003).

Globally, the issuance of ABSs decreased sharply in 2007, as US markets constitute the majority of issued ABSs and European and Asian markets remained constant. In 2008, US issuance was small and Euro Area issuance increased. In 2009, issuance increased again and remained at a relatively constant level until the time of writing. Relatively small amplitudes can be observed (see Figure 2.10).

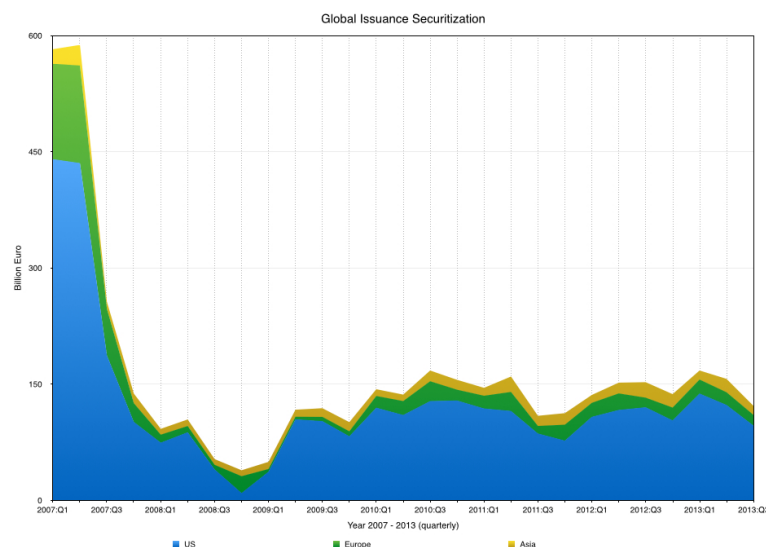


FIGURE 2.10: Global Issuance Structured Finance (Association for Financial Markets in Europe (AFME) Statistics, Securitization Data Report QI 2004 - QIV 2013; <http://www.afme.eu/documents/statistics-and-reports.aspx>; Date of Download 06. June 2014).

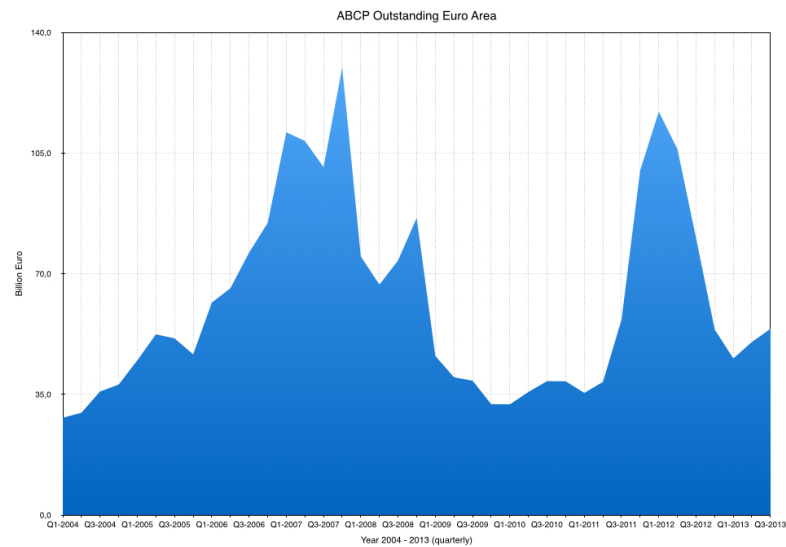
The issuance of securitized products in Europe and the US evolved differently. Outstanding short-term ABCP amounts peaked at the end of 2007. The year after, the level decreased sharply. From 2009 on the level decreased more gradually, to a low of Dollar 233,4 billion. In Europe, short-term ABCP amounts that were outstanding developed unsteadily. Until 2007, the amount increased, followed by a decline until the end of 2008. Over the course of the events of 2008 and 2009, the outstanding amount decreased sharply and remained at this level until 2011. Another short peak was reached in 2012 (Quarter I), after which it decreased almost to the level of 2009 and 2010 (see Figure 2.11). The ABS amount outstanding in US markets peaked in 2007 (Dollar 2.909

billion), and from 2008 until 2012 the amount decreased constantly, remaining stable in 2013 (see Figure 2.12(a)). Compared to this, structured finance in the Euro Area increased constantly until 2009 (Quarter IV). A sharp increase was noticed between Quarter III and Quarter IV of 2008. Following the financial crisis of 2008 and 2009, the outstanding amount decreased gradually. Compared to the amount outstanding in the US, the decrease of securitized assets outstanding in the Euro Area occurred downstream. This can be seen in the increase in 2008 and peak in 2009 in the Euro Area, while the US market had already decreased in 2008 (see Figure 2.11(a)). The development of underlying assets varied strongly in the US market. In the year 1985 until 1990 automobile credit portfolios dominated. In the 1990s, the major underlying collaterals were credit card loans, which totaled about 50%. In 2012 and 2013 CDOs (i.e., re-securitization) and other underlyings dominated the US portfolio (see Figure 2.12(b)). In the Euro Area, underlying portfolios evolved to be mainly made up of MBSs (50 to 70 %). This displays the funding of the mortgage market in the Euro Area. Compared to the US market, CDOs account for a relatively small fraction in the Euro Area (see Figure 2.11(b)).

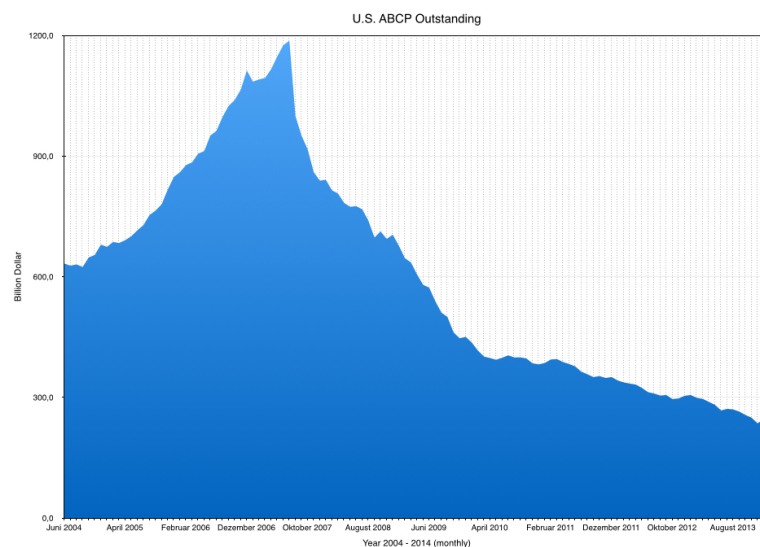
In the course of the financial crisis, a number of sources of friction within the securitization process became apparent (see Ashcraft & Schuermann, 2008). These mainly include asymmetrical information between participants in the securitization process and highly reliant ratings. In the following section, it is discussed how regulators address these frictions, with both different regulatory proposals and actions. Reliance on ratings of ABS transactions and linked valuation of collateral is dealt with by the FSB. Stable ratings will help investors to make investment decisions. The main reason to reduce rating reliance is to ensure the long-term stability of ABS value, so possible downgrading does not have an overall severe impact on market stability, as investors might be encouraged to draw back their engagement due to declining values, which could possibly lead to herd behavior. This analysis will concentrate mainly on risk retention regulation to ease and reduce asymmetric information and to resolve defective CRT.

### 2.3.3.2 Stylized OBSE

**Stylized OBSEs** serve only a securitization purpose. They purchase parts of loan portfolios or the whole pool of loans  $L_b^o + L_s^o$  in exchange for liquid resources (i.e., asset swap). The purchase of loans is refinanced through the issuance of structured debt instruments (e.g., ABCPs, ABSs, etc.) to commercial banks, shadow banks, and institutional investors. The process of purchasing loans and selling debt instruments occurs *unum actu*. In the case of credit failure, OBSEs have access to credit lines granted by commercial banks to meet their claims. The OBSE does not take any decision-making role. Within the stylized model, the OBSE's only purpose is to transform loan portfolios in tradable securities, which, as the name implies, are special purpose vehicles.

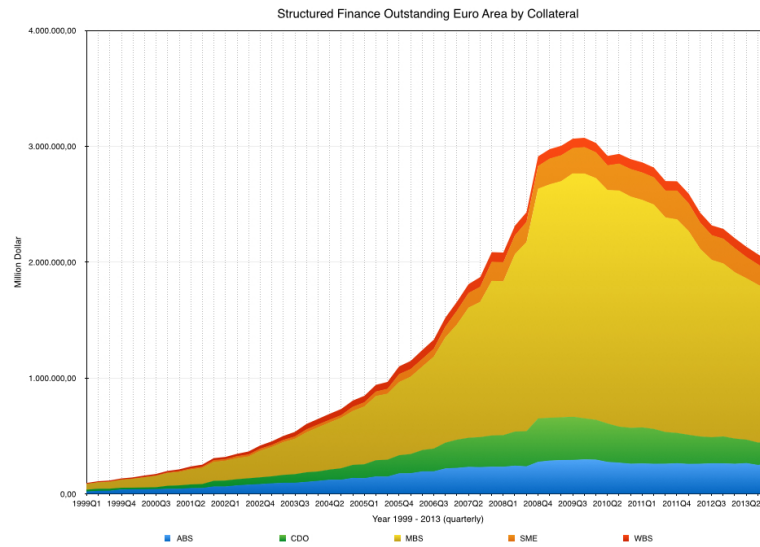


(a)

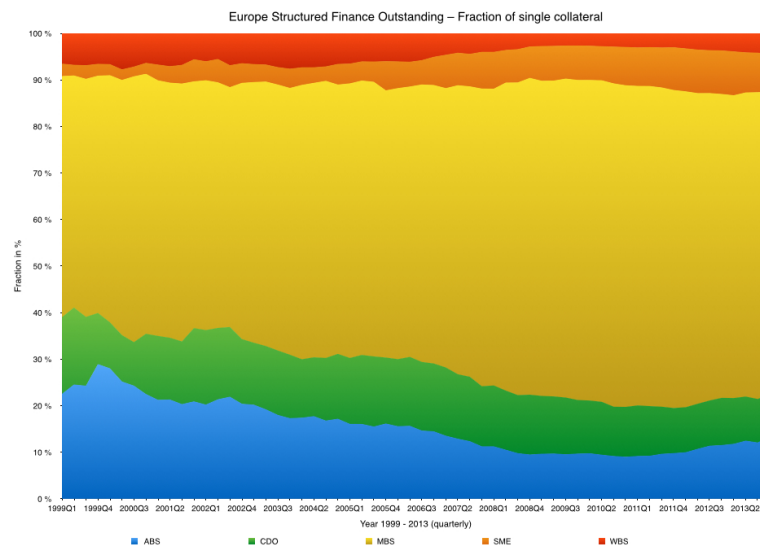


(b)

FIGURE 2.11: ABCP Amounts Outstanding Euro Area (a) and U.S. (b) ((a) Association for Financial Markets in Europe (AFME) Statistics - Securitization Data Report QI 2004 - QIV 2013; <http://www.afme.eu/documents/statistics-and-reports.aspx>; Date of Download 06. June 2014; (b) Securities Industry and Financial Markets Association (SIFMA) Research - Statistics on Funding U.S. Commercial Paper monthly June 2004 - March 2014; <http://www.sifma.org/research/statistics.aspx>; Date of Download: 06. June 2014).

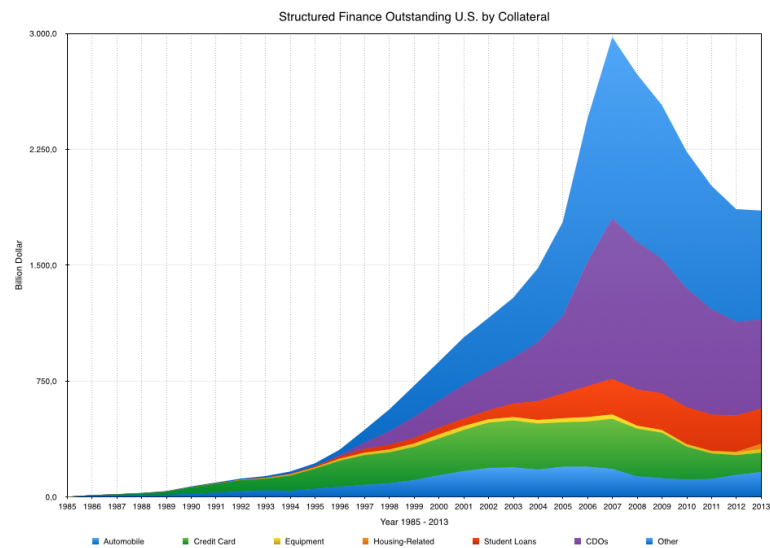


(a)

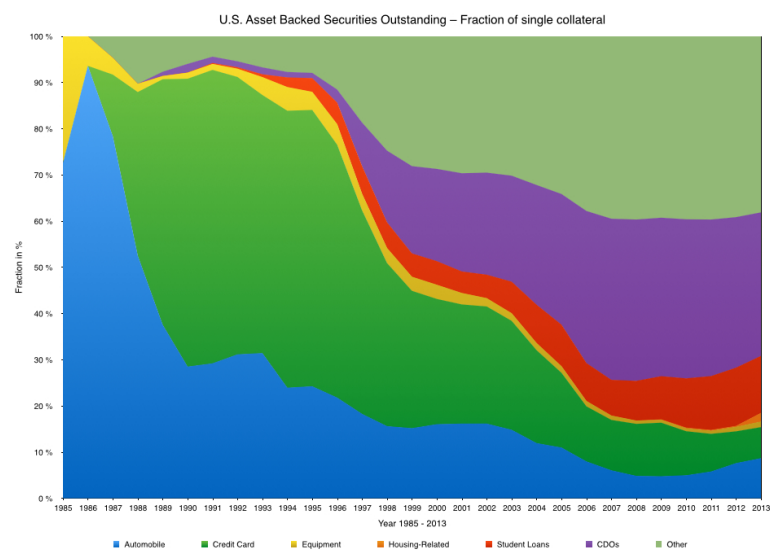


(b)

FIGURE 2.12: Structured Finance Amounts Outstanding by Collateral Euro Area. (a) Level of structured finance by collateral and (b) fraction of single collateral (Securities Industry and Financial Markets Association (SIFMA) Research - quarterly data from 1999 - 2014 [done in partnership with AFME]; <http://www.sifma.org/research/statistics.aspx>; Date of Download: 06. June 2014)



(a)



(b)

FIGURE 2.13: U.S. Structured Finance Amounts Outstanding by Collateral. (a) Level of structured finance by collateral and (b) fraction of single collateral (Securities Industry and Financial Markets Association (SIFMA) Research - yearly data from 1985 - 2014; <http://www.sifma.org/research/statistics.aspx>; Date of Download: 06. June 2014)

Their balance sheet reads:

$$L_b^o + L_s^o = B_o$$

### 2.3.4 Wholesale Funding - Risk Bearers

#### 2.3.4.1 Assets under management - institutional investors and managed funds

##### Conventional assets under management

In the context of this analysis, institutional investors are defined as entities that invest in debt instruments issued by risk originators and who provide collateralized credit (in the form of repos) to loan originators. Assets under management are the sum of all entities that fund the shadow banking system and constitute the end of the shadow banking intermediation chain. With the purchase of these instruments, the risk associated with the underlying asset moves from the risk originator's balance sheet to the risk bearer. Depository institutions and broker-dealers may also act as risk bearers, purchasing debt instruments and holding them in diversified portfolios on their balance sheets. This is considered a point of interconnection between the shadow and traditional banking systems. Issued ABSs find their way onto the balance sheet of depository institutions (i.e., banks). Asset price movements of these securities influence the entities' stability, and are therefore one source of contagion. Alongside these institutions, different institutions specialized in asset management can be defined as risk bearers, as they bear the risks of the issued securitized products, which they hold in their portfolios. The following section will describe types of assets under management, with a focus mainly on MMFs as shadow bank depositors.

Global asset management includes conventional funds, such as pension funds, mutual funds, and insurance companies, as well as alternative funds, such as hedge funds, private equity funds, and exchange-traded funds. Conventional funds under management accounted for about Dollar 71.3 trillion by the end of 2008. Combined with alternative funds, the global fund management industry totaled around Dollar 105 trillion by the end of 2009 (Maslakovic, 2010a). Here, this analysis will focus on mutual funds and, in particular, MMFs as conventional assets under management.

**Mutual funds**, as conventional asset-management funds, invest in diversified portfolios of securities, such as stocks, bonds, money market instruments, or combinations of these assets. Funds pool resources from investors, such as individuals, businesses, and other financial institutions, through the sale of mutual fund shares. In this way, it is possible for mutual funds to refinance their asset portfolios. Through collective investment, each

investor benefits from professional investment management, diversification, liquidity, and other benefits. Fund shares are redeemable, i.e., investors can sell their shares back to the fund (or to a broker acting for the fund) at any time. Basic types of mutual funds are stock (also called equity), bond, and money market funds (Investment Company Institute, 2010, p. 217 and Investment Company Institute, 2007, p. 3)<sup>7</sup>.

The total assets of investment funds worldwide amount to Euro 19.925 billion (Quarter I; Year 2013). A 27% decline in mutual fund assets in 2008 was followed by an increase of 21% in 2009. From 2009 on, the total assets of mutual funds rose constantly. About 50% of current mutual fund assets belong to the US financial sector, and 35% of investment fund assets are located in the Euro Area (see Figure 2.14).

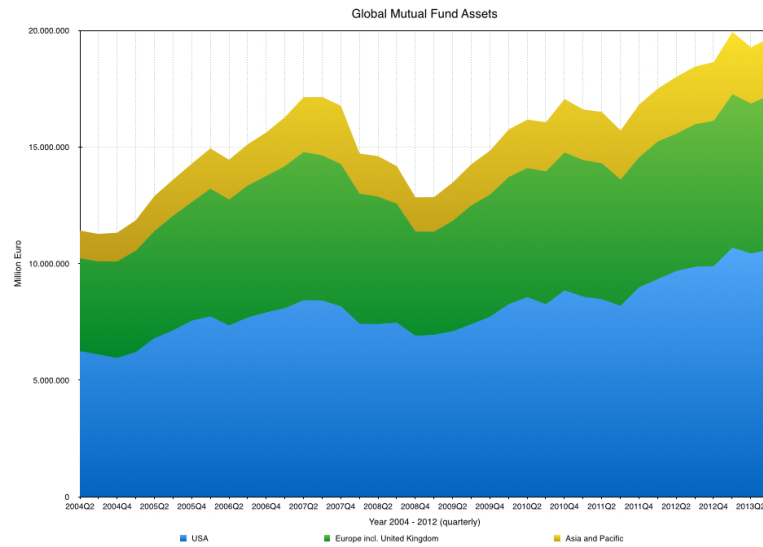
**Money Market Funds** are collective investment schemes that mainly invest in short-term, high credit quality, and liquid debt instruments, such as government securities, CPs, ABSs, ABCPs, certificates of deposit (CDs), discount notes, and other short-term securities, or that provide repos financing. Money Market Funds are classified based upon the clients they serve and the securities they invest in (e.g., prime MMFs, government MMFs, and treasury funds). Money Market Funds offer a bank-like service of almost-instant liquidity and a safe haven comparable to a safe deposit box. Funds may be withdrawn any time with little or no penalty. Compared with banks, MMFs earn a slightly higher yield relative to yields earned by deposit accounts. However, unlike depository institutions, MMFs are not guaranteed by deposit insurance or similar government guarantees (Tucker, 2010, p. 2 and Financial Crisis Inquiry Commission, 2010, p. 23).

The portfolio mix of MMFs is affected by guidelines set by security regulators and rating agencies. In the US, the SEC regulates the credit quality, issuer concentration, and maturity of assets that MMFs can hold in their portfolios, in accordance with Rule 2a-7<sup>8</sup> adopted pursuant to the Investment Company Act of 1940. In Europe, MMFs comply with the Undertakings for Collective Investments in Transferable Securities (UCITS) Directive (see Directive 85/611/EEC; Directive 2007/16/EC; Directive 2010/43/EU; Directive 2010/42/EU and Directive 2009/65/EC). The Committee of European Securities Regulators (CESR) published guidelines for harmonized MMFs. Funds that comply with the UCITS Directive also adopt these guidelines. Dollar funds domiciled in Europe adopt the code of practice by the Institutional Money Market Funds Association (IMMFA). These guidelines are very similar to the restrictions under Rule 2a-7 (Baba *et al.*, 2009, p. 68; Fund and Asset Manager Rating Group, 2010, p. 2 and Gorton & Metrick, 2010b, p. 6-7).

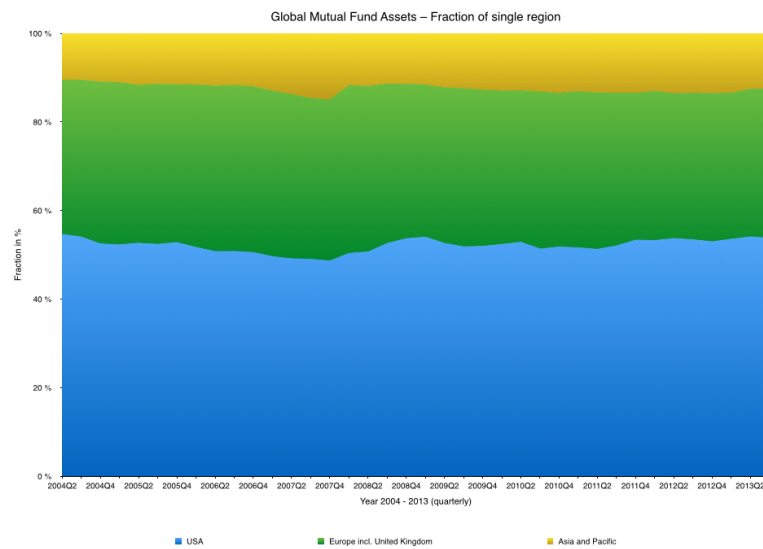
Similar to mutual funds, 60% of MMF assets are located in the United States and 30% in the Euro Area financial system. The level of MMF global total assets was equal to Euro

<sup>7</sup>See also <http://www.sec.gov/investor/pubs/inwsmf.htm>

<sup>8</sup>Rule 2a-7 includes restrictions to the portfolio mix concerning credit quality, diversification, maturity, and liquidity, as well as rules surrounding ongoing operation, reporting, and transparency.



(a)



(b)

FIGURE 2.14: Global Mutual Fund Assets. (a) Global Mutual Fund assets and (b) fraction of single region (European Federation of Investment Funds and Companies (EFAMA) Research and Statistics – quarterly data 2004 - 2013; <http://www.efama.org/statistics/SitePages/Statistics.aspx> and Investment Company Institute (ICI) Research and Statistics - Supplementary Tables; <http://www.ici.org/research/stats/worldwide/data>; Date of Download: 06. June 2014).



3.337 billion in 2013. Money Market Funds total assets peaked in the first quarter of 2009 and decreased in the following quarter. This peak and decrease in 2009 was mainly driven by the US market. Beginning in 2010, the level of total assets remained almost stable (see Figure 2.15). Worldwide, MMFs account for about 19% of mutual fund assets. United States mutual funds engage about 40% of their available funds in credit market instruments. Other assets that MMFs hold are treasury securities, repos, bonds, and both agency and municipal securities (see Figure 2.16). Shareholders of MMFs are households, corporate businesses, state and local governments, other funds and insurance companies, and funding corporations. Households hold the largest proportion of MMF shares (45–50%). In recent years, households have continually reduced their proportion of MMF shares (see Figure 2.17(b)). Funding corporations hold about 25% of total US MMF shares. Figure 2.17(a) shows that during the 2008–2009 crisis, shareholders reduced their engagement sharply. This could indicate a modern-type bank run, where shareholders redeem shares on a large scale.

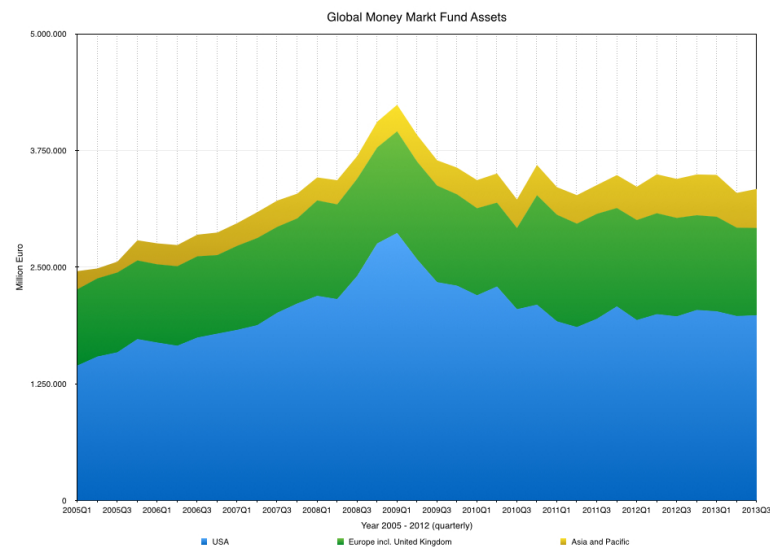
**Pension funds** and **insurance companies** are considered part of contractual saving institutions, and provide insurance and retirement funding for the private sector. They acquire funds at periodic intervals on a contractual basis. Unlike depository institutions or mutual funds, they are able to predict with reasonable accuracy how much they have to pay out in benefits. Therefore, liquidity of their assets is not that important. They invest in different stocks, bonds, and types of loan packages, such as mortgage backed securities and other debt-market instruments (Mishkin, 2006, p. 35 and Madura, 2010, p. 641f. and 660f.).

### **Alternative assets under management**

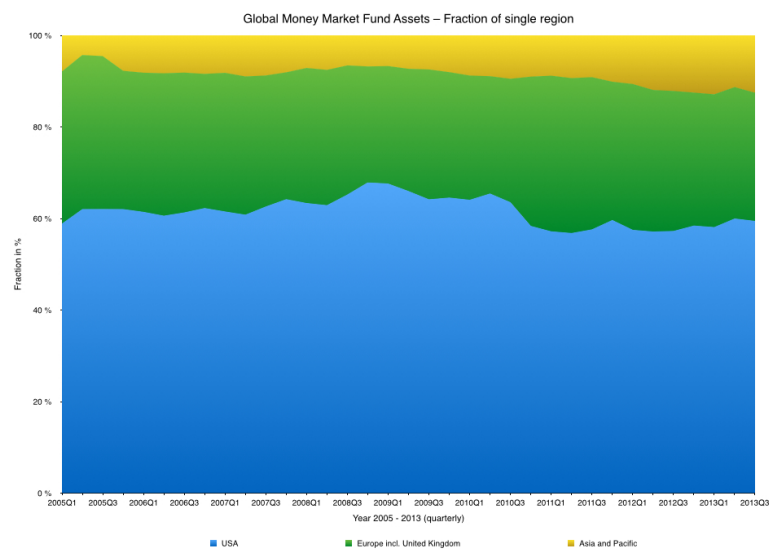
Mutual funds, which are more intended for a retail clientele, are restricted under Rule 2a-7. Unlike mutual funds, in particular MMFs, **hedge funds** are restricted to a small number of sophisticated customers and therefore do not need to be registered (the so-called ‘private adviser’ exemption). The term hedge fund has no precise legal or universally accepted definition. According to the SEC, hedge fund refers to “an (unregulated) entity that holds a pool of securities and perhaps other assets that does not register its securities under the Securities Act and which is not registered as an investment company under the Investment Company Act” (SEC definition of hedge funds <sup>9</sup>). Hedge funds invest in equity and use leverage and short selling to ‘hedge’ the portfolio’s exposure to movements of the equity market. They adopt a variety of investment strategies and styles (Sami, 2009 and United States Securities and Exchange Commission, 2003).

