

NHH



# SHADOW BANKING

*A European perspective*

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Master Thesis in Financial Economics

NORWEGIAN SCHOOL OF ECONOMICS

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## **Abstract**

The aim of this thesis is to examine shadow banking, paying particular attention to European securitisation markets, collateral intermediation, and money market funds. The term was introduced following the 2007-2008 financial crisis to describe credit intermediation activities undertaken partially or fully outside the regulated banking system, without explicit access to public sector backstops. The shadow banking sector's dependency on short-term, wholesale funding renders it vulnerable to market turmoil, which in turn can affect the broader financial system through the sector's close connection with financial institutions and key markets.

In order to contextualize this topic the first chapter describes how credit intermediation is conducted within certain sectors of the shadow banking system, and what supply and demand-side factors precipitated the rise of the system. The initial chapter also offers a brief overview of shadow banking's role in the financial crisis, since the evolution of the term and the on-going discourse surrounding it is closely tied to the stressed market conditions witnessed at the time. While initially, the thesis is most relevant in a US context since it was there the financial innovations discussed have been developed and widely adopted, the second chapter provides an assessment of the European system. First, by performing a macro-mapping exercise aimed at providing a broad measure of the shadow banking system, and second, by conducting a more detailed analysis of institutions that serve as the focus for this thesis.

The thesis demonstrates that European shadow banking institutions fund the extension of credit, that they are important intermediaries in the short-term funding markets, and that they support a host of financial transactions. Although prevailing commentary on shadow banking has highlighted the systemic risk brought about by shadow banking, this thesis seeks to take a balanced view of the sector, also emphasising its positive impact on overall markets.

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# 1. The shadow banking system

## 1.1 Defining shadow banking

The Financial Stability Board (FSB) has developed a widely adopted definition of shadow banking. The FSB (2011) defines shadow banking as “credit intermediation involving entities and activities outside the regular banking system”. This broad definition can implicate entities that do not constitute a systemic risk, and the FSB has therefore proposed to narrow the definition further. Shadow banking does not, as it may seem from the above definition, involve all forms of non-bank credit intermediation. Only non-banks which create bank-like risks through excessive leverage, maturity and liquidity transformation, and (possibly flawed) credit risk transfer, qualify as shadow banks because they pose risks to financial stability. Non-bank entities that undermine the stabilising efforts of bank regulators by engaging in regulatory arbitrage are also included in the FSB’s more narrow shadow banking category.

There is not yet a uniform and commonly agreed-upon definition of shadow banking<sup>1</sup>, and there are on-going discussions as to whether the concept is applicable to certain entities such as credit hedge funds and exchange-traded funds<sup>2</sup>. Yet the use of the term usually makes reference to market-funded collateral intermediation activities, where an entity or a chain of specialised institutions issue deposit-like instruments to fund credit extension to the financial and non-financial sector (Jackson & Matilainen, 2012).

Defining the shadow banking phenomenon has proved challenging because the concept seeks to capture a wide array of institutions and activities that are constantly evolving in response to regulatory change and financial innovation, and that vary across jurisdictions. Summarising a complete set of characteristics which can apply to past, current and forthcoming shadow banking functions is exceedingly difficult. Therefore, this thesis will focus on economic functions commonly recognised as shadow banking activities among

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<sup>1</sup> See Deloitte (2012) for an overview of various definitions of shadow banking.

<sup>2</sup> See (AIMA, 2012) for a discussion on the inclusion of hedge funds and credit hedge funds, and IMF (2011) annex 1.7 for views on exchange-traded funds.

international policy institutions. These activities are the centre of public and academic debate on shadow banking, and have caught the attention of regulators and policy makers.

Shadow banking is a fairly new term, introduced by Paul McCulley in the autumn of 2007 as the Global Financial Crisis was beginning to unfold. The term was initially used to describe securitisation-based credit intermediation<sup>3</sup> (McCulley, 2007), but has now come to represent several entities and activities. There is a call for alternative terms such as market-based financing or alternative market financing to be employed instead (FSB, 2013a) (BlackRock, 2013). The term “Shadow banking” has been deemed too pejorative to describe such an essential part of the financial system, as it can seem to suggest that this segment of the financial industry is invariably opaque and risky. Despite its negative connotations, “shadow banking” will be used to describe wholesale-funded credit intermediation in this paper because it has become a widely recognised term that touches upon the controversies surrounding non-bank intermediation. Efforts will be made to balance any negative connotations the term might carry by emphasising how shadow banks generate efficiency gains and add economic value.

A “functional approach” that describes the intermediation activities carried out by shadow banks can provide a more dynamic framework that can be applied across a greater range of entities and jurisdictions. The FSB has also applied such an approach, and therein identified five economic functions classified as shadow banking activities (FSB, 2013b):

- Investing client cash pools by directing funds to credit intermediation activities and through this, conducting maturity and liquidity transformation, making the investment fund susceptible to spiralling client withdrawals (a “run”)
- Loan or credit provision that is dependent on short-term wholesale funding
- Intermediation of market activities, such as securities broking and prime brokerage services, that are dependent on wholesale funding or secured funding of client assets
- Facilitating credit creation, for example by providing guarantees that support an intermediation chain, possibly resulting in flawed credit risk transfer

<sup>3</sup> McCulley refers to the shadow banking system as “the whole alphabet soup of levered up non-bank investment conduits, vehicles and structures” (McCulley, 2010).

- Securitisation-based credit intermediation that entails maturity, liquidity and credit transformation.

All the above activities may involve taking on bank-like risks while raising short-term market-based funding that can prove extremely fragile in times of financial market distress. Regular banks, on the other hand, typically fund their activities by obtaining demand deposits and, to a lesser extent, market financing. Banks have indeed proved to be fragile in the past, but bank deposits are today considered to be safe and accessible at short notice due to public sector backing.

Shadow banks seek to issue safe, short-term, and liquid money-like claims that resemble the deposits issued by banks, while being predominantly or fully dependent on market financing and lacking access to the public safety net. The shadow banking system is therefore still susceptible to modern-day versions of bank runs, such as those experienced during the financial crisis.

This thesis will apply a function-based framework to examine shadow banking, and explain activities within securitisation-based credit and collateral intermediation in particular. These activities are important economic functions that resemble those of banks and encompass many of the aspects highlighted by the FSB. When looking at shadow banking within the European area, money market funds will also be more closely examined.

## 1.2 Shadow banking activities

In a 2012 paper published by the IMF, Claessens et al. have highlighted two shadow banking activities that bear close economical resemblance to the functions carried out by traditional banks, namely securitisation and collateral intermediation. While securitisation is performed by off-balance sheet entities such as conduits and investment vehicles, collateral intermediation is carried out by broker-dealers and securities lenders. Although these activities differ in several aspects, they are similar in the sense that they produce seemingly safe, liquid investments for the wholesale funding market. However, collateral

intermediation's main economic function is first and foremost to reduce counterparty risk<sup>4</sup> and facilitate a magnitude of financial transactions.

### **1.2.1 Credit intermediation**

#### *Credit intermediation in the traditional banking system*

Shadow banking can be better understood by first examining how the traditional banking system works, and how the two approaches to credit intermediation differ.

Banking essentially involves extending long-term loans and funding them by short-term deposits (Edwards & Mishkin, 1995). In the traditional business model, banks mainly make profits by charging a sufficiently high interest rate and choosing creditworthy borrowers, so that on average, the interest income covers losses and funding costs (Admati & Hellwig, 2013). Banks serve as an intermediary between savers, who are the ultimate lenders, and borrowers. This kind of "indirect finance" is useful in circumventing transaction costs and asymmetric information issues that are present in the financial markets.

Banks can take advantage of their economies of scale and expertise to assess credit risks better and at a lower cost than small, direct lenders. Instead of limiting a saver's lending to a few borrowers, banks pool deposits and spread them over a multitude of loans, allowing for diversification at a relatively low cost. The pooling of deposits also enables individual savers to access their funds immediately, instead of tying up funds in illiquid direct investments. Meanwhile, borrowers get to access single large loans from banking institutions rather than having to gather funds from various direct lenders. Banks also reduce inefficiencies arising from asymmetrical information when they lend to creditworthy borrowers based on their capabilities in discerning good credits from bad credits<sup>5</sup> (Mishkin et. al, 2013).

Thus, banks allow savers and borrowers to participate in financial markets without carrying the burden of having to meet there directly, with all the risks and inefficiencies that may entail. In addition, banks safeguard money and offer efficient payment services. All in all,

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<sup>4</sup> Counterparty risk, also known as default risk, is the risk of the counterparty will fail to perform according to the terms and conditions of a financial contract, thereby causing financial loss.

<sup>5</sup> This reduces the "lemons problem" that is typically present in markets with asymmetrical information. On their own, savers would struggle to assess the creditworthiness of lenders and would therefore only be willing to lend funds at a relatively high rate. The creditworthy borrowers would then leave the market, leaving only the bad credits (the "lemons") behind (Mishkin, Matthews, & Giuliadori, 2013).



banking represents a social good through providing funding activities that mitigate many of the issues found in direct finance.

The credit intermediation performed by banks involves three critical activities known as maturity, credit and liquidity transformation (Luttrell et al., 2012):

Banks engage in maturity transformation when collecting short-term deposits and redistributing them as longer-term loans to borrowers. Funds obtained from depositors, other lenders or equity investors are used to grant loans that typically have a longer maturity than the liabilities they are funded with. Demand deposits must be repaid whenever depositors request their funds, while saving deposits are less accessible but mostly retrievable at short notice. The maturity mismatch between bank assets and liabilities creates risk; liquidity problems may occur because the banks have money tied up in long-term loans that cannot easily be converted into cash should depositors want to withdraw their funds or banks fail to renew other short-term funds (Admati & Hellwig, 2013). Since depositors normally do not withdraw their funds simultaneously, the flow of deposits and withdrawals in deposit accounts roughly balance out and banks keep cash reserves in order to cover any differences that may arise. Thus, banks can give loans to clients with longer-term needs while offering depositors the flexibility to make payments or withdraw cash.

Although diversified, the asset side of a bank's balance sheets is inherently more risky than the liabilities issued to provide banks with funding. Credit transformation enables banks to issue highly rated liabilities while lending to lesser-rated borrowers. Banks enhance the credit quality of their liabilities through a priority of claims. For instance, senior deposits are rated higher than the loans they back because junior equity absorbs a majority of losses (Luttrell et al., 2012).

Furthermore, bank assets are less liquid than the liabilities which are acquired to fund them. Loans not only extend over a longer fixed term, they also cannot easily be traded for cash, rendering them illiquid. Liquidity transformation allows the banks to issue highly liquid securities that will be available at the depositor's discretion, backed by a pool of less liquid loans.

In traditional banking, the entire credit intermediation process will be carried out in a single institution. The shadow banking system provides a similar service to savers and borrowers, but a chain of financial intermediaries and specialist vehicles carry out the intermediation

rather than a single entity (Pozsar et al., 2010). The maturity transformation conducted in the shadow banking system also turns short-term funding into long-term loans, but while banks traditionally have been depositary institutions that hold their loans to maturity, shadow banks rely on wholesale funding and securitisation to achieve the same purpose.

The traditional banking system suffers from inherent fragilities. Systematic mistakes in lending decisions can lead to large losses; massive deposit withdrawals can occur; a bank can experience issues in renewing its funding; banks may employ excessive leverage; and the return on loans and investments may not be sufficient to pay off depositors (Admati & Hellwig, 2013). Banks are typically highly leveraged institutions that concentrate substantial levels of risks on their balance sheets by running maturity mismatches and performing liquidity and credit transformations, and banks therefore depend on the confidence of their depositors and investors.

Bank runs like those witnessed in the nineteenth and early twentieth centuries have now been warded off by the provision of central bank funding and the introduction of deposit insurance schemes in most jurisdictions (Schich, 2008). The aim of these measures is to bestow confidence in times of turmoil so that depositors do not panic and withdraw the banks' funding en masse. Deposit insurance does, however, lead to moral hazard because it causes losses to be shifted from depositors to the insurance provider. Depositors are thereby discouraged from monitoring banks, and banks are in turn encouraged, especially in the case of risk-insensitive deposit insurance schemes, to take on additional risk, for instance by increasing their leverage and investing in risky assets (Santos, 2000). Capital requirements and other regulations have been imposed in part to reduce the banks' risk-shifting incentives and keep them from exploiting the overall "safety net" (Berger et al., 1995).

Deposit insurance addresses the credit risk arising from bank insolvency, while central bank funds aid illiquid banks that only have a temporary liquidity shortage and cannot fulfil deposit redemptions (Admati & Hellwig, 2013). Together, these measures mitigate risks arising from the maturity mismatch on banks' balance sheets. Banks gain access to the public backstops by submitting to regulations and supervision. Regulatory constraints range from capital requirements, liquidity buffers, and restrictions on lending and investment activities. In addition, banks must pay a fee to participate in deposit insurance programmes, and individual deposit accounts are only insured up to a certain amount (currently EUR 100,000 within the EU).

### ***Securitisation-based credit intermediation***

The securitisation process funds illiquid financial assets by transforming them into securities that can be sold to end-investors in the securitisation markets (Greenbaum & Thakor, 1987). Marketable securities are created by pooling cash flow-producing loan receivables, and the sale of which will provide the securitiser with the necessary funding. Modern-day securitisation has its origin in the 1970s in the United States. Mortgage loans were the first to be securitised, then other receivables followed in the mid 1980s. The market expanded rapidly in 2002 - 2006, reaching its peak right before the financial crisis (Choudhry & Landuyt, 2009).

Prior to the introduction of securitisation, banks adhered to an originate-to-hold model when extending loans. Loans were kept on the banks' balance sheet until they matured, providing the banks with income from the accompanying interest and principal payments. The long maturity of most bank loans meant that the banks' resources were tied up for long periods, limiting the banks' ability to manage their balance sheets. In an originate-to-distribute securitisation model, the banks sell off loans and their associated income streams, and instead make money by originating and servicing these loans. The banks no longer need to hold capital against the loans that are sold, and resources can therefore be made available for other uses. In addition, banks appear more profitable as performance measures such as return on assets and return on equity improve when assets are moved off the balance sheet, while still generating fee income (DeYoung & Rice, 2004).

The credit intermediation process, which was originally carried out by a single bank, is now broken up into several steps that are performed by a set of specialised entities. Due to the complex nature and length of the intermediation chains, this paper will go on to explain securitisation in greater detail, before examining the roles and functions present in this type of shadow lending.

### **The securitisation process**

The securitisation process involves selling off fractional interests to an underlying portfolio of loans in the form of securities. The process can generally unfold as follows<sup>6</sup>:

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<sup>6</sup> The description is based on Pozsar et al. (2010) and Pozsar et al. (2013).

A warehousing entity acquires income-producing debt obligations such as loans, mortgages, or other receivables from an originating institution and combines it into a loan pool. Pooled obligations that carry similar risk and return characteristics may be packed together and used as collateral to back the issuance of a security. The name of the security is reflective of the underlying debt obligations backing the security; a mortgage-backed security (MBS) is backed by a pool of mortgages, while an asset-backed security (ABS) can be backed by assets ranging from credit card receivables and leases, to corporate receivables. ABSs will be used as an example in the continuation of this section. Investors who invest in a securitised product effectively purchase the rights to payables associated with the collateral. ABS investors will receive regular revenue streams consisting of interest and principal payments from the ultimate borrowers until the security matures, less any fees paid out to the parties involved in the process.

The simple securitisation process described above can be tailored to investor needs by creating “tranches”. Tranches represent slices of the loan pool that differ in terms of maturity and risk. An individual security may be split into tranches such as senior, mezzanine, and equity. These tranches differ with respect to their risk-return profile. The subordinate tranches are left to absorb initial losses, while the most senior tranche will only take a loss once the lower ranked tranches are exhausted. This subordination of claims can increase the credit quality of senior tranches above that of the underlying asset pool because senior investors are more likely to receive the payables they are entitled to (Mizen, 2008). Credit rating agencies rate the tranches based on the seniority of their claims and the perceived quality of the underlying loan collateral, relying largely on quantitative models and macroeconomic forecasts to do so (Ashcraft & Schuermann, 2008).

A tranching structure enables financial intermediaries to offer securities with various risk and return characteristics, thereby appealing to a heterogeneous group of investors with different investment objectives and risk preferences (Cetorelli & Peristiani, 2012). In addition, the various tranching structures can attract investors that differ in their ability to assess the value of the securities and the underlying collateral. Sophisticated investors, such as hedge funds, possess the necessary information and capability to invest in the subordinated tranches, while less sophisticated investors may prefer to invest in the more “information-insensitive” senior tranches (Plantin, 2003).

The securitisation process, like credit intermediation conducted by banks, involves maturity, credit and liquidity transformation. The financial intermediary funds an aggregated amount of long-term loans by issuing short-term securities, thereby performing maturity transformation. The credit enhancement of a portion of the structure is achieved by creating subordinated claims, and finally, a pool of essentially illiquid loans back the issuance of tradable liquid securities, resulting in liquidity transformation. According to Acharya et al. (2010), securitisation programmes typically hold assets with a maturity ranging from three and five years, while issuing ABCP with a maturity of 30 days or less.

### **The roles in securitisation**

Cetorelli and Peristiani (2012) demonstrate how securitisation-based credit intermediation involves a set of specialised functions rather than the single-institution approach found in the originate-to-hold credit intermediation model. In order to match ultimate savers and borrowers, the intermediation chain must include an aggregator, an underwriter, a rating agency, a servicer, and an administrator. Originating institutions and third parties which provide ancillary support also partake in the credit intermediation process.

Loans are originated by banks, financial companies, and mortgage companies. The loan originator often continues as the servicer of the loans, collecting payables that will be passed on to end-investors. The aggregator is responsible for assembling a pool of loans to be used as collateral for the securitisation, and may be the original lender or simply a loan pool assembler. The aggregator generally purchases loans from one or more originators by extending a line of credit that the originators can use to fund the loans being underwritten.

After being warehoused, portions of the asset pool are sold off to an administrator, typically a subsidiary of a commercial bank or an investment bank. The administrator creates a trust, in the form of a special-purpose vehicle (SPV), which will eventually hold the loans. The asset purchase is funded by the SPV creating and issuing securities, enlisting the assistance of an underwriter. The underwriter arranges placements by structuring, marketing and selling securities on behalf of the SPV. The underwriter will also analyse investor demand and interact with rating agencies in order to structure tranches that satisfy investor preferences. Obtaining ratings is essential in order to sell the securities because a large proportion of the investor base, such as institutional investors and regulated financial firms, are required to hold investment-grade securities (SEC US, 2003). In addition, some investors use ratings as a supplement or substitute for their own due diligence. Obtaining liquidity and credit

guarantees from related or separate third-party entities can further enhance the risk profile and the rating of the securitisation issuance.

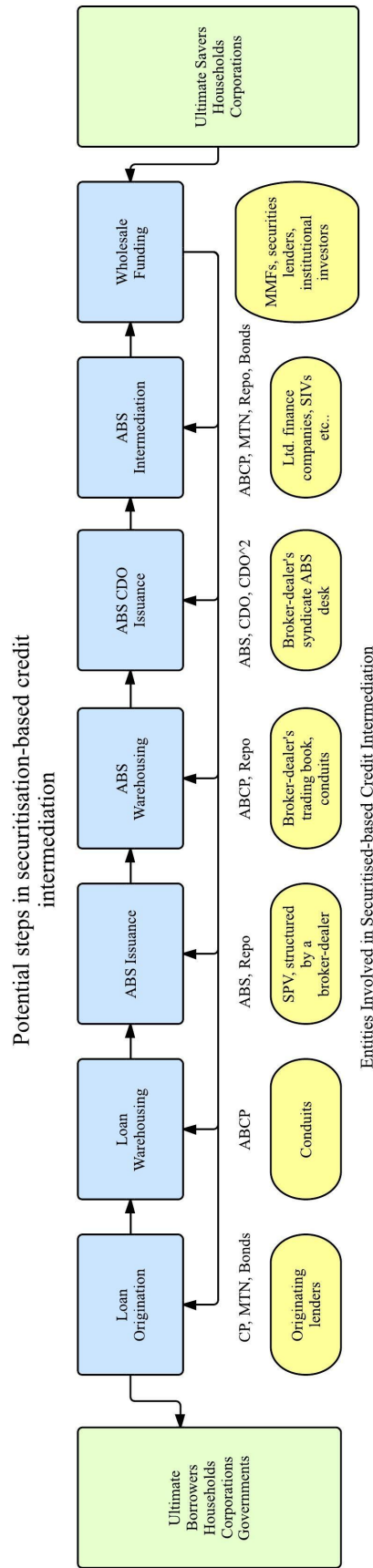
### **The intermediation chain**

Maturity, credit, and liquidity transformation occurs through a series of stages, beginning with loan-origination and ending in capital market funding (see figure 1). The steps presented below are not exhaustive - an intermediation chain may contain a varying degree of stages and entities. Typically, a pool of long-term, low quality loans requires a long chain of entities in order to enhance the quality of the securities sufficiently to meet the investors' requirements (Pozsar et al., 2010).