Beginning with the discussion on shadow banking and the breakdown of the Primary Reserve Fund in 2009, hedge funds have faced calls for stricter regulation. The FSB was established in April 2009, following the G20 London summit. This new body

<sup>9</sup>Available at <http://www.sec.gov/news/studies/hedgefunds0903.pdf>

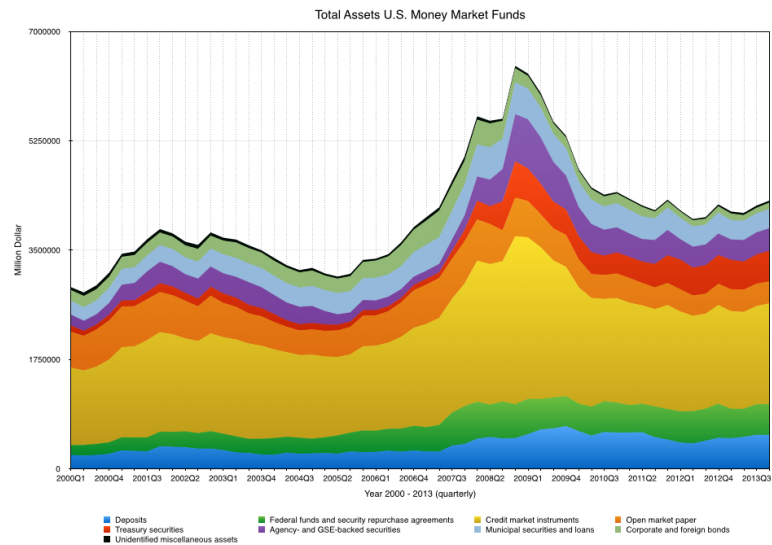


(a)

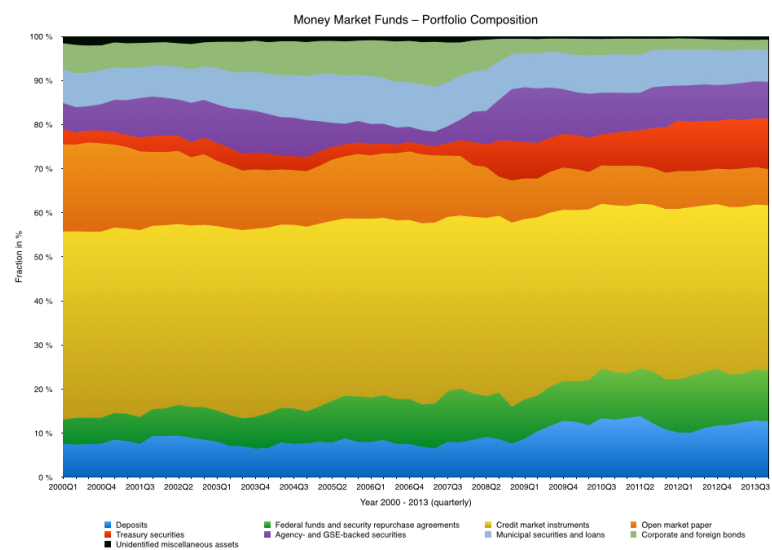


(b)

FIGURE 2.15: Global MMF Assets. (a) Global MMF assets and (b) fraction of single regions (European Federation of Investment Funds and Companies (EFAMA) Research and Statistics – quarterly data 2004 - 2013; <http://www.efama.org/statistics/SitePages/Statistics.aspx> and Investment Company Institute (ICI) Research and Statistics - Supplementary Tables; <http://www.ici.org/research/stats/worldwide/data>; Date of Download: 06. June 2014).

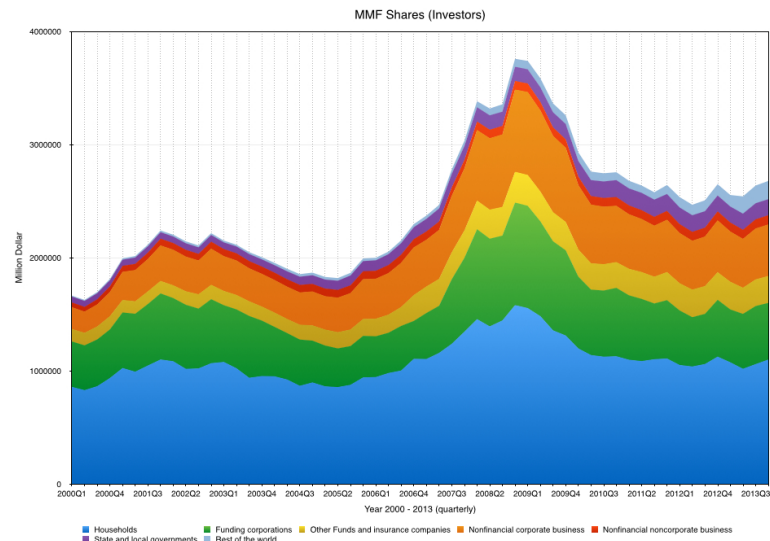


(a)

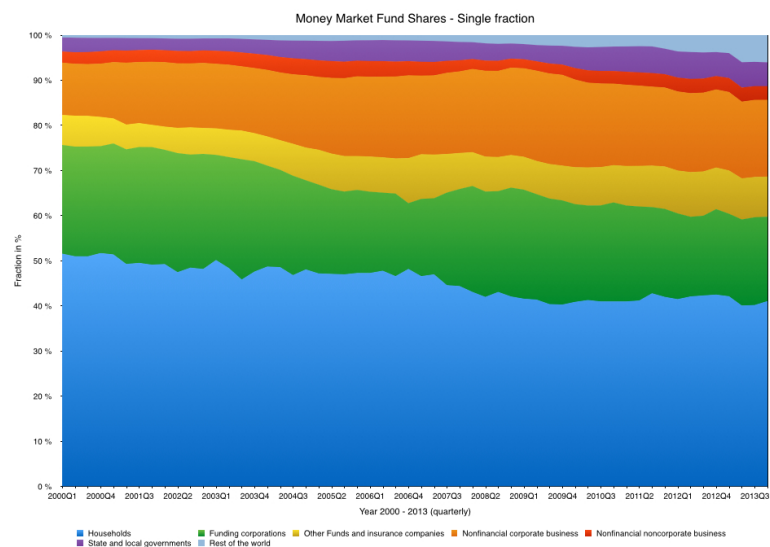


(b)

FIGURE 2.16: Assets MMF Portfolio Composition. (a) Total Assets of MMFs and (b) portfolio composition (Flow of Funds – Board of Governors of the Federal Reserve System Data Download Program; <http://www.federalreserve.gov/datadownload/Choose.aspx?rel=Z.1>; Table L.120, Date of Download: 06. June 2014).



(a)



(b)

FIGURE 2.17: Money Market Fund Investors. (a) Money Market Fund investors and (b) fraction of single investors (Flow of Funds – Board of Governors of the Federal Reserve System Data Download Program; <http://www.federalreserve.gov/datadownload/Choose.aspx?rel=Z.1>; Table L.206, Date of Download: 06. June 2014).

was extended to all financial institutions important to global financial stability, and included—for the first time—large hedge funds. US Congress passed a major regulatory reform, the Dodd-Frank (Wall Street Reform and Consumer Protection) Act of 2010, which made numerous changes to the registration, reporting, and record-keeping requirements of the Investment Advisers Act of 1940 amended Through P.L. 112-90 Dodd-Frank Act of 2010. Advisers to many private funds (i.e., hedge funds and private equity) in the US must now register with the SEC (Title IV "Regulation of Advisers to Hedge Funds and Others")<sup>10</sup>. In 2009, the European Commission also published a proposal for a Directive on Alternative Investment Fund Managers (AIFM Directive 2011/61/EU) to establish European Union (EU)-level regulation. The Directive enables hedge fund managers to conduct business in each member state through a single registration. The AIFMD will affect about a third of EU-domiciled hedge fund assets (Maslakovic, 2010b).

Two main types of hedge funds—macro and arbitrage funds—can be identified based on the investment strategy they employ. Macro funds take positions in currencies based in various financial and macroeconomic fundamentals, while arbitrage funds exploit pricing discrepancies between different financial market instruments, primarily through short selling.

In 2010, the global hedge fund assets under management amounted to Dollar 1.920 billion, which is below the record of Dollar 2.150 billion at the end of 2007. The hedge fund industry has become more and more concentrated over the last few years. In 2003, the top 100 hedge funds accounted for about 54% of the total industry. Currently, 70% of total industry assets are under the management of one percent of all hedge funds. With less liquid and more volatile markets, hedge funds shrank their balance sheets by de-leveraging, simplifying their strategies, and moving to core competencies (Maslakovic, 2010b).

#### **2.3.4.2 Repurchase agreements and securities lending**

In the run up to the financial crisis of 2008 and 2009, an increase in the level of repo transactions was noted (see Gorton & Metrick, 2010b). The demand for repo grew with the rapid growth of institutional investors, such as mutual funds, pension funds, hedge funds, and other managed funds. These institutions do not come under deposit insurance. Therefore, institutional investors do not have access to a safe, short-term, demand deposit-like product that earns interest while retaining flexibility. Furthermore, repurchase agreement transactions represent an important source of funding for loan originators (Gorton & Metrick, 2010a, see also King, 2008, for institutional features of the repo market, e.g., Duffie, 1996; Garbade, 2006 and Federal Reserve Bank of New York, 2010).

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<sup>10</sup>See <http://www.sec.gov/spotlight/dodd-frank/hedgefundadvisers.shtml>

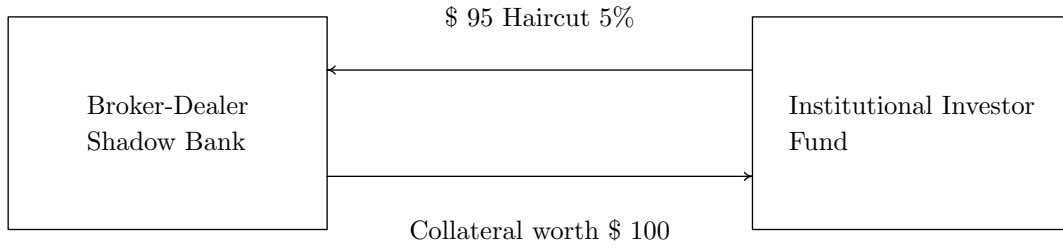


FIGURE 2.18: Structure of a repurchase agreement transaction. Author's drawing on basis of Krishnamurthy *et al.* , 2011, p. 11

Sale and repurchase agreements (i.e., repos) present a type of short-term funding used by a variety of market participants, such as institutional investors and non-financial firms with large holdings, to store cash safely, earn some interest, and have ready access. The market of sales and repurchase agreements can be divided into repo transactions and securities lending. Whereas the term securities lending describes the lending of actual securities by investors against the collateral cash. The repo transaction describes the lending of cash by capital seeking parties against a collateral in the narrow sense, a security. The securities lending activity can also be named a reverse repo. For the following analysis and further descriptions both activities will be summarized by the term repo transaction. These activities by counterparties seeking to invest money or to borrow securities are called security driven repo transactions (i.e., securities lending). Depository institutions and broker-dealers use repo transactions to finance inventories, create leverage, cover short positions, or hedge and speculate in interest rate movements. Activities of counterparties that seek to borrow cash are cash driven repo transactions (i.e., the pure repo transaction). A repo transaction involves the simultaneous sale of a security (i.e., collateral) and the agreement to repurchase the security at a later date at an agreed-upon higher price. Furthermore, institutional investors, such as different mutual funds, insurance companies, or corporate treasuries use these transactions either to invest surplus cash and earn returns, or to raise cash for investments (Hördahl & King, 2008, p. 38, see Figure 2.18 for a model of the repurchase agreement structure). Non-bank financial intermediaries largely use repurchase agreements for funding (e.g., broker-dealers) or investment purposes (e.g., MMF). The difference between the purchase price or value of the collateral ( $Y_t$ ) and sale price of the collateral at a later date ( $Y_{t+n}$ ) is the interest rate, also known as the repo rate ( $\frac{Y_{t+n}-Y_t}{Y_t}$ ). A repo transaction can also be viewed as a short-term collateralized loan, where the lender of the security posts an asset as collateral with a cash provider (Gorton & Metrick, 2010a, p. 508 and Hördahl & King, 2008, p. 37).

Collateral can be divided into traditional forms of collateral, such as treasuries and agency securities, and non-traditional forms of collateral, such as ABSs, MBSs, corporate debt, and equity. Depending on the type of collateral, the depositor may demand

a margin or haircut. Typically, the borrower has to post collateral in excess of the notational amount of the loan (i.e., overcollateralization). This haircut is defined as a risk control measure applied to the underlying asset. The value of the collateral is calculated as marketable value reduced by a certain percentage. Haircuts are defined as difference between the value of the cash and the value of the collateral and reflect the expectations of the future development of the underlying collateral and are used to protect the depositor from potential losses due to declines in the market value (Adrian *et al.*, 2013 and European Central Bank, 2011b, p. 143). Repo haircuts vary with the risk of the underlying collateral. The haircut is defined as  $(1 - \frac{V}{F})$ , with value of the collateral  $V$  and notational amount of the loan  $F$ . Prior to the 2008–2009 crisis, haircuts on non-traditional collaterals, especially ABSs, were extremely low (2%). Over the course of the crisis, haircuts rose to more than 50% (see also; Gorton & Metrick, 2009; Stein, 2010, p. 46 and Krishnamurthy *et al.*, 2011, p. 8 f.).

Data available on repurchase agreement transactions is limited due to their complexity and a lack of transparency. Also, the majority of repo agreements are over-the-counter transactions (OTCs), and are therefore not recorded. Proposed regulation of repo agreements addresses the problems associated with this complexity and proposes standardization and documentation to avoid raising haircuts and instability. For the purpose of the analysis in the present paper, it is important to highlight major lenders in repo transactions. Figure 2.19 confirms the assumption that MMFs and other funds are major providers of repo agreements (Board of Governors of the Federal Reserve System, 2011, Table L.207).

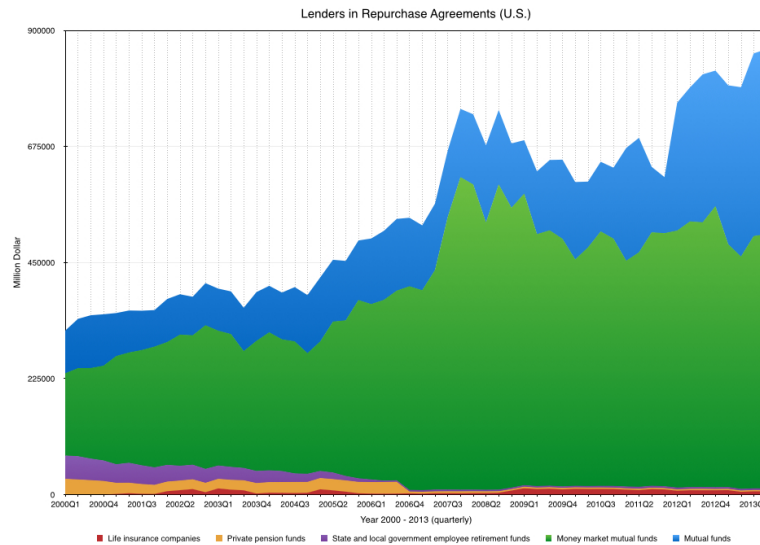


FIGURE 2.19: Lenders in Repo Transactions (U.S.) (Flow of Funds – Board of Governors of the Federal Reserve System Data Download Program; <http://www.federalreserve.gov/datadownload/Choose.aspx?rel=Z.1>; Table L.207, Date of Download: 06. June 2014).

### 2.3.4.3 Stylized Funds

**Managed funds or institutional investors** play an important role in the refinancing of banks and shadow banks (in a narrow sense); they are therefore referred to as shadow bank depositors. In this framework it is assumed that shadow bank depositors have the following assets: debt instruments issued by OBSEs  $B_o^i$  or by firms  $B_f$ , all surplus and capital of entities within the system  $C = C_f + C_b + C_s$ , and commercial papers issued by shadow banks  $CP$ . Shadow bank depositors also offer repurchase agreements to banks and shadow banks. Their asset side is financed through the issuance of fund shares to the private sector  $B_i$ . It is assumed that the private sector will not actively manage a portfolio of financial assets, but will instead transfer this task to funds, thereby gaining claims against the funds out of fund shares. Stylized funds adjust their portfolios according to portfolio theory, with an eye to risk and return. These assumptions are further restricted through guidelines and existing rules on portfolio composition (see US regulation of MMFs and European guidelines). These balance sheets read as follows:

$$\begin{aligned} B_o^i + B_f + CP + repo_i + C &= B_i \\ C &= C_f + C_b + C_s \end{aligned}$$

### 2.3.5 Stylized private sector and central bank

To generate a closed system of intermediation, the private sector (as both lender and depositor) will be analyzed and displayed in the following section. Households, firms, and the central bank are not usually directly engaged in the shadow banking intermediation chain, but belong to a global closed system of the shadow banking intermediation chain.

**Households** possess a given endowment of financial funds, (net financial wealth; NFW) which is the endogenous outcome of an intertemporal consumption-saving decision as it represents the accumulated stock of savings. Households can invest these funds in physical assets like housing  $H$ , shares of managed funds  $B_i^h$ , or deposits  $D^h$ . Typically, housing is financed by loans issued by commercial banks and shadow banks (in a narrow sense)  $L^h$ . Housing will serve as collateral for loans by banks and shadow banks in a narrow sense.

A number of studies have addressed the influence of illiquid assets on portfolio management and future liquidity needs. Key sources are Grossman & Laroque (1990), Flavin & Yamashita (1998), and Flavin & Nakagawa (2008). According to Grossman & Laroque (1990), the household's utility function depends on the consumption of goods and housing, as well as on the individual time preference of the household. Households strive to maximize their utility, investing income in risky assets, risk-free assets, and housing. Since the development of the housing value affects the allocation of individual



portfolios, housing plays a major role in the stylized model outlined in the present paper. Housing is mainly funded through credit lending, and an increased demand for credit to fund individual housing needs explains growing credit markets. Deposits and shares of institutional investors are held for transaction purposes as risk-free parts of individual portfolios. Through investment in fund shares, households delegate portfolio management and investment decisions to the fund, which invests the capital according to portfolio management theory.

The household balance sheet reads:

$$D^h + H + B_i^h = NFW + L^h$$

**Firms** possess a stock of physical capital  $PC$ , deposits  $D^f$ , and shares issued by managed funds  $B_i^f$ . Firm deposits are used for transaction purposes only, to fund production and labor costs. These assets are financed by refinancing debt instruments  $B_f$ , loans issued by commercial banks and shadow banks  $L^f$ , and surplus and capital  $C_f$ . Funding through banks or shadow banking credit can be seen as substitutes from the firms point of view. The balance sheet reads as follows:

$$PC + B_i^f + D^f = L^f + B_f + C_f$$

The stylized **Central bank** holds loans receivable to commercial banks  $K_c$  and issue repurchase agreements  $repo_c$  for commercial banks only. Their balance sheet discloses minimum reserves  $rD$  and Excess Reserves  $E$  from commercial banks, reading:

$$K_c + repo_c = rD + E$$

### 2.3.6 Stylized Intermediation Chain

Summarizing all segments of the shadow banking intermediation chain stylized intermediation chain delivers comprehensive picture of entities and activities within the shadow banking system. The various balance sheets of entities involved in the intermediation process can be resumed as follows:

Banks	$L_b - L_b^o + L^s + B_o^b + B_i^b + K^s + E = (1 - r)D + repo^b + K^d + C_b$
Shadow Banks	$L_s - L_s^o + B_i^s + B_o^s + D^s = repo^s + CP + C_s + L^s$
OBSE	$L_b^o + L_s^o = B_o$
Institutional Investor	$B_o^i + B_f + CP + repo_i + C = B_i$ $C = C_f + C_b + C_s$
Household	$D^h + H + B_i^h = NFW + L^h$
Firm	$PC + B_i^f + D^f = L^f + B_f + C_f$
Central Bank	$K_c + repo_c = rD + E$

While reducing these equations the following common relationships apply. The total of loans issued by banks and shadow banks in the narrow sense amount to the total of loans used by the private sector. Therefore, the amount of loans issued equals the amount of loans received.

$$L_b + L_s = L_b^h + L_b^f + L_s^h + L_s^f = L^h + L^f$$

Credit issued by the central bank, equal to the delta of interbank loans.

$$K_c = K^d - K^s$$

shares issued by institutional investors ( $B_i$ ) are purchased by a variety of market participants including banks and shadow banks ( $B_i^b, B_i^s$ ) for portfolios structuring purposes and households as well as firms as investments similar to bank deposits ( $B_i^h, B_i^f$ ).

$$B_i = B_i^h + B_i^f + B_i^s + B_i^b$$

Securities (i.e., ABS, ABCP) transformed and issued by OBSEs ( $B_o$ ) are transferred banks and shadow banks (signaling and portfolio structuring). The majority of these issued  $B_o$  are purchased by institutional investors ( $B_o^i$ ).

deposit of all market participants aggregated to the total level of deposits  $D$ :

$$D = D^h + D^f + D^s$$

Repo transactions within the stylized shadow banking sector include institutional investors, central banks as lending part usey, and banks and shadow banks as borrowing part. The amount of repo lending equals the total amount of repo borrowing.

$$repo_i + repo_c = repo^s + repo^b$$

Summing up the aggregation of all balance sheet results in equation:

$$PC + H = NFW$$

Prospectively, the resulting balance sheet equations of the main institutions can be used to outline the interconnections between single participants. The information about relationships between different entities and balance sheet positions of this stylized intermediation chain will be used for the scenario analysis in Chapter 3.

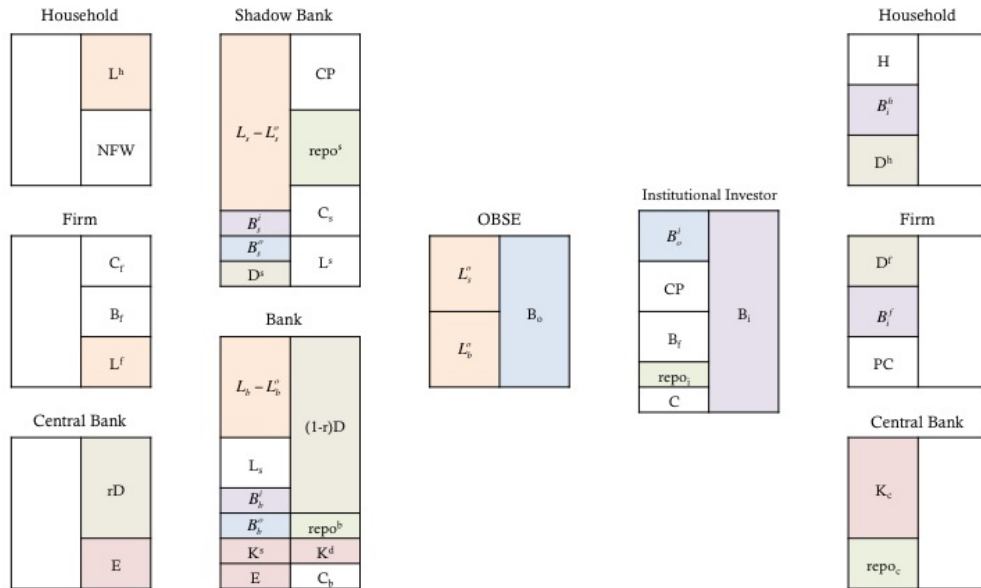


FIGURE 2.20: Stylized Intermediation Chain (Author's drawing).

## 2.4 Drivers of the growth in Shadow Banking

### 2.4.1 Supply Side

The latest growth in the overall shadow banking system, up to Dollar 71 trillion, as well as the growth in certain parts of the system (such as securitization or repo markets) can be attributed to different, closely related drivers. Gorton & Metrick (2012) use two approaches to explain the growth of different markets and entities that are linked to the shadow banking system, and that are responsible for the growth of the overall system. One approach is to look at the system from the supply side, meaning that originating institutions and OBSEs supply a massive amount of securitized assets to the market. Due to regulatory constraints, traditional banks face competition from institutional investors, finance companies, and broker-dealers. These non-bank financial intermediaries are able to offer higher interest rates, thanks to innovative products and weak regulatory constraints. Cetorelli *et al.* (2013) state that traditional banks have evolved to become conglomerate specialists, usually in form of bank holding companies, in order to compete with other entities. Bank holding companies also constitute an efficient solution for the new intermediation model of shadow banking. Investment in MMFs, a significant financial product innovation by the time of introduction, was an alternative to interest rate ceilings on deposits. This competition lowered banks' earnings. Concerning capital regulation, banks were not able to compete with finance companies and broker-dealers, which have not been subject to tight capital regulation in the way that commercial banks have. In order to expand their credit issuance, depository institutions have to expand their existing reserves. The demand for yield uplift and regulatory arbitrage stimulated traditional banks to change if they wanted to maintain their role as an industry and stay competitive (Gorton & Metrick, 2012, p. 20 f). Traditional banks therefore shifted from traditional loan issuance and funding (i.e., originate-to-hold) to an originate-to-distribute model. Instead of holding loans on their balance sheets, originators could easily sell and transfer these loans off balance sheet. Loans were transferred to specially created SPVs or OBSEs. Issued loans were pooled, underwritten, and sold as ABS. The originate-and-distribute model allowed for the risk associated with loans to be sliced, diced, and dispersed (i.e., CRT). Traditional banks were able to free up capital, which they used to issue further loans to the private sector. This helped traditional banks to manage risk and provided regulatory benefits. The issuance of ABSs has grown considerably since the late 1980s, both in the US market and across Europe. Issuance reached its peak in 2007 with almost Dollar 3.000 billion in outstanding US ABSs, and almost 1.200 billion dollars in ABCP. When the 2008–2009 crisis hit, outstanding ABSs decreased to about 1.500 billion dollars.

Cerrato (2010) provides empirical evidence as to why banks securitize. Securitization is the process whereby banks and other financial institutions issue marketable securities backed by an underlying asset pool. Liquidity is a principal motive for banks to

securitize, as a loan portfolio, on the asset side, can be considered both long-term and illiquid. There does exist evidence that liquidity and improved performance are the most decisive factors for securitization, and there is also some evidence that the transfer of credit risk and regulatory arbitrage are major motivators. This is consistent with Cardone-Riportella *et al.* (2010) and DeMarzo & Duffie (1999). Affinito & Tagliaferri (2010) show that capital requirements play a role, and Basel regulation created regulatory incentives to move off balance sheet. Despite the fact that regulatory arbitrage and CRT can be seen as drivers of securitization, liquidity will be viewed as the main driver in the present paper. The BCBS (2011) considers five reasons for securitization which are consistent with the beforehand mentioned drivers in empirical literature, including funding diversification, risk transfer, revenue generation, and capital and accounting benefits. Capital and accounting benefits can be considered as regulatory arbitrage.

### 2.4.2 Demand Side

The growth of the shadow banking system was also driven by the demand side, as entities demand marketable securities as attractive collateral for money market transactions, such as repurchase agreements (Gorton & Metrick, 2012, p. 20 - 21). Two forces drive the growth from the demand side: the demand for investment securities for funds' portfolios; and the growth of repo transactions, following the demand for collateral by banks and other entities to collateralize these transactions.

Over the last few decades, there has been an exponential increase in the amount of assets under management, and an enormous growth of the repo market. The total market of assets under management amounted to about Dollar 105 trillion in 2009. Managed funds and other institutional investors are important risk takers, through their investment in securities and other market debt instruments like ABSs and ABCP (Gorton & Metrick, 2010b).

The institutional investors (i.e., investment funds and different investment schemes) are also interested in safe alternatives to bank deposits, in order to store large amounts of liquid resources. Although deposit insurance generally works well, it is limited to relatively small sums. Institutional investors, such as managed funds, cash-rich non-financial companies, and states therefore lack access to safe, short-term, and interest-earning investments, which led to the use and growth of the repurchase agreement market. A repurchase agreement or shortly repo is defined as the sale of a security combined with the simultaneous agreement to repurchase the same collateral at a specific contracted date and price. Institutional investors appear as lenders in order to store their liquid resources in a way that was safe and backed by collateral. The increased use of repurchase agreement transactions led, in turn, to an increasing demand for high quality collateral. This growth in demand for collateral can be posited as a driver of securitization. However, there is no direct evidence that the growth in collateral demand led

to a growing ABS supply (however, for indirect evidence, see BIS, 2001). High-quality structured products were used as collateral to raise short-term liquidity in repurchase agreements transactions. Both main forces (demand and supply side) were assisted by governmental decisions and regulatory changes that allowed excessive securitization and repurchase agreement transactions and innovative product design. Specialization of financial intermediaries within the shadow banking system led to further growth of the system, benefits from economies of scale, and further comparative advantages.

## 2.5 Global Monitoring of the Shadow Banking System

### 2.5.1 An efficient monitoring process

A broad monitoring process is important to obtain a comprehensive picture of the market and its future development. It is essential to analyze what else the system consists of and what weak points might exist, to determine what needs regulation and harmonization. This monitoring should outline the sub-segments of the shadow banking system to target single details more precisely. To receive a clear picture of size and development and to estimate possible risks of different shadow banking activities and entities, the FSB applies a monitoring approach. A combination of quantitative and qualitative analysis aims to offer a widespread picture of the size and growth of this roughly differentiated sector, as well as detailed data and characteristics about single entities or activities (Financial Stability Board, 2011a). Quantitative information about the shadow banking sector has already been given by Bouveret (2011), Kocjan *et al.* (2012), Bakk-Simon *et al.* (2012) and the descriptive analysis above. However, these studies are not based on the same data, so their estimates of the shadow banking sector may differ (see Kocjan *et al.* , 2012, p. 9), resulting in no harmonized and sufficiently tested way to monitor shadow bank activities and entities. The definition of types of financial intermediaries diverge across jurisdictions; this definition, in turn, influences the size and appropriate monitoring process for shadow banks (see Kocjan *et al.* , 2012). Given this inconsistency, it is not possible to map a consistent global picture, and wide-ranging estimates have been proposed. Clearly, the authors viewing the mapping and monitoring process should aim to generate comparable and harmonized data, and a harmonized definition will facilitate this. To date, data on the flow of funds and other monetary statistics have been used for shadow banking size estimates. However, since this data was issued for a different purpose, estimates calculated on this data have limited validity. Hence, authorities, central banks, and the industry need to generate more specific and granular data.

To ensure more efficient monitoring, the FSB has introduced high-level monitoring principles (see Financial Stability Board, 2011b). These principles are as follows: (1) The **scope** of authorities should be such that they can obtain a comprehensive picture of the

shadow banking system and the risks that have an impact on the financial system; (2) the monitoring **process** should be reported on a regular and frequent basis, to ensure the identification and assessment of risks; (3) relevant authorities should collect **relevant data and information** and define pursuant parameters for reporting shadow banking data; (4) the monitoring task should be flexible and able to capture **innovations**, as well as the changing nature of activities and entities; (5) concerning **regulatory arbitrage**, monitoring authorities should keep in mind that changes of regulation could be an incentive to expand shadow banking activities; (6) in applying monitoring, regulatory authorities should keep the features, characteristics, and approaches to definition of different **jurisdictions** in mind, to make up for differences: the meanings and structures of local financial markets, and their international interconnections, should be taken into consideration; (7) authorities should **exchange information** within and across specific jurisdictional borders on a regular basis, which could help to identify certain spill-over effects and contagion risks.

The FSB monitoring approach (Financial Stability Board, 2011b) is split up into two steps, in which different types of information and data are gathered and diverse analytical methods are used. While looking at the shadow banking system from a **macro-mapping prospective** (Step 1), authorities focus on quantitative and system-wide data. This first step starts with gathering data, mainly on the flow of funds, as well as supplementary data, such as monetary statistics, regulatory and supervisory reports, and observations of banks and non-bank subsidiaries. In the present paper, this data will provide a useful overview on shadow banks and their interconnection with the traditional banking system.

It is difficult to simply aggregate flow of funds data across different jurisdictions, as there exist varying definitions and compositions of the term financial intermediary: some data include non-bank financial intermediaries, such as MMFs or central banks, and some do not. Flow of funds data might lack granularity regarding the financial sector. These aspects, varying composition of flow of funds, different definitions as well as insufficient granularity, contribute to more complexity in the global picture of the overall system. To obtain more consistent and assimilable data, the FSB recommends improving the granularity of data. Authorities also need to break down information on different non-bank financial intermediaries, such as pension funds, insurances, and MMFs, and should gather more information on the interlinkages between banks and NBFIs (i.e., using regulatory proposals of direct banking regulation to regulate shadow banks indirectly).

The second step of the FSB monitoring approach, the **micro-mapping prospective**, aims to narrow down the focus to specific systemic risk factors and regulatory arbitrage concerns. These factors should be monitored on a regular basis. The monitoring process should also be supplemented by taking specific factors of other jurisdictions into account. According to the FSB (2011b), the following key systemic risk factors should

be assessed: 1) the extent to which financial intermediaries use **maturity transformation** (to determine this, authorities need to obtain the weighted-average maturity and classify the remaining maturities); (2) the degree of **liquidity transformation** (although this is difficult to define); (3) regarding **CRT**, off balance sheet exposures and the appropriateness of credit-risk mitigation techniques, such as guarantees, commitments, credit derivatives, liquidity puts, and other implicit liquidity support; and (4) concerning **leverage**, the degree of leverage, especially leverage associated with off balance sheet activities.

Non-bank financial intermediaries (e.g., MMFs, broker-dealers, and other collective investment schemes) are not subject to the same regulatory and supervisory constraints as traditional banks. Therefore, banks have an incentive to circumvent regulation in order to stay competitive and balance out disadvantages. Monitoring should aim to detect regulatory arbitrage, meaning that it must be sufficiently flexible, forward-looking, and adaptable to identify new activities, innovations, and mutations within the financial system. Authorities should therefore gather disciplinary expertise from different areas, such as legal, economic, accounting, and policy research. Authorities need to combine quantitative data (performance indicators) and qualitative information (regular supervisory dialog). Cooperation and information exchange between supervisory agencies and regulatory authorities is necessary, on both a national and an international basis.

When conducting a detailed assessment, authorities need to pay particular attention to factors that may potentially have negative impacts on the financial system. The monitoring framework should provide information about the degree of interconnection, as there are strong interconnections between traditional banks and NBFIs, through asset holdings, derivative positions, and funding interdependencies. Authorities should also pay attention to the size of the shadow banking sector and collect data regarding total assets and liabilities on a regular basis. Earning performance indicators (e.g., Return on Equity; ROE, Return on Assets; ROA) should also be monitored to assess the sustainability of the loss-absorption capacity of shadow banking entities and activities.

### 2.5.2 Monitoring report results

Financial Stability Board (2012a) and Financial Stability Board (2013b) depict the results of the FSB monitoring process. To conduct a detailed macro mapping, data and information, including flow of funds data from the end of 2011 or early 2012, analysis of national shadow banking developments, and additional information taken from questionnaires from, for example, finance companies, from 25 jurisdictions and the Euro Area was collected (Financial Stability Board, 2012a). By the end of 2011, the shadow banking system was estimated to have a size of about Dollar 67 trillion (proxied by the assets of Other Financial Institutions; OFI). The 2013 report recorded further growth, to Dollar 71.2 trillion, which is equivalent to around 27% of the total financial assets



of the areas surveyed, as well to 117% of GDP for the areas surveyed (aggregated for 20 jurisdictions and the Euro Area <sup>11</sup>). There was a divergence in the definition of NBFIs among jurisdictions, depending on these entities' overall importance, their size relative to GDP, and growth trends (Financial Stability Board, 2012a). Policy recommendations and future regulation will influence individual jurisdictions in different ways. Compared to the 2012 report, monitoring in 2013 continued macro mapping, enhanced data granularity, and reduced undefined areas.

The 2012 monitoring report points out that high growth rates were recorded in all jurisdictions before the 2008–2009 crisis. Post-crisis, growth decelerated in almost all jurisdictions. In some areas, growth of the NBFIs sector declined (e.g., France, Canada, Italy, the US). An intense growth could be observed in emerging economies such as India and Indonesia. However, the shadow banking system remains small relative to overall national financial system of the emerging economies. In some advanced economies robust growth rates are still observable (e.g., the UK and Switzerland). With Dollar 23 trillion, the US has the largest shadow banking sector, followed by the Euro Area (Dollar 22 trillion) and the UK (Dollar 9 trillion). The US holds 35% of the total shadow banking system funds. A decline in US shadow banking assets was compensated for by increased asset volume in the Euro Area, the UK, and other jurisdictions, such as Brazil, China, and Hong Kong (Financial Stability Board, 2012a, p.14). Global development diverges strongly, from –11% in Spain to +42% in China (see Financial Stability Board, 2013b, p. 12, Exhibit 3-2). On average, emerging markets experience growth rate at about 20%.

The NBFIs sector can be divided into sub-segments. With Dollar 21 trillion (equaling 35%) 'other investment funds' constitute the largest sub-sector. This subsector comprises entities other than MMFs, such as equity funds, bond funds, mixed funds, ETFs, and, in some jurisdictions, hedge funds<sup>12</sup>. Securitization vehicles (SPVs) are a Dollar 5 trillion sub-sector, representing 8% of the shadow banking sector. Finance companies represent about 8% of the total NBFIs, and have the highest concentration in the US (35%) and in the UK (15%). Broker–dealers experienced a strong growth, from 5% to 12% (about Dollar 7 trillion). For example, the broker–dealer sub-sector is valued at 52% in the US. Money Market Funds account for about 6% of the whole OFI system, although their individual size differs in each jurisdiction. Money Market Funds are mainly located in the US and the Euro Area, with these two areas together representing 90% of the global MMF industry. Jurisdiction-specific entities are the last sub-sector of the shadow banking system, with examples including US funding corporations (4–5%), Dutch Special Financial Institutions (4–5%), and hedge funds (0.4%).

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<sup>11</sup>These jurisdictions comprised Argentina, Australia, Brazil, Canada, Chile, China, Hong Kong, India, Indonesia, Japan, Korea, Mexico, Russia, Saudi Arabia, Singapore, South Africa, Switzerland, Turkey, the UK and the US, as well as the Euro Area

<sup>12</sup>In some jurisdictions, hedge fund data can not be separated

The 2012 monitoring report also makes a statement regarding the interconnection between banks and NBFIs. To measure potential risk stemming from interconnections between banks and shadow banks, direct credit exposures and funding dependency are used. Intermediaries pose credit and funding risks to each other via credit contracts (dependent on the size and maturity structure of assets and liabilities). This analysis can be briefly summarized as follows: there is a high degree of interconnectivity between banks and shadow-banking entities, as was already intuitively assumed. In some jurisdictions, where there is a large dependency of NBFIs on bank funding, there might also exist a dependency of banks on NBFI funding, and vice versa. These interdependencies are points by which stress could be transmitted into both sectors. Funding obtained by banks increased in some jurisdictions in the period of 2002–2011 (e.g., Australia, the Netherlands). For further evidence on the matter of interconnection and the development of interconnection, it is useful to analyze the different development of different countries relatively to each other to understand why this different development occurred and to identify the risks that this might pose (Financial Stability Board, 2012a, p. 22ff).

As mentioned in the above paragraph, banks and NBFI are highly interconnected, which can lead to risks. The monitoring report of 2012 introduced a number of measures that can capture the risks that travel through interconnection channels. Notable measures include (1) sector-to-sector exposure information, which measures direct exposure between banks and non-banks using flow of funds data. This measure is useful for interconnection information between two sectors, but such data is only widely available for Japan and the Euro Area, and it might be difficult to find data for detailed analysis in other jurisdictions; (2) the analysis of equity investment by financial institutions in other entities of the financial sector, which may also bolster the understanding of interconnection and associated risks; and (3) the gathering of data on funding instruments such as repos, as financial institutions are affected by changes in those markets (Financial Stability Board, 2012a, Annex 4). These data are also useful for additional insight on interconnection.

The monitoring report 2012a also reveals shortcomings in data availability and information gathering. In some jurisdictions, even those with large NBSF sectors, there is no data that breaks down the assets and liabilities of banks and NBFIs. Furthermore, there are persistent domestic consolidation issues for data from different jurisdictions. The differences in flow of funds data and figures by authorities may affect how problems of NBFIs that operate across borders are handled. This lack of and difference in information hinders the accountability of activities, as they cannot be clearly assigned to specific domestic monetary statistics or flow of funds data.

## 2.6 Summary

Chapter 2 defined and outlined the shadow banking system, so as to identify potential weak points and risks that have persisted beyond post-financial crisis reforms. In order to determine the entities and activities that are related to the shadow banking system, a proper definition needs to be derived, since the size and components of the shadow banking system differ as a function of the definition used (see Kocjan *et al.*, 2012). The shadow banking system is therefore described as a system of different entities and activities that together conduct the financial intermediation process as a single bank would do. Following this definition, the three major parts of the shadow banking intermediation process—loan origination, loan warehousing and securitization, and wholesale funding—are all carried out by different shadow bank entities.

The evaluation of the quantitative development of shadow bank entities and activities enables readers to determine the role of single entities within the shadow banking system. This stylized picture of the shadow banking sector is used to understand the scenario proposed in Chapter 3 and to evaluate the regulatory proposals described in Chapter 4.

Loan Originators (e.g., depository institutions, credit institutions, and finance companies and others) provide loans to the real sector. It is assumed that these entities sell major parts of their loan portfolios to OBSEs in order to free liquidity and regulatory capital, transfer risks (i.e., CRT), and circumvent capital regulations (i.e., regulatory arbitrage). The loan origination part of the shadow banking intermediation chain remained relatively stable during the crisis of 2008 and 2009, although it was observed that assets shifted towards more liquid portfolios. Originated loans, however, are still the major asset on banks' balance sheets.

Off Balance Sheet Entities, as loan warehousing and securitization vehicles, buy loans issued by the group of loan originators. These entities then securitize illiquid loans and other bought underlying assets into tradable ABSs, which serve as investment opportunities for institutional investors and as collateral in repo transactions. In the run-up to the 2008–2009 crisis, the securitization process became opaque and complex. This decrease in transparency allowed for asymmetric information among market participants, which led to defective CRT. This process influenced the valuation of assets, and consequently the stability of the shadow banking system.

The wholesale funding part of the shadow banking intermediation chain is tasked with the general funding of all activities conducted. The institutional investor sector experienced tremendous growth during the two decades before the crisis. This growth led to rising demand for collateral in repo transactions (see Section 2.4). To fund loan origination, loan sale, and securitization, funds acquired funding from the general public (i.e., the private sector). The growth of institutional investors shows the importance of a functioning wholesale funding system, as a failure of institutional investors threatens funding and, hence, the stability of the shadow banking system.

During the 2008–2009 crisis, most entities and activities involved in the shadow banking intermediation process experienced declines. In recent years, the shadow banking system has recovered, and constant growth has been recorded. According to the quantitative data available, the shadow banking system is still experiencing growth, with an estimated value of Dollar 71 trillion in 2013.

The initial growth of the shadow banking system over the past three decades has been attributed to various aspects on both the demand and supply sides. On the one hand, the growth of the shadow banking system was mainly driven by the demand for collateral for use in repo transactions and securities lending. The intense growth of assets under management held by institutional investors led to the need to store liquid resources safely (i.e., backed by collateral) and on a short-term basis. On the other hand, the increased need for liquidity and the demand to transfer credit risks and circumvent regulation led to the growth of the securitization market and a growing supply of securitized assets. The growing shadow banking system and, hence, the importance of the overall financial system, entail risks that will be described in the following Chapter 3.

## Chapter 3

# Risks within the Banking and Shadow Banking System

### 3.1 Risks within the financial system

#### 3.1.1 Legitimation of financial regulation to address risks

The following scenario analysis of the shadow banking intermediation chain will discuss the effects and interconnections between the traditional and the shadow banking systems, as well as risks stemming from the activities of financial institutions and different transactions. There are diverse risks within the financial system that could endanger overall financial stability. Many of these risks and the resulting problems are addressed by regulatory regimes such as the Basel Accords, the Dodd-Frank Act, and Capital Requirements Directives (CRDs) II–IV. Such regulatory presence and intervention is legitimated through appeals to consumer protection, latent instability, costs arising from banking instability, and contagion effects (Utzerath, 2010). The regulation of financial markets increases the resilience of financial institutions and overall market robustness. Regulation aims to raise stability and strengthen market-based finance, thereby sustaining global growth (Financial Stability Board, 2013a).

The Basel Accords were developed to strengthen regulation supervision and risk management, allowing the financial system to sustain its ability to absorb shocks and remain stable. To date, regulators have focused their attention on consumer protection rights and regulation of individual financial entity. The need for consumer protection and the costs created by financial instability justify such financial regulation. Private investors are, compared to banks and financial intermediaries, uninformed. Such information asymmetries<sup>13</sup> create incentives to act as if there are no risks, which is ultimately to the disadvantage of private investors. In the case of a critical event (i.e., financial crisis),

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<sup>13</sup>Inherent protection of consumers is addressed by Waschbusch (2000).

adjustments in banking assets or declines in asset return can exceed banking capital, meaning that redemption requests by depositors might not be satisfied. Appropriate regulation and supervision could reduce misaligned incentives that are to the disadvantage of depositors. In general, regulators act as representatives of investors' interests, legitimating regulatory intervention (see also Dewatripont & Tirole, 1994).

To date, regulators have not focused on stability aspects, regulation of the whole system, or the interactions between two or more entities. The inherent instability of banks and the interconnections of financial institutions are additional reasons for regulating the financial system. The permanent redemption of liquid deposits and illiquid portfolio structures creates a maturity and/or liquidity mismatch. This mismatch creates no risks if only some part of the deposits is redeemed upon request. However, sudden and large redemptions of deposits, and the resulting imbalances, could lead to an institutional breakdown, and hence to a bank run. Interconnection and loss of confidence can create systemic breakdowns from problems with a single bank; explicit and implicit protection is meant to shield the financial system and overall stability from such dire effects of the breakdown of any one financial entity. This study will concentrate on the risks and problems that influence the functioning of the financial system, inducing contagion effects and consequently leading to financial instability. These risks and problems include procyclicality, contagion risks, problems arising through interconnection, and possible bank runs, as well as further risks stemming from CRT or international regulatory differences.

### **3.1.2 Procyclicality**

Part of the regulatory effort addresses the procyclical impact of capital requirements, with a goal of protecting the economy as a whole from downturns and from a decrease in the credit supply. Negative cyclical fluctuation could result from increased capital requirements due to rising nonpayment, or as a consequence of degraded valuations of balance sheet positions due to mark-to-market valuation (Deutsche Bundesbank, 2011, p. 40). Procyclicality is defined as the tendency of financial variables to fluctuate around a trend with increasing amplitude. According to Utzerath (2010), a variable can be considered procyclical if its growth within a boom period is less than its decline in corresponding downturn periods. Such a downturn might lead, in the banking sector, to a reduced capital base, or possibly to reduced loan origination due to loan defaults and higher capital requirements. Banks reduce their lending activities during cyclical downturns, which is attributed to the direct relationship between banking activities and the economic cycle. The solvency of creditors depends on economic development, and more optimistic conditions during boom periods lead to excessive risk capital and loan origination (Rajan, 2009, p. 400). This procyclical tendency is enhanced in the banking sector, and a downturn with preceded credit lending could severely destabilize the banking system. As the capital base of banks is driven by credit default, stresses

and strains are higher in recession periods. Credit default materializes countercyclical. Procyclicality can have negative feedback in the real economy, and may lead to a credit crunch or to strengthened dynamics, with deep overall economic recession during periods of downturn.

Financial regulation addresses procyclicality with a variety of instruments, with the goal of strengthening the bank's capital base. The first instrument is buffers, which are designed to absorb losses in the event of a crisis, keeping banks from sinking below the minimum quota of regulatory capital. This regulatory measure also enables banks to supply further credit to the real economy (see Deutsche Bundesbank, 2011).

### **3.1.3 Interconnection of financial entities - Risk of Contagion**

Linkages between two or more market participants take many forms. While looking at traditional and shadow banks direct and indirect linkages become apparent. Institutions are for instance contractual connected through contractual obligations (direct interconnection). Besides these contractual interconnections, financial institutions can also be connected through common exposures as investment in the same or similar assets (indirect interconnections). Common exposures appear as more complex, as they occur in many different forms and concentrations (see Georg & Minoiu, 2014).

Interconnections between banks and shadow banks are both direct and indirect (see Schoenmaker, 1996). Direct linkages exist when shadow banks are in relationship with traditional banks, and are part of the intermediation process. In the construction of a bank holding company, direct interconnection is created by the bank's ownership of a shadow banking entity. Banks are directly connected with shadow banks when they provide support as sponsors to OBSEs or other shadow banking entities (i.e., explicit and implicit commitment). Many MMFs are supported by sponsor banks (McCabe, 2010 and Brady *et al.*, 2012). These commitments, however, may increase the liquidity pressure on banks (see Acharya *et al.*, 2013). After financial support, funding dependence is another form of direct interconnection. This could take the form of investment into each other's assets. Investment in debt instruments issued by OBSEs, which is mainly done for signaling purposes by the bank as an originator, is one direct way of interconnection. Indirect linkages could exist through investment in the same or similar assets, or through exposure to common counterparties.

The risk of contagion or systemic risk is defined as "the risk of experiencing systemic events in the strong sense." (DeBandt & Hartmann, 2000). Systemic events arise when bad news or the failure of one or more entities lead to widespread adverse effects, which may spread to other entities. The interconnection of financial intermediaries, especially between traditional and shadow banks, facilitates the spread of liquidity and solvency problems throughout the financial system. Any dysfunction or distress within the

shadow banking system (e.g., a bank run) may be transferred to the regulated banking sector through various forms of interconnection, including both direct and indirect connections. Spillover effects between banks exist through interconnections such as interbank loans and similar lending transactions.

Common shocks can be transferred through contagion channels within the financial system from one entity to another, and feedback loops enable stressors to be amplified. Also, different parts of the financial system (especially the loan originating part of the intermediation chain) rely on repo funding. Problems in the funding process through repo contracts could transfer wide funding problems throughout the system. The commitment by banks and other shadow banking entities to retain a portion of their sold and securitized loans and their usage as collateral for repo transaction constitutes an interconnection between the securitization, banks, and repo funding sectors. Investor doubt could mitigate the initial action of share redemption, causing a severe funding problem for entities relying on short-term funding (i.e., repo) and the disposition of loans for securitization.

### 3.1.4 Bank Run

A bank run is an event that can reach systemic importance, although the distinction must be made between a bank run that affects a single bank or a banking panic, whereby an initial bank run on a single entity evolves into a systemic event involving additional entities. This process is amplified by interconnections between banks and other financial entities (see also DeBandt & Hartmann, 2000). The perceived risk of a bank run prompts the panicked withdrawal of deposits by bank clients. Several studies have covered the impact of early withdrawal or bank runs. The most important paper in this area, Diamond & Dybvig (1983) (DD), proposes a model for optimal bank contracts to reduce or, ideally, prevent bank runs through deposit insurance<sup>14</sup>. In the two-period DD model, banks offer either short or long-term investments to depositors. The short-term investment is terminated at the end of the first period ( $T = 1$ ) and is considered to be liquid. The long-term investment terminates at the end of the second period 2 ( $T = 2$ ); premature liquidation of such long-term investments incurs liquidation costs. The bank allocates capital and enables individuals to make consumption decisions. It is assumed that each individual investor's consumption demand differs from their individual endowment. Totzek (2009) assumes a particular outflow of deposits, with a certain probability as normal. However, Totzek argues that deposits are withdrawn from the banking sector due to a loss of confidence and the anticipation of possible liquidity problems. Depositors face risks and, consequently, different liquidity needs.

<sup>14</sup>For further literature on the influence of early withdrawals on the financial system see Gilkeson *et al.*, 1999, Ringbom *et al.*, 2004 and Stanhouse & Stock, 2004; for further literature on classic runs on a single bank see Waldo, 1985, Jacklin & Bhattacharya, 1988, Chair & Jagannathan, 1988, Calomiris & Kahn (1991) and Carletti, 1999. Multi-bank systems are addressed in Garber & Grilli, 1989, Smith, 1991, DeBandt, 1995 and Temzelides, 1997



In equilibrium, pareto-efficient allocation is ensured when banks accept deposits at any time and each consumer terminates deposits only when individual liquidity demands need to be satisfied. The bank is able to anticipate this liquidity demand and invests deposits in short- and long-term projects. However, banks face other possible scenarios: inefficient and efficient run equilibriums. The first bank run equilibrium, the inefficient scenario, arises due to investor worries about the safety of their money, leading depositors to panic and withdraw their investments within the first period. Seeing this panic, other depositors are likely to withdraw their investments, too, as the face value of their deposits is larger than the liquidation value of the bank's assets, and as bank insolvency appears increasingly likely. In this scenario, banks face rising liquidity costs as they work to liquidate long-term investments to satisfy depositors' liquidity demand; the more the demand, the higher their risk of insolvency. The second run equilibrium is considered to be efficient. Depositors are assumed to be rational actors who withdraw their investments only in the event of a severe liquidity shock. The behavior of other depositors is not anticipated to be effected, as they are assumed to not be affected by these factors.

The solution proposed by the DD model is to provide deposit insurance and to introduce capital regulation, thereby reducing the probability of a bank run. In this case, the motivation for a run is removed, as the optimal ratio between consumption and allocation is ensured. The DD model also limits what redemptions can be requested.

With regard to financial system stability, the shadow banking system is also prone to runs, as their funding source of short-term fund shares is run-able, as modeled in Diamond & Dybvig (1983). Shadow bank funding markets are specifically vulnerable to modern-type bank runs as they provide short-term (mostly overnight) funding for long-term assets, posing a maturity mismatch. This kind of maturity transformation is conducted without governmental security systems or access to lenders of last resort. A modern-type bank run can be defined as redemption requests for fund shares by investors. As put forward by Diamond & Dybvig (1983), the possibility of bank runs can be reduced by offering deposit insurance. A logical consequence might be the establishment of such a security mechanism for funds. The occurrence of runs in the financial system leads to refinancing problems, which will be described in the following scenario. In the course of a bank run, any type of financial intermediary may be forced to liquidate assets, leading to the phenomenon of fire sales (described in the next paragraph). The pressure to liquidate assets may be increased by the impossibility of borrowing through private money markets. The possibility of deposit insurance will be discussed in Chapter 4.