Loans are originated and sold off to a warehousing entity that assembles several loans and then sells part of the resulting loan pools to a SPV. This constitutes a true sale and assets are moved from the originator's balance sheet to that of the SPV. SPVs are separate legal constructs created by an administrator in order to fulfil a certain objective, and they are essentially paper entities with no physical manifestation such as an office location or employees. Specifically, a securitisation programme can be a single- or multi-seller conduit, a credit arbitrage conduit or, less commonly since the financial crisis, a special investment vehicle (Schnabl & Acharya, 2009). SPVs within the shadow banking system are created solely to hold collateral and issue securities. In the continuation of the paper, they will be referred to as SPVs or securitisation programmes.

Technically, a SPV is bankruptcy-remote; this implies that the assets of the SPV will be shielded in the event of the default of its administrator and vice versa. The sponsoring financial institution may, however, provide credit enhancements and backup lines of credit and liquidity. In addition to such contractual, explicit agreements, there may be a perception that implicit guarantees are also in place. An administrator has incentives to avert the failure of a securitisation programme should its failure damage the administrator's reputation, and investors are therefore likely to expect that the programme will not be allowed to fail. During the financial crisis, sponsoring banks took assets back onto their balance sheets due to explicit credit and liquidity support, as well as reputational risks (Pozsar, 2008).

Figure 1 A seven-step credit intermediation chain

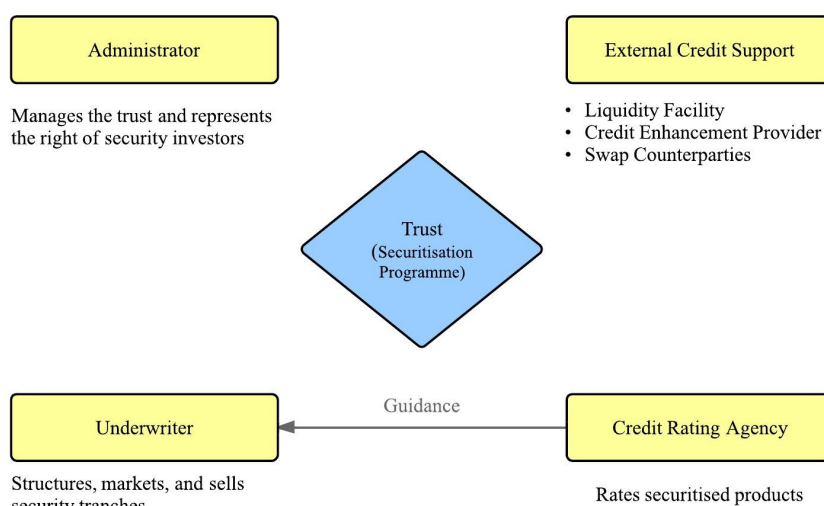


SOURCE: Adapted from Pozsar et al. (2010) and Pozsar et al. (2013). This is only serves as an illustrative example of a intermediation chain and the funding instruments used at various stages. The number of entities and type of instruments involved may vary

A securitisation programme aims to transform parts of the underlying collateral into investment-grade securities, and must therefore improve the credit quality of its liabilities so as to obtain the adequate credit rating from rating agencies. A SPV will typically have internal and external credit support measures in place to increase the likelihood of investors receiving the cash flows they are entitled to.

Overcollateralisation – providing loan collateral in excess of the value of the liabilities issued and/or subordinating a portion of the claims – constitutes an internal measure to improve credit quality. In addition, the SPV enlists support from creditworthy third parties to further improve the marketability of its securities. A bank, insurance company or a bank-like entity provides credit enhancements in the form of letters of credit, thereby promising to reimburse losses up to an agreed-upon amount (Cetorelli & Peristiani, 2012). The SPV will also need a financial institution to provide liquidity facilities that can cover the payment of maturing short-term liabilities in the event that the SPV is not able to roll over its funding or cannot collect sufficient cash from purchased assets. The SPV must pay fees to the third parties that provide protection against credit and liquidity risks, adding to the costs of the securitisation process (Schwarcz, 1995). In addition, risk arising from interest rate and exchange rate fluctuations can be reduced through swap transactions (Cetorelli & Peristiani, 2012). The SPV and the third parties it may interact with are outlined in figure 2.

*Figure 2 A SPV and its related third-party entities*



SOURCE: Authors depiction of roles within securitisation, adapted from Cetorelli and Peristiani 2012



A broker-dealer's syndicate ABS desk underwrites the SPV's issuance of securities that are backed by the acquired loan collateral. Typically, only highly rated ABS pieces are sold on the capital markets; residual claims with low credit ratings are retained on the broker-dealer's trading books or become restructured. By retaining exposure to the most subordinated tranches, the administrator can signal that its interests are aligned to that of investors. According to Pozsar (2008), however, the most senior and the least senior tranches saw the largest demand in the run-up to the financial crisis, leading to tranches in the middle of the spectrum, for example the mezzanine tranche, being recycled into new securities. By repeating the process, the leftover tranches are structured into new securities known as collateralised debt obligations (CDOs). Unsold asset-backed securities pieces are then warehoused before being combined into a CDO and structured into tranches, some of which may get an investment-grade rating. The CDO tranches that are not sold to the market can be re-securitised again and sold as CDOs-squared, and in the run-up to the financial crisis, some securitisation vehicles even issued CDOs-cubed (Mizen, 2008).

The final step of the credit intermediation chain constitutes the purchase of securities by wholesale investors. Alternatively, investors can fund a SPV's securitisation programme by accepting the securities as collateral in a repurchase agreement. The securitisation programme aims to create highly rated securities in the form of asset-backed commercial paper (ABCP) that can be used to raise proceeds or serve as collateral for short-term cash loans. While the assets backing these liabilities are longer-term and less liquid, the shadow banks' "deposits" must be safe and liquid, accommodating withdrawals on short notice. Wholesale investors can also contribute funds to the shadow banking system by buying medium-term notes, commercial paper, and bonds from other entities in the chain such as finance companies and warehousing entities. The types of wholesale funding listed in figure 1 are only tentative, included for illustrational purposes.

Money market funds (MMFs), securities lenders and institutional investors are among those who provide cash funding to the shadow banking system. According to Pozsar et. al (2010), MMFs and securities lenders invest in commercial paper and ABCP, and also lend cash through repurchase agreements. Fixed income mutual funds and institutional investors typically purchase medium-term notes and bonds. MMFs are one of the most important groups of investors in the shadow banking system. They take in short-term funds from retail

investors, institutional investors and corporations, and place the funds in short-term, low-risk investments<sup>7</sup>. Securities lenders are also prominent providers of funds; cash collateral obtained in a securities lending transaction may be reinvested in short-term investments such as ABCP and repurchase agreements.

## **1.2.2 Collateral intermediation**

Repurchase agreements (repos) and securities lending are short-term collateralised transactions that constitute part of the secured segment of money markets, and are critical to the functioning of the financial system. Repo and securities lending promote price discovery and liquidity in several markets by supporting market-making activities, settlement infrastructures, various trading strategies, and providing secured short-term funding (ECB, 2002) (Dive, 2011). Despite these far-reaching benefits, this type of financial intermediation can create bank-like risks through carrying out maturity and liquidity transformation and producing “money-like” liabilities (FSB, 2013c).

Repos and securities loans are both collateralised transactions whereby the collateral backing the transaction serves to mitigate the counterparty risk posed by the borrower. If the borrower defaults, the lender has possession of the collateral and can sell it in the market to recover the claim. The lender may, however, not be able to liquidate the collateral at the expected value, and these secured lending arrangements therefore include two additional measures to address such risk. Overcollateralisation and daily valuation procedures protect against the market, credit, and liquidity risk of the collateral (ECB, 2002). Transactions are collateralised in excess of the value of the cash or securities according to a “haircut” or initial margin<sup>8</sup> (see box 1). The daily marking to market ensures that the agreed-upon overcollateralisation is maintained throughout the life of the transaction. If the value of the collateral changes, the borrower may be requested to post more collateral, or the lender may need to return some of the collateral in order to reinstate the haircut.

<sup>7</sup> Money market funds will be discussed in greater detail in section 2.4, both as investors in securitised assets and as stand-alone shadow banking entities.

<sup>8</sup> Haircuts and initial margins both perform the same function, but are calculated somewhat differently.

### *Repurchase agreements*

The economical function of a repo is similar to that of a secured cash loan, but the two funding options differ in legal aspects (ECB, 2002). The provision of securities on the cash borrowers part, which is the very mechanism that collateralises and thereby secures the repo transaction, necessitates a full transfer of ownership (known as “transfer of title”) throughout the life of the transaction. In a repo, the borrower sells a collateral asset to the lender at one price and commits to repurchase the asset at a different price at a later date or on demand. The lender does not need to return the exact same security as the one posted in the transaction, but rather one that can be regarded as equivalent. According to (Ruchin, 2011), “securities are equivalent to other securities if they are of the same issuer, part of the same issue, and of an identical type, nominal value, description as well as amount”.

The repo market has cash-driven and a securities-driven segments, with the former being the most prominent (ECB, 2002). Both segments involve an exchange of cash and securities, but differ in the objective of the transaction and the type of collateral used. While cash-driven repos are motivated by a wish to borrow or lend cash, securities-driven repos are triggered by a wish to borrow or lend specific securities, often referred to as “specials” (ECB, 2002). The underlying collateral in a cash-driven transaction carries only secondary importance, and most of these transactions are therefore conducted against general collateral<sup>9</sup>. Thus, the securities-driven segment tends to be driven by the supply and demand of specific assets, and the cash-driven segment is largely driven by the supply and demand for cash.

Since a majority of repos are cash-driven, they primarily serve as a funding tool for cash borrowers. The level of haircut dictates how much cash can be raised with a given amount of collateral, and typically reflects counterparty risk and the quality of the collateral posted (see box 1) (Adrian et al., 2013).

There are two broad classes of repurchase agreements – bilateral and tri-party agreements.

<sup>9</sup> General collateral is a basket of securities in which the securities adheres to certain instrument type and quality characteristics, causing the basket to be accepted by a majority of market participants. While market participants used to be largely indifferent between different sovereign debt securities prior to the Euro area sovereign debt crisis, GC baskets now tend to be split up according to which country has issued its securities (ICMA, 2013a).

In a bilateral repo, the parties settle the repo directly between them on a “delivery versus payment” basis where cash and collateral are exchanged simultaneously, requiring the cash lender to either have back-office capabilities or acquire the service of a custodian agent to manage the collateral received. In a tri-party repo, a third party such as a clearing bank provides collateral management and settlement services, as well as taking on the counterparty risk of the two repo parties. While the tri-party repo offers an affordable way of borrowing cash against general collateral, the bilateral market typically serves as a way of obtaining specific securities.

Bilateral repo transactions are often utilised by prime brokers to supply their clients (hedge funds, real estate investment trusts, retail banks and other institutions) with cash financing. The clients use the cash to fund securities purchases, while the brokerage can earn additional returns by investing the client collateral in a separate tri-party repo.

The tri-party repo market serves as an important funding source for mainly securities dealers (banks and broker-dealers), as well as a few large hedge funds and institutions. They borrow from “cash-rich” entities, including MMMFs and securities lenders, and increasingly also non-financial companies (FSB, 2012a). Broker-dealers hold securities because they conduct market-making activities and proprietary trading, as well as offering collateral services to clients. The broker-dealers seek funding that is short-term and flexible because the securities inventories that are used to back the loans fluctuate with the level of trading activity. The repo lenders hold cash for different reasons, but most are looking for safe investments with a short duration that will enable them to earn some interest on their available cash holdings (Copeland et al., 2010). A MMF may prefer such short-term investments because it needs to be able to satisfy redemption requests, while corporate treasuries may want quick access to their cash for investment purposes.

The bilateral and tri-party repo markets are utilised by non-banks, such as securities broker-dealers, conduits and investment vehicles, to obtain short-term loans. Loan transactions that are backed by longer-term, less liquid assets result in “shadow” maturity and liquidity transformation. To the extent that these collateralised liabilities appear riskless to investors, shadow banks supply the wholesale funding market with seemingly safe liquid liabilities that resemble bank deposits.

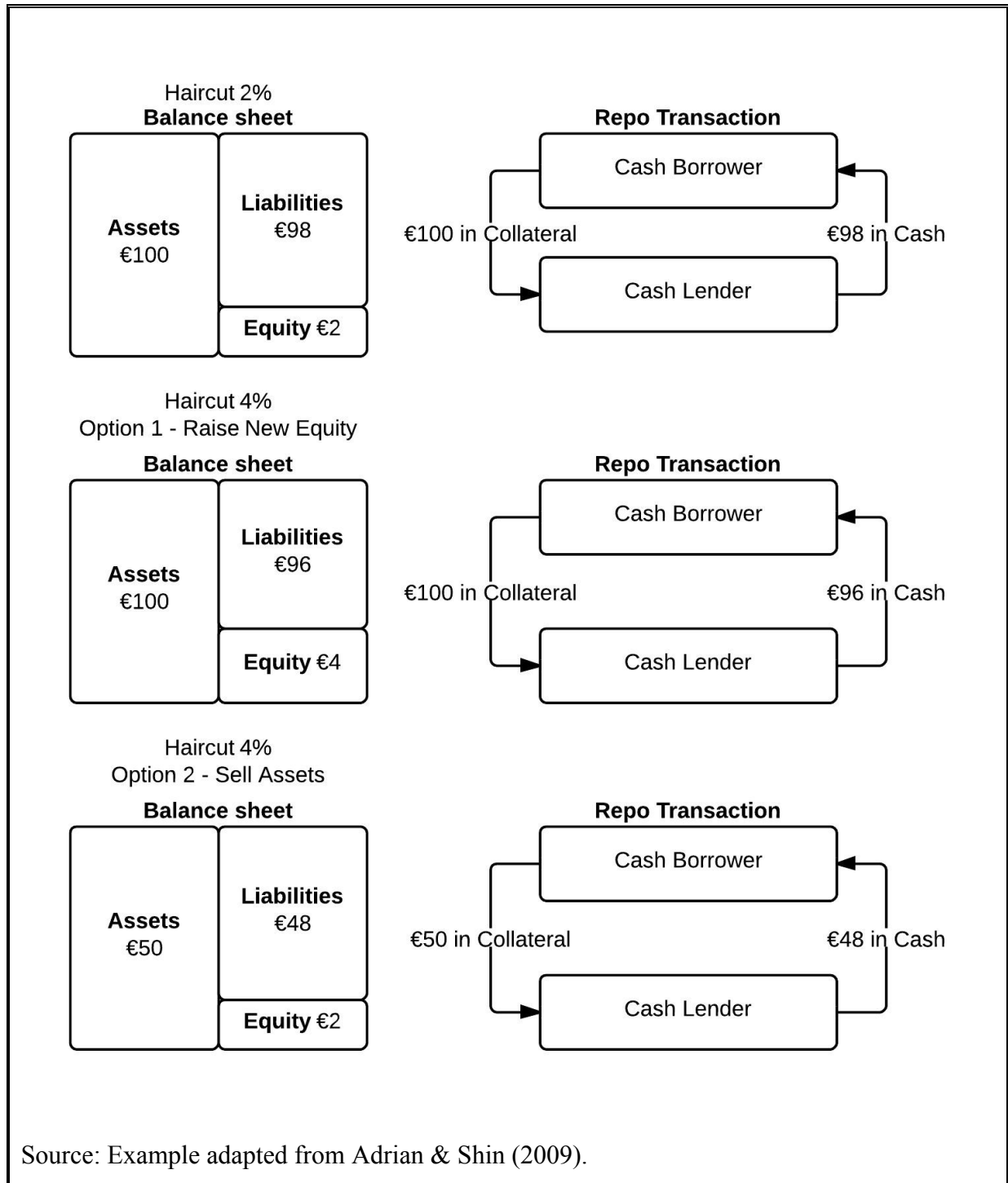
### Box 1 Haircuts

The haircut in a repo transaction decides how much leverage the cash borrower can take on, and thereby dictates the maximum leverage ratio (the ratio of assets to equity). The impact of haircut in a repo transaction can be illustrated by a simple example. An institution wants to take on leverage in order to finance €100 worth of asset purchases. At the current haircut of 2%, the institution will only be able to borrow €98 and must therefore put up €2 of equity. Alternatively, one can say that the institution needs to pledge collateral worth €100 in order to borrow €98 in cash. The maximum leverage ratio the institution can achieve is then 50 (€100 of assets / €2 of equity). Should the haircut double to 4%, the institution must put up €4 in equity in order to finance its €100 asset purchase. A 4% haircut causes the maximum leverage ratio to fall from 50 to 25. Alternatively, the institution could scale back its asset purchase to €50, and still achieve a 25 leverage ratio without having to raise more equity.

As illustrated in the figure on the following page, when the level of haircut increases, the borrower in a repo transaction must either raise more equity (option 1) or sell off a large portion of its (existing) assets (option 2), both of which lead to significant deleveraging.

Financial turmoil tends to cause an increase in repo haircuts. Haircuts on repo agreements involving asset-backed security collateral increased from 3-5% in April 2007, just before the financial crisis, to 50-60% in August 2008 (Adrian & Shin, 2009).

While haircuts dictate how much can be borrowed for a given level of collateral, other factors also affect the repo transaction. Changes in credit risk or market price of the underlying collateral may impact the parameters of the transaction. In addition, a cash lender's re-usage of the collateral in other transactions may raise concerns that the collateral will not be returned (ECB, 2013).



### *Securities lending*

Securities can either be obtained in a securities-driven repo or through a securities lending transaction, but the latter is more commonly applied for this purpose. Securities lending transactions are predominantly open-term, providing both lender and borrower with the flexibility to suspend the arrangement at any given point in time, while repos are typically entered into for a predetermined, fixed term.

Securities loans are primarily conducted to facilitate market-making activities, trading strategies, or generate additional income on a securities portfolio (Dive et al., 2011). They may, however, also be used to obtain funding<sup>10</sup>.

A prime brokerage, typically an independent firm or the subsidiary of a bank holding company, provides services to hedge funds and other professional investors, ranging from clearing services to securities and cash lending (Singh & Aitken, 2010). Broker-dealers are market makers that stand ready to buy and sell securities, and by doing so improve the liquidity of various securities markets. A brokerage can borrow securities in order to meet investor demand for securities not found in their inventory, avoid settlement failures, and collateralise derivative positions (Dive et al., 2011).

When not borrowing on their own behalf, the brokerage acts as an intermediary between clients who wish to borrow to finance their trading activities and institutional investors (beneficial owners) with securities to lend. Brokerage clients borrow securities via the brokerage in order to support trading strategies such as short-selling, arbitrage trades and hedging of long positions, strategies which in turn can enhance liquidity and price mechanisms in the market (Garbaravicius & Dierick, 2005). In addition to on-lend securities loans, a prime brokerage also assist clients in financing asset purchases, either through providing the client with a margin account or serving as the cash lender in a repurchase agreement. All the above financing options can result in risky maturity transformation.

Some prime brokerage clients cannot borrow cash unsecured or borrow securities directly from beneficial owners. They, therefore, rely on prime brokers to facilitate their investment strategies that involve leverage and short sales. A prime brokerage has a pool of lendable securities, making them able to offer clients constant financing of their short positions while allowing for beneficial owners to withdraw their securities loans upon request (FSB, 2012a). Most lending transactions are open and therefore generally considered to be short-term positions that are fairly easy to liquidate. The lenders might choose to terminate the arrangement when they need to sell the on-lend securities or exercise shareholder voting rights.