### **3.1.5 Fire Sales**

Financial intermediaries are especially likely to be confronted with funding problems if they rely on short-term funding. In decisive situations of liquidity shocks and the

high valuation of assets, investors have incentives to liquidate their security holdings and to sell assets at a discounted price to non-specialized buyers. This phenomenon of deleveraging of financial portfolios works destabilizing and is defined as fire sales (see Shleifer & Vishny, 2011).

Payable liabilities may result from negative market conditions or from a lack of investor confidence. To meet those liabilities, banks need to liquidate their assets on short notice; this triggers a wide deleveraging process, which leads to fire sales. If banks seek to maintain their assets, their equity will be wiped out to meet the requested liabilities. Assets on the bank's balance sheet will decline in value, as the bank is forced to sell them at short notice. As these assets were also intended to serve as collateral for short-term lending transactions, the bank will then face the problem of a short-term lending gap, as discontinued funding cannot be compensated for (Shleifer & Vishny, 2010). Fire sales deplete the bank's balance sheet and weaken their overall financial stability (see therefore also Squam Lake Group, 2010, p. 67). The breakdown of one bank can set off a cascade of banking distress, impacting other banks. This can lead to decreases in the overall lending and risk-bearing capacity of the financial system: due to interconnections, the asset decline of a single bank can lead to a systemic event. Other market participants that invested in the same or similar assets and are affected by the same shock face market distress and are forced, in turn, to sell their assets. This simultaneous sale of assets by many entities entails further declines in asset prices. These effects are self-reinforcing; asset sales by multiple investors lead to downward spirals, illiquidity, and, ultimately, to systemic risk, which transmits shocks from the financial system to the real economy.

### **3.1.6 Defective CRT**

Misaligned incentives, asymmetric information, or incomplete or absent monitoring and screening within the securitization process all impair the effectiveness of the CRT (Ashcraft & Schuermann, 2008). This defective CRT influences the valuation of securitized products, and could lead to destabilizing effects. Originators might be encouraged to securitize as much as possible, so long as the securitized products find a ready market. Securitization allows investors to diversify their portfolio according to their individual risk attitude, and so offers economic benefits. However, the possible failure of ABSs or negative expectations about market conditions can persuade investors to question the return and quality of structured products. Wholesale investors of ABSs, or private sector investors in funds that buy ABSs, might anticipate problems in credit quality, the probability of return, or incomplete or absent screening and monitoring processes. In such cases, investors divest themselves of investments in securitized products, and OBEs (i.e., the purchasers of asset portfolios and sellers of ABSs), face problems of ABS turnover, making them unwilling to buy further assets and loans. The funding of the securitization process no longer offers any benefits, influencing the funding of different

entities within the financial sector that rely on financing through loans and asset sales to OBSEs.

Regulators address the problem of defective CRT with different risk-retention approaches. Risk retention aims to protect the promised quality and return of the transaction. As originators need to retain a set percentage of the originated portfolio on their own balance sheet, this creates a signaling effect concerning overall quality, thereby reducing possible instabilities within the securitization sector, and, by extension, the overall financial sector. Retention can be approached from the investors' or originators' side. An analysis of the optimal retention approach to ensure proper securitization is given in 5.

Some risks do create conditions encouraging each other, occur in combination, or entail other problems, as the detailed example of the interconnections and risks of modern-type bank runs demonstrates. While such interconnection is not inherently a threat to the entire financial system, solvency problems in one institution or a possible run could spread to other entities and cause system-wide instability. These interconnections arise through investment in the same or similar assets, investment in each other's assets, or contingent credit lines.

The proposed regulations are designed to address risks stemming from the characteristics and structure of the financial system. The following scenario outlines different risks inherent in the system and their impact on its vitality. The regulatory proposals are also explained and their possible impact on specific risks is analyzed.

### **3.2 Scenario of risk contagion within the shadow banking intermediation chain**

The (shadow banking) intermediation chain and financial transactions can be interrupted at different points. These financial shocks can then be transmitted to the whole financial system, thereby leading to financial failure (systemic risk and transmission of financial shocks is addressed by DeBandt & Hartmann, 2000). The main interruptions include, among others, early withdrawal of bank deposits, early redemption requests of fund shares, or loss of confidence in asset values. The focus in this scenario is on the withdrawal of bank deposits and the redemption of fund shares, which together constitute a bank run. The withdrawal of MMF shares and bank deposits does have severe spillover effects on the whole financial system, leading to a spiral of further withdrawal and fire sale mechanisms. As a consequence of these withdrawals, funds need to liquidate assets and stop contracting in short-term repo markets, thereby removing a funding source that other market participants count on. This liquidation can cause fire sales. The traditional banking system and shadow banks are connected through different channels that could transmit funding problems throughout the financial system. The following scenario analyzes the transmission of risks within the system initiated by MMFs that

operate without explicit guarantees. This run scenario can be triggered by both the private sector (i.e., households and firms) and by banks. During a run, funds are forced to meet redemption requests made by investors. A withdrawal of a tremendous number of shares from the MMF sector can be seen in Figure 2.17, and was observed in the bank run during the 2008–2009 crisis. The Primary Reserve Fund ‘broke the buck’ as a consequence of the insolvency of the Lehman Brothers investment bank. “Breaking the buck” refers to a decline in funds’ assets, reflected by the constant NAV falling below one dollar. This decline in the Primary Reserve Fund below one dollar resulted from the value decline of Lehman Brothers certificates, where the fund was invested. Using a short-term governmental guarantee, the Primary Reserve Fund was initially able to suspend redemption by investors. However, the requested redemption caused uncertainty regarding asset value, which led to uncertainty in share value development and expected returns. Investors of funds assumed that values would decline, triggering a 14% redemption of shares in US prime funds within one week after Lehmann Brothers became insolvent (PwC, 2012 and Scharfstein, 2012).

Households, insurance companies, other funding corporations, and banks can all be investors in MMFs. In the following scenario, it is assumed that funds are dealing with two different investor groups that could request to redeem fund shares. If investors in funds expect a decline in asset values and severe economic effects, and hence fear the loss of their invested endowment, they will tend to withdraw deposits and request the redemption of their MMF shares. The requested redemption of fund shares by the private sector or by banks will be discussed in the following section and is pictured in Figure 3.1. The first group is private investors (Figure 3.1; (1)), who have a comparably smaller invested endowment. Households as investors are able to invest their available income in two different ways: either as a bank deposit with a traditional bank, or as an endowment in the form of investment fund shares, which can be redeemed at any time. While individual households or private investors might each have only a small endowment, together they represent an intense force, especially as this group is prone to collective, herd behavior, and a large proportion of investments might be withdrawn at the same time. The second group of investors is banks (Figure 3.1; (2)). If banks request redemption of shares, this will have a severe impact on MMFs and on the funding of the larger financial system, especially the shadow banking system. It is assumed that banks have two reasons to redeem significant numbers of their shares. This first reason would be that banks are exposed to personal liquidity shocks, or other situations that require liquidity, such as when large numbers of private investors are withdrawing their deposits (Figure 3.1; (A)). If this happens, and if this withdrawn amount exceeds the amount guaranteed by deposit insurance, banks are forced to generate liquidity out of their balance sheet. Since they are a short-term and easily liquidated investment, MMF shares are the first investment to be liquidated. The second reason that banks might want to redeem their shares would be if they, like private investors, considered their investment in those MMF shares to be a poor one, and they saw redemption as a

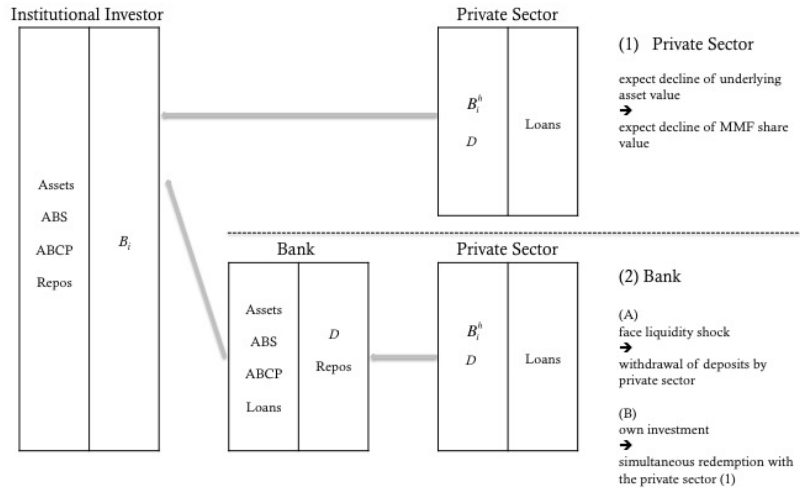


FIGURE 3.1: Redemption of MMF shares by the (1) private sector and (2) banks. Banks have two reasons to redeem shares: (A) own liquidity shock and (B) anticipation of share value decline.

way to avoid a major loss of their investment (Figure 3.1; (B)). However, whatever the motives, large-scale redemption has severe effects on the MMF sector. As banks are, proportionally, one major shareholder in MMFs, the withdrawal of large amounts of fund shares can have severe consequences on the financial system's funding. The effects of these redemption requests will be discussed further on in the direct scenario.

In the case of negative market developments or expected severe market distortions, households can withdraw their bank deposits at any time or request MMF share redemption. Bank withdrawal is secured, up to a certain value, through deposit insurance. Banks can draw on their deposit insurance up to a capped amount to meet these requests for the withdrawal of deposits <sup>15</sup>.

Money Market shares are assumed to be highly liquid and easy to redeem at little to no cost; they are therefore regarded as safe and liquid alternative to bank deposits. However, such funds are not eligible for government guarantees, such as the federal discount window and other guaranteed liquidity. These funds are therefore forced to hold sufficient assets, or to liquidate assets to meet all requested redemption. Holding a part of the portfolio as liquid assets reduces the efficiency of the fund's portfolio management and will not reach the frontier of efficient portfolios. To meet all possible requests, funds need to retain a specific amount of liquid resources, or need to be able to

<sup>15</sup>Deposit insurance for Germany and the majority of countries in the EU is capped at Euro 100.000 for demand funds, restricted cash, and account books; in the UK the cap is Pound 85.000 (see European Commission, 2010, Art. 7(1a) as of December 2010). The US increased the amount of deposit insurance up to Dollar 250,000 with the passage of the DFA (initially introduced by FRB, n.d.).

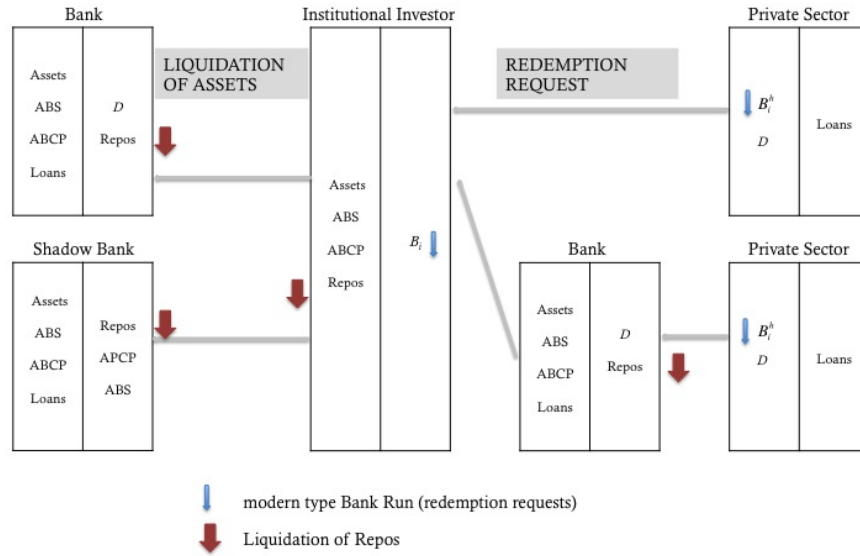


FIGURE 3.2: Run Scenario Step 1 - Redemption requests by MMF investors lead to a decreasing  $B_i$  depicted by a blue downward arrow. This in consequence results in portfolio restructuring to meet sudden redemption requests, starting with highly liquid and easy to liquidate repo contracts  $\text{repo}\downarrow$  (depicted with a red downward arrow).

liquidate assets and free up capital at no cost. The FSB has proposed mandating that funds retain specific levels of liquidity, a capital buffer (this will be discussed further on in Chapter 4). The effects of redemption requests by the private sector and banks are reflected in the decreasing  $B_i$  on the fund's balance sheet in Figure 3.2.

For simplicity's sake, it is assumed that MMFs invest their available resources in securities, such as ABSs, ABCPs, and other assets, as well as in repos (as seen on the asset side of the fund's balance sheet in Figure 3.2). As mentioned in Chapter 2, repos serve as a short-term funding source for banks, especially shadow banks in a narrow sense. It is assumed that repos are collateralized by high-quality assets that can be treated as secure and liquid investments to provide temporary cash balances and working capital. In the presented stylized model of the shadow banking system, it is assumed that banks and shadow banks rely on repo funding. In the case of a traditional bank, repos can be used for short-term funding, as an alternative to interbank loans. However, traditional banks do not rely as heavily on repo funding as do shadow banks (Gorton & Metrick, 2010c, p. 3). Shadow banks, in contrast, do not receive deposits and rely on short-term repo funding (see Figure 3.3). Repo lending allows a wide range of market participants to participate in wholesale money markets. Within the fund's portfolio management, repos can be viewed as safe admixtures. Funds use repo contracts as an alternative to deposits, allowing them to store liquid resources safely, while still making those funds available at any time and earning reasonable interest. Funds are not able to store large amounts of money in savings accounts in traditional banks (which would give them a

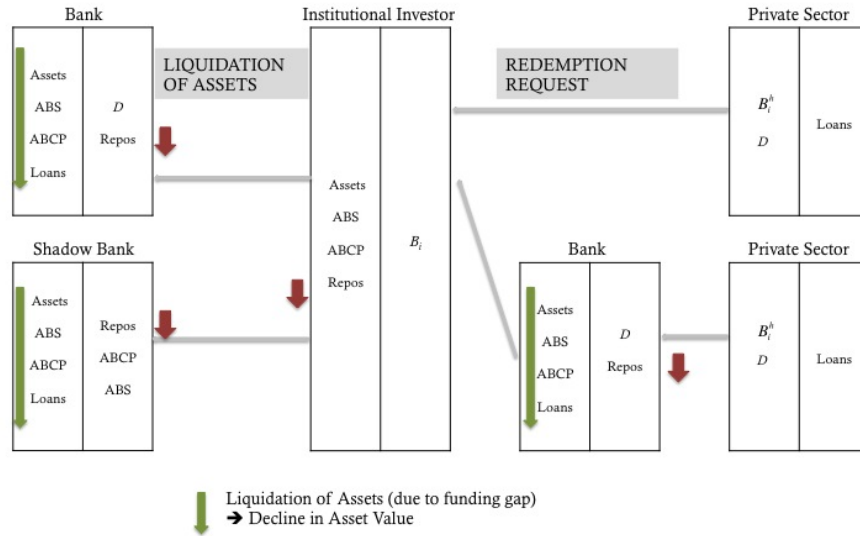


FIGURE 3.3: Run Scenario Step 2 - Due to a repo funding gap, institutions that rely on repo funding now face tight liquidity positions. Institutions need to liquidate assets in order to serve claims and requests, and compensate defaulted repo contracts.

safe, liquid way to generate reasonable interest), as federal deposit insurance is capped at levels that would not cover the amounts invested by MMFs. The amount of liquid resources increases with the assets under management, as MMF shares are an interest-earning alternative to bank deposits for the private sector (Gorton & Metrick, 2010c). Repos constitute a highly liquid asset within the funds' balance sheets, and one that is different than other assets with longer maturity, such as investment fund shares, governmental and non-governmental bonds, and stocks. Repos are realizable at little cost and within a short period of time, and can therefore be used to meet initial redemption requests. High requested redemption causes a decreasing  $B_i$ , which prompts portfolio restructuring to meet additional potential requests. Funds then work to free up resources to meet redemption requests, as illustrated in Figure 3.3.

Repo contracts, which are viewed as a cheap and broad financing possibility for financial intermediaries, are assumed to be the first resource that will be liquidated. In the event of liquidation of contracts or of failed prolongation of revolving contracts, funds will revoke this funding source for a number of market participants. Funds will not be able to pursue or prolong repo transactions and consequently withdraw a funding source for mainly shadow banks in a narrow sense and also banks. This constitutes one point where funding problems of one entity, the fund due to redemption, leads to severe liquidity problems of a whole sector due to interconnection.

Banks and other financial intermediaries use repos to ensure their (mostly short-term) financial needs. Alternatively, banks can participate in the interbank credit market. The

immediate reverse transactions free up liquid resources and meet redemption requests. This leaves market participants with tighter liquidity positions, as they might rely on the funding provided through revolving short-term repo contracts on a longer-term basis. Normally, these short-term repo contracts will be renewed. In case of a reverse transaction to free up liquid resources, funds may no longer be willing to renew these contracts. Banks and shadow banks need to liquidate assets as well as other, including ABS or ABCP in order to compensate for defaulted repo funding, as described in Figure 3.3. Declining repo lending result in the sale of assets to compensate for funding shortages, and the immediate sale of assets to fill these gaps might lead to declining asset prices.

As not all redemption requests might be satisfied following the liquidation of repos, funds will realize portfolio components in a successively cascaded manner, according to their maturity and ability to be liquidated at low costs. A rapid realization of risky and high-yield assets might lead to a markdown, which could cause a downward spiral of mounting redemption requests. A price decline in assets is expected to have an impact on the price development of fund shares, as private investors and banks withdraw all remaining investments as they notice price decline. Investment funds recall further investments, such as ABCPs and ABSs, which leaves entities that rely on funding through the same of ABCPs or ABSs with funding problems. At this point, the fund portfolio will be dissolved, with increasing markdowns or also called haircuts and liquidity charges, which eventually risks triggering fire sales mechanisms.

In this scenario, funds will not buy available ABSs, ABCPs, or other assets that are sold by other market participants. Due to portfolio regrouping, funds do not act as consumers of either assets offered by banks and shadow banks in a narrow sense, or of securitized OBSE assets. Securitized assets remain unsold and do not generate the desired liquidity for banks and shadow banks in a narrow sense. Next to funding through repos another major funding source is therefore missing. Furthermore, funds will not keep illiquid assets in their own portfolios, as they want to generate enough liquidity to meet redemption requests, as well as other possible but unknown requests. Banks and other shadow banks are therefore forced to sell assets at discounted prices to find transaction counterparts. Furthermore, OBSEs are not able to place securitized ABSs and ABCPs on the market, as there are no potential recipients, so OBSEs do not buy originated loans, as they usually do. Loan originators do not gain liquidity through origination and distribution, leading to reduced loan origination and loan supply to the real economy.

To avoid tight liquidity positions, banks and other financial institutions might substitute or supplement their financial needs with interbank credits or other suppliers of short-term credit, which can be seen as near substitutes for repo contracts. In perfectly performing markets, these substitutes can be unwound frictionlessly. In the case of non-performing or poorly performing interbank markets, banks need to look for other funding sources. Banks and shadow banks in a narrow sense (that highly rely on repo funding) must



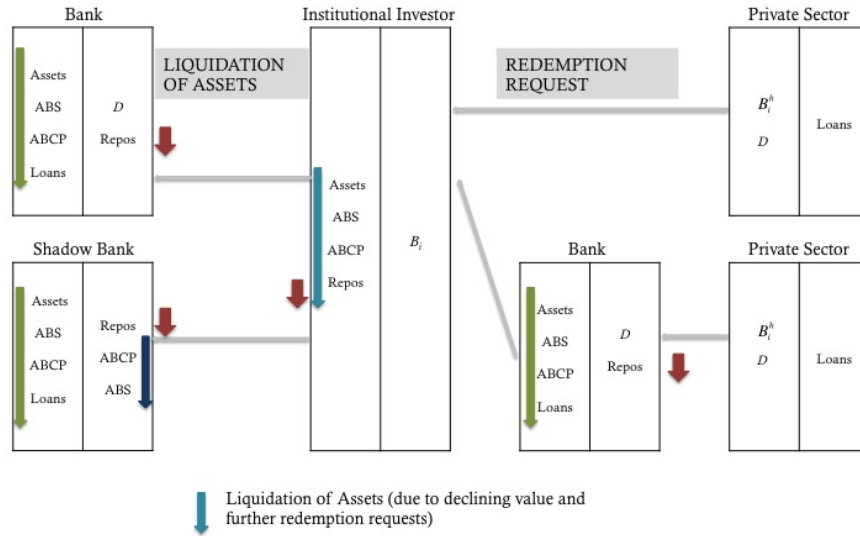


FIGURE 3.4: Run Scenario Step 3 - Continuing liquidation of repos and other assets to satisfy further redemption requests (light blue ↓) and due to declining asset values. Shadow banks reduce the issuance of ABCP and ABS, as there doesn't exist a market for trading and MMFs no longer purchase securitized assets due to portfolio liquidation (dark blue ↓).

compensate for their higher liquidity needs - which have risen due to the lack of renewed repo contracts - through new repo contracts. However, in such a scenario, borrowers (i.e. capital-seeking parties) in those contracts might be required to provide more security to lenders. This contractual haircut reflects the anticipated performance of the underlying collateral. In the case of high haircuts, the involved participants expect a sharp decline in prices in the near future, along with a decline in the value of the collateral. This means that capital-seeking parties need to provide more collateral. It might be possible for banks and shadow banks in a narrow sense to acquire funds through repo transactions if the market is still offering such contracts; however, in such a scenario, the capital-seeking parties might not be willing or able to raise the expected amount of collateral to satisfy their financial needs. These severe financial needs might force banks to liquidate their asset positions, as funding by the liability side is not guaranteed, causing a shortening of the asset side of the balance sheet (balance sheet contraction). Banks and, especially, shadow banks in a narrow sense that are missing a funding source might be forced to liquidate other portfolio assets to compensate for this funding gap. The liquidation of portfolio assets under pressure leads to a decline in asset prices, as assets need to be liquidated as fast as possible to reduce the funding shortfall.

Consequently, financial intermediaries (i.e., banks and shadow banks in a narrow sense) are only able to sell illiquid assets at enormous markdowns or also called haircuts, or under hindered conditions. It is unclear whether these markdowns and price declines

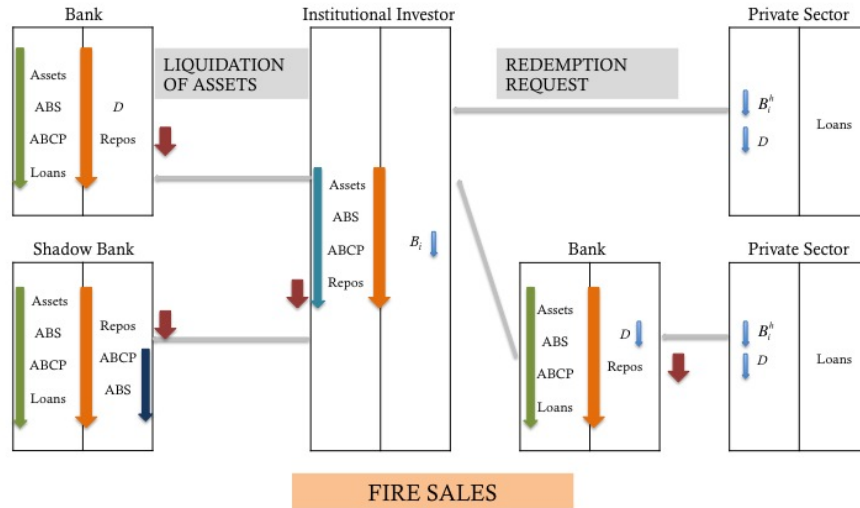


FIGURE 3.5: Market participants liquidate further assets to minimize a funding gap. As assets need to be liquidated fast asset price decline (markdown). Herd behavior of simultaneous asset sale by market participants leading to fire sales (orange ↓).

are also influenced by the expectations of market participants. The asset market price or fundamental value is influenced both by expectations about the market (e.g., self-fulfilling prophecies) and by price development. The sudden liquidation of assets leads to declining prices and fire sales (see Figure 3.5), which fuels further price deterioration.

### 3.3 Summary

Risks and structural aspects that threaten both the traditional and the shadow banking system are described in Chapter 3, and include procyclicality, risks stemming from the interconnection of entities, bank runs (which can lead, ultimately, to fire sales), and defective CRT. These risks persist in the traditional banking system, and might be enhanced in the shadow banking system through this system's unique structural characteristics and features.

Procyclicality is already addressed by banking regulation by the BCBS. It is defined as the tendency of financial variables to fluctuate around a trend with increasing amplitude, which can enhance downward spirals and destabilize the financial system. Activities such as repo lending can increase procyclicality within the financial system. Concerning regulatory proposals on shadow banking activities, regulators need to have an eye on those activities that raise procyclicality.

Interconnections between financial entities do not necessarily spread risks. The failure of one entity could, however, transfer negative effects throughout the system via contractual or common exposure interconnections, spreading funding problems and failure to other entities and raising the risk of a systemic breakdown. In seeking to control these contagion effects, regulators need to take possible interconnections, their development, and their meaning for the financial sector into consideration.

One potentially systemically important event that can be transferred throughout the financial system by such interconnections is a bank run. Following negative expectations regarding the development of market conditions, banks face huge sudden withdrawals of bank deposits. Interconnections can turn the resulting bank failure into a systemic failure, including additional institutions and, potentially, the entire financial system. The characteristics of a bank run can also be transferred to the shadow banking system, where MMFs might be threatened by modern-type bank runs by investors in MMF shares.

During a bank run or other systemic events, banks and other market participants must liquidate assets as fast as possible to close funding gaps. This liquidation exerts an increasing downward pressure on prices, i.e., fire sales. Market participants who invest in the same assets are directly affected by fire sales; further on, market participants who hold common exposures or who invest in similar assets might be affected indirectly, as the decline of prices is transferred to additional asset classes.

Defective or incomplete CRT is another risk to financial stability. A well-functioning risk-transfer process indicates high quality and accurate valuation of securitized assets. In the case of a financial crisis, prices remain stable, so long as their pricing is profunded. To control risks relating to incomplete CRT, regulators have mainly introduced instruments that strengthen the assessment of security values and reduce asymmetric information and frictions within the securitization process (i.e., risk retention).

The second section of Chapter 3 introduces a scenario of a modern-type bank run. This scenario aims to identify the risks that appear during the shadow banking intermediation process, as well as interconnections that transfer those risks throughout the financial system. Areas of potential regulatory need are then pointed out. In the event of a modern-type bank run, MMFs might face the redemption of MMF shares by investors, similar to the way in which deposits are withdrawn from traditional banks. Since MMFs are a major funding source for the shadow banking system, the redemption of MMF shares and the liquidation of repos leaves the shadow banking system with a funding gap. As shadow banking entities and connected institutions in the traditional banking sector seek to close those funding gaps as quickly as possible, the high pressure liquidation of assets could trigger fire sale mechanisms. This creates a risk of severe declines in asset prices and further destabilizing effects throughout the financial system. Chapter 4 outlines the financial regulations that could potentially control or limit the risks described in this scenario.

## Chapter 4

# Proposed Regulation addressing the Shadow Banking System

### 4.1 Traditional regulation of risks to stabilize the financial system

#### 4.1.1 Basel regulations

##### 4.1.1.1 Basel regulatory framework

In addition to prompting suggestions regarding regulations of the shadow banking system, the financial crisis of 2008–2009 unveiled the shortcomings of existing banking regulations, especially regulation of systemic risks and systemically important institutions (SIFIs). The G20 leaders responded to those shortcomings with a new regulatory framework: Basel II.5. This framework is an amendment to Basel II. Basel III was then endorsed as a regulatory framework in 2010, to contribute to a more resilient “global banking system by raising the quality, quantity and international consistency of bank capital and liquidity, constrains the build-up of leverage and maturity mismatches, and introducing capital buffers above the minimum requirements that can be drawn upon in bad times” (BCBS, 2012c; BCBS, 2010 and BCBS, 2010/2011). The breakdown of the regulatory proposals contains a capital reform, liquidity standards, and issues concerning systemic risk and interconnections. The Basel Accords are therefore segmented in three Pillars: (1) capital, risk coverage and leverage (2) risk management and supervision, and (3) market discipline. The first of three Pillars intends to strengthen the banks’ capital base and aims to reduce bank failure and enhance their possibility to absorb losses. The international harmonization of risk management and supervisory oversight to enhance the ability of banks to manage risks are the objects of Pillar 2. Pillar 3 comprises public disclosure and market discipline to enhance transparency (BCBS,

2012c, p. 1). In addition to microprudential regulation, the new regulatory approach includes a macroprudential approach to stabilizing the financial system against risks arising from interconnection and interactions between financial institutions. The new regulatory standards on banking supervision also address consolidation and accounting issues, large exposure regimes (i.e., Groß- und Millionenkreditverordnung; GroMiKV), and risk-based capital rules (G20, 2011). The Basel Accords aim to provide an international consensus for bank and financial market safety and soundness. International harmonization in banking regulation is essential, as variation in regulations could disadvantage banks and other financial institutions. Different regulatory regimes also open the possibility for regulatory arbitrage, which entails further risks and problems of general regulatory enforcement.

The BCBS introduced a reformed framework for future banking regulation in 2010<sup>16</sup>. The BCBS aims to raise and strengthen the quality, consistency, and transparency of regulatory capital, thereby enhancing the resilience of banks and, hence, the overall financial system. Furthermore, regulators want to achieve a consistent definition, as well as an understandable and harmonized terminology, of capital across various jurisdictions, to promote comparability and market assessment. This appears to refer to shadow banking regulations, as necessary. The definition of shadow banking can be considered to follow from a clear definition of banking. To set up a clear and consistent definition, it is crucial to define financial markets and banking precisely (see Chapter 2 for a definition of shadow banking). The regulatory framework of traditional banks constitutes another source of shadow banking regulation. This regulatory framework may highlight unknown needs regarding the regulation of shadow banking. Hence, it is important for banking regulators to develop clear and globally consistent terminology regarding the financial system and banking. This will allow them to create and enforce consistent regulatory approaches, thereby preventing regulatory arbitrage. A globally consistent definition of banking helps create clearer definition and ideas about shadow banking, which facilitates adequate regulation.

Pillar 1 of the Basel Accords addresses systemic and procyclical risks through regulation concerning capital, adequate risk coverage, and leverage. To approach capital and make institutions more resilient against losses, the BCBS suggests a greater focus on improved quality and higher levels of own funds. Own funds consist of Tier 1 and Tier 2 Capital (Art. 72 CRR - Regulation (EU) No 575/2013). Tier 1 Capital is composed of 4,5% Common Equity Tier 1 Capital (CET1) and 1,5% Additional Tier 1 Capital. Including the Tier 2 Capital own funds sum now up to 8% (Art. 26 ff and 62 ff. CRR - Regulation (EU) No 575/2013). Also introduced is a capital-conservation buffer of 2,5% and countercyclical buffer of between 0 and 2.5% to counteract excessive credit growth (Art. 440 CRR - Regulation (EU) No 575/2013; see Georg, 2011 and Deutsche Bundesbank, 2011).

<sup>16</sup>“Basel III: A global regulatory framework for more resilient banks and banking systems” (BCBS, 2010/2011) and “Basel III: International framework for liquidity risk measurements, standards and monitoring” (BCBS, 2010)

Further mandatory buffer will apply to banks that are labeled as systemically important (KPMG, 2013). To cover risks within the banking sector, banks need to strengthen the general capital base. Pillar 1 also proposes enhanced risk coverage through stronger capital requirements, which would capture both on and off balance sheet credit risks. Regulators have also turned their attention to the capital treatment of securitization and the trading book. This includes significantly higher capital and generally strengthened capital for complex securitization transactions, trading and derivative activities, and counterparty risks. Proposed actions include a stressed value-at-risk framework, a more rigorous credit analysis, and a counterparty risk framework. The Basel framework aims to strengthen the supervision of counterparty risks and exposures to the central counterparty. To constraint a possible build-up of leverage, the BCBS introduced a leverage ratio to supplement capital requirements and constrain banking sector leverage (Deutsche Bundesbank, 2011).

The risk management and supervision proposed in Pillar 2 seek broader governance and risk management to detect off balance sheet exposures and securitization activities (Deutsche Bundesbank, 2011, p. 28). This should incentivize the management of risk concentration, risk and return, sound compensation and valuation practice, and stress testing, and should also improve governance and accounting standards. Pillar 3 also introduces revised disclosure requirements, which should enhance transparency and provide more detailed information about exposures, sponsorships, components of regulatory capital, and the calculation of capital.

To strengthen the liquidity position of banks and the associated supervision monitoring, the BCBS introduced a liquidity-coverage ratio (LCR) that would require banks to have “sufficient high-liquid assets,” as well as a long-term net stable funding ratio (NSFR), which would address liquidity mismatches and give banks incentives to use stable sources of funding (liquidity will be regulated in Art. 411 ff of the CRR - Regulation (EU) No 575/2013). The BCBS also introduced principles for sound Liquidity Risk Management and Supervision, which could be used to review sound practices for managing liquidity risks. These principles also include monitoring to identify and analyze liquidity risks (Deutsche Bundesbank, 2011, p. 30).

Addressing systemic risks and the interconnection of market participants is another important issue, as risks are transmitted through interconnection across the financial system and the economy (G20, 2011). The question is whether regulators can articulate and implement regulatory approaches without the support of a clear theoretical and model-based analysis of the system and the economic effects arising from banking and shadow banking interaction. The regulation of SIFIs and the interconnections of financial market participants can be considered a crucial issue for shadow banking regulation. Interconnections among both the traditional and the shadow banking sectors create potential risks. The direct regulation of traditional banks influences the development of shadow banks, in the form of indirect regulation. Working together, the BCBS

and the FSB are designing quantitative and qualitative indicators to capture the systemic importance of specific financial institutions and to develop specific requirements concerning exposures and interactions.

Banking regulation plays an important role in shadow banking regulation. Banking and shadow banking entities are mutually dependent through interconnections, in several ways. Actions taken by banks and shadow banks, together or individually, can cause effects to both sectors. Consequently, an effective regulation of the shadow banking system also depends on adequate banking regulation; this would, for example, help to avoid regulatory arbitrage inadvertently created through strict banking regulation (see Section 4.2.3). A recent article of Piper (2014) however argues that the new banking regulation concentrating on less risky activities enhances regulatory arbitrage. Therefore, banking regulation and the impact on the shadow banking sector is approached in the first Workstream of the proposed FSB framework to shadow banking regulation. With respect to shadow banking regulation and the impact of banking regulation on shadow banks, transactions with the shadow banking sector or liquidity back up lines to funds need to be covered with more regulatory equity. Rules concerning consolidation will include specially outsourced SPVs in order to display a real picture of the banks' engagements. For example, the regulation of governing large exposures and million loans reporting (i.e., GroMiKV) explicitly includes and regulates extended credits and large exposures to shadow banking entities (see Financial Stability Board, 2013c).

#### **4.1.1.2 Basel III Implementation**

The Basel III implementation review program was designed to operate as a three-level review. This review focuses on ensuring (1) the timely adoption of the Basel III accords, (2) the consistency of the Basel III accords, and (3) the consistency and harmonization of the outcome. Perceptions regarding Level 1 were released frequently every quarter as "Progress Report on Basel III implementation." So far, progress has been as follows: As of May 2012, 21 of the 27 member states have implemented the Basel II regulations, including the US, Argentina, China, and Turkey still to go. In the US, Basel II has been mandatory for institutions to implement in their approaches to credit and operational risk. These institutions are therefore called "in parallel" run and report to supervisors. Institutions operating under parallel run are subject to Basel I regulations (BCBS, 2012b, p. 3). The preliminarily version of the Basel II.5 regulations has been fully implemented by 20 member states; Russia and the US have drafted regulations, but, as of the time of writing, have not passed any finalized regulations. United States authorities tend to finalize regulations after considering a public consultation process (BCBS, 2012b, p. 5). According to the BCBS, there might be challenges in meeting the final deadline for Basel III implementation, as no member states have yet fully implemented final regulations. To be in full compliance with the Basel regulations, member states must fully implement the suggested accords by 2019.

**European Regulation - Implementation of the Capital Requirements Directive IV package**

Within the Euro Area, the internationally agreed-upon Basel Standards have been adopted by the Capital Requirements Directive. So far, implementation of the Basel approach comprises CRD I (see Directive 2006/49/EC and Directive 2006/48/EC) CRD II (see Directive 2009/111/EC; Directive 2009/27/EC and Directive 2009/83/EC), which together aim to ensure the soundness of banks and investment firms, and CRD III (see Directive 2010/76/EU), which proposes capital requirements for the trading book and for re-securitizations. The proposed Basel III standards are implemented by the CRD IV package (CRDIV - Directive 2013/36/EU and CRR - Regulation (EU) No 575/2013). The CRD IV Package includes the Capital Requirements Regulation (CRR - Regulation (EU) No 575/2013) and the Capital Requirements Directive (CRDIV - Directive 2013/36/EU). Directives allow the member states to legislate individually and separately, but in consequence hinder full harmonization of regulation. The regulation, which includes references to technical standards and guidance, is not required to be adopted into national legislation, but will apply to all EU Member States. The CRR will also be titled single rule book for banking regulation. The CRR and CRD were ratified by the European Parliament on 17 April 2013 and will come into effect on 1 January 2014 (Höpfner, 2014 and Deutsche Bundesbank, 2013). The assessment process within the Euro Area revealed that most of its key components are compliant or largely compliant with the Basel III framework. However, substantial gaps do exist in the clear definition of capital and the Internal Ratings-Based (IRB) approach. The assessment further points out that the EU approach of maximum harmonization may be at odds with the minimum harmonization concept proposed in the Basel rules. This does not necessarily represent an inconsistency, but rather reflects the supra-national and complex structure of the Euro Area. Overall, the EU framework is geared towards maximum harmonization, which entails harmonized banking rules and limited gaps between the approaches used by national authorities (BCBS, 2012a, p. 8). Law adopted at the EU level must be agreed on by and applies to all member states. A full implementation is expected by January 1, 2019.

**US Regulation - Dodd-Frank Act - Implementation**

Apart from the suggested Basel regulations, US regulatory authorities introduced the DFA of 2010. This act addresses capital requirements for banks “to promote the financial stability of the United States by improving accountability and transparency in the financial system, to end ‘too big to fail,’ to protect the American taxpayer by ending bailouts, to protect consumers from abusive financial services practices, and for other purposes” (Dodd-Frank Act of 2010, for further details on the DFA framework see, Kern, 2010). Both the implementation of the final version of Basel II.5 and the proposed regulations



of Basel III were introduced in June 2012 as an Integrated Capital Framework (ICF) consisting of the Basel III Notice of Proposed Rule-making (NPR) and the Market Risk Final Rule. The ICF will prompt consistency within the constraints of the implementation of the DFA. However, proposed rules will not become valid until January 2013<sup>17</sup>.

## 4.2 International approaches to shadow banking regulation

### 4.2.1 United States Dodd-Frank Act

The DFA addresses systemically important nonbank entities, using a rather general entity-based approach (nonbank SIFI). The Financial Stability Oversight Council (FSOC) is empowered within Section 113 of the DFA (Dodd-Frank Act of 2010 codified at U.S.C., Title 12) to designate a nonbank financial company as a nonbank SIFI. Those nonbank SIFIs need to be supervised by the Board of Governors of the Federal Reserve (FED) System if a “material financial distress at the nonbank financial company, or the nature, scope, size, scale, concentration, interconnectedness, or mix of the activities of the nonbank financial company, could pose a threat to the financial stability of the United States” (U.S.C., Title 12 Chapter 53 Sec. 5323). By June 2013, the FSOC had designated three financial service companies (AIG, GE Capital and Prudential) as nonbank SIFIs according to Section 113 of the U.S.C.. Section 165 of U.S.C. extended the prudential banking regulation of nonbank SIFIs to include aspects of capital, leverage and liquidity requirements.

The FSOC can also include systemic activities and utilities under the regulation of the DFA, so long as the “conduct, scope, nature, size, scale, concentration, or interconnectedness of such activities or practice” create or increases risk or spread problems “among bank holding companies and other nonbank financial companies” (U.S.C., Title 12 Chapter 53 Sec. 5330).

Despite what it does accomplish, the prudential banking regulation might not, however, be adequate to regulate and supervise nonbank SIFIs, as it lacks nuance and does not elaborate on special nonbank characteristics. Furthermore, questions may arise as to whether the FED has the relevant expertise to create adequate shadow banking regulation, as well as if it is necessary to target only bank-like activities, or all activities of nonbank SIFIs.

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<sup>17</sup><http://www.federalreserve.gov/newsevents/press/bcreg/20121109a.htm>

### 4.2.2 European Commission Green Paper

Parallel to the FSB approach to shadow banking regulation, the European Commission published a Green Paper on shadow banking (European Commission, 2012). The European Commission finds that the EU showed global leadership in meeting the 2010 G20 commitment (G20, 2010). The Commission further “considers it a priority to examine in detail the issues posed by shadow banking activities and entities.” Similar to the FSB’s definition, the Commission focuses on entities and activities (see Chapter 2 for the definitions of shadow banking). Moreover, the FSB and the EU Commission can be considered as working in parallel, as the Commission has contributed to a great extent to the elaboration of the FSB. The conclusions and views of the FSB and the EU Commission are therefore very close.

Following a consultation period and a conference on shadow banking, the Commission published a final communication regarding the steps the EU should take to address the risks stemming from the shadow banking sector (see European Commission, 2012, p. 14ff. and European Commission, 2013). In this communication, the Commission identifies a number of priority issues, including regulation through banking regulation, transparency, a harmonized framework for asset management and risk transfer, and security financing transactions and others.

The EU has taken a global leadership position in financial reform, passing a number of regulations. For example, the EU has addressed the issue of regulatory arbitrage, which pushed the growth of the shadow banking system and threatened financial stability, by reinforcing requirements imposed on banks. This indirect approach to shadow banking regulation concerns prudential banking regulation, including the implementation of CRD II and CRD III, and the future implementation of CRD IV. With regard to the asset management sector (i.e., wholesale funding and other alternative funds), the EU established a harmonized framework, AIFM Directive 2011/61/EU and strengthened the UCITS Directive 85/611/EEC amended by Directive 2009/65/EC, Directive 2010/43/EU, and Directive 2010/42/EU. With the introduction of the European Market Infrastructure Regulation (EMIR), the European Parliament and Council introduced a framework for risk-transfer instruments and securitization, with the goal of enhancing transparency and promoting stability (Regulation (EU) No 648/2012 and Regulation (EU) No 236/2012). To enhance overall transparency of the shadow banking sector, the EU initiated an additional monitoring process on both the national and the supranational levels, with the goal of identifying and monitoring the risks associated with the shadow banking system (European Central Bank, 2013).

### 4.2.3 Mandate of the Financial Stability Board

There are three different approaches in shadow banking system regulation: (1) the G20 mandated approach by the FSB, (2) the DFA, which focused on significant financial entities including non-bank SIFIs in general, and (3) the European regulatory proposal by the European Commission, in the form of a European Commission (2012).

The G20 recognized that adopting new capital requirements can simply cause capital to migrate to areas that are less regulated, triggering new adverse effects. The G20 therefore mandated that the FSB, in collaboration with other international standard-setting bodies should “develop recommendation on the oversight and regulation” of the shadow banking system (see e.g., G20, 2010; Financial Stability Board, 2011b and Financial Stability Board, 2011a). The FSB has initiated a task force to define and clarify the shadow banking system and to analyze the role of NBFIs within the financial system. A further objective is to analyze the risks and identify the scope for additional regulatory measures, to address both risks and possible regulatory arbitrage (Financial Stability Board, 2011a).

The FSB set up Workstreams (WSs) to survey different shadow banking subjects in detail and to develop specific regulatory proposals to govern the shadow banking sector. They will review existing regulations and supervisory actions, and establish the necessity of new policy recommendations to strengthen regulation and supervision (Tochtermann, 2011). The Basel Committee’s responsibility encompasses the indirect regulation of NBFIs within the direct regulation approaches of Basel II.5 and Basel III, as well as mitigating spillover effects between banks and NBFIs (WS1). To do this, the BCBS will review scope of consolidation, large exposure regimes, banks’ investments in NBFI funds and similar investments of NBFIs and banks. For information on Workstream 1 see Section 4.1.1.1. The IOSCO is mandated with proposing MMF regulations to reduce susceptibility to runs (WS2) and the evaluating securitization issues, such as transparency and standardization (WS4). The FSB task force itself focuses on the evaluation and mitigation of potential risks concerning other shadow banking entities that have not yet been examined in detail (WS3), as well as on risk and procyclicality incentives linked to secured finance instruments, such as repos and securities lending (WS5) (Financial Stability Board, 2012d, p. 3). In addition to these five Workstreams, the FSB will also monitor three other regulatory initiatives: (1) data reporting and transparency<sup>18</sup>, (2) underwriting standards<sup>19</sup>, and (3) Credit Rating Agencies (CRAs)<sup>20</sup> (Financial Stability Board, 2011b).

In the following section, the regulatory proposals concerning issues and risks that arose in the scenario analysis of a MMF modern-type bank run will be discussed further.

<sup>18</sup>FSB Enhanced disclosure task force – Report on “Enhancing the Risk Disclosure of Banks”.

<sup>19</sup>FSB report on “Principles for Sound Residential Mortgage-underwriting Practices”.

<sup>20</sup>FSB report on “Principles for reducing reliance on CRA ratings”.

This analysis will only cover regulatory issues of the MMF sector, selected proposals of securitization, and repo regulation. An overview will be given in Appendix B .

Further steps on shadow banking regulations includes the activating of the proposed policy framework, by the time recommendations are finalized. The FSB will therefore introduce a detailed implementation schedule. The implementation process and the development of the shadow banking system under introduced regulation is accompanied by intensive monitoring and reporting - in form of detailed peer reviews (Financial Stability Board, 2013c, p. 8).

## 4.3 FSB proposed regulation

### 4.3.1 Principals of future regulation and need for new regulation

Concerning the regulation of NBFIs, the FSB makes it clear that a single approach will not fit all components, entities, and activities of the shadow banking system, nor will it cover all risks and problems associated with the various forms of NBFIs. Regulations need to be differentiated according to the specific needs and capabilities of different entities. General principles have therefore been derived to assure efficient and effective regulation (see Financial Stability Board, 2011b). These principles are as follows: (1) Regulatory measures should be carefully designed and focused to **target** specific risks and externalities. Furthermore, regulators should keep in mind that regulation can have a far-reaching impact, and there may be unintended consequences, such as impaired competition, moral hazards, or other disruptive effects. (2) Policy recommendations and future regulation should be set up **proportionally**; smaller and less interconnected entities should not be burdened with disproportional regulation and concomitant costs. (3) To account for future development and emerging risks, regulation should be **forward looking and adaptable**: new measures should not only cover the risks that are presently apparent, but also address potential evolving risks, the development and growth of entities and activities, and changes to the structure of the NBFI system. (4) Regulations should be designed and implemented in an effective manner and should also consider international activities to avoid **cross-border arbitrage**. (5) Regulatory measures should be subject to **regular assessment** and review to adjust and improve efficiency if needed. Policy options could be used along or in combination with others rules and guidelines; hence, regulators should keep in mind that combining regulatory measures could have unintended impacts.

### **4.3.2 Regulatory reform of Money Market Funds and analysis**

#### **4.3.2.1 IOSCO mandate**

The FSB emphasized the need for reform of the regulation of MMFs. This need for the regulation and supervision of asset management has also been taken up by the European Commission. The EU aims to introduce a harmonized framework for asset management and alternative investment funds. This framework would take into account the characteristics and roles of different entities in funding markets, as well as how they contributed to the course of the financial crisis. A critical and comprehensive analysis of the shadow banking system is needed to inform potential regulation. It is important to research the overall role of MMFs and their interconnection with other financial institutions and market participants. To create appropriate regulations, differences concerning categories, characteristics, and systemic risks posed by the funds in different jurisdictions need to be analyzed. The significant size and role of MMFs within the financial system highlights the need for the monitoring and implementation of potential regulation. Due to the characteristics of deposit-like instruments, MMF shares are exposed to risks of modern-type bank runs. The position of MMFs within the financial system is clearly described in Chapter 3. The scenario in Chapter 3 makes the significant role of MMFs as a funding source and as a money market access point apparent. Existing regulatory initiatives and standards also need to be taken into consideration (Financial Stability Board, 2011b, p. 20).

The Workstream on MMF risk analysis and reform options is executed and supervised by the Technical Committee of the IOSCO. The consultation report “Money Market Fund Systemic Risk Analysis and Reform Options” (IOSCO, 2012d) was published in April 2012, with the objective of sharing the analysis regarding possible risks stemming from MMFs and mapping out possible policy options. A consultation period gave authorities, governments, academics, and the industry an opportunity to comment on proposed regulatory approaches. The final report on regulatory possibilities was issued in November 2012. The report published in April 2011 mainly analyzed the features and characteristics that make MMFs vulnerable to risks, and proposed possible regulatory measures. The aim of the MMF working stream is to implement common standards for management and regulation across various jurisdictions. The realization of regulatory standards may vary depending on local economic conditions, as well as on regional regulatory and legal structures (IOSCO, 2012e, p. 8).

#### **4.3.2.2 Characteristics and development**

The role of MMFs within the financial system can be elucidated using quantitative market data. The volume of assets under management amounted to Dollar 4.7 billion worldwide in the third quarter of 2011. Money Market Funds, as a subcategory of

the CIS, comprise about 20% of total mutual fund assets. Together, US and European MMF assets represent 90% of the global industry (see Figure 2.15; IOSCO, 2012d, p. 1). About 60% of MMF assets are located in the US. To ensure that entities and schemes with similar objectives are captured by appropriate regulation, the term MMF should be explicitly defined. Existing limitations concerning assets in which MMFs may invest must also be defined, including average weighted terms to maturity and weighted average life of the portfolio. In order to trace the development and impact of regulatory measures, authorities should regularly monitor MMF development, as well as the development of vehicles similar to MMFs.

The run on several funds in 2008 alerted regulators to the fact that MMFs could potentially raise systemic risks (see PwC, 2012 and Scharfstein, 2012), despite the fact that they did not cause the initial crisis. The run on different MMFs was, rather, an indication of an overall unstable system and uncertainty about the development of different financial assets, in which MMFs played a significant role in spreading risk and amplifying the crisis (IOSCO, 2012d, p. 5). Money Market Funds have different features and vulnerabilities, which make them systemically important and a focus of regulators.

Within the financial system, MMFs are important providers of short-term funding, and a diversified alternative in economical terms to bank deposits. As institutional investors, they provide funding to a variety of businesses, other financial institutions, and even governments. A confidence shock of MMFs and the subsequent redemption of shares can have a crucial impact on both the funding market and on broader economic circumstances (IOSCO, 2012c). Shareholders have an incentive to redeem their shares for any reason, before others do, as they might otherwise suffer a loss. Money Market Funds are neither equipped with regulatory capital buffers nor with insurance for when they must pay these liabilities. In order to meet redemption requests by investors, funds must retain liquid resources, rather than investing in commercial papers or other short-term instruments. This leads to funding problems for those relying on MMF investments. It also makes apparent the reliance of traditional banks on short-term funding, and the significant role of MMFs in funding markets (IOSCO, 2012d, p. 7).

Another characteristic of MMFs is their connection with the traditional banking sector, through the investment of banks in MMF shares. This creates further vulnerabilities, as during periods of stress funds may be confronted with large and simultaneous redemption requests by banks (see Figure 3.1).

In comparison with banks, MMFs can be considered safe and diversified alternatives to bank deposits. As collective investment schemes (CIS), they provide diversified and high class rated investment opportunities, and enable investors to participate in favorable markets. Money Market Funds also constitute efficient cash-management tools for diverse sophisticated investors and institutions (IOSCO, 2012c).

The reliance of MMFs on capital support creates risks for capital sponsors, as sponsors must cover potential losses, which could lead to contagion effects. Reduced funding by MMFs can also cause funding problems that can be transmitted throughout the system and can throw off financial stability. This is another interconnection with the banking sector, as traditional banks can function as MMF sponsors (IOSCO, 2012d, p. 8). It should be noted that support by sponsors is implicit. Meaning, this support is expected by the funds, but not guaranteed. This uncertainty regarding the availability of liquid resources can enhance the likelihood of runs. Investors should be aware of the fact that sponsors are not always willing and able to offer support. The IOSCO recommends that these warnings should be included in funds' financial documentation (IOSCO, 2012e, p. 24). The eventuality of access to central bank liquidity will be discussed further on in the last section of regulatory proposals to MMFs.

#### **4.3.2.3 FSB Policy recommendations and further proposals**

##### **Current regulation**

To implement adequate MMF regulation, recent trends and the current regulations should first be considered. In the US, MMFs are regulated under Rule 2a-7 of the Investment Company Act of 1940 codified in 15 U.S.C. Para 80a-1–80a-64, Rule 2a-7 of the Investment Company Act of 1940 amended in 2010 by the Securities and Exchange Commission (SEC)<sup>21</sup>. Adopted pursuant to the Investment Company Act of 1940, all MMFs must be registered with the SEC. In the Euro Area, MMFs must comply with the UCITS Directive. To harmonize CISs, the Committee of European Securities Regulators (CERS) issued guidelines for CISs that apply to collective investment undertakings authorized under the UCITS Directive, which was replaced by the European Securities Markets Association (ESMA) Committee of European Securities Regulators (2010). Implementation of the UCITS Directive varies across jurisdictions in the Euro Area and is accompanied by the simultaneous enforcement of the Eligible Assets Directive (Directive 2007/16/EC and Committee of European Securities Regulators, 2007). Key regulations that arose from the 2008–2009 financial crisis include the harmonization of funds through CERS (now ESMA) in the Euro Area, as well as an Amendment to Rule 2a-7 of the Investment Company Act of 1940 in the US.