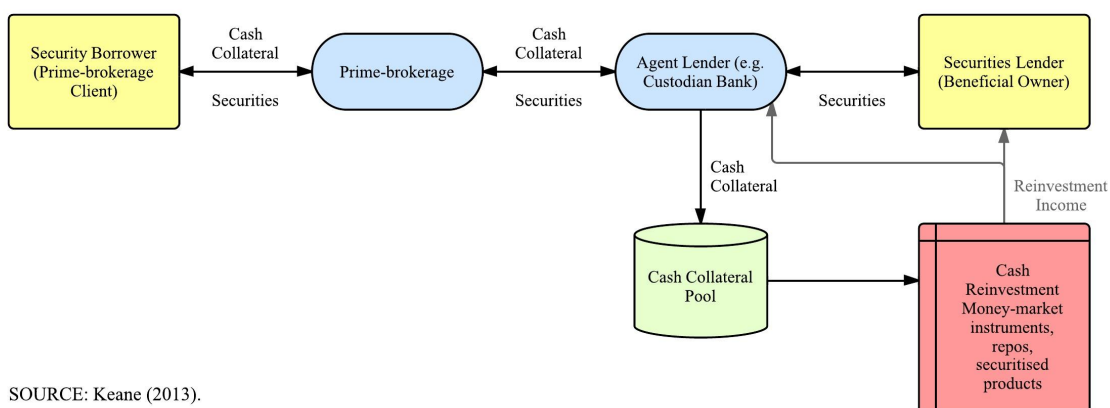
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<sup>10</sup> Securities transactions may however be used to obtain funding, either through borrowing or lending securities. An institution, typically a bank, may borrow securities to perform a “collateral upgrade”, exchanging less liquid collateral for collateral that is more appropriate for raising money in the repo markets. Alternately, lending out securities can provide broker-dealers with needed financing to support their own transactions (Dive, Hodge, Jones, & Purchase, 2011).

Securities lending is a way for beneficial owners to earn additional income on their securities holdings from fees paid by borrowers. Securities lending is mostly done against cash collateral, and funds obtained in such securities-for-cash transactions can be reinvested by the securities lender in order to generate even higher returns from a securities portfolio. In some cases, the beneficial owner's motivation may shift from lending out securities for a low-risk return into lending out securities in order to fund a levered cash-reinvestment business. Cash reinvestment is often undertaken with the help of a securities-lending agent such as a custodian bank or a third party investment manager.

An illustration of cash reinvestment involving an agent lender is demonstrated in figure 3. Pursuing a conservative reinvestment strategy focused on safe and liquid assets can maintain the funds' intended function as cash collateral, enabling the lender to return the cash when the loans mature or are cancelled (Acharya et al., 2010). More aggressive reinvestment practices, enhancing returns by investing in longer-term risky assets, give way to credit and liquidity risk that can create issues when the cash is recalled. Cash collateral is commonly invested in money-market instruments, repos or deposits, but can also be invested in more risky structured products (Keane, 2013). The securities lender engages in maturity transformation and liquidity transformation when the maturity of the investment or the time it takes to sell off the investment exceeds the maturity of the loan.

*Figure 3 Securities lending transaction with cash reinvestment*



SOURCE: Keane (2013).



### 1.3 Shadow banking as a systemic risk concern

Shadow banks and regular banks both run maturity mismatches that expose them to liquidity risk. Shadow banks, however, are more vulnerable to changes in market sentiment due to their reliance on capital market funding and lack of public sector backing (Adrian et al., 2013). While banks can make use of deposits and market-based funding, shadow banks are typically reliant on short-term market funding. Shadow banks use the financial markets to provide its products and services, and these markets are highly sensitive to information and uncertainty regarding that information (Schwarcz, 2009) (Schwarcz, 2012). Shadow banks seek to issue “deposit-like” liabilities that are perceived as safe and liquid by investors, but experience has shown that these shadow banking liabilities can turn risky and illiquid when the financial system is subject to severe stress. Shadow banks do not have direct access to the public safety net, and this reintroduces the risk of disruptive funding runs to the financial system.

Regulated banks and shadow banks alike can pose a systemic risk to financial stability, but shadow banks are still susceptible to modern-day bank runs and are more inclined to expand or contract their balance sheets in accordance with the level of economic activity. Systemic risk is the risk of a systemic event, such as the collapse of a particular funding market, not being contained and thereby spreading, damaging the financial system and eventually the broader economy<sup>11</sup> (Bullard, Neely, & Wheelock, 2009). Systemic events have the potential to trigger widespread stress and contagion in the financial markets, which in turn can have an adverse effect on the real economy. An idiosyncratic event in one part of the financial system can, for example, heighten overall counterparty risk and cause intuitions to hoard liquidity rather than offering it in the interbank markets, effectively straining the supply of credit and causing a decline in economic activity.

Stress or uncertainty within the shadow banking system can expand to the banking system and other financial institutions through direct or indirect channels. While interconnections with banks and other financial institutions are often pointed out as a channel of contagion,

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<sup>11</sup> See Kaufman & Scott (2003) for alternative definitions of systemic risk.

indirect linkages, such as massive asset sales in the shadow banking sector causing a price fall in unrelated financial and real assets, can be just as important (European Commission, 2012). One of the main systemic risk concerns is in fact shadow banks' exposure to runs. A withdrawal of funds can force fire sales of shadow banking assets, possibly depressing a broad range of asset prices and causing distress for institutions which provide support or invest in such assets (Jeffers & Baicu, 2013).

### **1.3.1 Wholesale funding runs**

Runs in the shadow banking sector can be labelled as wholesale funding runs because it is capital market investors of considerable size, rather than individual bank depositors, that withdraw the funds. A loss of confidence, either caused by a systemic event or the perceived weakness of a shadow bank institution, can provoke a run by wholesale investors and thereby result in fire sales and sudden deleveraging within the shadow banking system.

In a typical bank run, banks do not have sufficient cash reserves to accommodate the spiralling withdrawal of depositors' funds, a problem known as the "sequential servicing constraint". A run on shadow banks is more akin to a "fire sale constraint" where the shadow entity needs to sell assets in order to make up for lost funding (Adrian et al., 2013). While bank depositors fear that a bank will not have enough cash to accommodate upcoming redemption requests, shadow bank investors anticipate that assets can only be sold off at increasingly depressed prices and therefore seek to withdraw funding before other investors do.

Banks and shadow banks need to continually roll over their funding in order to finance their long-term loan holdings and accommodate redemption requests. Banks are able to roll over their deposits by maintaining a good quality loan portfolio and limiting the risks they are (perceived) take on (Admati & Hellwig, 2013). Securitisation programmes' ability to renew their short-term funding depends on the quality of the securities they issue and the underlying loans they hold. A perceived deterioration of the asset holdings, possibly caused by delinquencies or defaults in the underlying loan portfolio, can lead to investors refusing to provide further financing. In the case of collateral intermediation, the quality of the underlying collateral and the shadow institution's creditworthiness will affect their capacity to obtain funding.

A run on securitisation programmes can be likened to investors ceasing to refinance maturing securities issued by the securitisation vehicle, or discontinuing any repo agreements (Gorton & Metrick, 2012). Additionally, the haircuts required in repos may increase so that the shadow bank entity cannot borrow as much as before (or at all) for a given amount or type of collateral. Either way, the liabilities of the entity will decrease which necessitates the use of alternate sources of funding. Money can be raised by selling off asset holdings, but during a market-wide turmoil where few are willing to buy, it might only be possible to liquidate the holdings at a discount. Investors will observe that selling assets at distressed prices can lead to further falls in asset prices, making them try to withdraw their funding before others, as in a traditional bank run. Covitz et al. (2012) have documented that runs during the financial crisis typically affected ABCP securitisation programmes with weak characteristics such as large exposures to assets that had deteriorated in quality, holding little liquidity support and low credit ratings.

Collateralised borrowing arrangements such as securities lending and repo transactions are sensitive to perceived counterparty risk, as well as to the market values of the securities being exchanged or used as collateral. Run-like behaviour can occur in a securities lending transaction where the cash collateral has been reinvested in longer-term assets. Under normal circumstances, a securities lending transaction would be terminated because the borrower no longer has a need for the securities, but in times of turmoil, the borrower may demand the cash back due to counterparty risk - the possibility of the securities lender defaulting and not being able to return the collateral (Keane, 2013).

A run on repo financing occurs through an increase in haircut levels or a cancellation of further repo transactions, constraining the cash borrower from rolling over its short-term funding. During the financial crisis, runs materialised in bilateral repo markets through a sharp increase in haircuts (Gorton & Metrick, 2012). Cash borrowers needed to sell assets in response, which contributed to a reduction in asset prices and a subsequent increase in haircuts. In the tri-party market, haircuts remained less affected, but funding was to some extent withdrawn through the cancellation of repo agreements (Copeland et al., 2011).

Collateral service providers who engage in “rehypothecation” of client assets further exacerbate the risk exposure they have to clients. Broker-dealers typically obtain client collateral from securities lending, bilateral repo agreements and OTC derivative transactions. The securities lending and repurchase agreements they facilitate are collateralised

transactions, requiring one of the parties to “hypothecate” – pledge collateral - in the form of securities or cash deposits. The client of a prime brokerage retains the legal ownership of the collateral posted, but the broker-dealer may repledge the collateral in its own name unless the client withholds re-hypothecation rights (Manmohan, 2011). In return, the brokerage may offer the client cheaper funding. The client collateral can be given as collateral simultaneously in several transactions to back the broker’s own borrowing in the repo and securities lending segments, a procedure known as “churn”. This allows the broker-dealer to assume a greater amount of leverage, but may cause severe problems should the prime-brokerage clients choose to withdraw their collateral. A withdrawal of funds exposes the broker to liquidity risks – when collateral is recalled, the dealer bank may have to find new collateral or liquidate its positions (FSB, 2013c). In cases where the collateral has been re-hypothecated or re-used in several transactions, a withdrawal may affect a long chain of entities (Monnet, 2011).

### **1.3.2 Mispricing of risk**

The short-term liabilities provided by securitisation programmes and collateral service providers have largely been viewed as safe and liquid prior to the financial crisis, despite of their lack of explicit public sector backing (Tarullo, 2013). The investors lending to shadow bank entities are willing to supply credit because these are secured transactions that are over-collateralised and short-term. A securitisation vehicle will typically have third-party guarantees in place to enhance the credit quality of their assets, and collateral transactions utilise securities that are considered fairly liquid, with positions being monitored daily through marking-to-market and margin call procedures. The collateral backing the above transactions are typically exempt from automatic stay in bankruptcy, ensuring investors that they are likely to get their money back even in the event of a default.

Based on the experiences drawn from the financial crisis, it appears that securitisation programmes and broker-dealers did not fully account for the potential risks arising from their activities. Some securitisation programmes were in the business of converting opaque, risky loans into assets that could back AAA-rated securities through a long intermediation chain that seemed to dilute the underlying risk. The resulting liabilities may have appeared riskless and deposit-like, but the associated risk was in reality mispriced (Adrian et al., 2013). Broker-dealers, on the other hand, may not have fully acknowledged the externalities that

appear when funding is withdrawn and positions need to be liquidated or assets need to be sold rapidly in a depressed market (Tarullo, 2013).

The failure to fully internalise the true costs associated with the risks being taken, enabled shadow banks to raise cheap funding relative to banks who were obligated to account for such risks in accordance with regulatory standards (Schwarcz, 2012). The mispricing of risk thereby promotes the conversion of risky loans and complex security structures into highly rated securities.

### **1.3.3 Procyclicality and excessive leverage**

Shadow banking activities can amplify financial cycles, and thereby increase the procyclicality of the financial system. They do so by accelerating the credit supply and supporting asset price increases when market confidence is high, while undertaking deleveraging and precipitating a fall in asset prices when there is a loss of confidence in the markets.

When asset prices are rising, securitisation programmes can raise more funds based on their asset holdings, while securities lending and repo agreements require lower initial margins and haircuts. The situation is typically reversed during a downturn. For instance, an increase in perceived counterparty risk and volatility in the collateral base could lead to a contraction in the supply of repo financing (CGFS, 2010). As haircuts increase and certain collateral types become ineligible for repo transactions, borrowers may be unable to renew or obtain funding, possibly resulting in a system-wide deleveraging. The very measures that have been instated to protect repo counterparties, namely mark-to-market accounting and margin calls, further exacerbate the deleveraging pressures. Also, the liquidation of assets by borrowers can precipitate a further fall in asset prices, which in turn leads to further haircut increases and margin calls.

Such procyclical behaviour can contribute to a build-up of leverage and asset-price bubbles during a boom, while causing disruptive deleveraging when market conditions worsen, thereby making the financial system more fragile as a result. The shadow sectors' ability to over-leverage its institutions can also make the financial markets more vulnerable. Regulated banks face regulatory constraints in which assets they can hold and the amount of capital backing those assets, while the absence of regulation and supervision in the shadow sector enables the entities to lever up excessively (FSB, 2011).

### **1.3.4 Flawed credit risk transfer and misalignment of incentives in securitisation**

One of the objectives of securitisation is to transfer the credit risk associated with the loans to outside investors who are willing to take on the risk, and thereby disperse the risk that would otherwise be contained on the banks' balance sheet. Many banks who originated loans for securitisation failed to transfer the credit risks in the run-up to the financial crisis, resulting in a concentration of risk in the banking sector rather than a risk distribution to third-party investors (Acharya et al., 2010).

Banks sold off their loan holdings to securitisation vehicles, but retained the risk by keeping the equity tranche in the securitisation or extending guarantees (Nijskens & Wagner, 2011). Banks effectively insured outside investors by committing to pay off all or parts of the maturing ABCP that could not be refinanced due to a lack of liquidity in the market, and they committed to do so irrespective of the current underlying asset values. Credit risks were thereby offloaded from the investors, with the bank still taking on the underlying systemic risk of the loan pool. Investors would only take losses if both the underlying assets and the banks' credit guarantees proved insufficient. The ABCP investments were essentially risk-free for investors as long as the supporting banks were solvent, but banks were exposed to significant risks (Schnabl & Acharya, 2009). Banks may also have given implicit guarantees – the failing of a securitisation vehicle connected to a bank might hurt the bank's reputation, causing the bank to help the distressed vehicle even though there was no such obligation. The usage of off-balance sheet vehicles did allow banks to hold less regulatory capital and access cheap funding in the ABCP markets because the assets had been moved to a bankruptcy remote unit (FSB, 2011). It must, however, be noted that asset-backed commercial paper differs from other securitisation programmes such as mortgage-backed securities, where most of the loans' credit risk is transferred to investors.

Securitisation has also come under pressure because the disintegration of the credit intermediation process into several separated entities with diverging interests has given rise to severe agency problems. Ashcraft and Schuermann (2008) have listed seven “informational frictions” arising between ultimate borrowers, originators, administrators, credit rating agencies and investors. Securitisation can lead to a deterioration of underwriting standards because the originator is left with fewer incentives to monitor the quality of its borrowers. Loans are sold off and passed down the intermediation chain, supposedly

transferring the risk of troubled loans to end-investors. The credit rating agencies' payment structure can constitute a source of conflict of interest, possibly leading to distorted credit ratings. Investors tend to rely heavily on credit ratings rather than performing their own due diligence that would require significant skills and resources. The credit rating agencies are paid by issuers of the securities and not the investors themselves, and agencies may therefore become too lenient in rating securities because they want to preserve their source of revenue.

### **1.3.5 Lack of transparency**

The complex and opaque nature of the shadow banking system can itself lead to unexpected risk accumulations. Shadow banking entities forming part of a credit intermediation chain are highly connected in a complex network and problems in one entity can quickly spread to others. Long chains, typically needed to convert low quality risky loans into savings products, can lead to a great deal of entities being affected by stress further along the chain. The complexity makes the system less transparent and it can therefore be difficult for investors and regulators alike to uncover the location of the risks incurred during the intermediation processes. If risk exposures are allowed to accumulate over time without the knowledge of market participants, their eventual disclosure, which might only come about in times of systemic stress, can lead to panic and market turmoil (FSB, 2011). The system's lack of transparency and its complicated investment structures can also give rise to misconduct and opportunistic behaviour.

### **1.3.6 Interconnectedness**

Not only are shadow banks closely linked to each other, they also have strong connections to banks and other financial institutions. Although shadow banking is often described as bank-like entities operating outside of the traditional banking system, they usually appear to be heavily intertwined with banks. Commercial banks are heavily involved in securitisation and often own broker-dealer subsidiaries (Cetorelli & Peristiani, 2012). The interconnectedness creates channels for contagion and increase the systemic risks present in the banking system at large.

Banks can establish linkages to shadow banks by facilitating or participating in the activities that take place along a credit intermediation chain. Banks which originate loans and sell them to off-balance sheet entities (thereby constituting an element in the chain) can effectively gain relatively low cost funding from the shadow banking system and possibly

reduce their regulatory capital holdings. Banks' leverage can thereby be increased significantly above the level that appears on their balance sheet and what is supported by regulatory capital.

Banks can also form part of the intermediation chain by setting up conduits that warehouse loans. If this is done in anticipation of the structuring of the ABS deal and the gathering of funds from investors, the banks temporarily expose themselves to the risks of the underlying asset pools while awaiting funding. Banks can facilitate shadow banks' maturity and liquidity transformation by providing guarantees that are necessary to achieve high credit ratings, possibly allowing for even cheaper funding. Third-party entities such as financial guarantors, monoline insurers and other protection sellers can also give financial guarantees, thereby exposing themselves to the financial risks of the shadow banking system (Pozsar et al., 2013). Banks can also be connected to shadow banks by investing in shadow banking assets or by receiving funding from MMFs or other shadow banking entities (Jeffers & Baicu, 2013). As pointed out before, stresses in the shadow banking system can transmit through less direct linkages as well – a fire sale of assets by shadow banks can depress asset prices in the financial markets at large.

### **1.3.7 Regulatory arbitrage**

Regulators seek to impose stringent regulations on the banking system so that credit and liquidity risks are contained within stated regulatory limits. In doing so, regulators force banks to disclose information and hold capital reserves they would otherwise be unlikely to. Banks, which are concerned with maintaining and enhancing their profitability, have incentives to avoid such restrictions through “regulatory arbitrage” – the restructuring of financial activities in order to reduce the costs of regulations. Shifting activities out of the traditional banking system and into the shadows can help banks avoid the regulations that banks must endure to gain access to the public safety net.

Banking regulations (relevant to this context) are aimed at achieving an appropriate pricing of risk, ample liquidity and sound capital reserves within the banking system. Regulators' efforts are undermined when banking activities move into a scarcely regulated and complex shadow banking system, possibly resulting in a build-up of excessive leverage and risk that could threaten financial stability (BIS, 2012). Fein (2013), however, argues that shadow banking activities are mainly carried out by regulated banks, and that this development has



been encouraged by regulators in the past. For instance, Fein considers previous capital requirements to have been structured so as to incentivise banks to securitise loans.

## 1.4 The rise of shadow banking

The shadow banking system is predominantly a set of financial innovations that emerged due to regulatory changes, as well as an increased demand for money-like liabilities or safe investments that could offer above-market yields. Shadow banking can therefore be regarded as a natural development in which the financial system has evolved due to the underlying regulatory regime and fundamental changes in the economy (Gorton & Metrick, 2010).

### 1.4.1 Regulatory factors

Pozsar (2008) identifies the capital requirements introduced by the Basel Committee on Banking Supervision under the 1988 Capital Accord as the catalyst for the initial growth in securitisation-based credit intermediation.

The Basel I Accord imposed internationally regulated capital requirements that applied according to the riskiness of a banks' assets. Consequently, banks were incentivised to circumvent the new, costly capital requirements by modifying their credit risk exposure (Iacobucci & Winter, 2005). Banks undertook a reconfiguration of their balance sheets by buying credit default swaps that insured against credit losses or by repackaging and securitising loans, which allowed them to change the overall risk profile of their loan portfolios (Pozsar, 2008). Liquidity facilities backing off-balance sheet entities were assigned low risk weights, while securitised products held in the entities carried none (IMF, 2009).

Over time, securitisation developed from what initially resembled a capital requirement management tool applied to existing asset holdings, into a funding vehicle that could support the creation of new loans<sup>12</sup> (Pozsar, 2008). While regulatory arbitrage may have triggered

<sup>12</sup> See section 2.2.2 for a discussion on why banks are inclined to use securitisation as a funding tool.

the expansion of private-label securitisation<sup>13</sup>, low interest rates and the emergence of institutional cash pools created the demand necessary to support large volumes of issuance.

Regulations not only induced the growth of shadow banking through regulatory arbitrage, but also by reducing the competitiveness of banks. Banks in several countries were prohibited from paying interest on demand deposits in parts of the 20th century, which benefited money market funds and repo markets since these could provide safe placements that offered a market-based return (Tobias & Ashcraft, 2012). Finally, regulations that were introduced to support these financial innovations also contributed to their growth. For instance, the securitisation and repo markets depended on the underlying collateral to be truly “bankruptcy-remote” so that the assets could be recovered in the event of default (Gorton & Metrick, 2010).