It is essential that funds comply with strict criteria concerning credit quality and liquidity management. The interconnectedness with banks and other financial institutions and their role within the financial system makes the safety of such funds extremely important. The IOSCO report emphasizes that policy options should reinforce the safety and robustness of MMFs (IOSCO, 2012d, p. 14). Authorities should be able to explain the rationale behind policy measures and regulatory changes, which will also help to prevent unforeseen and undesirable reactions.

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<sup>21</sup>(<http://www.sec.gov/rules/final/2010/ic-29132.pdf>)

The consultation report of April 2012 (IOSCO, 2012d) emphasizes the need for regulation of the following issues: **(1) the mandatory move to variable Net Asset Value (vNAV)** and structural alternatives, **(2) the valuation and pricing framework**, **(3) liquidity management**, and **(4) reliance on ratings**. Referring to the scenario stated before in Chapter 3, the following analysis will focus on liquidity management, split into liability and asset-side regulation, valuation and pricing, and the mandatory move to vNAV funds.

The following section analyzes the choice of regulatory instruments. Regulatory proposals by the FSB apply to different points of the modeled scenario of a modern-type bank run and risks of transmission throughout the global financial system. Regulation focuses on the mitigation of risks. Instruments concerning the direct regulation of MMFs will be studied first. Their purpose is to stabilize MMFs against massive redemption requests. This will prevent funding and liquidity gaps within the financial system due to excessive asset sales and failed prolongation of repo contracts. The second purpose of these regulations is to ensure functional credit risk transfer process and repos contracts, thereby ensuring short-term money market funding, the stability of MMFs, and the stability of the larger financial system.

The susceptibility of MMFs to runs, and the threat this causes to overall financial stability, indicates a need for regulation. The FSB proposed different instruments to directly regulate MMFs, stabilizing the funds against the effects of risks caused by maturity and liquidity transformation, and preventing bank runs. To stabilize MMFs against risks, funds need adequate liquidity management. Liquidity requirements or redemption restrictions can help to reduce redemption pressure.

Possible barriers to competition and cluster risks should be kept in mind, as well as how the proposed instruments may function in relation to each other, circumstances, and stakeholders. Regulators propose different strategies to respond to stability and systemic issues. The first strategy is changes to the valuation of funds (which will be discussed in the second part of this section), and the second is the mitigation of risks through structural restrictions of the asset and liability side of the balance sheet (discussed in the following section).

### **Regulation of the Asset Side**

Regulation of the asset side of MMF portfolios aims to restrict risks connected to certain investments and to raise liquidity, to better respond to liquidity shortfalls. The fundamental objective is to obtain international harmonization to minimize liquidity requirements. This has been mainly hampered by divergent classifications of liquid and illiquid asset in different jurisdictions. Along with liquidity backstops, there could also be requirements like redemption restrictions (e.g., the number of shares for sale) or liquid fees for premature redemption of shares (for further information concerning the liquidity



management of CISs (see IOSCO, 2013). These proposals include, but are not limited to, provisions regarding the liquidity, maturity, and concentration of portfolio assets (i.e., portfolio regulation). The establishment of mandatory liquidity buffers also comes into consideration. Strict portfolio regulation is a common practice for pension funds and life insurances. However, in pension funds and insurances, portfolio regulation is not used for stability purposes, but rather for the equalization and maximization of investment returns. To date, portfolio regulation has been conducted to protect investors' endowments in fund shares and to ensure a certain liquidity of the fund portfolio to cover potential losses. As in all cases, instruments used to ensure stability and protect investors' rights may have unintended effects. In Europe, portfolio regulation for mutual funds is grounded in the UCITS Directive. American funds are regulated under Rule 2a-7 of the Investment Company Act of 1940.

Davis (2000) analyzed the regulation of portfolios for pension funds and life insurances, and found that the regulation of investments (concerning maturity, liquidity, and the concentration of assets) affects the competitive ability of funds, the optimal allocation of assets, and the formation of an efficient portfolio. Davis (2000) describes this as an inability to follow the frontier of efficient portfolios. A study by the European Commission (1999) considered the quantitative regulation of portfolios to not be useful, as this does not lead to an optimal allocation of assets. Funds could be at a competitive disadvantage due to strict regulations that prevent them from structuring appropriate portfolio following the frontier of efficient portfolios.

Given these threats to fund competitiveness, possible regulation has to be considered with care. Competition also serves as a process whereby possible risks can be detected: the enforced parallelization of competition through regulation might lead to undesired arbitrage effects and make the process of risk detection impossible. Competition should be considered as an invigorating instrument and as beneficial for market vitality. Funds that are subject to tighter portfolio regulations (i.e., when national directives differ) have competitive disadvantages, and fund activities may simply move to less regulated regions.

Furthermore, constraining specific investment portfolios increases cluster risks. Prior to strict quantitative portfolio regulation, funds invested in different types of securities (e.g., government and corporate bonds, ABSs, repos). Funds structured different portfolios in pursuit of the frontier of efficient portfolios. These efficient portfolios might differ in structure, volume, and risk appetite, in response to individuals needs. In some cases, funds might have invested in similar assets, but with the concentration of parallel investments within limits. However, due to new strict portfolio regulations, funds are now strongly compelled to invest in similar portfolios, with similar and or even the same assets. Risks and benefits connected with these portfolio regulations could lead to contagion effects. All funds under regulation are exposed to the same risks and benefits stemming from the composition of efficient portfolios. Losses and price declines could

logically lead to a breakdown of any funds that hold these assets in their portfolios. Minimal investment in similar or identical assets by various funds, or joint asset allocation, both reduce contagion effects, restricting problems to a single fund or to a limited number of funds. Portfolio regulation and compelled investment in the same assets and asset classes raises a risk of clustering. Losses and price declines of assets affect the stability and portfolio performance of various funds. First, the funds are affected by the decline of asset values, since they have over-invested in the same assets. Transmission effects then result in price declines in related asset classes. These potential losses are transmitted throughout the MMF sector and, subsequently, the whole financial sector.

### **Regulation of the Liability Side**

The FSB has suggested instruments to address the liability side of MMF balance sheets or to regulate requests for share disbursement. These regulatory proposals are geared towards minimizing the risk of bank runs where investors of MMFs request sudden redemption of MMF shares and subsequent fire-sale mechanisms. Instruments applied to the liability side hope to diminish the herd behavior of investors, and the suspension of redemption requests offers funds valuable time to generate liquidity or liquidate assets at reasonable prices to meet liabilities produced by redemption requests. This could prevent fire sale mechanisms, as it is the compelled sale of assets that leads to price markdowns and fire sales. These restrictions would be in the form of gates, fees, or notice periods; investors would need to understand that the investment in funds is not a perfect substitute in economic terms for bank deposits.

Share restrictions to control the liability side include different liquidity restrictions (e.g., gates, side pockets, withdrawal fees) and suspension instruments (e.g., lockup or redemption notice periods). Regulations that suspend the redemption of shares using lockup or notice periods are used by hedge funds or other funds for institutional investors. To request share redemption, investors need to comply with a determined notice period and pre-announce their scheduled withdrawal. In case of a market depression, funds have valuable time to liquidate parts of the portfolio.

For the hedge fund industry, these instruments have been incorporated into their business model, rather than being used for stability purposes. This has enabled these funds to invest in long-term assets, as the investor endowment is locked up for a specific period of time, by contract. Managers are able to plan with a longer investment horizon and to generate a higher portfolio return. Instruments such as notice and lockup periods should, therefore, mitigate the risk of bank runs and enhance the overall stability of the financial system. To date, most of the existing literature has been on the theme of withdrawal suspension, or been on the theme of share restrictions as a business model, as opposed to as a risk-reducing instrument. Share restrictions can be in the form of transaction costs, which discourage the sale of fund shares by investors Maier *et al.*

(2011). The, in most cases, empirical literature by Aragon (2007), as well as additional work by Bali *et al.* (2007), Liang & Park (2007) and Agarwal *et al.* (2009) been on the theme of an illiquidity premium in non-crisis periods. The previously cited work by Aragon (2007) and Liang & Park (2007), as well as that by Khandani & Lo (2011), all find a negative relationship between share restrictions and portfolio liquidity, indicating that restrictions increases portfolio illiquidity. Schmid & Schaub (2013) empirically investigated the relationship between share restrictions and portfolio liquidity. According to Liang (1999), instruments of suspension reduce the required liquidity needed in the fund portfolios: since redemption needs to be pre-announced, funds do not need to hold liquidity available to meet redemption requests by investors. Funds are therefore able to invest in more long-term assets, and have valuable time to liquidate assets at moderate prices, as opposed to with excessive markdowns. Managers that invest in longer-termed assets might not be forced to make fire sales that might also be harmful to other funds Coval & Stafford (2007). A strict regulation of the liability side might, in light of these findings, lower the need for portfolio restrictions.

Instruments that suspend impact or redemption requests should also be considered. For example, is it possible to introduce suspension and gates as situative used instruments? In this case, regulators should introduce specific proceedings and precise trigger points to indicate when these instruments should be used. If those instruments are instead used at individual funds' discretion, they could be used inappropriately, which could irritate investors and raise the risk of preemptive runs. Investors of funds could anticipate problems in other funds, leading to run-like events. It is also not known if fund shares would remain an attractive liquid alternative to bank deposits if regulation introduces a permanent lock-up period or period for requested redemption - given such changes, the private sector could be reluctant to invest, costing the MMF sector its major investor group. The situational use of lock-up and notice periods could cause funds to anticipate problems or could create negative market conditions, both of which might lead to runs on other market participants. The market might react with asset markdown, and fire sales could come into effect earlier than expected.

Another question is how long this notice period should be, and whether this time interval would actually suffice to liquidate relevant assets to meet redemption requests. The use of notice and lock-up periods also draws into question the necessity of building up a liquidity buffer - if banks are able to liquidate assets in time for a adequate price, it might not be necessary to also hold liquidity. One possible option is a combination of a notice or lock-up period and a liquidity buffer. An appropriate notice period could reduce the amount of required liquidity, enabling funds to liquidate assets for a decent price without delaying the payout of requested MMF shares to investors. Access to central bank liquidity might also be one possible way to reduce the amount of liquidity held in liquidity buffers, and could potentially eliminate the need for a notice or lock-up period.

Alternative instruments to reduce the sudden withdrawal of fund shares are gates and side pockets. Using these instruments, funds are able to hold on to a specific amount of the portfolio assets and hence limiting the amount withdrawn (gates) or separate an illiquid portion of the portfolio from liquid assets into a side pocket. This fraction of the portfolio does not need to be liquidated to meet investor redemption requests, and can be instead sold later on at a fair value, after the market has stabilized. These instruments had been used in the past to ensure fund performance, as part of the portfolio can be invested in more illiquid assets to meet expected performance. Introducing restrictive instruments into the funds industry ensures that funds can invest in more illiquid and complex assets under normal market conditions. In the 2008–2009 financial crisis, funds were overwhelmed with extraordinary volumes of redemptions requests, which led to fire sales. To cope with such high redemption requests, funds introduced side pockets and gates. Through side pockets or gates, fund investors are forced to stay engaged with the fund, at least to some degree. This enables at least some part of the portfolio to recover from vast price declines. Gates can entail temporary, partial, or fully restricted redemption of an endowment. By using side pockets, funds create a separate account with an illiquid or hard-to-value proportion of the portfolio (Aiken *et al.*, 2013, p. 7). When these instruments are in place, investors must stay engaged with the funds for an extended time. In their empirical study, Aiken *et al.* (2013) address liquidity restrictions and their consequences for investors. These restrictions can extend fund managers' ability to invest in illiquid assets and avoid fire sales. However, on the other hand, these instruments also impose costs on investors, and Aiken *et al.* (2013)'s study indicated that such funds may perform poorly, meaning that investors do not benefit from locked up accounts.

Klebeck (2012) argues that redemption requests lead to liquidity gaps as liquidity used in repo transactions is used to meet investor requests (see the scenario analysis in Chapter 3). As redemption requests might be satisfied through the liquidation of repos, funds do not face a liquidity gap in the first place. The termination of repos can be considered a transitory process, with liquidity gaps arising further down the intermediation chain, where other market participants rely on repo funding that has been discontinued. Holding liquidity available or acquiring time through suspension might prepare funds for sudden requests, but it also leads to poorer performance. Such restrictive instruments are considered positive tools to increase financial stability, as they prevent investors from redeeming their fund shares.

Using suspending instruments for one fund could influence other funds that do not use suspension - if investors anticipate negative market conditions, they will transfer these expectations to other funds, and make redemption requests. If this happens, redemption requests will overwhelm other funds, triggering fire sales throughout the financial system. In this case, instruments that are primarily intended to reduce the risk of sudden redemption lead to increased redemption elsewhere. This risk was noted by

the IOSCO (2011), which warned that instruments that suspend redemption or impose costs can lead to herd behavior elsewhere in the financial system.

In case of a market breakdown, investors in MMFs may have an incentive to redeem their investment as fast as possible to take advantage of the so-called “first mover advantage.” McCabe *et al.* (2012) suggests a combination of share restrictions and liquidity restrictions, meaning redemption is suspended to a later date and limited to a certain percentage, to disincentivize a run on funds. The Minimum-Balance at Risk (MBR) is a suggested small fraction that could only be redeemed with a delay. Consequently, investors stay invested with a fraction of their endowment. This reduces the benefits of early redemption, as investors share in any losses caused by withdrawal. The work of McCabe and others outlines the MBR concept using a small example, which models the optimal size and potential impact on liquidity and demand for MMFs. In terms of fees, MBR can be classified as an internal fee for requested redemption.

The FBS has also suggested direct fees on redemption as another instrument of redemption restrictions, which would disincentivize sudden and overwhelming redemption. Sudden redemptions oppose funds and remaining investors to costs associated with the redemption of shares. Fees, as a restrictive instrument, are addressed by the HSBC (2011a), Geffen & Fleming (2011a), and Geffen & Fleming (2011b). Similar to the argumentation made by McCabe *et al.* (2012), the HSBC argues that sudden redemptions requested by investors impose transaction costs on the remaining investors. Fees on redemption, instead, redistribute these costs to those investors who are actually responsible for these costs. The reasoning is that investors will have less of an incentive to request redemption, as they will pay in the form of redemption fees. Geffen & Fleming (2011a) and Geffen & Fleming (2011b) both support the HSBC (2011a) argumentation, and consider fees a potent instrument to internalize any costs that may arise. The internalization of costs imposed by redeeming investors could be considered a Pigovian tax, whereby a tax is applied to a market activity to regulate a negative externality and so correct an inefficient market outcome. If redemption fees were introduced, funds might be considered less desirable investment vehicles. However, conversely, such a regulation could also attract new investors, who appreciated the risk mitigation added by such a regulation.

Capital buffers have been proposed as possible ways to improve MMFs’ general stability, by providing an appropriate liquidity base. The build-up of a capital buffer ties up resources that could otherwise be used for investment, affecting the overall competitiveness of funds. Buffers also influence or limit the possibility of repo contracts, as free liquidity goes towards building up the required liquidity buffers, instead of funding the shadow banking intermediation chain through repo contracts - recall the risk-detecting function of competition and possible disadvantages. In case of a crisis event, the capital base should absorb possible losses, congruent with the capital buffers of the Basel III framework. However, the question arises as to whether these buffers will mitigate risks

as much as is hoped. From a psychological standpoint, it is not known whether the establishment of a capital buffer might encourage investors to stay engaged with the fund, even during times of financial stress or crisis.

A wide range of literature including the Squam Lake Group (2011), Mendelson & Hoerner (2011), Goebel *et al.* (2011) and McCabe (2010) supports the creation of capital buffers. One of the first questions that arises is who is responsible for building up such buffers. There is considerable disagreement on this point. Goebel *et al.* (2011) thinks investors themselves should be responsible, through retention of earnings. This would, however, lead to a rather slow buildup. McCabe (2010) and BlackRock (2011) believe a third party should be responsible for establishing buffers (BlackRock, 2010); this would require a sponsor to provide a capital buffer for the fund. A contingent commitment by a sponsoring bank could partly be replaced by a capital buffer, changing that bank's role from a contingent sponsorship to an actual buffer. None of these alternatives address, however, what would happen in the case of a critical event and how write-downs on the capital buffer would proceed. Such capital buffers could also disincentivize prudent risk management, as small management mistakes leading to losses would be absorbed by the buffer.

### **Change in Valuation Practice**

The use of cNAV funds raises the expectation that MMF shares are a risk-free cash element. Conversely, a move to vNAV funds would counteract this expectation, and would emphasize that MMFs are sensitive to losses and carry the potential risk of a run. CNAV funds are established to maintain a stable value per share (i.e., usually Dollar 1 or Euro 1). The general NAV of a fund fluctuates. Therefore the market value of a MMF share is not always fixed to a specific amount. In order to maintain a stable share price cNAV funds use amortized cost accounting while evaluating assets. Shareholders of MMFs purchase and redeem shares with a stable value. Using the amortized cost method keeps the numerator stable. In the case of vNAV funds the numerator is calculated with the mark-to market method which leads to a fluctuating numerator. Dividing a constant numerator by a constant denominator results in a constant value. Dividing a fluctuating numerator by a constant denominator results consequently in a fluctuating share value.

$$\text{NAV} = \frac{\text{Assets} - \text{Liabilities}}{\text{Amount of shares}}$$

Evidence suggests that vNAV reduces shareholder incentive to run through price transparency. A change to vNAV could reduce the risks associated with cNAV pricing. Variable NAV funds reduce the likelihood of a run, as they allow for price fluctuation. These funds also improve investor understanding of the risks associated with funds, and stress

the clear distinction between MMF shares and bank deposits. The move to vNAV could be challenging in certain jurisdictions, and might require a transition period. A mandatory move to vNAV funds would also prohibit the use of amortized cost valuation. However, full immunity against MMF runs is not ensured, even for vNAV funds. During the consultation process, respondents did not consider the risk of runs as sufficient reason to ban the use of cNAV (IOSCO, 2012e, p. 23; IOSCO, 2012d, p. 14, see also EFAMA, 2012, p. 18). If there was a change in valuation, higher cost and complexity would adequately reduce the expected risks.

In addition to the structural regulation of the asset and liability side, the FSB suggests a change in the valuation practices of funds. Money Market Fund share value is generally calculated using different valuation methods. Funds classified as cNAV calculate shares using the amortized costs method, while variable vNAV funds calculate shares by fair value (i.e., mark-to-market calculation). The regulatory proposal of a valuation change dictates that the valuation of funds must shift from constant to variable valuation. The present valuation of constant NAV shares reflects an ineffective mechanism to calculate price risks. Constant valuation assumes that asset return has a minimal risk of loss. Risks and return are mutualized. Many investors perceive shares with a constant NAV as being deposit-like and collateralized investments. Using HSBC's logic, a variable NAV reflects changing share fluctuation, as well as the risks connected with the investment. If they are made aware of these aspects, investors have a disincentive to request share redemption.

Several papers have argued that a simple valuation change does not completely remove the risk of a run (see ICI, 2012; HSBC, 2011b and Bengtsson, 2013). The HSBC (2011b) holds that, while investors have a disincentive to redeem shares if they can observe the fluctuation of shares, this is not sufficient to fully eliminate the risk of a run. To date, there is no clear evidence that cNAV and vNAV funds have unequal risks if the fluctuation of share prices is observable. According to Financial Stability Board (2013c), regulators consider the move to a floating NAV for prime institutional MMFs as useful to be adopted.

Birdthistle (2010) and Gordon & Gandia (2012) support the idea of observable fluctuation, a concept that enables investors to recognize the inherent risks and fluctuation of investments, and that encourages them to stay engaged and withstand what appear to be temporary changes in asset value. A number of alternatives to the elimination of cNAV funds have been put forward (Birdthistle, 2010, Gordon & Gandia, 2012 and Witmer, 2012). Collective collateralization, in the fashion of bank-like collateralization, is one possible scenario. Birdthistle argues in favor for a bank-like collateralization similar to deposit insurance. Possible is here a collateralization by the sponsor of fund-advisor. In this scenario, a premium is raised and any costs that arise are distributed throughout the investor base in the form of reduced interest. However, the possibility of central

bank liquidity access or some kind of deposit insurance would entail regulation regarding minimum balance requirements. This will be discussed further on in the section regarding “central bank access”.

Fluctuations are not equivalent to market breakdowns; encouraging investors to understand price fluctuations gives them a disincentive to run from MMFs at the first sign of trouble. Alternatively, Gordon & Gandia (2012) advise implementing a capital buffer to absorb possible losses (see McCabe *et al.*, 2012; for information concerning competitiveness of MMFs in the international markets see regulation of the asset side). According to Witmer (2012), it is empirically evident that funds are less prone to risks if they are valued using a mark-to market method. Witmer (2012) empirically examines if variable NAV provides any benefits. However, as mentioned before, elimination of cNAV funds does not remove these risks entirely.

The negative effects of changes in valuation practice (including administrative expenditures) must also to be considered. It is also assumed that markets and other participants in related financial transactions anticipate negative effects stemming from those valuation changes. The argument is that changing valuation practices will enable investors to view the price development of their shares, making them more willing to hold onto their investment as they anticipate growth under normal market conditions. This might reduce the risk of a bank run and sudden redemptions. Being able to observe price development allows investors to draw conclusions regarding future development, which might encourage them to reclean large portions of their invested portfolio. This change might not occur suddenly, but might have a major impact later on (Fisch & Roiter, 2011 and HSBC, 2011b).

Fisch & Roiter (2011) and HSBC (2011b) consider changes in valuation practice to be counterproductive, reducing the stability and vitality of the entire fund sector. Furthermore, it is argued that cNAV and vNAV funds have similar characteristics, and that simply making it possible to observe price fluctuation is not a strong enough reason to undertake this valuation change. The HSBC (2011b), along with Jank & Wedow (2010), find no empirical evidence that a change in valuation practice would guarantee that there would be no bank run in the case of market distortion.

Another way to create awareness of sudden redemptions is to put into place policies and procedures to evaluate the investor base regarding future cash needs, their approach to risk, and level of sophistication. Regarding investor evaluation, there is a question of to what extent it is possible to evaluate the investor base and individual investor sophistication without imposing unbearable costs on funds. It is also unclear which criteria institutional investors should use to calculate what constitutes a sufficient investor base. The IOSCO recommends adding additional safeguards to enhance stability in the overall system, notably, limits on further purchases by individual investors, the establishment of a minimum holding period, and the creation of a longer notice period for redemption.



The IOSCO also recommends that MMFs conduct a regular stress testing based on historical and/or hypothetical events (IOSCO, 2012e, p. 14). Funds should also be able to react to exceptional market conditions and redemption pressure with a variety of tools.

### **Central Bank Access - A Proposal**

As pointed out beforehand, MMFs do not receive explicit governmental support in the form of access to central bank liquidity. Granting them access to a short-term supply of liquidity might help avert negative consequences stemming from sudden redemption requests. In the event of tremendous and sudden redemption requests by investors, funds could then satisfy these requests with liquid resources supplied by the central bank, rather than having to liquidate their portfolio positions, allowing these funds to continue supplying market participants with MMF funding. By giving MMFs access to central bank liquidity funds, these funds have an alternative source to serve requests by investors, and the transmission of funding problems that have negative effects on the intermediation chain is stopped at an early stage.

The following section introduces the approach for granting MMFs access to central bank facilities. Is the possibility to participate in open market and credit operation conducted by the central bank legally feasible and how will this operations affect the general proceedings of MMFs. Legal feasibility will be discussed further. Access to central bank liquidity would be provided through open market and credit operations, as well as by standing facilities. This would include refinancing operations with different maturities, with main refinancing operations (MRO) of one-week liquidity. This would provide both and long-term refinancing operations (LTRO). Main refinancing operations aim to manage short-term liquidity needs at participating institutions. Standing marginal lending facilities would provide overnight liquidity to eligible counterparties. There is currently some debate over whether MMFs can be considered eligible counterparties, and therefore be granted access to central bank liquidity.

According to the Protocol (No 4) on the statute of the European System of Central Banks of the ECB (defined by Art. 129 (2) TFEU), National Central Banks (NCB) are authorized “to conduct credit operations with credit institutions and other market participants” in order “to achieve the objectives of the ESCB” (Protocol No 4 on the Statute of the ESCB and ECB Art. 18.1 - C326/238). The EU defines a credit institution through CRD IV and CRR as “an undertaking, the business of which is to take deposits or other repayable funds from the public and to grant credits for its own account” (Title (1) Art. 3 No. 1 Pt. (1) - L176/351 of CRDIV - Directive 2013/36/EU and Part One Title (1) Art. 4 No. 1 Pt. (1) of the CRR - Regulation (EU) No 575/2013). No definitive answer can be given as to whether or not MMFs match this definition. Such funds receive investments from the private sector, which can be regarded deposit-like. However, the term share deviates from the legal term of deposit, as stated in the definition of taking

deposits. Investment in MMF shares are “payable funds from the public.” By using repo transactions as short-term securitized credit, MMFs “grant credit for [their] own account.”

The ECB definition considers Monetary Financial Institutions (MFI) “resident credit institutions (as defined in EU law) and all other resident financial institutions whose business is to receive deposits and/or close substitutes for deposits from entities other than MFIs and, for their own account (at least in economic terms), to grant credit and/or invest in securities” and “the latter group consists predominantly of money market funds”<sup>22</sup>.

Following this argumentation, MMFs cannot be considered credit institutions in a legal sense. They do, however, undertake the same tasks as credit institutions, from an economics standpoint. From this point of view, MMFs can be considered other market participants, as they perform activities closely related to those of credit institutions. Hence, other market participants can be put on the same level as credit institutions. Money Market Funds may therefore be eligible counterparties to participate in open market and credit operations with the ECB.

Article 18.2. of the Protocol No 4 on the Statute of the ESCB and ECB states that general principals for credit operations are specified by the ECB. Concerning this matter, the Guidelines of the ECB from September 20, 2011 on monetary instruments and procedures of the Euro System (The Governing Council of the European Central Bank, 2011a, L 331/11) are cited to articulate who is considered a transaction counterparty. Eligible counterparties in outright and credit operations “may fulfill certain eligible criteria” specified in 2.1(a) of the Guideline of the ECB; eligible counterparties comprise “institutions subject to the Eurosystem’s minimum reserve system according to Article 19.1. of the Protocol No 4 on the Statute of the ESCB and ECB [...]. Institutions which are exempt from their obligations under the Eurosystem’s minimum reserve system [...] are not eligible to be counterparties to Eurosystem standing facilities and open market operations.”

As MMFs and other asset managers are not subject to the minimum reserve system, they cannot be considered eligible counterparties in ECB open market and credit operations. Under the current regulation, they therefore cannot have access to central bank money through credit operations. In working to avert possible future financial crises, it might instead be possible to engage other market participants in open market transactions to bridge liquidity gaps and to secure the stability of the overall financial system.

In order for MMFs to be considered eligible counterparties to the ECB in open market operations, the Guideline of the ECB need to be broaden who is included in the definition of eligible counterparties in Article 2.1(a) of the Guideline of the ECB, beyond the

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<sup>22</sup><http://www.ecb.europa.eu/home/glossary/html/glossm.en.html#447>

institutions subject to the minimum reserve system by other market participants, which includes MMFs. This would constitute a change of secondary legislation.

A change in secondary legislation would require lawmaking by the EU institutions within the framework of their primary legislative powers. However, broadening Art. 2.1(a) of the Guideline of the ECB would entail broadening the minimum reserve requirements to include MMFs, in order to achieve the parallelization of their legal position. If MMFs had the same rights (i.e., access to central bank liquidity through open market and credit operations), they would need to have the same regulatory requirements (i.e., regulation of minimum reserves).

Including MMFs under the minimum reserve requirements would require a change of Art. 19.1 of the Protocol No 4 on the Statute of the ESCB and ECB. This change would require changes in primary legislation by the ordinary legislative procedure. The bases of such a change to the ECB statute are Art. 129 (3) TFEU and Art. 40 of the Protocol No 4 on the Statute of the ESCB and ECB, which allow the European Parliament and the European Council to change pre-defined articles, including Art. 19.1 of the Protocol No 4 on the Statute of the ESCB and ECB, within the ordinary legislative procedure outlined in Art. 294 TFEU.

The change of Art. 19.1 of the Protocol No 4 on the Statute of the ESCB and ECB would require a change of the regulation of the central bank (Regulation (EU) No 1358/2011) with an internal resolution of the ECB Governing Council. A change of the Council Regulation (Regulation (EC) No 134/2002) is not required, as this Council Regulation refers only flexible to Art. 19.1 of Protocol No 4 on the Statute of the ESCB and ECB. However, a change in council regulations would indicate a procedure under Art. 129 (4) TFEU, as these regulations are based on Art. 19.2 of the Protocol No 4 on the Statute of the ESCB and ECB.

There is a question as to which liabilities from MMF balance sheets would be subject to minimum reserve requirements. Unlike banks, funds do not receive deposits. However, as already mentioned, fund shares can be considered deposit-like in an economical sense, which might be a legitimate reason to consider shares—and, by extension, the funds issuing them—as subject to minimum reserve requirements. It is also unclear how liquidity acquired through outright transactions with the central bank could be used to mitigate the risk of a modern-type bank run. Liquidity gained in an open market or credit operation cannot be transferred directly to private sector accounts to meet redemptions requests.

Central bank liquidity could be used to mitigate the risk of a modern-type bank run, thereby mitigating contagion effects and preventing fire sales. In this scenario, in the event of a redemption request, the  $B_i$  of the liability side is expected to decrease (see Figure 4.1). To meet redemption requested by investors the fund is not willing to liquidate assets or repo contracts in order to secure the funding of further entities in the

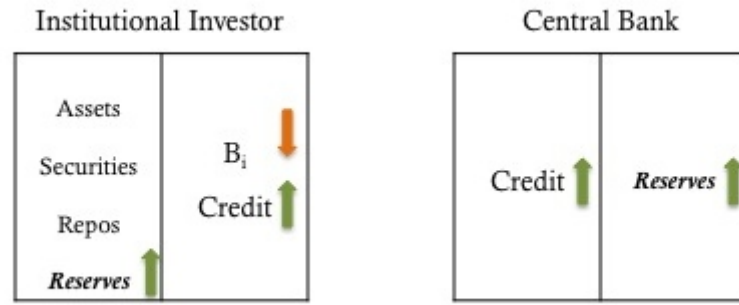


FIGURE 4.1: Central Bank Access Step 1 - Decreasing  $B_i$  (orange  $\downarrow$ ) needs to be served. Raising of credit from the Central Bank implies raising reserves (green  $\uparrow$ ).

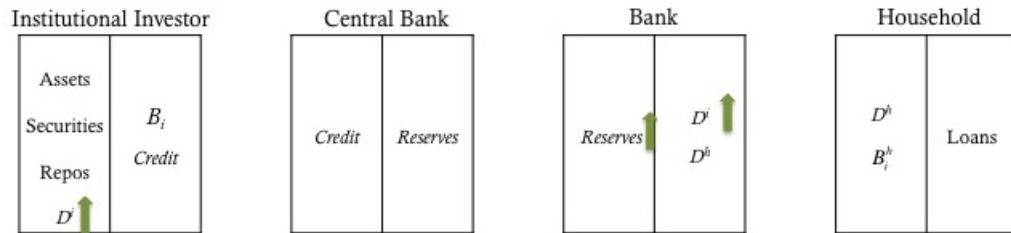


FIGURE 4.2: Central Bank Access 2 - Transformation of reserves to  $D^i$  held on the bank's balance sheet ( $D^i$  green  $\uparrow$ ).

shadow banking system. Since repos provided by funds play a major role within both the funding of shadow banks in a narrow sense and banks, the fund is trying to secure the funding, and consequently, the stability of the overall financial system.

As funds may participate in outright transactions with the central bank, they may obtain liquidity through credit. This credit would appear on the liability side of the fund's balance sheet, and would generate a reserve, credited to the asset side (see Figure 4.1). The fund would then transfer these reserves as demand deposits into a banking account (see Figure 4.2). In order to meet fund shareholder requests ( $B_i$ ), the fund would then reduce the level of demand deposits ( $D^i \downarrow$ ) before liquidating other assets. The aggregated level of deposits on the bank's balance sheet would therefore be balanced out. The private sector would substitute the withdrawal of fund shares by making larger bank deposits ( $B_i \downarrow$ ,  $D^h \uparrow$ ), as bank deposits are considered similar to fund shares for private sector investors and promise a secure investment. On the bank's balance sheet, there would be an exchange of  $D^i$  to  $D^h$  (see Figure 4.3). In the end, the access to central bank liquidity would allow risks to be mitigated through the transfer of reserves to a bank account and a reduction of those deposits in the event of large redemption requests.

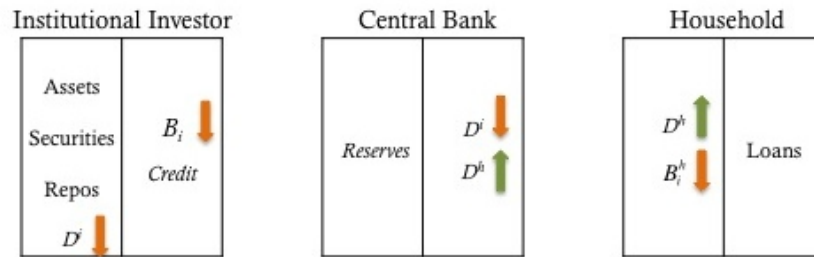


FIGURE 4.3: Central Bank Access 3 - Funds reduce deposits  $D^i$  ↓ in the bank's account to meet redemption requests without liquidation of further assets. Households swap  $B_i^h$  ↓ to  $D^h$  ↑. Level of deposits remains constant on the bank's balance sheet as deposits withdrawn by funds are balanced by enhanced deposits by the private sector.

### 4.3.3 Regulation of Repos and Securities Lending

#### 4.3.3.1 FSB Workstream

The Workstream on Securities Lending and Repos developed policy options and recommendations to enhance regulations. The FSB task force issued a consultation paper in April 2012, followed by a Consultative Document in November 2012 Financial Stability Board (2012c). Repo and securities lending constitute significant global refinancing options. Both options are important for price discovery and secondary market liquidity; however, in addition to these benefits, repo instruments can create additional leverage and enhance the risk of becoming illiquid in the event of failed follow-up financing (Financial Stability Board, 2012c, p. 2). It is therefore crucial to investigate the special characteristics and risks of repos, and of the approaches being proposed, to mitigate the possibility of future market failure. The majority of participating institutions in repo transactions are regulated entities. Banks, for instance, play a significant role and need to be taken into account in creating a new policy framework. To date, as already mentioned in Chapter 2, regulation has been focused on consumer protection rather than on financial stability. Policy goals regarding the repo and securities lending markets want to ensure transparency and limit risks stemming from these transactions (e.g., the risk of fire sales through a modern-type bank run), with the goal of guaranteeing overall stability.

#### 4.3.3.2 Repos and securities lending markets

The securities lending and repo markets can be divided into four different market segments: (1) the securities lending segment, (2) the leveraged investment fund financing and securities borrowing segment, (3) the inter-dealer repo segment, and (4) the repo-financing segment (see Financial Stability Board, 2012b). For a detailed descriptive analysis of

the repo segment and development within the 2008–2009 financial crisis, see Chapter 2. The securities lending segment lends securities from institutional or other sophisticated investors to banks and other lenders against collateral, such as cash or other securities. This type of lending is typical for the US and Japanese markets. The second segment assists in the financing of leveraged investment funds' long positions, using reverse repo transactions or margin lending. This second segment also includes the lending of securities by prime brokers to cover short positions of hedge funds. The inter-dealer repo segment covers repo transactions for government bonds among broker-dealers and banks, with an overnight maturity. The last segment is the repo-financing segment. Here, banks and broker-dealers borrow from cash-rich and sophisticated entities such as funds (e.g., MMFs). The key motivation of these banks and broker-dealers is to finance short-term liquidity needs. Asset Backed Securities are regularly used as collateral, which can be considered a key driver of the growth in ABS issuance (see Gorton & Metrick, 2010c). Those repo transactions can be conducted as bilateral or tri-party transactions.

The FSB Workstream describes different drivers of market growth (see, Financial Stability Board, 2012b, p. 5). There is a need for money-like instruments for institutions with a specific and individual certain risk aversion triggering the widening of repo transactions in order to retain a required amount of liquidity. These entities usually do not have regular or guaranteed access to central bank liquidity or similar guarantees. Market participants, such as MMFs, reserve managers, insurances, and pension funds are normally excluded from deposit insurance, or their invested cash holdings exceed the amount normally covered by deposit insurance. Through repo transactions, these entities are able to cover short-term lending with collateral and store cash surplus safely - and with interest. The total value of repo transactions grew significantly, along with the growth of institutional investors in the last three decades (see Gorton & Metrick, 2010b, p. 12). The growth of the repo segment has also been driven by the financing needs of commercial banks and broker-dealers. Such entities use collateralized short-term funding as part of their wholesale funding or securities dealing. Highly leveraged or insufficiently creditworthy funds also use repo and securities lending transactions to cover short-term liquidity needs. The increased supply for accessible securities to optimize collateralization due to growing securitization has enhanced the growth of repo markets. The acquisition of collateral can be referred to as collateral mining; during this process, banks and broker-dealers want to ensure the smooth conduct of repo and security lending transactions. Another driver that has enhanced the growth of the repo market has been the lending of securities by institutional investors to generate additional income.

### 4.3.3.3 Policy recommendations

#### General Annotations

The FSB (2012b) differentiates between risks associated with shadow banking only and risks that span traditional as well as shadow banking. Risks that are purely associated with shadow banking include risks caused by the direct use of repos as money-like instruments, short-term liabilities, and securities lending as a collateral reinvestment instrument. All three of these activities enhance the use of maturity and liquidity transformation outside the banking system and, hence, pose risks to the overall stability of the financial system. Regulators and authorities could counteract those activities by enhancing transparency, limiting risks arising through the build-up of leverage, and limiting the reinvestment of cash collateral. Risks that arise from the interconnection of banks and shadow banks, i.e., those that span both traditional and shadow banking, include variations in asset values, which have a tendency to increase the procyclicality of leverage; the risk of fire sales, which can cause counterparty defaults and sudden redemptions; and the inadequate valuation of assets.

Various approaches to enhancing the stability of repo markets and, consequently, that of the financial system, have been proposed. These approaches attempt to improve transparency, as well as to address both specific regulatory issues and larger structural concerns. To enhance transparency within the repo and securities lending markets, more information needs to be made available to investors. This thesis will therefore, here, discuss proposals that address the risk of high haircuts, which lead to the liquidation of repos.

To date, banks and other major counterparties in repo transactions have been regulated, and have been required to improve consumer protection and risk management for both lenders and borrowers. As the Basel regulations are not harmonized across jurisdictions and have not been fully implemented, the regulation of repo transactions still varies. Further, the Basel regulations do not directly address specific repo market issues. The regulated parties in repo transactions are banks, investment funds, and insurance companies, all of which are restricted and regulated by different requirements. Together, these regulations are intended to manage counterparty credit risks, liquidity risks, and collateral guidelines (for more details, see Financial Stability Board, 2012b).

The FSB approaches focus on borrowing via the repo market, enhanced maturity and liquidity transformation, investment of safe cash collateral in risky investments, and collateral swaps. To address the stability of financial markets, regulation should focus on the enhancement of transparency in complex and rapidly developing markets, stabilization of repo instruments, and mitigation of procyclical leverage build-up. The re-use and re-hypothecation of collaterals, as well as the re-investment of cash collateral, is also

addressed. Investors may be uncertain about the source, use, and treatment of collaterals. Policy goals mainly encompass the standardization and transparency of valuation, as well as the documented use of collateral. In order to avoid fire sales and other risks, regulators need to develop sufficient valuation and management practices.

The Consultative Document of the Financial Stability Board (2012c) publishes policy recommendations addressing transparency, disclosure and reporting, general regulation, and structural aspects of the repo and securities lending segment. Since the repo and securities lending markets are so complex, the FSB recommends improving transparency in order to detect and monitor risks stemming from lending activities. Standardized data and processes would be helpful in reducing complexity and processing various forms of data, thereby improving regulatory reporting and enhancing market transparency. Data collection could take place through regular reporting, trade repositories, and market surveys coordinated by the FSB. The FSB Data Gaps Group developed a comprehensive overview and consistent framework to pool and share relevant data.

### **Transparency and standardization**

To improve general data availability and, hence, enhance transparency of the repo market and repo transactions, the FSB Workstream on repos and securities lending suggests the establishment of transactions registers (TRs), as well as a central clearing counterparty (CCP). Before these systems can be put in place, however, more information is required as to whether this regulated and artificially created transparency will indeed lead to a more efficient pricing process. Regulators must also bear in mind the trade off between enhanced transparency and the costs of establishing TRs and CCPs. This constrained transparency, data gathering, and forced trading via a CCP would also restrict freedom of choice in conducting transactions, and might have the unintended consequence of inhibiting potential transactions.

Transparency and enhanced disclosure requirements are assumed to offer more insight into the interconnections among shadow banking entities and other financial intermediaries, and to reduce complexity and risks. Both private investors and regulators benefit from transparency and standardization, as enhanced transparency leads to liquid markets, price detection, and risk valuation. Enhanced transparency also removes information asymmetries between transaction counterparties, and stabilizes trust in market conditions (see also IOSCO, 2011p).

Transaction registers would collect all data associated with repo transactions, including size, volume, collateral, and involved counterparties. This acquisition, storage, and disclosure of data would enable regulators to supervise markets and transactions, allowing them to identify the patterns and gaps that lead price irritations and potential distortions. Distortion of the normal transaction process can be spotted using available data, and the risks associated with transactions and underlying collateral can be accurately



calculated. This call for comprehensive data gathering is also supported by Adrian *et al.* (2013).

To fully enforce the scope of these TRs, it is important to set out general requirements regarding how and to what extent data is gathered. The exchange of data between different TRs is key to detecting interconnections and further commonalities between transactions and counterparties; this allows regulators to implement precautionary measures in the event of a market breakdown. In addition to the data exchange between different TRs, international or supranational data comparison would be facilitated, and patterns in other regions could show evidence of distortions and enable regulators and market participants to take precautions. The harmonization of requirements and data gathering is supported by BIS and IOSCO (2011). Of course, one should bear in mind is that not all data collected through a TR would be significant, and that TRs would not deliver all of the desired information; for example, irregular transactions might not produce meaningful data. To be most useful, data collection needs to include information about the frequency of various types of transactions.

The FSB's consultative report introduces CCPs as another important structural and transparency instrument. This multilateral netting might reduce the interconnection of institutions within the market, and a central counterparty would also promote standardized and centralized data. However, the benefits and costs of CCPs need to be taken into account, as they pose a number of moral hazards and associated costs (for detailed information see Financial Stability Board, 2012e). It is hoped that introducing CCPs would reduce the complexity of the repo transaction market, as all counterparties conduct their lending transactions with one central counterparty, the CCP. As a result, the sum of all repo transactions could be considered a non-transparent web with a number of counterparties, where all participants contract with each other. A central counterparty would structure these transactions and all transactions run in one direction.

The concept of CCPs has already been introduced to the derivatives market. Gai & Kapadia (2011) examine the impact of the establishment of CCPs on complexity and concentration. Their findings confirm the general assumption that CCPs would reduce complexity and the number of bilateral contracts, helping the structure of the market to evolve into a more radial and organized system. Transactions between already systemically important institutions would be reduced, as they now contract with the CCP as opposed to directly with each other. It should be noted that the risk of direct contracts is not eliminated, but is reallocated to the CCP.

This risk reduction between direct counterparties and reallocation to the CCPs has also been approved by BIS and IOSCO (2004). The management of risks connected to transactions through the CCP leads to a more resilient risk control. As noted by BIS and IOSCO (2004) and Gai & Kapadia (2011), risk is not eliminated, but rather reallocated to another market participant, which, as a result, becomes a significant and systemically important institution. Putting CCPs in place would contribute to more standardization,

as transactions with the CCP follow defined patterns. However, besides the positive effects, negative aspects also need to be taken into consideration. With the CCP as the only transaction counterparty, all risks are reallocated and concentrated in the CCP, making the CCP a systematically relevant institution whose failure could have severe effects on both the repo market and the overall financial system. The structure of the market has been clearly modified, with the CCP becoming an important hub for repo transactions. The failure of a CCP could lead to contagion effects within the financial system, especially if there were only one monopolistic CCP. Regulators need to ensure that CCPs are subject to appropriate risk management (i.e., risk detection and control), and that they have suitable resources and capitalization. Adequate risk management implies that clear eligibility requirements concerning collaterals and processes are in place for parties that wish to contract with CCPs.

With the overarching goal of risk reduction, especially due to systemic risks, the question arises as to whether establishing a more structured and organized market would also create new systemically important institutions that need to be supervised carefully. The wisdom of a trade off between risks stemming from unorganized and unstandardized markets, and the creation of other systemically important institutions, is unclear.

The transparency concerns in the repo and securities lending segment also require enhanced disclosure of data and information about transactions (see Financial Stability Board, 2012e). To improve corporate disclosure, institutions should frequently disclose comprehensive information about their exposures and activities, improving investors' and authorities' insight into their activities. To date, disclosure practice is poor in comparison with the regulation of transactions and activities. Enhanced disclosure should include the sources and use of collateral. This could be arranged as additional footnote information, as templates for firms on the basis of Basel Pillar 3, or as more quantitative information in the company's management report or the note. Information about important or large transactions should be disclosed on a very timely manner. The FSB has also focused on improved reporting to end-investors. Reports of institutions involved in repo and securities lending must deliver appropriate information to investors, to allow those vendors to make informed investment decisions. This information should include, for example, global data, such as securities on loans relative to assets under management; absolute data, such as counterparty information and concentration; and specific data, broken down into repo, reverse repo, and the re-use and re-hypothecation of collateral.

Another issue is the investment of cash collateral. The FSB intends to minimize the risk stemming from cash collateral reinvestment through the introduction of minimum standards. To accomplish this, high-level principles were derived (see Financial Stability Board, 2012e, p. 20). Investors of cash collaterals should be prepared for unexpected requests for cash collateral that can be recalled at any time on short notice. Investment guidelines and strategies should take this into account before investing the liquidity

available. Furthermore, the use of cash collateral should be consistent with the overall investment policy of investment institutions, so as to add no further risks. For the purpose of enhanced transparency and disclosure, transactions should be properly documented and communicated to all stakeholders. Those guidelines should be approved, documented, and regularly reviewed. To mitigate risks due, for example, to liquidity and maturity, investments should be limited and in line with consistent risk management structures.

To ensure the proper re-use or re-hypothecation of collaterals, so as to mitigate risks and deter excessive leverage build-up, Financial Stability Board (2012e) is lobbying for more safeguards, sufficient disclosure, and adequate regulation of liquidity risks. These changes would improve investors' understanding of their exposure. The harmonization of re-hypothecation requirements would prevent cross-border arbitrage, and re-hypothecation activities should not encompass own-account transactions.

### **Structural regulation**

Haircuts reflect changes in collateral value and should therefore capture risks associated with the quality and value of collateral. Haircuts also reflect the expected liquidity under all market conditions, as well as the risk of price fluctuations during times of market stress. The value of collateral is influenced by the simultaneous liquidation of large exposures, the concentration of a single counterparty and default; all of these influences should therefore be taken into account. The FSB has proposed minimum standards and guidelines for calculating haircuts appropriately. Financial Stability Board (2012e) introduced a framework for haircut regulation and for the minimum margins to compensate against losses.

Unusual changes in haircuts (particularly during the 2008–2009 financial crisis) can enhance the risk of procyclicality (see Chapter 3) and harm financial stability. The literature has emphasized the need for constant haircuts in order to mitigate those risks (BIS, 2010; Ashcraft *et al.*, 2010, and Charles A.E. Goodhart and Anil K Kashyap and Dimitrios P. Tsomocos and Alexandros P. Vardoulakis, 2012). As mentioned in the preceding paragraph, however, raising haircuts might trigger entities to liquidate their assets rapidly, before the values decline further, so as to ensure a decent sales price. Raising haircuts would distort markets and might lead to destabilizing actions by market participants, including runs on bank deposits or MMF shares. The regulation of haircuts up to a peak value might (i.e., constant haircut) cause contagion effects. However, constant haircuts are not being considered as a stand-alone instrument to mitigate risks associated with repo transactions (see ICMA, 2012; Gai & Kapadia, 2011 and Charles A.E. Goodhart and Anil K Kashyap and Dimitrios P. Tsomocos and Alexandros P. Vardoulakis, 2012).

To date, there is insufficient significant data on the impact of constant haircuts on procyclicality, leaving questions about how constant haircuts should be designed so as to generate the most significant positive impact and best mitigate risks. A constant haircut needs to cover a number of different types of collateral, which differ in respect to their ability to be liquidated, their maturity, and their quality, all of which need to be considered to set a constant haircut. Omitting any of these aspects could have severe negative effects on financial stability. For instance, if there was one specific underlying aspect not covered by the haircut regulation, a negative development in the underlying aspect could have an effect on the haircut of this transaction, and could consequently impact the value of other types of collateral and assets, even perhaps triggering fire sales.

With regard to the establishment of CCPs, the regulation of constant haircuts could be beneficial, as constant haircuts support standardization and transparency of transaction. However, the introduction of constant haircuts could also trigger a rationing effect and intrude into the price detection mechanism. It is possible that transactions might not be performed with a strict and constant haircut that is set. Since haircuts are generally negotiated while performing the transaction and reflect the individual development of the underlying activities, a constant haircut is unable to ensure a correct reflection of the development and risks associated with the collateral. The setting of a small, regulated haircut could mean that risks are reflected insufficiently. Setting the haircut level too high might entail the circumstance that transactions are not conducted at all and leaves counterparties with unsatisfied liquidity positions.

#### **4.3.4 Securitization issues**

##### **4.3.4.1 Securitization in general**

The IOSCO, in coordination with the BCBS, was mandated to find regulatory approaches for securitization. Following a consultation report in April 2012, the IOSCO issued the final report on “Global developments in Securitization” in November 2012 (IOSCO, 2012a). The IOSCO gave an overall analysis of global initiatives on securitization regulation (e.e, risk retention, transparency, and standardization, and further). In this analysis, the US and the EU were named as the largest markets, globally, making them of particular interest for regulators and capital market authorities. The US and the EU are similar but independent regulatory regimes. Any policy needs to support the recovery of global securitization markets, restore trust and confidence, and prevent the creation of excessive leverage. To achieve these aims, the IOSCO and the BCBS want the following issues to be addressed: (1) risk retention by investors and originators, (2) improved and standardized disclosure, and (3) investor understanding of complex securitization products (IOSCO, 2012a and IOSCO, 2012b)

Securitization markets are crucial, as they constitute a valuable alternative funding market (see, Chapter 3 for information on the funding on shadow banks in a narrow sense and Chapter 4 for information on the relevance of securitization within the presented scenario). Securitization markets enable investors to raise funds from alternative and diversified sources. In the 1980s, housing in the US was almost completely financed through securitization, although the full diverse benefits not fully unfolded. Banks also rely on funding from securitization markets, which depend on sound and reliable markets. Banks receive liquidity and freed up regulatory capital through the securitization of illiquid assets. Looking back on the global financial crisis of 2008–2009, financial markets and securitization markets were adversely affected by an overreliance on ratings, a lack of due diligence on the part of investors, and inadequate pricing of risk. Securitization markets are not purely domestic, and cross border-issuance and investment are crucial features. Securitization markets vary across jurisdictions in terminology, underlying assets, forms, and structure of issuance. Those differences reflect diverse regulatory regimes and can impose additional costs on market participants who interact across borders. Consistency and integration for all market actors is the desired goal, in order to prevent additional costs (IOSCO, 2012b).

Data shows, that the securitization market in the US seems to be recovering, although the European market is still weakened. Several data sources can provide an approximate picture of the securitization markets. Data provided by the Securities Industry and Markets Association (SIFMA), was used in IOSCO (2012b) final report, and set the size of the US non-agency issuance at Dollar 124 billion in 2011. Most securitized underlyings in the US are auto and student loans. The European market peaked in 2008 with Euro 700 billion (of which Euro 25 billion have officially been placed on the market, the rest was retained), and is now valued at Euro 207 billion (Euro 88 billion placed). For a comprehensive overview of the development of the securitization market in the Euro Area and the US see Chapter 3.

A sound securitization process plays a crucial role in preventing scenarios such as modern-type bank runs and their negative sequelae. A high-qualitative and well-functioning securitization process determines the value of the securitized assets and promotes their value development. Stable asset values of, for example, ABSs and ABCPs, are crucial in protecting from sudden and unexpected price declines in the event of a modern-type bank run.

In the following section, the instruments of risk retention will be analyzed further. Risk retention is considered crucial to signal stability and to the quality of a well-functioning securitization process, stabilizing the value of ABSs and ABCPs against price declines.

#### 4.3.4.2 Policy recommendations

##### **Risk retention**

In 2009 the G20 recommended that originators and sponsors should be obliged to retain part of the risks connected with the underlying (G20, 2009). To date, especially in the time leading up to the financial crisis, investors did not pay attention to information asymmetries. Retaining a proportion of the securitized portfolio aims to mitigate risks that arise due to imperfect securitization processes, as well as to adjust misaligned incentives between suppliers of securitized products and their investors. Retaining a proportion of the securitized portfolio is also hoped to mitigate regulatory arbitrage. If sponsors and originators retain a proportion of the issued portfolio or underlying assets—colloquially referred to as having some “skin in the game”—this might reduce adverse selection and other agency problems<sup>23</sup>. Regulators from both the EU and the US have attempted to address the issue of risk retention with different overall approaches, forms of retention, and exemptions. As with any other form of regulation that differs across jurisdictions, these regulatory differences could cause friction in the form of access barriers, compliance costs, and limited flexibility (IOSCO, 2012b, p. 16).

In the Euro Area, retention is set out in the CRD II framework and in guidelines created by the EBA. In accordance with CRD II, credit institutions in the Euro Area are prohibited from investing in securitized products unless the originator or sponsor of the securitized product retains no less than five percent of the investment. Hopefully, this ensures that sponsors and originations issue quality products, and have an incentive to carefully analyze and evaluate the risks of the underlying portfolio. This self-interested behavior should then signal true portfolio quality. In the US, regulation under the Exchange Act requires that sponsors directly retain an interest equal to no less than five percent of the credit risk connected with the underlying asset. Originators and sponsors are therefore strongly encouraged to exercise due diligence, as they keep a proportion of any exposure to risk. The EU approach, in contrast, tends to protect institutional investors and consequently the private sector, including households and firms, who purchase securitized products. However, this more indirect regulatory framework leaves investors uncertain about whether the originating parties truly comply with the risk retention requirements. This uncertainty creates additional complexity, creating a need for more disclosure requirements. These cross-border differences in regulation create tension and need to be addressed (IOSCO, 2012b, p. 18). The US’s direct risk retention approach encourages a more stringent due diligence process in portfolio management, as the issuer retains a proportion of the pure and undiversified risks associated with the underlying portfolio. In the Euro Area, issuers are, instead, indirectly encouraged to retain risks: retention requirements are attached to the investor side, forcing issuers to provide stringent and precise due diligence to persuade investors to invest. Issuers in the

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<sup>23</sup>For more on agency problems and signaling, see Leland & Pyle (1977) and Gorton & Rosen (1995)

EU are also compelled to retain a required proportion of their portfolio, and exposures and interests cannot be sold or hedged in any way.