### **1.4.2 Institutional cash pools**

The emergence of large, centrally managed cash pools has created a demand for safe, liquid investments that can serve as alternatives to demand deposits and publicly-guaranteed debt (Pozsar & Manmohan, 2011). “Institutional cash pools” are cash balances being held by large corporations and asset managers. These cash pools, which can range from USD 1 billion to over USD 100 billion, result from corporations centrally managing the aggregated cash balances of their subsidiaries, and asset managers administering investor funds (Pozsar, 2011).

Corporate treasuries and asset management firms seek investments that provide principal safety and liquidity. Corporations do so to ensure that their cash balances are accessible whilst earning a modest return, whereas asset managers demand short-term investments for various reasons. Investing in short-term securities can help an asset manager deal with inflows and outflows – new funds that are not ready to be invested long-term can be placed temporarily in short-term placements, while redemption requests can more easily be accommodated if a portion of the capital is invested in soon-maturing securities. Alternatively, an asset manager can try to earn a return from timing the market using short-term securities, or the investment could be part of a synthetic investment strategy – i.e.

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<sup>13</sup> The term private-label refers to securitisations that are not issued or backed by a government or a government-sponsored agency.

gaining a desired risk exposure indirectly through the use of derivatives, futures and swaps rather than investing directly in an asset (Pozsar & Manmohan, 2011). Finally, an asset manager can be restricted by investment standards found in a fund mandate or the regulatory framework to hold a certain amount of safe, short-term investments. Funds that aim to be classified as money market funds in the EU and US, for example, are restricted to investing in soon-maturing, liquid debt instruments or deposits (IOSCO, 2012a).

Bank deposits and short-term government securities cannot satisfy the entire demand for safe, short-term investments (Pozsar & Manmohan, 2011). Deposit insurance is limited on interest bearing accounts, and banks therefore cannot accommodate large cash balances seeking safe, low-risk returns. By placing cash balances in excess of the deposit insurance limit, corporations and asset managers would effectively be taking on unsecured exposures. In addition, a substantial part of US cash holdings are kept in offshore locations, which disqualifies them from deposit insurance schemes in other jurisdictions (Claessens et al., 2012). Meanwhile, the supply of short-term government paper is limited, and the government paper market may not match investors' liquidity or maturity requirements.

The shadow banking system satisfied part of this demand through securitised products, repurchase agreements, securities lending, and money market fund units (Pozsar & Manmohan, 2011). Many securitised products were highly rated, while repos and securities lending were considered safe because they were short-term arrangements secured by high-quality collateral. Money market funds, on the other hand, were considered to be conservatively managed with capital preservation and liquidity in mind (Ansidei et al., 2012).

Investments provided by the shadow banking system did, however, prove to be less safe than expected when faced with the market stress arising from the financial crisis. For instance, investors had viewed securitised products as safe due to the supposed risk diversification from investing in a pool of loans (Pozsar, 2008). Loan pools consisting of corporate debt might have been well diversified from systemic risk because they consisted of loans from different industries and businesses with varying sensitivity to business cycles. Loan receivables backing asset- and mortgage-backed securities, on the other hand, were sensitive to the overall economy and therefore still contained (even in aggregate) large concentrations of systemic risks (Pozsar, 2008). In the years leading up to the financial crisis, a significant

share of the securitised receivables were subprime loans that proved to be highly correlated when the nationwide US housing market declined..

### **1.4.3 The search for yield**

A sustained period of low interest rates increased the assets available for securitisation and brought about a “search for yield” in the financial markets (ECB, 2007). First, low interest rates led borrowers to request more loans to be originated by banks and finance companies, and the ensuing credit growth provided collateral pools that could be used for securitisation. Second, decreasing returns in the financial markets induced investors to instigate a “search for yield” whereby they requested assets that could provide an attractive return while having low risk characteristics<sup>14</sup> (Joint Forum, 2009).

The financial industry responded to the demand by supplying investors with assets that provided a return above that of traditional fixed-income assets and at seemingly low levels of credit risk. Securitised assets that were considered to be high-quality credit risks, received ratings that made them suitable for institutional investors whom faced requirements as to what they could invest in. In addition, securitised products gave institutional and retail investors exposure to a diversified pool of loan assets that they would not otherwise have been able to access (Schawarcz, 2012). Through the use of tranche structures and credit enhancements, securitisers created products that appealed to various risk-return preferences, thereby attracting a broad pool of investors (Blommestein et al., 2011).

### **1.4.4 Demand for collateral services**

Pozsar and Manmohan (2011) identify three sources of demand for collateral intermediation; (I) in times of heightened counterparty risk, secured funding becomes more attractive; (II) the increasingly globally-integrated financial system uses collateral to manage counterparty risk and as a substitute for trust; and finally, (III) regulatory changes, for example, those calling for greater use of collateral in derivatives transactions, require more transactions to be underpinned by collateral. Collateral is also needed to support various trading and hedging activities, market-making and settlement procedures.

<sup>14</sup> For instance, demand for low-risk, high-quality assets in the run-up to the financial crisis caused the yield on “safe” fixed-income securities such as sovereign and corporate debt to fall (Joint Forum, 2011).

The shadow banking system has not only produced assets that could be used as collateral in financial transactions, but also established procedures that made efficient use of collateral. The demand for collateral assets continue to rise in many jurisdictions, particularly so after the financial crisis (CGFS, 2013). The demand for eligible, high-quality collateral can, however, be reduced through collateral re-use or rehypothecation<sup>15</sup>. These practices allow one unit of scarce “primary” collateral to be churned in subsequent chains and thereby support more transactions than it could have otherwise (Pozsar & Manmohan, 2011).

## 1.5 Shadow banking and the financial crisis

The financial crisis was the result of a combination of factors, but shadow banks have been widely recognised to having contributed to the crisis (Constâncio, 2012).

In their 2009 paper “Initial Lessons of the Crisis”, the IMF seeks to identify key factors that caused the 2007-2009 financial crisis. The IMF proposes that sustained asset prices and growth in the credit supply led to a build-up of risk in the financial markets. A low interest environment backed by loose monetary policies not only made credit relatively cheap, it also spurred a search for yield that led investors to invest in continually riskier instruments. The financial system, and shadow banks in particular, satisfied investor demand by developing products that offered an attractive yield at a supposedly low risk. In addition, the flawed incentives found in the originate-to-distribute banking model and a protracted period of low volatility may have contributed to a significant mispricing of risk, thus giving rise to excessive risk taking.

The aggregate risks residing in the shadow banking system’s securitised products were misjudged by credit rating agencies, regulators, banks and investors. Market participants had failed to internalise the sharp increase in correlation between the prices on the underlying collateral assets and the correlation in the price of different securitised products that could occur a systemic event (Pozsar et al., 2013). A low-probability, negative tail event of the

<sup>15</sup> Although often used interchangeably, collateral re-use and rehypothecation do not grant identical rights. In the case of collateral re-use, the party acquires “title of transfer” rights and thereby ownership of the asset, and can sell or pledge the asset to others. Rehypothecation rights, on the other hand, only allows the party to repledge the collateral (Manmohan, 2011).

type shadow banks were exposed to did eventually occur, as housing prices fell across the United States.

Pricing models deployed by the rating agencies relied on assumptions or information regarding underlying loan pools and the contractual features of the security structures. Loan defaults were thought to have a low correlation, which proved untrue in the case of subprime loans. When investors realized that the statistical models had failed to predict the default and delinquency rates that were materialising, they lost confidence in ratings and were uncertain how to value their own securities and the ones held by counterparties (Dwyer & Tkac, 2009). The opaqueness of the shadow banking system and the complex nature of the structured instruments it produced, made investors uncertain about the true size and location of risk and the true value of their investments (Gorton & Metrick, 2012).

Privately created debt instruments that had appeared safe in the past, now proved to be fraught with both price and liquidity risk. Liquidity not only evaporated in markets relating to subprime housing loans, which is where initial defaults and delinquencies occurred, but also in asset markets that were unrelated to housing. Runs on ABCP programmes and money market funds followed, as well as runs on securities lending and repo in the form of increased haircuts or withdrawal of funding.

The explicit guarantees handed out to securitisation programmes meant that banks were forced to bring the off-balance sheet loans back onto their balance sheet as programmes were failing to roll over their funding. Some also acted on implicit guarantees to protect the reputation of the bank, while other banks let securitisation vehicles collapse despite investors having perceived that such an implicit understanding had been in place (Claessens et al., 2012). In addition, banks were subject to mark-to-market accounting rules that required them to value structured assets based on their current market price, notwithstanding the actual default performance of the underlying loans (Choudhry & Landuyt, 2009). The reluctance amongst investors to buy such structured products strained the liquidity in the market, and asset values declined. The mark-to-market valuation technique then exacerbated the price decline and the resulting losses caused banks' capital reserves to diminish. The expansion of the banks' balance sheets and the corresponding losses reduced their capital ratios and caused banks to deleverage and reduce general lending, which in turn had adverse effects on the real economy (Pozsar, 2008).

## 2. Shadow banking in the European context

Estimates of the size and scope of the shadow banking sector indicate that it is a significant force in the European financial markets, albeit smaller than its US counterpart in terms of share in overall financial intermediation<sup>16</sup>. The presence of shadow banking institutions varies considerably between European countries, a disparity that may be attributed to differing legal and regulatory structures.

The shadow banking systems in both the US and Europe experienced dramatic growth up until the financial crisis, but have since been suppressed by the disruption in financial markets, continued weak economic conditions, and investor mistrust. Certain components of the shadow banking sector are expected to rebound, albeit in different forms as a result of regulatory changes. Money market funds, repo and securities lending continue to carry great importance in short-term financing markets and collateral intermediation. It is also conceivable that securitisation will once again contribute to the financing of loans, should faith in European securitisation markets be properly restored and new regulatory frameworks not be made too restrictive.

For this chapter, the first section will provide a rough aggregate measure of the size of the shadow banking sector within the Euro area. To supplement this broad estimate, the paper will go on to analyse certain shadow banking entities in detail. Securitisation and collateral intermediation will serve as the focus for this analysis, as well as money market funds due to their central position in the on-going discussion on European shadow banking. These entities, along with other ones recognised as part of the overall shadow banking system, are highly heterogeneous. For that reason, securitisation, money market funds, and collateralised funding markets will be examined separately and on the basis of miscellaneous data sources.

This paper will not set out to provide a more comprehensive and accurate approximation of shadow banking than the aggregated measure presented in section 2.1, but rather focus on a detailed study of certain shadow banking institutions. At times, the analysis will only include Euro area countries, as data scarcity and inconsistent statistical definitions make it difficult

<sup>16</sup> See, for instance, (Bakk-Simon, et al., 2012) and Bouveret (2011).

to aggregate and compare statistical data across countries. Much of the discussion will, however, be relevant to other European countries as well.

Issues concerning data availability do not apply only to Europe, but also to the Euro area and other jurisdictions. Financial statistics were not designed with detecting shadow banking in mind, and consequently do not offer sufficient granularity to identify shadow banking activities and the resulting risk exposures. Macroeconomic financial statistics tend to be recorded according to categories based on institutions rather than activities, and data may be collected irregularly and sparsely for some of the institutions involved in shadow banking<sup>17</sup>. The ECB has published flow-of-funds statistics since 1999, but these are not as granular as the US flow-of-funds which allow for a detailed breakdown of shadow banking liabilities (Bakk-Simon, et al., 2012).

Despite the general scarcity of data, detailed statistics on securitisation and money market funds are published by the ECB, industry associations and commercial providers. Comprehensive data on the scale and structure of the European repo and securities lending markets are less available. The remainder of the paper should nevertheless provide insights as to shadow banking's location in the European financial system, and highlight how relevant the activities and risk aspects discussed in chapter one are to the European financial market.

## 2.1 A broad measure of shadow banking

The purpose of this section is to provide a broad measure of shadow banking in the Euro area based on an approach put forward by the Financial Stability Board. Although this approach and others similar to it can serve as approximations of the level of shadow banking activity, the statistical data at hand lack the sufficient breakdown and scope to exhaustively assess the European shadow banking system. The broad measure does capture non-bank credit intermediation, but it also contains institutions that do not fit well with the shadow banking definition (see section 2.1.5).

<sup>17</sup> See ECB (2013) and Bakk-Simon, et al. (2012).



### **2.1.1 Methodology**

The Financial Stability Board has published recommendations on how authorities can monitor shadow banking activities taking place within their respective jurisdictions. The methodology is laid out in a 2011 report, and has subsequently also been applied in the FSB's 2012 and 2013 Global Shadow Banking Monitoring Reports<sup>18</sup>. The approach outlined by the FSB takes a broad view by initially looking at all non-bank credit intermediation, and thereafter focusing on activities that constitute a source of systemic risk or provide opportunities for regulatory arbitrage that is problematic from a financial stability perspective.

The following analysis will adopt the approach proposed by the FSB. The analysis will be limited to the FSB's initial macro-mapping exercise, with the purpose of assessing the relative size of the shadow banking system juxtaposed to the overall financial sector<sup>19</sup>.

The FSB uses the assets and liabilities of other financial intermediaries as a proxy for the size of the shadow banking system. The financial sector is broadly separated into the regulated banking system, central bank(s) and non-bank financial intermediaries (NBFIs). Other financial intermediaries are included in the latter category, but differ from the overall category in that they do not include insurance corporations and pension funds.

### **2.1.2 Data sources**

The ECB collects balance sheet statistics from national central banks belonging to the Eurosystem and publishes the aggregated results. This data is particularly useful when mapping the shadow banking system because it derives from similar reporting procedures and is built on consistent statistical definitions of the various financial institutions. Table 1 provides an overview of the financial sectors as represented in the ECB statistics.

In this section of the paper, the ECB's monetary statistics and Euro area accounts (EAAs) are used to provide a proxy for shadow banking. In the continuation of the thesis, only

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<sup>18</sup> See FSB (2011), FSB (2012c) and FSB (2013a).

<sup>19</sup> See FSB (2011), pages 7-8.

monetary statistics will be used, and then simply be referred to as ECB statistics or ECB data.

*Table 1 Groups of financial intermediaries in the ECB statistics*

<b>Financial institutions</b>	<b>Data source</b>
<b>Monetary financial institutions (MFIs)</b>	Monetary statistics
Central banks (the Eurosystem)	Monetary statistics
Credit institutions	Monetary statistics
Other deposit-taking institutions	Monetary statistics
Money market funds (MMFs)	Monetary statistics
<b>Other financial intermediaries (OFIs)<sup>20</sup></b>	
Investment funds	Monetary statistics
Special purpose vehicles (SPVs) <sup>21</sup>	Monetary statistics
Non-securitisation vehicles	-
Securities dealers	-
Finance companies	-
<b>Insurance companies and pension funds (ICPFs)</b>	Monetary statistics

The monetary statistics record balance sheet data for various financial institutions, while the EAA data gives an overview of the accounts of different financial sectors in the Euro area, including total assets of various sectors. Data from these two sources are, however, not fully comparable.

The monetary statistics and EAAs differ as to which Euro area countries are included in the aggregate figures. The monetary statistics use a changing composition where member countries are only added into the statistics that are produced after they join the euro, while

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<sup>20</sup> The ECB's definition of other financial intermediaries differs from that of the FSB in that it does not include MMFs.

<sup>21</sup> SPVs are referred to as financial vehicle corporations (FVCs) in the ECB statistics.

EAA statistics utilize a fixed composition in which new members are added into the entirety of the statistics together with existing members. The financial sectors in the six countries that have adopted the euro between 1999 and 2013 are fairly small, so the difference between the changing and fixed composition should be quite small (Jackson & Matilainen, 2012).

### 2.1.3 Assessing the size of the Euro area shadow banking sector

Two amendments have been made to the ECB data in order to comply with the FSB approach or for illustrative purposes. In the ECB statistics, money market funds are classified as monetary financial institutions (MFIs) together with credit institutions (a category mainly consisting of commercial banks) and central banks. In accordance with the FSB classifications, MMFs have been included in the estimate for other financial intermediaries (OFIs) instead. Furthermore, hedge funds have been separated from the investment fund category because they are more commonly regarded as a part of the shadow banking system, rather than the investment industry as a whole (for further discussion, see section 2.1.5).

*Table 2 Assets of financial institutions in the Euro area, 2013 Q4*

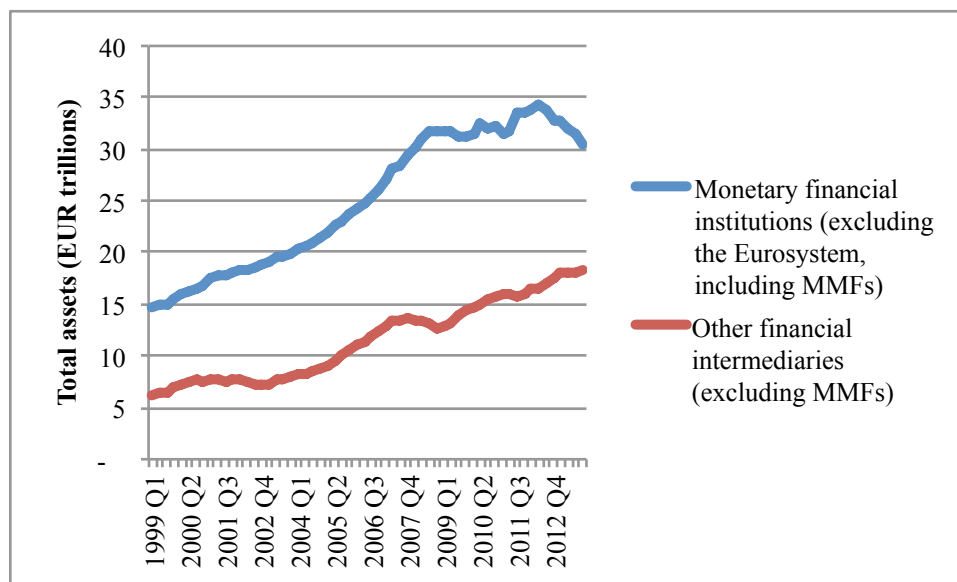
<b>Financial subsector</b>	<b>EUR trillions</b>	<b>% of total</b>
Commercial banks	<b>29.6</b>	<b>52%</b>
Non-bank financial intermediaries	<b>19.1</b>	<b>34%</b>
<i>Money market funds</i>	<i>0.8</i>	<i>1%</i>
<i>Hedge funds</i>	<i>0.2</i>	<i>0.3%</i>
<i>Other investment funds</i>	<i>7.7</i>	<i>14%</i>
<i>SPVs</i>	<i>1.9</i>	<i>3%</i>
<i>Miscellaneous intermediaries</i>	<i>8.4</i>	<i>15%</i>
Insurance corporations and pension funds	<b>8.0</b>	<b>14%</b>
Total assets of the financial sector	<b>56.7</b>	<b>100%</b>

The macro-mapping exercise offers the following results. As of end-2013, the total assets of the Euro area financial sector are estimated to be EUR 56.7 trillion. Within this, other

financial intermediaries (our preliminary proxy for the shadow banking system) accounted for EUR 19.1 trillion, indicating that 34% of financial intermediation activity took place outside the regular banking system.

Separate balance sheet statistics based on the breakdown of financial sectors represented in table 2 have only been recorded in recent years, and therefore cannot be used to demonstrate the development in financial sector assets over time. The statistics do, however, show the development in aggregate OFI and MFI assets from 1999 to 2013 (see graph 1). While MFI assets have doubled since 1999, the assets of OFIs have nearly tripled.

*Chart 1 MFI and OFI assets, 1999 - 2013*



Source: ECB

## 2.1.4 Breakdown of other financial intermediary assets

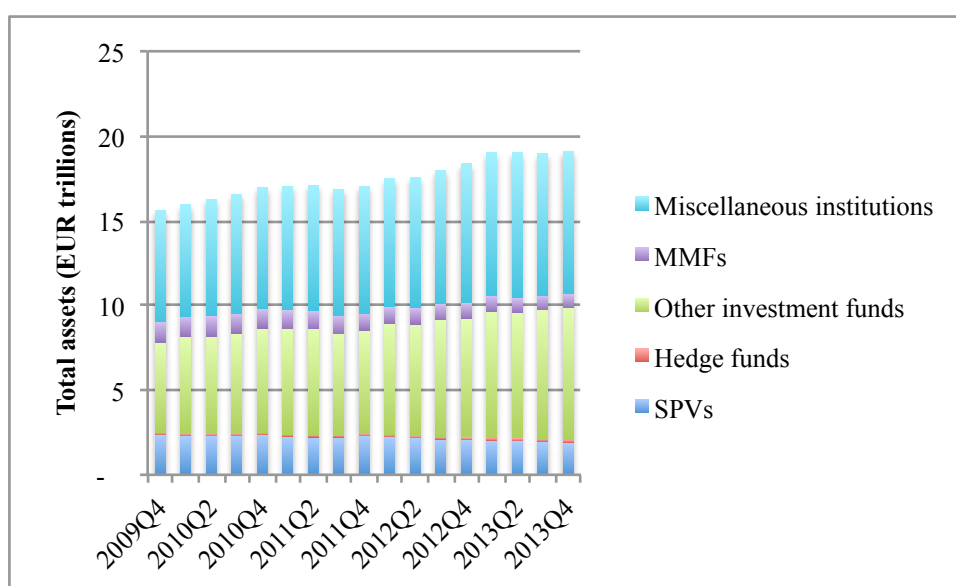
Separate balance sheet statistics can be gathered for money market funds, SPVs, hedge funds and other investment funds, and can serve to give a breakdown of the different non-bank sub-sectors (see chart 2). Since statistics cannot be extracted for sub-sectors such as financial vehicles and securities dealers, this categorisation only provides a limited picture of the sector. Residual assets, belonging to entities that cannot be identified due to a lack of granularity, constitute 44% of total NBFIs assets. Together with “other investment funds”<sup>22</sup>,

<sup>22</sup> Other investment funds are investment funds other than MMFs and hedge funds. These include equity, bond, real estate, and mixed funds.

many of which are likely not to be shadow banking entities, it accounts for more than 85% of assets.

Next to “other investment funds” and assets that cannot be allocated to any specific group of entities, SPVs constitute the third biggest NBFIs sub-sector. SPV assets amounted to EUR 2.4 trillion in 2009 (15%) but have since shrunk to EUR 1.9 trillion (10%). Meanwhile MMFs and hedge funds account for 4% and 1% of assets, respectively.

*Chart 2 Breakdown of the total assets of non-bank financial intermediaries (NBFIs)*



Source: ECB

### 2.1.5 The validity of the broad measure

The above measure may exaggerate the size and importance of the European shadow banking sector. Not all financial intermediaries that are included in the measure fall under the shadow banking definition. Some do not perform credit intermediation, or only to a limited extent (Deutsche Bundesbank, 2014). This holds true for pure equity-based funds and foreign currency trading, but the FSB maintains that they should be included in the measure. This is because investment funds may form part of a credit intermediation chain by

being involved in securities lending, or engage in innovative activities that are not possible to capture in the existing statistical data<sup>23</sup> (FSB, 2011).

In a 2012 paper published by the ECB, Bakk-Simon et al. present a proxy for the Euro area shadow banking system similar to the one in section 2.1.3, except that investment funds other than MMFs are excluded from the measure. They argue that the institutions omitted, except for hedge funds, are mainly regulated investment funds that should not be considered shadow banking entities. A later ECB paper adds that the proxy not only ignores hedge funds involved in credit intermediation (“credit hedge funds”), but also other suspected shadow entities such as private equity funds and exchange-traded funds<sup>24</sup> (ECB, 2013). Real estate investment trusts (REITs), in particular mortgage real estate investment trusts (mREITs), have also been labelled shadow banking entities (IMF, 2013). If “other investment funds” and hedge funds are taken out of the proxy in section 2.1.3, the assets of the alleged shadow banking sector falls from EUR 19 trillion to EUR 11.1 trillion (20% of total financial sector assets).

<sup>23</sup> According to the FSB, the funds may be trading “credit-related financial instruments such as bonds and structured/hybrid financial products as well as related derivatives” (FSB, 2011).

<sup>24</sup> For a discussion on exchange-traded funds (ETFs), see Annex 1.7 in IMF (2011) and Ramaswamy (2011).

## 2.2 The European securitisation market

The European securitisation market, together with the overall global market, expanded rapidly in the years prior to the financial crisis. In the peak years of 2006 and 2007 securitisations outstanding amounted to over EUR 2 trillion<sup>25</sup> in value, but have since contracted and stood at EUR 1.5 trillion at end-2013. The reduction in market size may, however, have been even greater if the European securitisation issuance had not been supported by various monetary policy measures. A majority of issuances are now posted as collateral with central banks, instead of being placed with third-party investors. Consequently, it appears that investor confidence in securitisation has not yet been fully restored. Meanwhile, some central banks have stressed the importance of reviving the European securitisation markets in coming years, as they offer important benefits and have the potential to support economic growth.

### 2.2.1 Data sources

The Association for Financial Markets in Europe (AFME), an industry association, provides quarterly data on securitisation issuances and amounts outstanding. Country-specific figures are based on the country origin of the underlying collateral used in the securitisation, except in the case of CDOs since these tend to use collateral from several jurisdictions. CDOs are therefore assigned to specific national markets according to what currency it is issued in (AFME, 2014a).

The ECB publishes balance sheet statistics of securitisation issuers who are domiciled in the Euro Area, but recordings are only from the end of 2009. The country origin of a securitisation programme, referred to as a financial vehicle corporation in the ECB data, is defined by where it is incorporated. Thus, SPVs that appear in the ECB sample (utilised in the broad measure in section 2.1.3) can be engaging in the securitisation of loan assets located outside the Euro area.

Due to the greater detail and number of years covered compared with other data sets, the AFME data will be applied in the following analysis unless stated otherwise.

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<sup>25</sup> See ECB & BoE (2014a).

## 2.2.2 Background

The US securitisation market was introduced by government agencies in the early 1970s and remains the largest single market globally. In the 1970s, agencies owned or sponsored by the US government purchased pools of mortgage loans and issued asset-backed securities backed by the acquired mortgages. They did so in an attempt to establish a secondary market for securities backed by mortgage assets (Deutsche Bundesbank, 1997). Furthermore, the agencies enhanced the liquidity of these early securitisation markets by guaranteeing the securities they issued (Altunbas et al., 2007). The market eventually developed to include private-label securitisations and expanded rapidly in the 1980s on the back of deregulation, benign economic conditions, and the introduction of the Basel I bank capital requirements<sup>26</sup> (ECB, 2007).

### *Global factors*

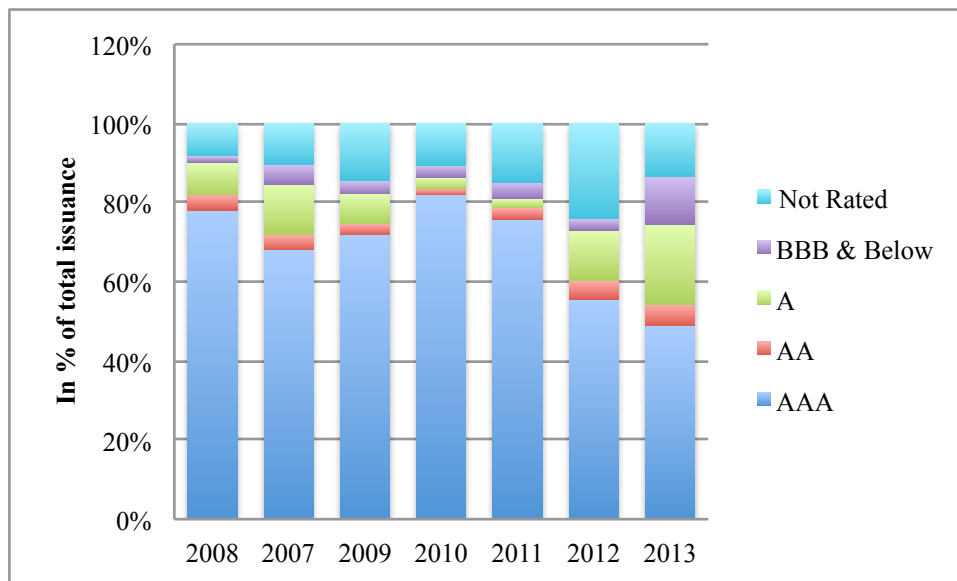
Advances in technology further supported the evolution of this financial innovation. Information technology made it easier and more affordable to bundle and transform loans into securities, and collect and then distribute the associated revenues on to investors. In addition, the increased capability to store and process large amounts of financial data enabled the application of information-intensive pricing models (ECB, 2007). As a result, technology opened up loan origination to finance companies and other intermediaries. Originators could now rely on statistical models to assess credit risk, thereby reducing the advantage banks previously had in this field (Edwards & Mishkin, 1995).

As put forward in section 1.4.3, the growth of the securitisation markets can also be attributed to a low interest rate environment that increased credit growth and caused investors to look for low-risk assets that could offer an attractive yield. Between 1990 and 2006, securitisation vehicles became large suppliers of “safe” fixed-income products. 75% of the securitisations issued worldwide during that period received a AAA-rating, which is comparable to ratings on sovereign bonds and treasury bills (Joint Forum, 2011). Likewise, in 2008, as much as 80% of the European securitisation issuance was rated AAA (see chart 3).

<sup>26</sup> See the previous section 1.4.1 for further details on the Basel I regulatory capital framework and its impact on securitisation.



Chart 3 European securitisation issuance by credit rating, 2008 - 2013



Source: AFME<sup>27</sup>

### ***Banks' incentives for securitising***

There is a popular perception that regulatory arbitrage was not only an initial trigger, but also the key driver for securitisation up until the financial crisis. A majority of the empirical literature on the subject has not been able to source evidence that substantiates this claim<sup>28</sup>. Instead, securitisation appears to be driven by a set of incentives, with funding diversification and cost reduction being the most significant motives (Joint Forum, 2011). Thus, securitisation can be viewed as a genuine funding tool that can provide banks with diversified, low-cost financing (ECB & BoE, 2014a).

First, a portion of the securitised products may receive a high rating that commands relatively lower yields than other funding options. By issuing these securities in the market, banks can attain funding at a lower cost than they normally would have based on the quality of the loan pool and their overall balance sheet (Joint Forum, 2011).

Second, securitisation serves as an alternative financing tool to other sources of funding. By selling off long-dated assets, a bank can receive immediate capital inflows rather than gradually as the loans are repaid (ECB, 2007). By transforming loans into highly rated

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<sup>27</sup> See AFME's "Securitisation Data Report: Q4 2013", retrievable from <http://www.afme.eu/Documents/Statistics-and-reports.aspx>

<sup>28</sup> See Joint Forum (2011) appendix 1 for a review of the literature on this subject.

securities, banks can gain access to new investors or be in a better position to borrow more from existing investors. This ability to attract new or added interest derives from securitised products representing a targeted type of funding, which only gives exposure to a portion of a bank's business (Joint Forum, 2009). A broader range of funding options, in addition to a more diversified investor base, may in turn result in more stable funding for banks (ECB, 2008).

Securitisation can potentially increase the lending capacity of banks by altering the volume and cost of funding available. Access to new and cost-effective funding, as well as an ability to reduce regulatory capital reserves, can be used by banks to grant more loans than under conventional market approaches, which can lead to an increase in the loan supply (ECB, 2008). According to the ECB (2007), it is difficult to quantify the securitisation market's exact impact on the European loan supply in terms of quantity and price. Part of the challenge lies in the scarcity of data, as well as the difficulty of distinguishing between the influence of conjectural and structural factors. An increase in the loan supply may, for example, derive from favourable interest rates, abundance of liquidity and a "search for yield", rather than financial innovations such as securitisation.

### **2.2.3 Developments in securitisation in Europe**

Although securitisation markets in countries such as France and the UK were established in the late 1980s<sup>29</sup>, the overall European securitisation market did not experience significant growth until the end of the 1990s when the euro was introduced as a currency. From then on, the market developed rapidly, especially from 2005 and up until the financial crisis. The European market grew due to global factors such as technological innovation, regulatory capital requirements and low interest rates, but financial integration within the EU also contributed to its expansion (Altunbas et al., 2007).

A paper written by Baele et al. (2004) examines how government and corporate bond markets, amongst other market sectors, were affected by increased financial integration in the Euro area<sup>30</sup>. The introduction of the euro eliminated exchange rate risk within the area,

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<sup>29</sup> See Birouk & Cassan (2013) and Wainwright (2010).

<sup>30</sup> In this ECB Occasional Paper Series, financial integration has been defined as a state where "all economic agents in Euro area financial markets face identical rules and have equal access to financial instruments or services in these markets" (Baele, Ferrando, Hördahl, Krylova, & Monnet, 2004). Securitisation markets were not included in the study.

while policy initiatives further expanded investors' opportunities by opening up for increased cross-border investment. A higher degree of integration may be characterised by markets becoming more developed in terms of volume, diversity and liquidity, which in turn make them more attractive to investors. Also, local debt issues are no longer entirely dependent on the domestic supply of funds. Consequently, loan funding has taken on a more global character wherein foreign investors contribute to financing domestic economies. This trend is evident in the Netherlands, where 13% of residential mortgages were financed by foreign investors through the purchase of securitised products in 2012 (DNB, 2012a).

## **2.2.4 The fallout of the financial crisis**

The current condition in the European securitisation market continues to be influenced by the fallout from the financial crisis (ECB, 2011). Even though European securitisations performed relatively well throughout the downturn period, the market remains affected by poor macroeconomic conditions and general mistrust amongst investors following the crisis.

A sudden and widespread loss of confidence brought US and European securitisation markets to a halt in mid-2007 (Caprio et al., 2008). An unprecedented amount of AAA rated securities became subject to downgrades or defaults, with the latter mainly being concentrated in the US market. US structured-finance issues experienced a 7.7% default rate during the crisis, but the corresponding figure was only 0.95% for Europe (Blommestein et al., 2011). Investors in European securitisations did, however, experience losses, but these were mainly caused by liquidity risk rather than credit risk. While much of the underpricing in the US markets pertained to credit risk, liquidity risk had been inadequately priced in the European market (Blommestein et al., 2011).

Liquidity was withdrawn from the securitisation markets as investors became aware of their increasing vulnerability to incurring losses (Joint Forum, 2009). The inactivity in secondary markets caused prices to tumble, which led to further withdrawals of liquidity. This spiral of evaporating liquidity and downward valuations imposed mark-to-market losses on investors (ECB, 2008). Essentially, the securitisation markets proved to be less liquid than previously assumed when faced with substantial market stress.

The European securitisation market differs from the US in several respects, and these variances may serve to explain why securitised products fared relatively well though the crisis. According to Blommestein et al. (2011), European securitisation has primarily been

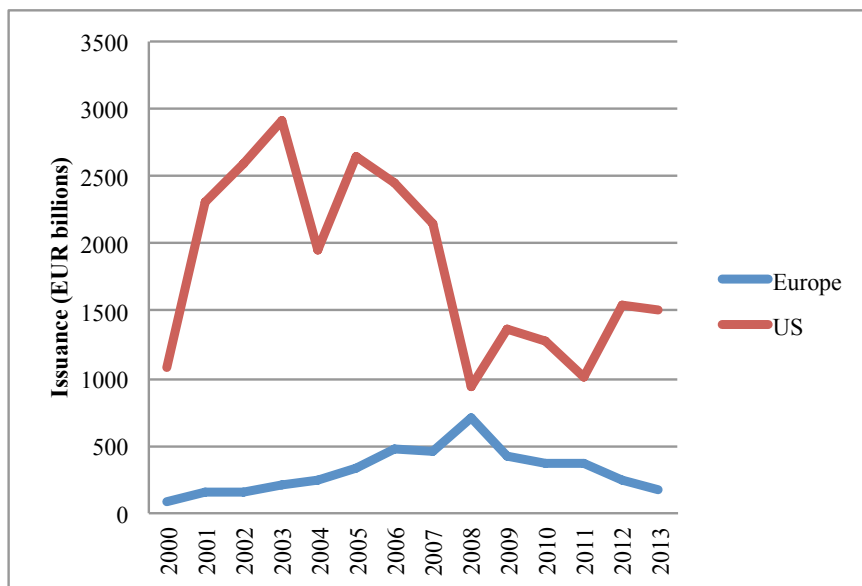
used as a funding technique rather than as a vehicle of regulatory arbitrage. In addition, European banks kept more of the risk exposure on their balance sheet by retaining certain securitisation tranches, which, next to already robust underwriting standards, may have inhibited the securitisation process from becoming as poorly executed as it sometimes did in the US.

Although the European market distributed poor-quality credit risks to a lesser extent than the American securitisers<sup>31</sup>, the European mark-to-market losses, along with events in the global market, undermined investor confidence in securitisation as a whole (Blommestein et al., 2011).

### 2.2.5 Securitisation issuance levels

During 2013, EUR 181 billion worth of securitised products were issued in Europe, a decrease of 75% since the peak of EUR 711 billion in 2008 and a decrease of 28% from the year prior. Both US and European securitisation markets experienced a sharp drop in issuance during the financial crisis, but some market segments have been partly upheld by government support and asset purchase programmes.

*Chart 4 American and European securitisation issuance, 2000 - 2013*



<sup>31</sup> Not all American securitisation activity was poor. Securitisation did indeed enable shadow banks to convert risky subprime mortgages into investments that could be marketed as low risk AAA-rated debt, but subprime securitisation only constituted 10% of the overall US market (Blommestein, Keskinler, & Lucas, 2011). Although subprime lending was not common in Europe (Joint Forum, 2011), it did occur to some extent in markets such as the UK (Wainwright, 2010).

Source: AFME

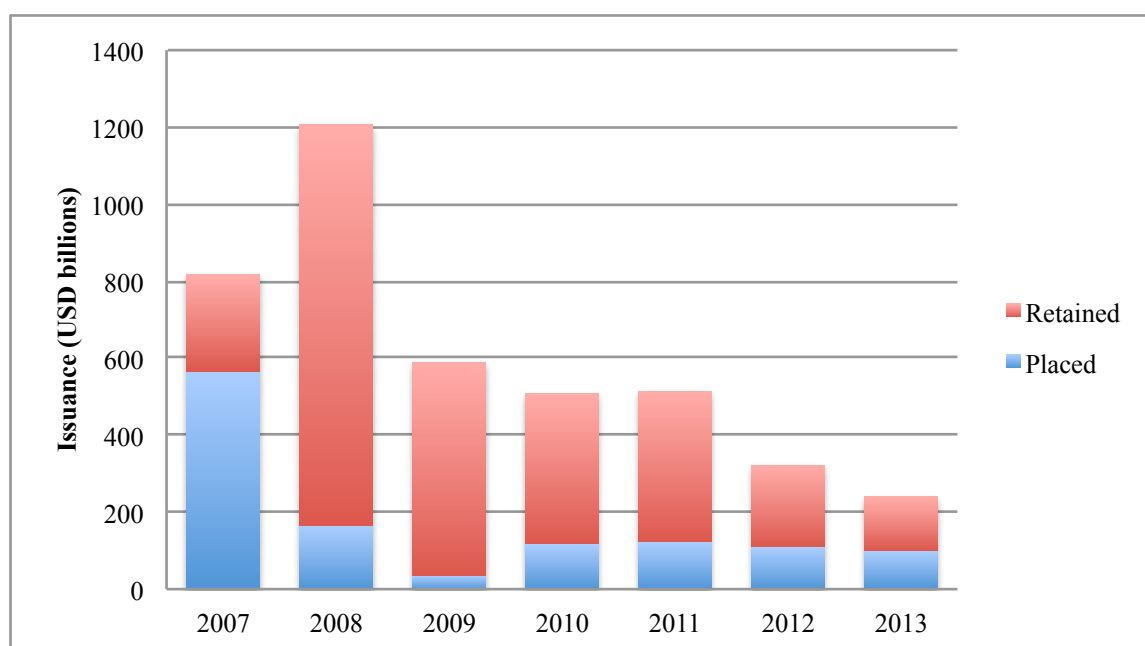
While the US market has been sustained by central bank asset purchase programmes and government-agencies issuing MBSs (known as agency MBSs, amounting to 82% of issuance in 2013), the European market has benefited from the ECB's and Bank of England's (BoE's) monetary policies. In an attempt to lessen the liquidity and refinancing difficulties faced by banks in and outside of the perimeter of distressed Eurozone countries, the ECB and BoE initiated credit operations that provide banks with funding (ECBC, 2013).