The EU directive CRD II introduces risk retention with Article 122a, and will apply to all credit institutions that are subject to State Member authorization. “A credit institution, other than when acting as an originator, a sponsor or original lender, shall be exposed to the credit risk of a securitisation position in its trading book or non-trading book only if the originator, sponsor or original lender has explicitly disclosed to the credit institution that it will retain, on an ongoing basis, a material net economic interest which, in any event, shall not be less than 5 %.” (The European Parliament and the Council of the European Union, 2009a, p. L302/110 and Art 404-410 CRR - Regulation (EU) No 575/2013). In this rather indirect approach, originators are not directly required jurisdiction to retain a proportion of their portfolio. If originators wish to place securities for sale in securitization markets they need to retain at least five percent, so regulated credit institutions are allowed to hold securitized positions as an investment. This retention can be structured in different ways. The issuer is obliged to retain at least five percent of the nominal value of each tranche sold or transferred (i.e., vertical slice). In the case of revolving securitization, issuers retain a *pari passu* share of no less than 5 percent of the nominal exposure value. This can be in the form of at least 5 percent of randomly selected exposures or, alternatively, investors can retain the first-loss piece of the transaction, and other tranches, so that the retention (in total) equals no less than 5 percent (The European Parliament and the Council of the European Union, 2009a, p. L302/110 and CEBS (2010)).

Securities Exchange Act of 1934 requires a general risk retention of no less than 5 percent. Acceptable forms are similar to those under CRD II. Under the vertical slice option, issuers are obliged to retain no less than 5 percent of each class in a securitization transaction. The horizontal retention option demands the retention of at least 5 percent of the pay last (i.e., FLP) residual of the credit risk of the entire securitized asset pool. A hybrid option constitutes the L-shaped retention option, whereby a sponsor is obliged to retain at least 50 percent in the form of a vertical slice and 50 percent in the form of a horizontal slice. Sponsors are also free to use the representative sample option, whereby no less than 5 percent of a randomly selected representative sample of the securitized assets is being retained. Finally, in securitization transactions in the form of a revolving asset master trust, the sponsor typically retains at least 5 percent of the unpaid principal balance of all assets held (i.e., seller’s interest) (SEA, n.d., Section 15G p. 253ff amended through DF2, 2010, Section 941 p. 515).

Both EU and US regulations include exceptions and safe harbor provisions. Here, too, regulation differs significantly across jurisdictions: US sponsors or originators do not need to retain any portion if ABSs are collateralized by certain high quality assets. The definition of ABSs includes high quality commercial loans, commercial real estate loans,

automobile loans, and residential loans, as well as other loans that are backed by government insurance or guaranteed assets. In the EU, retention does not apply if exposures are guaranteed by (1) central governments or central banks, regional governments, local authorities or public sector entities of any Member States; (2) institutions to which a 50% risk weight or less is assigned; or (3) multilateral development banks (The European Parliament and the Council of the European Union, 2009a, Paragraph 3 p. L302/111). Authorities should limit exemptions to risk retention to only when strictly necessary, as cross-border issuance is widespread (IOSCO, 2012b, p. 48).

In order to conduct proper cross-border issuance, issuers of ABSs are expected to comply with retention requirements of the pertinent jurisdictions. Although some structures are able to meet all requirements, this also entails a loss of flexibility, as complying with both sets of requirements precludes certain securitization structures, and imposes adoption costs (IOSCO, 2012b, p. 21). Exceptions impede cross-border issuance and could have unintended consequences and incentive alignment. Competitive distortion could occur if foreign issuers want to comply with different requirements and use exemptions; national issuers clearly have competitive advantages. Those aspects need to be taken into consideration when seeking to achieve global harmonization. Jurisdictions have different levels of risk retention requirements. Authorities should develop clear and consistent approaches, which explain requirements and the rationale behind any exemptions, thereby avoiding competitive distortion and revitalizing international securitization markets.

The following principles support effective risk retention, and need to be kept in mind in analyzing the retention regulation of the Euro Area and the US (see Geithner, 2011: (1) retention needs to align incentives to mitigate risks and stabilize the market. (2) When originators have a stake in the outcome, this provides greater certainty and confidence among other market participants. (3) Risk retention should promote an efficient allocation of capital to those investors who are subject to risk retention. However, (4) risk retention rates should preserve flexibility, as the market and other circumstances may evolve. (5) A broad range of market participants should be able to continue to safely engage in lending activities.

The majority of academic papers emphasize the importance of risk retention and incentives in monitoring and screening regulations (see Kiff & Kisser, 2010; Kiff & Kisser, 2011; Fender & Mitchell, 2009b; Fender & Mitchell, 2009a; Geithner, 2011 and IOSCO, 2012b).<sup>24</sup> Of their own volition, originators are already retaining parts of their securitized portfolios for signaling purpose; this highlights the quality of the underlying portfolio and encourages market participants to purchase the securitized assets. This signaling communicates that the originator has “skin in the game” in terms of both costs due to monitoring efforts and portfolio-related risks.

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<sup>24</sup> “These requirements have been and are being developed as a means of addressing misaligned incentives that may be embedded in the ‘originate to distribute’ model of some securitization products with a view to encouraging prudent behavior by issuers and sponsors.” IOSCO (2012b).



Although most academic papers support risk retention, all of them question the efficiency of fixed retention rates (Kiff & Kisser, 2010; Kiff & Kisser, 2011; Fender & Mitchell, 2009b; Fender & Mitchell, 2009a and Malekan & Dionne, 2012). United States and Euro Area Regulators introduced a fixed retention rate of at least 5%. However, this fixed rate does not account for the variety of different underlyings and participants in securitization transactions (see Wu & Guo, 2010). The Staff & the FSB Secretariat (2009) found that the retention rate is affected by a complex array of traits, including accounting standards, capital requirements, and market conditions. Investors are directly incentivized by this required retention to invest and operate prudently. Fender & Mitchell (2009b) also argue that optimal retention is influenced by the size of the retained tranches and the economic position of the originator. This enumeration can be completed based on the size of the total portfolio, which impacts the optimal amount of retention in ways beyond the percentage that has to be retained. This indicates that, by extension, not all originators can bear the same retention rate: for originators with a strong capital base, a low retention rate loses the incentivizing effect and might enable riskier engagements; to smaller originators that depend on sales revenue from securitization, a fixed and - from their perspective - high retention rate might cause negative effects. Retention regulation should be flexible and adapt to the existing circumstances and the characteristics of individual originators and underlying portfolios. This individualized approach is supported by Kiff & Kisser (2011), who argue that a different credit pool has a severe impact on the effectiveness of retention.

In addition to external components that can determine effective risk retention rates, there remain questions as to what part of the underlying portfolio should be retained so as to ensure the desired impact. Regulations by the EU and the US take different approaches to determining the retained parts of portfolios. Kiff & Kisser (2011) and Fender & Mitchell (2009b) argue that strictly retaining the FLP does not necessarily create the best incentive.

Clearly, the regulation of risk retention needs to be expanded and harmonized to ensure that the desired incentives and impacts are achieved. The fixed retention that has been introduced by regulators will not necessarily generate the desired outcome; rather, the retention rate must adapt to the characteristics of the underlying portfolio and to the needs of the specific originator. In establishing an optimal retention rate, regulators should consider the concentration of creditors or specific kinds of credit within the portfolio, potential future development of the portfolio, and surrounding market conditions of competitors.

The proposed framework of optimal risk retention needs to be harmonized to prevent regulatory arbitrage across borders, and other adverse effects. It is especially important that regulations of risk retention are harmonized between the Euro Area and the US, as these are the two largest markets. Ideally, a globally consistent regulatory framework on risk retention calculation should be established.

The indirect regulatory approach of the Euro Area might leave originators that do not retain a proportion of their securitized portfolio with unsold positions. However, it also enables investors to choose from variety of investment possibilities to match their individual risk appetite, as they might wish to invest in securitized portfolios that are not subject to retention requirements and therefore possibly offer a higher yield. The indirect approach of the Euro Area might open up possibilities for all market participants, as opposed to regulating them. However, this topic is not being explored, as this thesis focuses on the establishment of risk retention.

### **Transparency and disclosure**

To enhance transparency and build confidence in securitization markets and instruments, it is essential to implement strong disclosure requirements. This aim is well developed, and harmonized minimum disclosure requirements already exist for a number of jurisdictions. An analysis of US and EU markets indicates that regulation is already in place requiring upfront and ongoing disclosure. Upfront disclosure regulations vary according to whether ABSs are offered publically or privately. In the US, publically offered ABSs must disclose comprehensive data about payment allocation, credit enhancements, fees, and expenses payable (DF2, 2010, Section 943). European regulations (defined in the Prospectus Directive 2010/73/EU) require information about credit enhancements, subordinate debt facilities, and payment allocation and priorities to be disclosed (IOSCO, 2012b, p. 29). Publically offered ABSs in the EU must comply with CDR II and AIFMD. Originators and sponsors need to supply a great deal of upfront information, so as to enable a comprehensive assessment. This information includes data regarding credit quality and performance of the underlying asset, structure, cash flow, collateral support, and stress testing (IOSCO, 2012b, p. 30).

The content and form of ongoing disclosure vary across jurisdictions. The EU Prospectus Directive does not include specific requirements, meaning that there are no required updates if significant changes occur. Institutions are solely obliged to inform investors and regulatory authorities if they do or do not supply investors with permanent and ongoing disclosure information. Under the CDR II, issuers must supply investors with relevant information to comply with their due diligence obligations. United States issuers are bound by Exchange Act 15(d) to disclose information for the life of the security.

The disclosure of stress testing information and the outcomes of scenario analysis are of special interest, as this information allows investors to conduct their own due diligence. Experts in this area agree that regulatory authorities should support the need for robust and timely information, which allows investors to conduct detailed analysis and due diligence and make informed investment decisions, while also avoiding overreliance on CRA. It is important to provide tools and indicators to investors, so they can conduct their own stress testing geared to their own information needs (IOSCO, 2012b, p. 34).

However, the information required is dependent on individual investors' sophistication and needs, raising the question as to what kind and level of investor sophistication regulators want to cater to. It might be too ambitious to cover too wide a range of heterogeneous investors, as regulators must balance costs and benefits, and providing so much information might be excessively burdensome for fund originators.

There are also questions regarding disclosure standardization. Most jurisdictions do not require a standard format for the presentation and documentation of disclosed information, in terms of the nature, content, or verification of information. The IOSCO sees standardization as useful in supporting transparency and facilitating disclosure. There are regulations regarding asset-level disclosure in several jurisdictions. The goal of the IOSCO is to strengthen the existing framework, rather than to build a new one. The enhancement of harmonization supports cross-border issuance, and the standardization of information and data allows investors to make informed investment decisions (IOSCO, 2012b, p. 29). To achieve this goal, it might be useful to require some minimum level of harmonized information regarding risk and reward profiles, fees and expenses, possible scenarios, and securitization structures, as well as performance information for the underlying portfolio and equal access to data and information, without the intermediation of credit rating agencies. Harmonized disclosure would enhance global comparability of the securitization process and hence the quality of the process.

Issuers are also being encouraged to offer more standardized and less complex products, so as to create sustainable securitization markets. With regard to liquidity, investors in securitized products should be able to liquidate their assets in times of market eruptions, without excessive discounts or time restraints. Regulators should focus on the simplicity and standardization of securitized products and processes. Many jurisdictions favor greater harmonization, as global minimum harmonization—comprising harmonized standards for disclosure and standardization of processes, as well as simplified access and pooling of information—would create greater comparability and transparency.

## 4.4 Summary

Following the descriptive analysis in Chapter 2 and the walk-through of the scenario in Chapter 3, Chapter 4 addresses potential regulation of selected aspects of the shadow banking system. Proposed regulation pertains mainly to the regulation of MMFs to mitigate risks within the MMF sector, regulation of the securitization process to stabilize the quality and valuation of asset prices, and regulation of the repo market to mitigate procyclicality and to stabilize repo funding of the shadow banking system.

Banking regulation has changed in the wake of the financial crisis. The BCBS introduced new regulation in the form of Basel II.5 and Basel III. These new banking regulations aim to strengthen the quality, quantity, and consistency of required capital and liquidity,

and have a goal of enhancing the overall resiliency of banks. The impact of such banking regulation on the shadow banking sector, due to their interconnections, is addressed by WS 1 of the shadow banking regulation proposal framework. The BCBS worked out an agenda addressing many of the regulatory issues that concern shadow banks. These issues include the consistent consolidation of banking activities, so as to capture potential risks and mitigate arbitrage opportunities; a framework to measure and control large exposures by banks and shadow banks, to protect banks from the risks involved with those lending activities; and banks' investment in fund equity. In addition to WS 1, the FSB, as mandated by the G20, has proposed further regulatory changes concerning MMF regulation (WS 2), other shadow banking entities (WS 3), securitization (WS 4), and S repos and securities lending (WS 5).

The analysis of the proposed shadow banking regulation in this thesis concentrates on proposals regarding MMFs, securitization, and repo transactions. The proposed regulation of MMFs seeks to reduce entities' susceptibility to runs. This proposal focuses mainly on the regulation of asset-side characteristics (i.e., regulation of the portfolio structure), the regulation of liability-side characteristics (i.e., suspending redemption, introducing liquidity fees and gates), and changing the valuation practice of MMFs from cNAV to vNAV. Access to central bank liquidity has also been proposed. At the time of this writing, changes in vNAV valuation, as well as the introduction of liquidity fees and redemption gates are seen as probable, while access to central bank liquidity remains contentious.

To enhance the quality of the securitization process and stabilize the value of securitized assets, regulators have introduced retention requirements for originators. A fixed retention rate of at least five percent is currently being discussed in academic circles. To have the intended effect, the retention rate should be flexibly calculated as a function of the underlying portfolio and characteristics of the originator, as well as external market conditions, expected developments, and additional influencing factors.

To address the risks detected in the modern-type bank run scenario, the last section of Chapter 4 discusses regulation of the repo and securities lending markets. Regulators have suggested the introduction of TRs and CCPs, to enhance transparency and reduce complexity, as well as the regulation of haircuts, to reduce procyclical effects that may arise through moving haircuts. Overall, the introduction of TRs and CCPs is regarded as a positive step towards transparency and reduced complexity in repo transactions. The introduction of CCPs, however, bears the risk of creating another systemically important market participant that needs to be supervised and monitored. The regulation of haircuts also needs to be approached with care: the intention of capping haircuts to moderate fluctuations and procyclicality and so stabilize the financial system is clear. However, the regulation of haircuts could constitute an excessive influence on price detection and trading. Such regulated haircuts might discourage many transactions, leaving liquidity or security demands unsatisfied.

In general, the proposed regulations target enhanced transparency and reduced complexity in both shadow banking activities and in interconnections among market participants. In implementing regulatory proposals, however, regulators should keep in mind possible spillover effects, adverse reactions, and interdependencies, so as to ensure the most effective regulation.

## Chapter 5

# Concluding remarks

The size and nature of the shadow banking system contributed to the growing importance of shadow banks within the global financial system. Shadow banks offer investors additional investment possibilities, and provide both a funding source to many market participants and risk transfer possibilities to loan originators. However, this lightly regulated class of entities and activities has destabilized the global financial system due to excessive leverage, CRT, amplified procyclicality, a lack of government guarantees, and missing access to liquidity backstops.

The present work aimed to outline the structure of the shadow banking intermediation system and to analyze the development of different entities and activities. Chapter 2 provides an overview of the definitions developed by recent research on shadow banking, and demonstrates how these definitions strongly influence what is understood to be the size and composition of the shadow banking system. Once definitions were established, the main entities involved in loan origination, loan warehousing and securitization, and wholesale funding were analyzed with regard to their development within the past decade, with an especial focus on the 2008–2009 financial crisis.

Several shadow banking system entities experienced sharp declines in 2008 and 2009, although various sectors developed differently in different regions. However, the overall growth of the shadow banking system from Dollar 67 trillion in 2009 to Dollar 71 trillion in 2013 indicates that most sectors recovered very well after the crisis. The shadow banking system is, in this context, described as a chain of entities covering different functions (i.e., loan origination, loan warehousing and securitization, and wholesale funding) of the intermediation process. The shadow banking system was found to be mostly short-term funded through MMFs, giving these funds a major role within the shadow banking system.

Chapter 3 analyses the main points of interruption within the shadow banking intermediation chain through the scenario of a modern-type bank run on MMFs. This scenario shows that redemption requests to MMFs are transferred throughout the whole system

via the interconnections among market participants. Although MMFs might be initially affected by the run, they just liquidate their assets, thereby passing on these funding problems to the entities that rely on the short-term funding that they offer. This causes a chain of funding gaps, triggering the further liquidation of assets throughout the whole system. This prompts a number of severe asset valuation problems, culminating in fire sales of all asset classes within the financial system.

The problems and risks described in Chapter 3 that are inherent to the financial system are addressed in regulation proposed by the FSB. Chapter 4 outlines the structures of proposed regulation and evaluates their effectiveness in controlling MMF stability, defective CRT and risk retention, and stable repo and securities lending contracting. In light of this analysis, MMF stability emerged as one of the key points in stabilizing the funding of the shadow banking system, and, consequently, the financial system as a whole. Regulation pertaining to MMFs concentrated on structural aspects regarding the asset and liability sides of funds' balance sheets. Regulators have proposed guidelines to control redemption requests, such as gates and suspension fees.

Changing valuation practices from cNAV to vNAV funds seems promising to regulators. This change enables MMF investors to observe price fluctuations and to better understand the real risks inherent in the investment. This awareness is hoped to encourage investors to stay engaged with funds, rather than liquidating their shares at the first sign of negative market conditions. The present paper also explores how offering central bank access to MMFs could allow these funds to meet redemption requests without liquidating their portfolio assets and jeopardizing the supply of market funding. Offering MMFs central bank access would entail legal changes (e.g., changes to the Statute of the ECB), and its economic feasibility is explained more in-depth. Making MMFs subject to minimum reserve requirements is argued to make them eligible counterparties to the central bank in open market and credit transactions, thus ensuring liquidity access.

Academics have, overall, welcomed proposed risk-retention regulation, which requires funds to retain a proportion of the originated loans. However, the efficiency of a fixed retention rate of at least five percent is debatable. The analysis offered in this thesis comes to the conclusion that the retention rate should be able to react flexibly and to take into account key aspects of the underlying portfolio, such as concentration of creditors and quality and type of assets, as well as key aspects of the originator, such as size, market position, capital base, and size of the securitized portfolio relative to other activities and further aspects. Retention is considered the main instrument with which to signal the quality of ABSs, stabilize confidence in the securitization market, and stabilize the valuation of assets.

As repo contracts play a major role in the funding of the shadow banking system, the regulatory proposals regarding the standardization and stabilization of the repo market have been analyzed in the present thesis. Initially, standardization and enhanced transparency, such as through the establishment of TRs and CCPs, seems beneficial.

However, establishing CCPs would create a new systemically important function that needs to be understood and supervised. The regulation of haircuts is also considered as one way to stabilize the valuation of repo contracts and collateral values. This regulation, however, constitutes a major intervention into both market pricing and the making of transactions. Such an intervention might prevent transactions from being performed, potentially leaving the need for cash or securities unsatisfied.

Proposed regulation on shadow banking entities seeks to set requirements that will create transparency and standardization, thereby stabilizing the shadow banking system. Structural requirements, such as the regulation of MMFs, should be seen in the context of a competitive marketplace, where any loss of competitiveness may create additional regulatory arbitrage for those funds that apply the new regulation. The possibility of spillover effects, adverse reactions, and interdependencies might influence the efficiency of well-intentioned regulatory approaches. For this reason, regulatory authorities should monitor and assess the efficiency of introduced proposals.

Overall, the findings of this work support the argument that the shadow banking system has developed into a crucial part of the global financial system, and cannot be abandoned. It offers a wide range of alternatives to traditional banking, catering to a diverse range of participants. However, weak points (e.g., MMFs' lack of access to liquidity) and risks need to be monitored on a regular basis to detect possible critical events in advance. As most entities within the shadow banking system are already liable to regulation, regulators should instead focus more on the interactions among entities and the smooth handling of transactions. This should include comprehensive monitoring and reporting on shadow banking entities and activities, with continuous monitoring and understanding of interconnections between the traditional and the shadow banking system being of especial importance. Regulators and the financial industry as a whole need to detect potential points of contagion and proper regulatory approaches, so as to mitigate risks stemming from those connections.



## Appendix A

# Appendix Shadow Banking Definitions

Financial Stability Board (2011a)	Credit intermediation involving entities and activities outside the regular banking system, (1) systemic risk concerns, in particular by maturity/liquidity transformation, leverage and flawed credit risk transfer, and/or (2) regulatory arbitrage concerns”
European Commission (2012)	Entities operating outside the regular banking system engaged in one of the following activities: (1) Accepting funds with deposit-like characteristics, (2) performing maturity and/or liquidity transformation (3) undergoing credit risk transfer, and/or (4) using direct or indirect leverage. Activities that could act as important source if funding for non-bank entities: (1) securitization, (2) securities lending, and/or (3) repos.
Tucker (2010)	Instruments, structures, firms or markets which, alone or in combination, replicate, to a greater or lesser degree, the core features of commercial banks, monetary or liquidity services, maturity mismatch and leverage.
Tucker (2012)	Shadow banking comes in a lot of shapes and colors.
Pozsar <i>et al.</i> (2010)	Shadow banks are financial intermediaries that conduct maturity, credit, and liquidity transformation without access to central bank liquidity or public sector credit guarantees. Examples of shadow banks include finance companies, asset-backed commercial paper conduits, limited-purpose finance companies, structured investment vehicles, credit hedge funds, money market mutual funds, securities lenders, and government-sponsored enterprises.

Bernanke (2012)	Shadow banking, as usually defined, comprises a diverse set of institutions and markets that, collectively, carry out traditional banking functions — but do so outside, or in ways only loosely linked to, the traditional system of regulated depository institutions. Examples of important components of the shadow banking system include securitization vehicles, asset-backed commercial paper (ABCP) conduits, money market mutual funds, markets for repurchase agreements (repos), investment banks, and mortgage companies.
Financial Crisis Inquiry Commission (2010)	Shadow banking refers to bank-like financial activities that are conducted outside the traditional commercial banking system, many of which are unregulated or lightly regulated. Many of the activities performed within the shadow banking system take funds from savers and investors and ultimately provide them to borrowers. Within this broad definition are investment banks, finance companies, money market funds, some hedge funds, special purpose entities, and other vehicles that aggregate and hold financial assets.
Gorton & Metrick (2010b)	In its broadest definition, shadow banking includes familiar institutions as investment banks, money-market mutual funds, and mortgage brokers; rather old contracts, such as sale and repurchase agreements (repo); and more esoteric instruments such as asset-backed securities, collateralized-debt obligations, and asset-backed commercial paper.

Gennaioli <i>et al.</i> (2012)	Shadow Banking (securitized banking) refers to origination and acquisition of loans by financial intermediaries, the assembly of these loans into diversified pools, and the financing of these pools with external debt, much of which is short term and supposedly riskless.
Kocjan <i>et al.</i> (2012)	Shadow banking is a market-funded, credit intermediation system involving maturity and/or liquidity transformation through securitization and secured funding mechanisms. It exists at least partly outside the traditional banking system and does not have government guarantees in form of insurance or access to the central bank.

## Appendix B

# Appendix Proposed regulatory instruments

Appendix – Overview Policy Recommendations

<b>Workstream 1</b> <b>Banking Regulation</b> <b>Capital</b>	<b>Pillar 1</b> (1) Capital <ul style="list-style-type: none"><li>- quality and level of capital</li><li>- Capital loss absorption</li><li>- Capital Conservation Buffer</li><li>- Countercyclical Buffer</li></ul> (2) Risk coverage <ul style="list-style-type: none"><li>- Securitization</li><li>- Trading book</li><li>- counterparty risk</li></ul> central counterparty exposure (3) containing leverage <ul style="list-style-type: none"><li>- leverage ration</li></ul> <b>Pillar 2</b> Risk management and supervision
<b>Liquidity</b>	<b>Pillar 3</b> Market discipline and disclosure requirements <ul style="list-style-type: none"><li>- liquidity coverage ration</li><li>- net stable funding ration</li><li>- Principles for Sound Liquidity Risk Management and Supervision</li><li>- Supervisory Monitoring</li></ul>

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**Workstream 2**  
**Money Market Funds**

- (1) structural alternatives
    - mandatory move from cNAV to vNAV
    - Special Purpose Bank (under prudential banking regulation)
    - Insurances
    - Liquidity Backstops and Buffer
    - Two-tier system
  - (2) Changes in valuation practice (amortized cost accounting vs. marked-to market accounting)
  - (3) enhanced liquidity management
  - (4) investors base valuation
  - (5) reducing reliance on CRA ratings
- 

**Workstream 3**  
**other shadow banking entities**

- (1) management of client cash pools with features that make them susceptible to runs
    - investment restrictions (portfolio assets)
    - redemption restrictions (impaired portfolio option, redemption fees, redemption gates, suspension of redemption)
    - liquidity buffers
    - liquidity risk management
  - (2) Loan provisions dependent on short-term funding
    - prudential regulation of prohibition of deposit taking
    - liquidity buffer
    - leverage limits
    - asset concentration limits
    - detailed monitoring
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**Workstream 3**  
**other shadow banking entities**

- (3) Intermediation of activities dependent on short-term funding
    - liquidity requirements
    - capital requirements
    - restrictions on asset-use (re-hypothecation)
  - (4) Facilitation of credit creation
    - enhancing risk management (loss modelling, stress testing)
    - restrictions regarding scope and scale of business
  - (5) Securitization and funding of financial entities
    - liquidity and maturity transformation restrictions
    - eligible collaterals and exposure restrictions
- 

**Workstream 4**  
**Securitization**

- (1) risk retention
  - (2) enhanced transparency and disclosure (upfront and ongoing disclosure disclosure standardization)
  - (3) standardization of terminology
  - (4) Process and Product standardization (product registration)
  - (5) limited reliance on CRA ratings
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**Workstream 5**  
**Repos and Securities Lending**

- (1) Valuation and management practices
  - (2) Disclosure (exposure, activities, source and use of collaterals counterparty information and concentration, data breakdown)
  - (3) Enhanced reporting to end-investors
  - (4) minimum haircuts and standardized calculation
  - (5) standards and restrictions for cash collateral investment
  - (6) standards and restrictions on re-use and re-hypothecation
  - (7) central clearing – central counterparty (CCP)
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# Promotionserklärung

Erklärung gemäß § 4 Abs. 1 Pkt. 3 PromO

Hiermit erkläre ich,

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Jena, 09. Juli 2014

Jenny Poschmann