Banks that perform securitisation for liquidity purposes retain the securities on their balance sheet rather than selling them in the market. The retained securitisations can subsequently be used as collateral in repo or secured lending with either a central bank or the commercial market participants as counterparts. While ABS products only constituted 11% of the collateral posted with the ECB in 2006, by 2008, it had become the most prominent asset class, accounting for 28% of the collateral held (ECB, 2011). In order to be accepted as eligible collateral for transactions with the ECB or national central banks, the securitisations must fulfil precise criteria pertaining to the underlying assets and a minimum credit rating, amongst other things (ECBC, 2013). The credit operations supply the banks with liquidity, essentially freeing up their balance sheet so they can continue to lend money to the public (Blommestein et al., 2011).

The impact of monetary policy support in Europe can be witnessed from the drop in "placed" issuance, and the corresponding surge in retained issuance. According to the AFME statistics, placed issuance fell from EUR 460 billion to EUR 25 billion between 2006 and 2009, constituting a 95% decline. Placed issuance has, however, recovered to EUR 76 billion in 2013 (58% of total issuance), which can be interpreted as a sign of market recovery (Blommestein et al., 2011).

Securitised products that have been placed with the public have in recent years typically had a short maturity or been backed by high-yielding assets or loans to small and medium-sized enterprises (SMEs) that receive backing from governments or other entities (ECB & BoE, 2014b).

Chart 5 European securitisation issuance, 2007 - 2010 (USD billions)



Source: SIFMA<sup>32</sup>.

## 2.2.6 National securitisation markets

Securitisation volumes have increased in most European countries since the process was introduced (ECB, 2008), but The United Kingdom, the Netherlands, Spain and Italy host about 70% of the overall activity (see table 3). These countries are currently the leading issuers of securitised products in Europe, and have the largest volumes outstanding.

The presence of stringent legal, administrative and regulatory frameworks may affect the expansion of securitisation activity in a given country (ECB, 2008). For instance, the absence of an appropriate framework can result in the sale of securitised assets being more costly, time-consuming and subject to greater uncertainty. Prior to the Italian “securitisation law”<sup>33</sup> being passed in 1999, Italian SPVs were mainly incorporated abroad due to legal impediments on Italian companies issuing securities in excess of their share capital and a requirement to pay withholding tax on interest paid to foreign investors. The securitisation

<sup>32</sup> See SIFMA’s “European Structured Finance Issuance and Outstanding” statistics, retrievable from <http://www.sifma.org/research/statistics.aspx>.

<sup>33</sup> Law no. 130 of April 1999 (Mourant, 2002).

law provided a simple and precise framework in which Italian SPVs could operate, and its introduction was thereby followed by a growth in securitisation activity in Italy (Mourant, 2002).

*Table 3 Issuance and outstanding volume by country, 2013 Q4*

<b>Country</b>	<b>Issuance</b>		<b>Outstanding</b>	
	EUR	%	EUR	%
<b>The United Kingdom</b>	33 bn	19%	437 bn	29%
<b>The Netherlands</b>	39 bn	21%	263 bn	18%
<b>Spain</b>	27 bn	15%	184 bn	12%
<b>Italy</b>	27 bn	15%	179 bn	12%
<b>Sum above countries</b>	127 bn	70%	1,063 bn	71%
<b>Total European Market</b>	181 bn		1,503 bn	

Source: AFME.

Although a law passed in the late 1980s in France allowed for the establishment of securitisation programmes, it was not until 2008 that assets other than bank loans with a minimum two-year maturity were allowed to be securitised<sup>34</sup>. The recently passed legislation opens up for trade receivables and insurance risks to be used as collateral, and permits re-securitisation and the employment of a wider array of securitisation techniques (Birouk & Cassan, 2013).

In the UK, the passing of the 1986 Financial Services Act opened up the mortgage market to originators other than building societies, which previously had a monopoly on issuing mortgages. This precipitated the rise of “centralised lenders”, which funded their loan business with securitisation techniques instead of deposits (Wainwright, 2010).

Legal and regulatory frameworks may further impact whether it is economically desirable to securitise certain assets. Banks may wish to securitise residential mortgages (the most considerable securitised product type in the overall European market) in order to transfer prepayment risk, a term used to explain the risk of the mortgage being repaid prematurely by

<sup>34</sup> Act 88-1201 of 23 December 1988 and the Order of 13 June 2008.

the borrower, to third parties in the capital markets. The motive to do so will be less in countries where borrowers are discouraged from prepaying through early repayment fees or other penalties (ECB, 2008).

Developments in the underlying credit markets may also serve to explain the presence of securitisation. Residential mortgage-backed securities (RMBSs) accounted for 54% of all European issuance in 2006, and although the figure has now dropped to 36%, it is still the European market's most prominent asset class. ECB (2008) therefore proposes that development in a country's RMBS segment can serve to explain why some countries have more active securitisation markets than others.

The Netherlands and Spain are the markets most dominated by RMBSs. In the Netherlands, RMBS stood for 95% of the outstanding volume and 99% of issuance in 2013. According to the ECB (2008), the fact that mortgage lending growth rates have outpaced the growth in deposits in these countries, have caused banks and other lenders to look to the securitisation markets for funding.

This claim is supported by De Nederlandsche Bank<sup>35</sup>. According to the central bank, the Dutch bank system's mortgage lending is larger than what deposits alone are able to accommodate. With domestic loans exceeding domestic customer deposits by EUR 500 billion as of 2012, Dutch banks are dependent on foreign deposits, and to a large extent, market funding. Parts of the strong growth in mortgage lending can in turn be linked to the country's generous tax relief on mortgage interest payments.

### **2.2.7 Asset classes**

Initially, the majority of securitised products were backed by homogeneous, consumer-related assets but with time, the variety of underlying asset classes in the European market increased.

Securitisations based on a uniform pool of assets are less prone to informational asymmetries and therefore enable investors to assess the value of the underlying portfolio more accurately and thoroughly (ECB, 2008). These characteristics apply to RMBSs that are based on high-

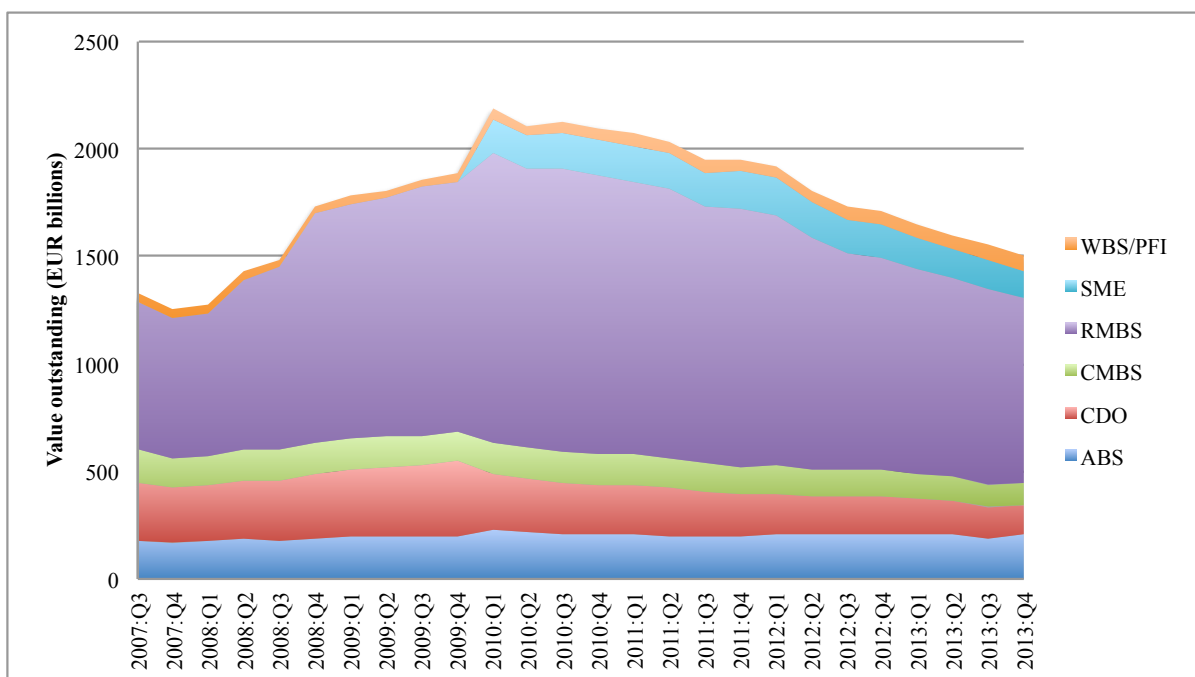
<sup>35</sup> See DNB (2012b).



quality collateral. The RMBS segment has typically been the largest of all European securitisation categories, and as of today, constitutes a majority of the outstanding volumes in the four main domestic markets.

At the end of 2013, the value of European securitised debt outstanding was EUR 1.5 trillion, 21% of which were securities issued in the peak years of 2006 and 2007. RMBSs have remained the most prominent asset class, totalling 58% (EUR 866 billion) of all securitisation outstanding at the end of 2013.

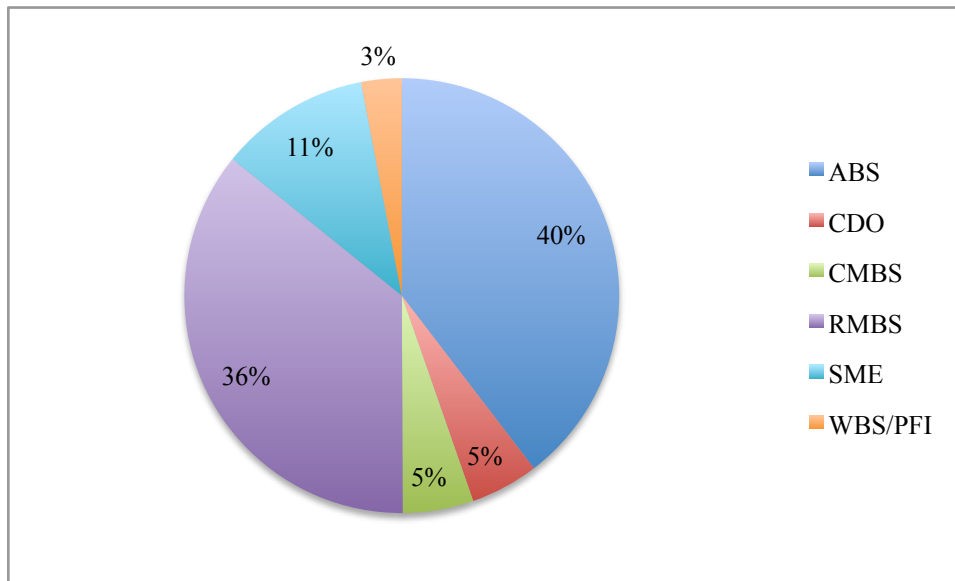
*Chart 6 European structured finance outstanding, 2007 - 2013*



Source: AFME.

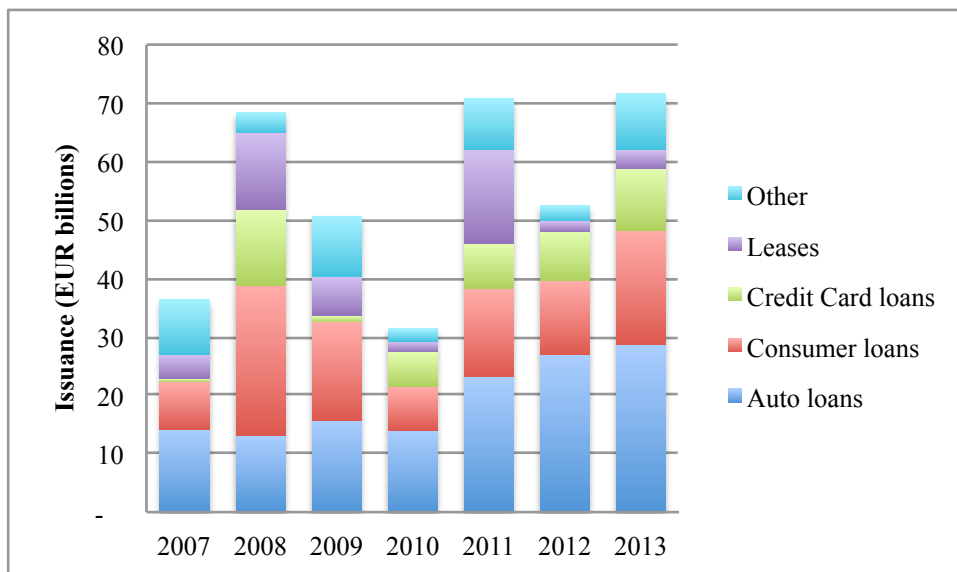
Asset-backed securities are the second most important asset class, and have been issued in excess of RMBSs in 2013. While Italy and Spain have the largest volumes outstanding (28% and 15% of the overall European volume), ABSs have dominated securitisation products' issuance in Italy (81%) and the UK (77%) in 2013. Out of the current ABS issuances that are placed in the market, a majority tend to be relatively short-dated ABS, typically with a two to five year maturity, and backed by either auto loans or consumer loans (see chart 8) (ECB & BoE, 2014a).

Chart 7 European securitisation issuance by asset class, 2013 Q4



Source: AFME

Chart 8 European ABS issuance by collateral, 2007 - 2013



Source: AFME

SME loan securitisations, the second biggest category in terms of issuance, have mainly been concentrated in the core markets such as Spain, Germany and Italy. Issuance of SME securitisations has been fostered by government support programmes in Italy and Spain<sup>36</sup>, aimed at increasing the lending to a sector that provides a majority of new job creation while

<sup>36</sup> National guarantee programmes include the FTPYME and FTGENCAT programmes in Spain, as well as the FCGMPI programme in Italy (ECB & BoE, 2014a).

being vulnerable due to its dependency on bank funding (AFME, 2013). Securitisation can provide SMEs with indirect access to the capital markets. It may also prove to be a more stable source of funding because the resulting risk transfer transaction makes banks' lending decisions less dependent on the business cycle (ECB & BoE, 2014a). The development of a SME sector in other domestic securitisation markets may, however, be inhibited by the fact that SME loans are a heterogeneous asset class consisting of small loans for which little consistent, performance-related data exists (ECB, 2008). These characteristics can make it difficult for issuers to evaluate the underlying loan collateral based and achieve sufficiently large transactions.

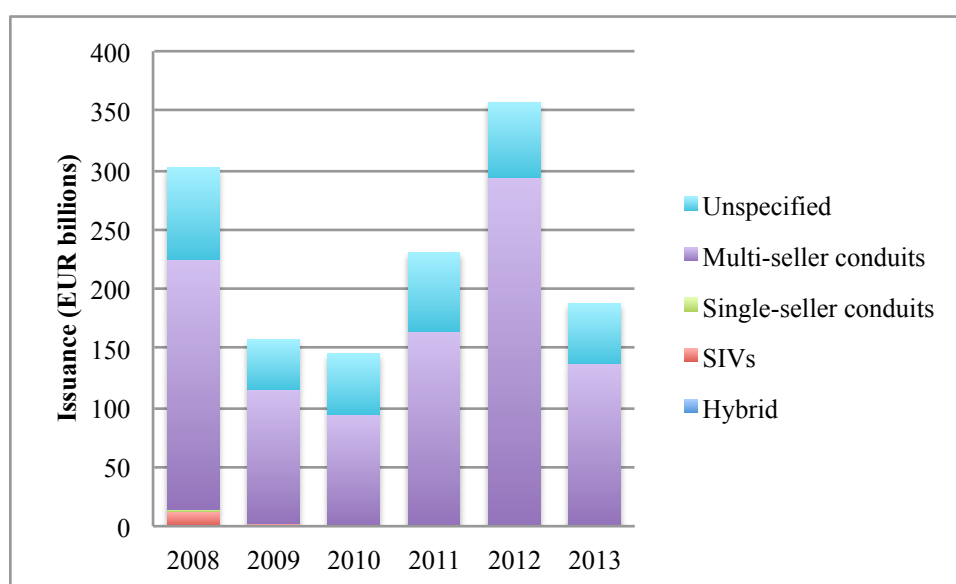
The Spanish government encourages SME lending by guaranteeing SME securitisations that fill certain criteria (ECB, 2011). The European Investment Fund (EIF) (2010) also attributes the expansion in Spanish SME securitisations to the relative importance of SMEs in the economy, as well as strong growth in GDP and lending to SMEs prior to the financial crisis (EIF, 2010). In 2013, European Investment Bank (EIB) and European Investment Fund (EIF) launched a European-wide scheme to purchase SME ABS tranches or issue guarantees (ECB & BoE, 2014b).

### **2.2.8 ABCP markets**

The ABCP market had an outstanding value of EUR 125 billion in 2008 (the US market was seven times bigger at the time) but declined to EUR 48 billion by 2010 (ECB, 2011). The level of issuance and outstanding volumes are concentrated outside the major securitisation markets, namely in Ireland, France and Germany.

Special purpose vehicles that run ABCP programmes include single-seller conduits, multi-seller conduits, securities arbitrage conduits, and structured investment vehicles (SIVs). SIVs proved to be particularly vulnerable to market value fluctuations and rollover risk during the financial crisis, and have mostly been discontinued or restructured since the crisis (see chart 9) (Joint Forum, 2009). According to the ECB (2011), European banks currently prefer to issue this form of commercial paper in the US market where there is more investor interest for ABCP.

Chart 9 European ABCP issuance by securitisation vehicle, 2008 - 2013



Source: AFME.

## 2.2.9 The outlook for the European securitisation market

In a 2014 joint paper, the ECB and BoE call for a rebound of the European securitisation market, stating:

“if appropriately structured and regulated, [securitisation] can complement other long-term wholesale funding sources for the real economy, including for small and medium-sized enterprises (SMEs). Furthermore, if a sufficient share of the overall ABS issuance were publicly placed, this could translate into a diversified funding source for banks and potentially transfer credit risk to non-bank financial institutions, thereby providing capital relief that could be used to generate new lending to the real economy” (ECB & BoE, 2014b).

In the short-term, a rebound of the securitisation markets is impeded by cheap alternative funding, uncertainty about future regulations, unfavourable economic conditions that weaken the performance of underlying loan collateral, and a low demand for loans that limit the amount of collateral available for securitisation (ECB & BoE, 2014b).

Steps have been taken by European nations and the European Union to promote a more simple and transparent securitisation process. The rules that have been implemented are meant to realign incentives along the securitisation chain and reduce information asymmetries and mispricing of risk (ECB & BoE, 2014b). The new legal frameworks may, however, be viewed as overly conservative compared to legislation on other wholesale

funding techniques. In addition, the laws tend not to distinguish between high-quality securitisation (having a simple and transparent structure) and more complex and opaque securitisation structures. Proposed liquidity and capital requirements for banks and insurance companies may also cause a significant part of the investor base to allocate funds away from securitisation and into alternative categories such as corporate and covered bonds<sup>37</sup> (Blommestein et al., 2011) (ECB & BoE, 2014b).

According to the Joint Forum (2011), market participants expect that markets will only rebound to half of their pre-crisis levels due to the disappearance of complex securitisation products and high-risk securitisation vehicles such as SIVs<sup>38</sup>.

Despite the securitisation markets having inflicted an unexpected amount of losses on investors due to non-performing loans, price declines, and the drying up of liquidity in secondary markets during the financial crisis, this form of shadow banking activity can be beneficial when applied properly. Intermediating credit in this manner does admittedly involve creating bank-like risks, but its systemic implications may be subdued if the market is focused on constructing standardised and transparent products. With proper risk transfer and sufficiently liquid securitisation markets, this process has the potential to produce high-quality assets that can add to the supply of collateral to support transactions in the financial markets. Securitisation can also provide European banks with several funding-related benefits, and open up the market for finance companies representing an alternative to bank lending.

<sup>37</sup> As laid down in the proposed Basel III capital and liquidity requirements for banks and in the EIOPA Solvency II capital requirements for insurance companies (Blommestein, Keskinler, & Lucas, 2011).

<sup>38</sup> Joint Forum's interviewees included "investors, originators, sponsors, attorneys, trustees, accountants and credit rating providers - who had been active in the market in 2006 and 2007" (Joint Forum, 2011).

## 2.3 Repo and securities lending in Europe

Repo and securities lending markets have gained in importance since the turn of the millennium, and are now critical to the functioning of the European financial system. Increased risk aversion following the financial and Euro area sovereign debt crises has magnified an on-going shift towards collateralised funding, despite credit terms in secured lending markets having been tightened. Most repo transactions are collateralised with government bond collateral, and the use of securitised products has diminished. Bilateral CCP repos, which is a safer alternative to regular bilateral arrangements, continue to capture market share in the repo market. Cash reinvestment is less prevalent in Europe than the US, while rehypothecation is largely unrestricted under the current regulatory regimes.

### 2.3.1 Data sources

There is limited public availability of statistical data related to securities lending and repo. For repo, sources include the ECB's Euro Money Market Survey (ESCB survey) and ICMA European Repo Council's semi-annual European Repo Market Survey<sup>39</sup> (ERC survey).

The ESCB survey is based on flow data and does not primarily display absolute volumes. Instead, trends and structural developments in the money market are indicated by using data indexed to the 2003 turnover level. It is an annual survey that includes aggregate turnover data from the second quarter (Q2) of each year. 161 banks, which account for much of the trading volume in the money market, participated in the 2013 survey. 105 of these partake in a constant panel which the contributions allow for longer-term analysis.

The ERC survey collects data on the size and composition of the European repo market and publishes absolute outstanding levels. As of 2013, 64 European financial institutions participated in the survey of which a majority were banks. Non-bank financial institutions and non-financial institutions are also important participants in the money market but their transactions are likely to be with or via banks, which indicates that their activities are captured in the above surveys (Westwood, 2011).

<sup>39</sup> For data on the UK money market, see BoE's biannual "Sterling Money Market Survey", available at <http://bankofengland.co.uk/publications/Pages/other/mmlg/default.aspx>. For information on data on other European markets, see (FSB, 2013c), Annex 7.

Both the ESCB survey and the ERC survey use data that omit developments and trends in the market outside of the sample period. While ESCB reports aggregate volumes for the second quartile of each year, the ERC survey measures the stock of transactions on two specific days a year. The surveys can thereby miss peaks and troughs, which may have been especially prevalent due to the volatility witnessed in money markets following the financial crisis (ECB, 2012). In addition the surveys consist of gross figures, causing transactions between a pair of survey participants to be counted twice. According to ERC, the scale of double counting from aggregating repo and reverse repo transactions is likely to be too small to carry much significance (ICMA, 2013a).

The results found in the ESCB and ERC surveys cannot be directly compared not only because one offers flow data while the other publishes stock data, but also because their methodologies and samples differ. For example, the ERC survey includes non-bank financial institutions as respondents and collects data on transactions with all types of counterparties (including customers). The ESCB survey, on the other hand, focuses entirely on interbank transactions<sup>40</sup>.

Commercial providers collect global data on securities lending, but the data does not allow for a geographical breakdown and is not currently available to the public (FSB, 2012a). The FSB has, however, displayed data from some of these providers<sup>41</sup>. The ESCB survey includes securities lending against cash collateral in its sample for the secured segment of the money market, while the ERC survey accounts for securities lending conducted from repo desks. None of the surveys do, however, offer much detail on securities lending.

### **2.3.2 Background**

Repo transactions were first introduced in 1918 as a means for the US Federal Reserve to lend money to banks, and are still used for this purpose by central banks around the world (Acharya & Öncü, 2013). In general, the growth of repo markets can be attributed to factors such as the expansion of government debt markets, an increase in market-making activities and trading strategies involving short-sales, hedging, and derivatives (Choudhry, 2010).

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<sup>40</sup> For more information on the differences, see ECB's "Euro money market study December 2012", annex 3.

<sup>41</sup> See (FSB, 2012a), annex 2.

According to the ECB (2002), the early growth of the European repo markets can be attributed to three factors in particular.

First, repo transactions served as a way for banks to reduce their regulatory capital through a reduction in credit risk exposure. When lending money via the repo markets banks replace the credit risk that would normally arise in an unsecured lending transaction with the risk of the collateral received (ECB, 2002). Repo collateral is subject to market, credit (the issuer of the securities defaulting) and liquidity risk. These risks are relevant to the lender because they impact the recovery value the lender can collect from selling the collateral assets in case the borrower should default. The risk attached to the collateral is, however, thought to be lower than the counterparty risk in an unsecured transaction (ECB, 2002). Thus, replacing unsecured lending with repo lending may result in lower capital charges (Choudhry, 2010).

Secondly, the overall financial markets have demonstrated a preference for limiting credit exposures, in part due to heightened awareness of counterparty risk after incidents such as the failure of Barings bank in 1995 (Choudhry, 2010). Although unsecured funding was the largest component of the money market in the early 2000s, a survey conducted by the ECB in 2000 recorded a preference for repo when lending at longer maturities (Santillán et al., 2000). Since then, the repo market has grown to become the largest segment of the euro money market. Although this trend has also been present in other money markets, it has been particularly prevalent in Europe.

Thirdly, the financial integration following the introduction of the euro in 1999 further enabled the repo market to develop in terms of size and structure. The establishment of a common currency in the Euro area induced a harmonisation of market and risk management practices, and steps were taken to fortify legal frameworks governing repo transactions. For example, rules ensuring a proper “transfer of title” that protect the cash borrower in case of insolvency contributed to the further integration of European repo markets. Increasingly stringent rules and standardisation efforts not only benefited cross-border transactions, but also transactions within domestic repo markets (ECB, 2002).

### **2.3.3 Recent market developments**

The activity and structure of the euro money market has changed in the wake of the financial crisis, and in this respect, the Euro area sovereign debt crisis and the Eurosystem’s monetary policy have been of particular importance.



The Euro area sovereign debt crisis raised concerns about the creditworthiness of euro area banks. Although sovereign bond yields had been increasing following the collapse of Lehman Brothers in September 2008, the late-2009 Greek sovereign debt crisis sparked a sudden increase in the interest rate demanded by investors (De Santis, 2012). Investors were concerned that several Euro area countries would not be able to service or refinance their government debt, and the effect this could have on other European countries. Certain banks held large amounts of Euro area sovereign debt, which left them exposed to losses in the case of debt restructuring or a sovereign default. The failure of such banks could have adverse consequences for an unknown number of other banks, as the specific extent of interbank exposures was unclear. Consequently, the fear of bank failures of an unknown magnitude caused the sovereign debt crisis to spill over to the European banking system (Allen & Moessner, 2013). Banks situated in countries such as Greece, Ireland, Italy, Portugal and Spain became burdened with increased sovereign risk premiums and struggled to attract funding (De Santis, 2012).

The financial and sovereign debt crises were followed by a contraction in interbank lending due to higher perceived counterparty risk (Allen & Moessner, 2013). Increased risk aversion caused unsecured funding to be carried out at shorter maturities than before, and part of the lending activity shifted to secured funding markets or was supplied by central banks (ECB, 2012).

There had been a continued trend of increased turnover in the secured lending segment prior to the crisis, but now, due to the heightened risk aversion, repo lenders became more cautious about what collateral to accept and which counterparties to enter into repo transactions with (ECB, 2012). A working group established by the Committee on the Global Financial System<sup>42</sup> (CGFS) has identified the move towards secured funding to be particularly prominent in the European banking system. Yet, the overall trend varies considerably between banks according to what jurisdiction they are in, as well as the market structures which are prominent in their respective segment and the business model they adhere to (CGFS, 2013).

<sup>42</sup> CGFS, a committee made up of senior officials of various central banks, monitors and examines issues related to the stability of financial markets and the global financial system.

Finally, the Eurosystem's credit operations have reduced European banks' need for interbank and market funding (ICMA, 2014). In response to the financial and sovereign debt crisis central banks belonging to the Eurosystem as well as other central banks in Europe, introduced unconventional monetary policy measures to provide the banking system with liquidity. In the Euro Area, the Eurosystem's Longer-Term Refinancing Operations (LTROs) reduced the banks' current dependency on the interbank market and other funding sources<sup>43</sup>. In doing so the ECB took on an intermediating role whereby they supplied banks with stable, long-term funding. This has resulted in ample liquidity, with excess liquidity rising from EUR 100 billion at the end of 2010, to more than EUR 775 billion at the end of 2012 (ECB, 2012).

### **2.3.4 The euro money market**

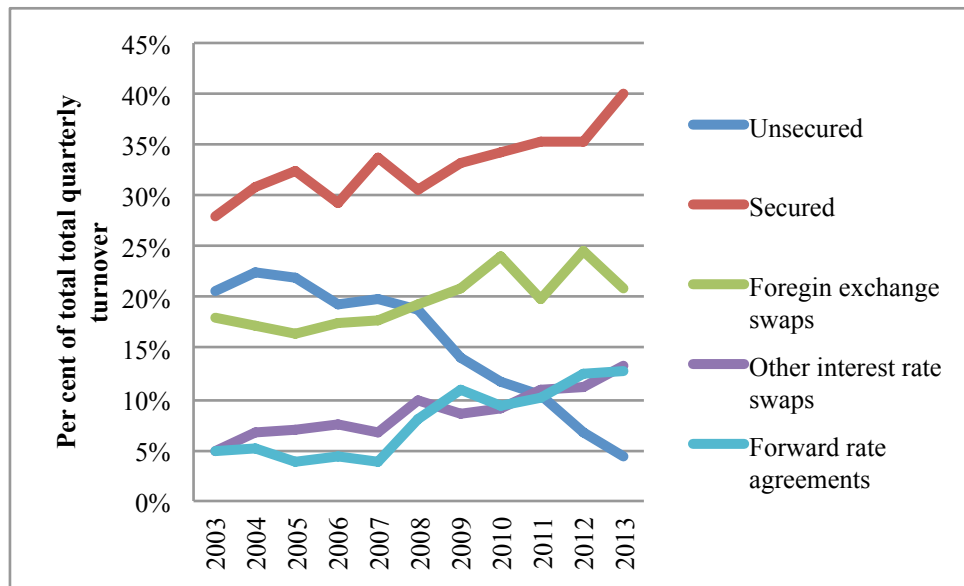
The euro money market comprises euro-denominated instruments used for short-term borrowing, investment and trading, carrying a maturity of one year or less. In the second quarter of 2013, the aggregate turnover in the euro money market stood at EUR 75 trillion<sup>44</sup>. This represents a 3% expansion in the money market, following an 18% decrease between 2011 and 2012.

The repo market has emerged as the largest component of the euro money market, accounting for 40% of the transaction volume in 2013 (see chart 10). Other notable segments are made up of short-term derivatives, namely foreign exchange swaps (21%), interest rate swaps (13%) and forward rate agreements (13%). The unsecured market segment contracted to EUR 3.2 trillion in 2013, a 34% reduction compared to the previous year. The unsecured segment used to comprise a majority of euro money market transactions, but its share of the overall transaction volume has dropped from 22% in 2006, to 4% in the second quarter of 2013.

<sup>43</sup> LTROs with a maturity of six months were first introduced in March 2008, and have since been expanded to offer one and three years maturities (ECB, 2012).

<sup>44</sup> These figures are based on the 2013 ESCB survey, which sampled information from 161 banks. The figures are therefore not representative of the total euro money market, but do reveal significant trends.

Chart 10 Segments of the euro money market, 2003 - 2013



Source: The ESCB 2013 survey

### 2.3.5 The repo market

According to the ESCB survey, the repo segment (repo and reverse repo) grew by 17% to EUR 30 trillion between 2012 and 2013, and is thereby approaching the turnover level witnessed in the second quarter of 2011 (see chart 11).

According to the ERC survey, which records data for the European repo market, the total value of secured transactions outstanding on the books of the 68 institutions participating in June 2013 was EUR 6 trillion<sup>45</sup>. Although this represents an 8% increase from the previous year, corresponding results from later that year in December 2013 show that outstanding volumes have come to a four year low at EUR 5.5 trillion<sup>46</sup>. Thus, even though volumes picked up in mid-2013 (as indicated by the ERC survey), stocks at the end of 2013 demonstrated that values were 11.4% below those witnessed in late 2011. It is, however, important to note that the ESR survey does not include central bank intermediated repos in its data material and that repo books tend to contract at year-end<sup>47</sup>. For comparison

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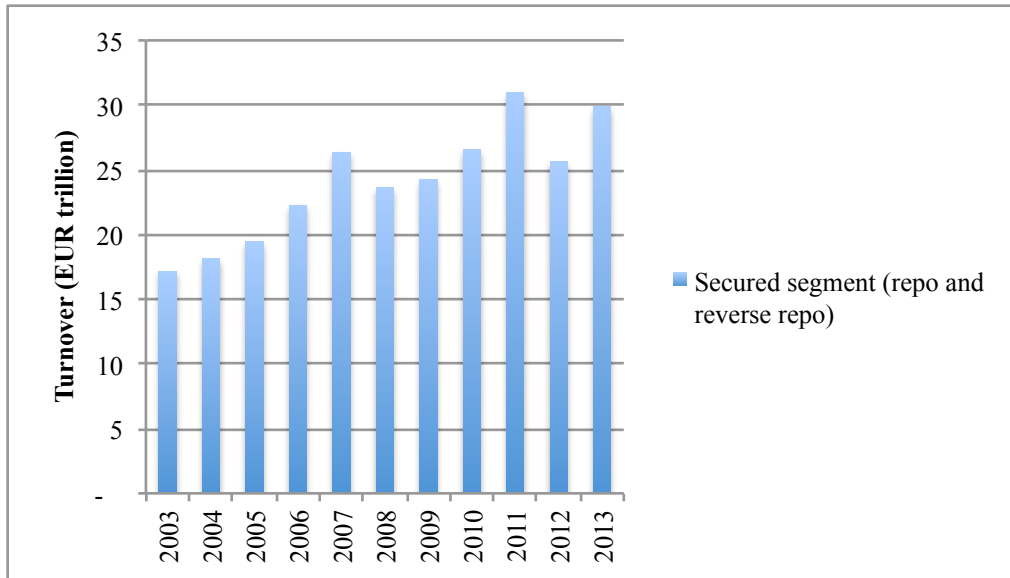
<sup>45</sup> The ERC survey does not include repo transactions that are part of the monetary policy operations of central banks.

<sup>46</sup> The number of participating institutions has increased from 2012, which impacts the numbers. For institutions that have participated in all surveys the three previous years, outstanding volumes dropped by only 8% (ICMA, 2014).

<sup>47</sup> Repo books usually contract at year-end, and perhaps even more so in 2013 in light of ECB offering lending to cover seasonal funding shortages.

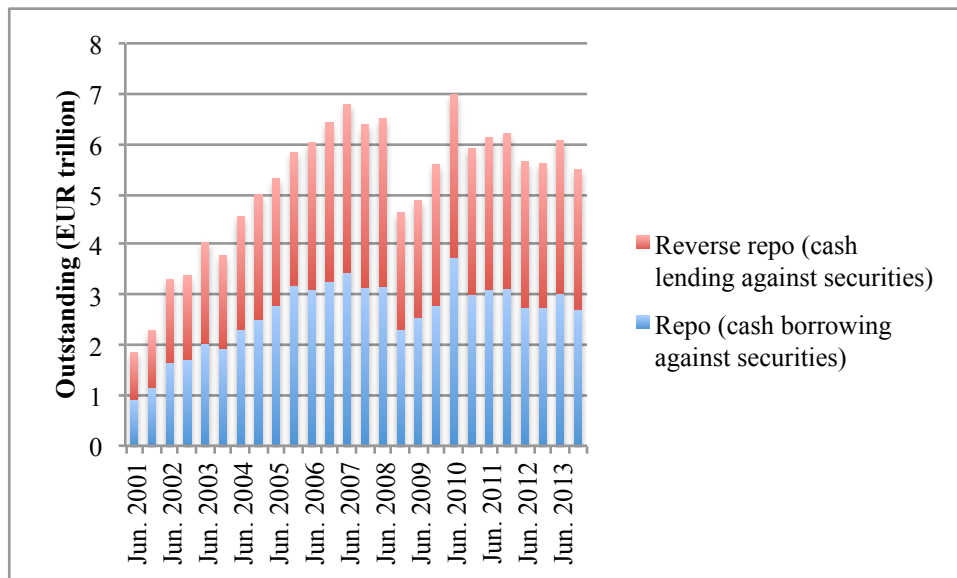
outstanding volumes reached a 4.6 trillion low in 2008, following the pre-crisis 2007 peak of 6.8 trillion (see chart 12).

*Chart 11 Quarterly turnover in secured cash lending and borrowing, 2003 - 2013*



Source: ESCB 2013 survey.

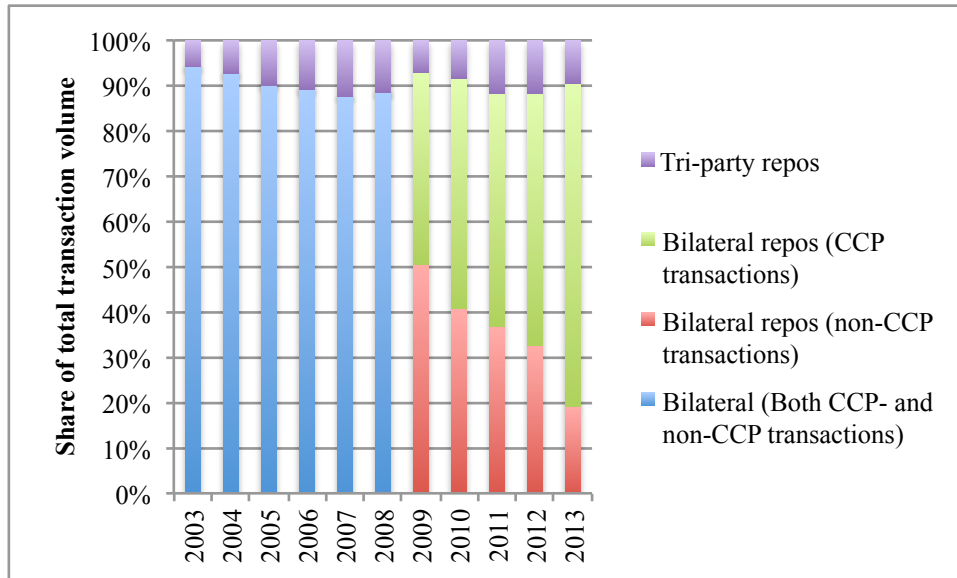
*Chart 12 Secured transactions outstanding, 2001 - 2013*



Source: ERC December 2013 survey.

The bilateral repo segment is the most prominent market segment in the European repo market, accounting for 90% of transaction volumes in the second quarter of 2013 (see chart 13). Since the ESCB survey started collecting more detailed information on bilateral repos in 2009, the data has shown an increased preference for transactions cleared by a central counterparty (CCP).

*Chart 13 The European repo market, 2013 Q2*



Source: ESBC 2013 survey.

Bilateral CCPs are repos settled through a clearing house. The central counterparty structure reduces the credit risk exposure of the parties involved by acting as a AAA-rated, low-risk counterparty (ICMA, 2013b). Clearing houses also offer benefits in terms of netting out repo and reverse repo transactions of individual counterparties, resulting in a lower net exposure and thereby a larger risk reduction than market participants could have achieved through regular bilateral transactions. This can in turn lower or eliminate the regulatory capital charges applicable to the transaction.

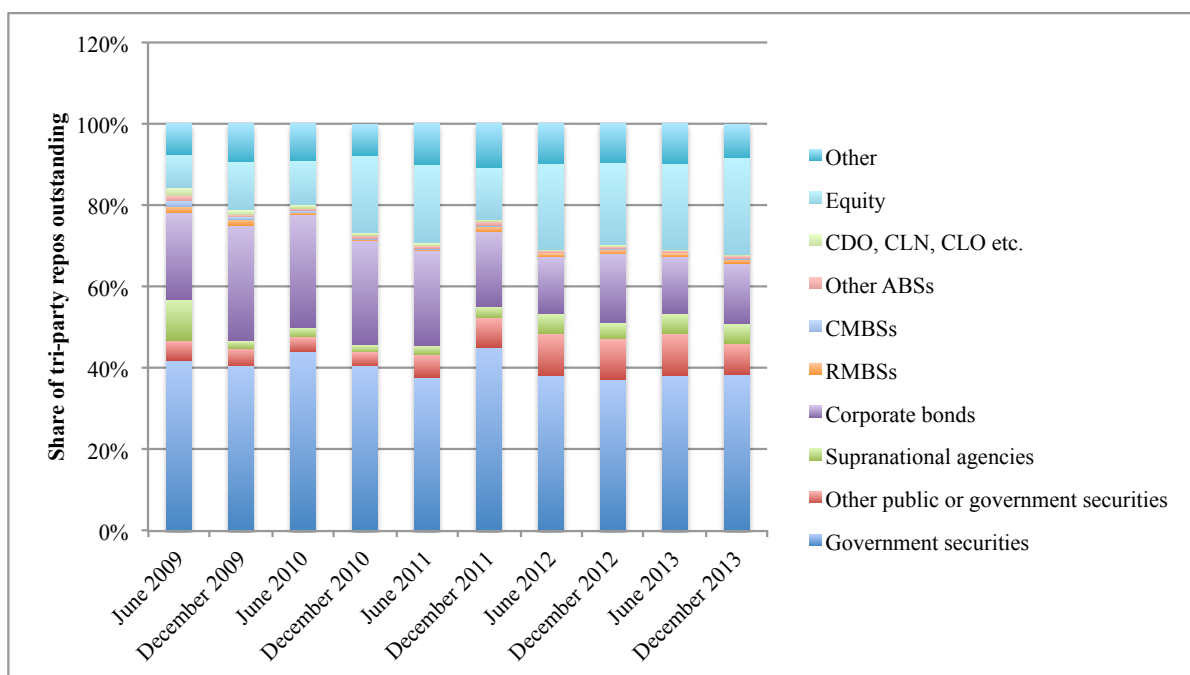
Some of the growth in CCP-cleared repos can be traced to more European banks joining the international repo platforms, but the increase can also be explained by heightened concerns about counterparty risk (ECB, 2012). For instance, according to ICMA, there are indications that Italian banks increased their use of CCPs in 2013 when political instability gave rise to concerns about the banks' creditworthiness (ICMA, 2014).

The tri-party repo market has remained relatively small in the European context, accounting for about 6% to 12% of transaction volumes from 2003 to 2013 (see chart 13). It did gain in

importance prior to the financial crisis, and has resumed its expansion in later years. The European tri-party market is, however, fairly small compared to the US market, where tri-party repos account for 50% of the overall repo market.

Previously, the tri-party counterparties tended to use less liquid collateral such as corporate bonds and securitised products. After the financial crisis, however, higher-rated, non-corporate securities such as government bonds are substituting other types of collateral to an increasing extent (ECB, 2012). In addition, market participants in both the tri-party and bilateral segments discriminate more between asset classes than before, resulting in a larger spread in the haircuts charged on various asset classes. Bakk-simon et al. (2012) see these developments as demonstrating a “flight to quality” by investors following the crisis. As of 2013, nearly 40% of tri-party collateral recorded by the ERC survey was government securities, with 37% and 30% of the collateral pool being rated AAA and AA respectively (see chart 14). For comparison, government bonds accounted for 81% of the EU-originated collateral used in the overall repo market in 2013 (ICMA, 2014).

*Chart 14 Tri-party repos by type of collateral, 2009 - 2013*

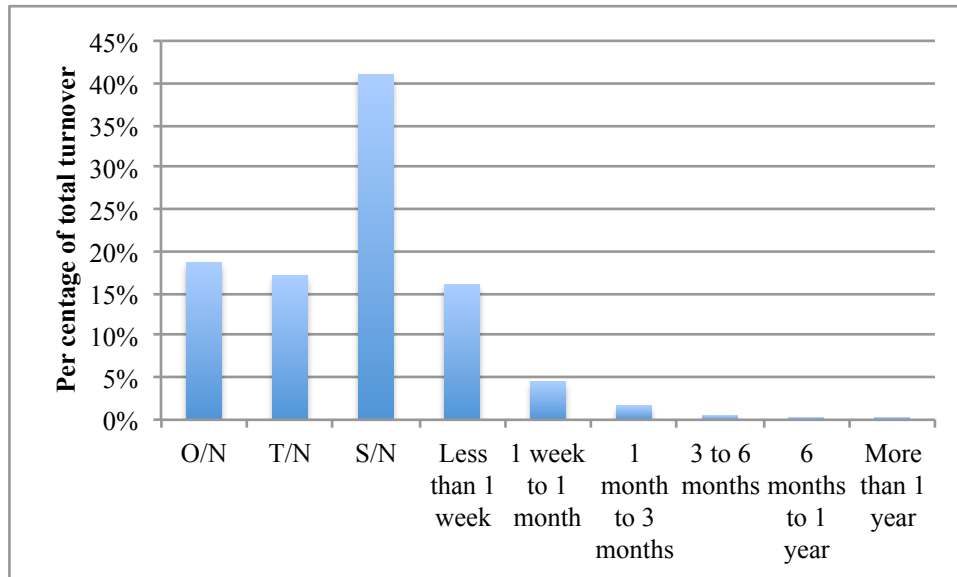


Source: Data only available in ERC surveys conducted from June 2009 and on.

Repo trading activity is mainly concentrated at shorter maturities, with maturities exceeding one week only accounting for 7% of total turnover (see chart). When looking at outstanding repo volumes, longer maturities (exceeding one month) do in fact account for 42% of repos,

while the corresponding figure in terms of turnover is only 3% (ICMA, 2014). Compared to the repo market, the unsecured deposit market operates with even shorter maturities; 76% of all activity is conducted at overnight maturities.

*Chart 15 Maturity of aggregated turnover in secured transactions, 2013 Q2*



Source: ESCB 2013 survey.

The ERC December 2013 survey provides a geographical breakdown of electronic repo trading. Repos cleared over automatic trading systems constitute approximately 32% of the volume of repos reported to the ERC, and out of this, 26% were with domestic parties, 18% with Euro area countries, and another 40% were agreements with foreign counterparties from outside the Euro area. The remaining quarter of the electronic repo trading was cleared through central counterparties, and therefore anonymous. In all the reported repo transactions, 66% of the cash exchanged was denominated in euro, while US dollars (15%), pound sterling (10%), and Japanese yen (5%) were the other major currencies traded.

### **2.3.6 Securities lending**

The securities lending market emerged as the size and trading activity of securities markets grew. In spite of it initially being introduced in the United Kingdom, securities lending was mainly developed in the US before taking on a more international character in the 1980s as US broker-dealers and banks expanded globally (Faulkner, 2010). At the onset securities lending was used by market makers to cover delivery and settlement failures, but as new trading strategies emerged it came to support various arbitrage strategies, derivatives trading,

hedging and short sales. The market experienced rapid growth in the 1990s, as regulatory and structural barriers were removed in a number of jurisdictions, meanwhile technological advances enabled even more trading strategies to be established.

The ERC survey publishes data on participants' repo desk business that can be broken down into repo and securities lending and borrowing. However, this should not be considered an exhaustive measure. In 2006 to early 2008, securities lending and borrowing accounted for 19% to 22% of total repo desk business. Following the Lehman Brothers bankruptcy in September 2008, this figure hit a then record-low of 12.5% in the December 2008 survey, a contraction that was larger than the 26% contraction witnessed in the repo markets. The share fluctuated in the following years, but reduced sharply again in 2012 and now stands at another record-low of 9.9%<sup>48</sup>. The ERC survey states that the reason for the most recent contraction is unclear.

Transactions in the securities lending market are predominantly bilateral, with agent lenders or asset managers lending securities to a broker-dealer acting as a principal intermediary on behalf of smaller institutions (Dive et al., 2011).

### **2.3.7 Repo and securities lending as sources of systemic risk**

As with the overall shadow banking system, repo and securities lending are intermediation arrangements that may be particularly vulnerable to market stress. Uncertainty about collateral values and heightened counterparty risk can precipitate a sharp increase in haircuts and result in certain collateral types to becoming ineligible for funding purposes. This, together with a general withdrawal of liquidity by repo investors, can disrupt the liquidity in these short-term financing markets.

The vulnerability of short-term financing markets is mainly rooted in their inherent short-term nature, procyclicality and the interconnections they create. Haircuts and marking-to-market valuation cause repo and securities lending arrangements to be highly procyclical, leading to a build-up of leverage in good times and abrupt deleveraging during a market downturn. A rise in haircuts in 2008, together with a tightening of other lending terms, led to

<sup>48</sup> See the ICMA European Repo Committee's European Repo Market Survey for 2006 – 2013, available at <http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/repo/latest/>.



deleveraging and a contraction in the supply of secured financing<sup>49</sup> (CGFS, 2010). Interconnectedness, which will be treated in greater detail below, creates channels for contagion that transmit problems to other parts of the financial system.

### ***Interconnectedness***

Repo and securities lending can result in exposures that extend beyond that of the two original counterparties when collateral is reinvested or employed in other, unrelated transactions. Despite its associated benefits, rehypothecation, collateral reuse and cash reinvestment create chains of counterparty exposure that can threaten financial stability (Dive et al., 2011). The longer these chains are, the greater the number of institutions that can be adversely affected by market stress transmitted through the network of financial transactions. For instance, issues experienced at one institution can raise concerns about the counterparty risk posed by not only this institution, but also others that are exposed to it. The interconnectedness may impact a broad set of entities, especially if the risk exposures are opaque and hard to identify (Dive et al., 2011).

### **Rehypothecation and the re-use of collateral assets**

Rehypothecation and collateral reuse, from here on referred to as rehypothecation, can give rise to unexpected counterparty exposures. First, rehypothecation may delay or prevent the recovery of collateral in the event of default. If a collateral asset has been pledged in several trades and by various institutions along the chain, these institutions may find that, in reality, their positions are not collateralised at all since it is unclear who should receive the collateral in case of default. Therefore, the institutions' positions are not as secure as intended because they remain exposed to third-parties they have not entered into any explicit agreement with (Monnet, 2011). Second, concerns about one institution's creditworthiness can spread to other institutions along the chain due to the exposure, possibly aggravating their funding position (CGFS, 2010).

Chains of counterparty exposure not only have the potential to translate into financial difficulties for broker-dealers and the institutions involved, but can also impact the liquidity in the markets they trade in. If broker-dealers experience difficulties in obtaining funding

<sup>49</sup> The maximum leverage available in repo and securities lending markets depend on the level of haircut, what collateral is considered eligible at the time, and other credit terms (CGFS, 2010).

their ability to conduct market-making activities is impaired, which in turn can result in reduced liquidity in equity and bond markets (Dive et al., 2011).

Regulation of rehypothecation differs between countries. In the US, Federal Reserve Regulation T and SEC Rule 15c3-3 limit the extent to which a broker-dealer can rehypothecate client assets. A broker-dealer may only rehypothecate an amount up to 140% of the client's liability to the brokerage. In the UK, there is no such restriction, and this also seems to be the case in the rest of Europe (Singh & Aitken, 2010).

### **Cash reinvestment in Europe**

Cash reinvestment is practised in European securities lending markets, but to a lesser extent than in the US. According to Dive et al. (2011) cash is widely used to collateralise such lending arrangements in US markets, while bonds and equities tend to be the preferred collateral in European transactions. As of 2011, nearly 90% of securities loans were collateralised by cash, and the corresponding figure for Europe was approximately 15%<sup>50</sup>.

Prior to the financial crisis, some agent lenders had pursued higher returns through longer-dated, riskier investments, often on request from beneficial owners (CGFS, 2010). Since then reinvestment programmes have been downsized as securities lending has decreased and beneficial owners have become more aware of the risks involved. Cash reinvestment schemes have largely become more conservative, with beneficial owners paying greater attention to the investment strategies being followed. Using a sample of US cash reinvestment programmes Dive et al. (2011) demonstrate that investments in money market instruments has increased from 54% in the second quarter of 2007 to 73% of total cash reinvestment in the second quarter of 2011. Meanwhile, the share of asset-backed securities has fallen from 26% of investments to 6%.

<sup>50</sup> See chart 2 in Dive et al. (2011).

## 2.4 The European money market fund industry

### 2.4.1 Introducing MMFs

#### *Essential functions and types of MMFs*

Money market funds are open-ended, meaning that they can sell an unlimited amount of shares or units to investors who decide to invest in the fund. Open-ended funds are obligated to buy the shares or units back, effectively redeeming the investors on demand. This stands in contrast to closed-end funds that raise a fixed amount of capital by issuing shares, which are then traded in secondary markets (Godfrey et al., 2010). MMF shares or units, from here on only referred to as MMF units, must be repurchased at either the net asset value (NAV) price or a constant price depending on the kind of fund it is. Variable NAV funds (VNAVs) repurchase units at their net asset value, which is defined as the value of total assets, net of liabilities, per unit outstanding. Constant NAV funds (CNAVs), on the other hand, aim to redeem investors at a fixed value of EUR 1 per unit<sup>51</sup>.

MMFs offer almost instant liquidity and pay dividends that generally reflect money market rates. Their investors include households (more commonly so in the US), as well as institutional investors and corporate treasuries which use them as a cash management tool (Tucker, 2010).

Institutional cash pools, originating from institutional investors and corporates, seek principal preservation (i.e. safety), liquidity and a return that fulfils fiduciary responsibilities<sup>52</sup> (Pozsar, 2011). Managers of these cash pools not only intend to avoid excessive exposure to a single bank because placing money above the EUR 100,000 deposit insurance limit can entail taking an unsecured position, but also because they depend on banks for a multitude of other services and products that result in additional exposure.

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<sup>51</sup> Or a unit in any other currency denomination.

<sup>52</sup> Institutional cash pools are defined by Pozsar (2011) as "large, centrally managed, short-term cash balances of global non-financial corporations and institutional investors such as asset managers, securities lenders and pension funds".

Money market funds, albeit investing in both secured and unsecured money market instruments, can serve as an attractive placement alternative by offering liquidity and a higher degree of diversification across securities, issuers and countries (Pozsar, 2011) (Bengtsson, 2013). MMFs can also offer benefits to retail investors, notably in the form of competitive market-based rates on cash holdings, presenting a temporary placement option, or serving as a safe investment in times of market turmoil (IOSCO, 2012a).

MMFs aim to limit their exposure to market, credit and liquidity risk that could compromise the net asset value of a fund. They do so by investing in high-quality, short-term debt instruments that present minimal default risk, such as government paper, certificates of deposits, repos, and commercial paper (IOSCOa, 2012). They may also invest in soon-maturing long-term assets such as ABCP and floating rate notes<sup>53</sup> (Ansidei et al., 2012). Money market funds typically hold a significant portion of their assets in highly liquid instruments so that they can meet expected redemption requests. Finally, they try to diversify their portfolio holdings by limiting exposure to any single issuer. Essentially, a MMF seeks to lend out money in a way that ensures it maintains its objective of being a low-risk and low-return investment product.

### *Origin of the European MMF industry*

The first money market fund was created in the US in 1971 as a response to the regulatory capping of demand deposit rates. Regulation Q limited the interest rate commercial banks were allowed to pay on demand deposits, and MMFs were consequently introduced as an attractive alternative to bank deposits that could offer market rates above the rates set out in the regulation (Tobias & Ashcraft, 2012). Although they initially gained popularity among retail investors by offering competitive market rates that the banks could no longer provide, MMFs eventually also came to serve as an alternative placement option for institutional cash pools looking to limit their credit exposure to any single bank (IOSCO, 2012a). MMFs were essentially a financial innovation that filled a niche by specialising in short-term instruments (Cook & Duffield, 1979). By the time Regulation Q expired in 1986, MMFs had gained momentum as an investment vehicle and their assets under management continued to grow in the following years.

<sup>53</sup> Maturity refers to the period of time for which a financial instrument remains outstanding. Upon the maturity date, the instrument will cease to exist and the principal is repaid, plus any applicable interest to the lender.

The European MMF industry originated a decade later, driven by many of the same reasons. In Europe, money market funds were first established in France in reaction to the regulatory restrictions on the interest paid on deposit accounts (Le Coz, 2009). Klapper et al. (2004) have also attributed the strong presence of money market funds in European countries such as Greece, Italy, Spain, Portugal and Norway to similar deposit rate regulations that were in place for an extensive period of time in these locations.

MMFs have since then developed to become an integral part of the financial system. They supply banks, companies and governments with low cost short-term financing, while offering safe, liquid placements to large corporate and institutional cash pools, as well as other investor funds (IOSCO, 2012a). Please refer to section (2.3.2) for a more thorough recount of the development of the major domestic MMF markets in Europe.

### *Portfolio valuation methodologies*

MMFs mainly invest in money market instruments, for which recent or reliable trading or quoted prices are not always available (IMMFA, 2013). In the absence of market prices, MMFs must estimate fair prices that serve as an approximation to the true market values. This can be achieved through mark-to-model valuation techniques, such as yield curve pricing, or amortised cost accounting (PWC, 2014). VNAVs only apply amortised cost accounting for instruments with a maturity of less than three months, and otherwise use observed market prices or model-based pricing. CNAV, on the other hand, use amortised cost accounting to value their entire investment portfolios.

CNAV are able to maintain a stable NAV because they use amortised cost accounting to price their units. The accounting method linearizes the value of a given asset over its lifecycle so that it maintains a stable value. Any premium or discount is added to the acquisition cost in a linear fashion until maturity. When maturity is reached, the asset is valued at par (CESR, 2007).

Although the amortisation method may be a useful approach in the absence of readily observable values, it may be perceived as opaque by unit holders and can result in incorrect pricing. While the amortisation method may be appropriate for money market instruments that have a short maturity and limited sensitivity to market factors, it can lead to mispricing when applied to longer term instruments that are more sensitive to interest rate movements and credit risk (CESR, 2007). Discrepancies can be significant in the event of abrupt changes

to interest rates or credit risk, in which case the amortised method perhaps no longer serves as a good approximation for the market price. Consequently, regulatory frameworks in both Europe and the US contain specific requirements on what type of funds can use this valuation method, and the kind of instruments it can be applied to (IOSCO, 2012a).

### *EU regulatory framework for MMFs*

Due to recent regulatory advances, a pan-European definition has emerged to define the type of investment funds which qualify as money market funds. Previously, there was no commonly agreed-upon definition, and the resulting disparity in regulation gave rise to a heterogeneous European MMF industry with varying investment strategies and risk profiles (Baklanova, 2012). Money market funds are classified as collective investment undertakings (CIUs) and are regulated by either the UCITS Directive (2009/65/EC) or the national law of EU member state (CESR, 2010). They are classified as CIUs because they run collective investment schemes that utilise funds raised from the investor public, with units being redeemed or repurchased from the fund's assets at the holder's request<sup>54</sup>.

New guidelines introduced by the European Securities and Markets Association (ESMA, previously known as CESR) in 2011, distinguish between "short-term money market funds" and "standard money market funds"<sup>55</sup>. Funds need to satisfy certain criteria to fall into a given category, and European funds that do not satisfy either of the sub-category requirements can no longer label themselves as a money market fund. After the guidelines took effect in 2011, a significant number of funds that were previously marketed as MMFs have been renamed and migrated into other fund categories (ESRB, 2013).

The common guidelines are meant to improve investor protection, so that investors can be assured that funds which are domiciled or sold in the European Union and market themselves as MMFs, have capital preservation and liquidity as their main objectives (CESR, 2010). In addition, the guidelines are designed to ensure that funds within the MMF industry are sufficiently stable and have an appropriate liquidity profile to withstand redemption pressures (European Commission, 2013a).

<sup>54</sup> See Directive 2009/65/EC Of The European Parliament And of the Council (13 July 2009) OJ L302/32, Chapter 1.

<sup>55</sup> Standard money market funds are simply referred to as Money Market Funds in the legal works, but will in this paper be labelled standard money market funds, an expression which is also currently being used by the European Commission.

According to the guidelines, short-term money market funds must operate with a very short weighted average maturity and weighted average life, while standard money market funds can operate with a longer weighted average maturity and weighted average life<sup>56</sup> (CESR, 2010). The maturity and life measures address a fund's interest rate sensitivity and credit risk, respectively. Both sub-categories must however comply with the following guidelines:

1. Their primary investment objective

- A MMF seeks to maintain the fund's principal value
- A MMF pursues a rate of return that is in line with the interest rates on money market instruments

2. Their investments

- A MMF invests in assets that comply with the criteria for money market instruments set out in UCITS Directive 2009/65/EC, or in bank deposits.
- A MMF that does not have a "UCITS passport" may invest in other high quality assets but must ensure that the liquidity and valuation of these assets are assessed consistently with the provisions laid out in the UCITS Directive<sup>57</sup>.
- A MMF must invest in high quality assets. It is up to the fund to assess the quality of an instrument, but they must consider key factors such as
  - the credit quality of the instrument (must have attained a high credit rating or be of comparable quality),
  - the nature of the asset class represented by the instrument,
  - the operational and counterparty risk inherent in structured financial instruments, and
  - the instrument's liquidity profile

3. Liquidity and transparency criteria

- A MMF must provide daily subscription and redemption of funds
- A MMF must provide daily NAV and price calculation

<sup>56</sup> Weighted Average Maturity (WAM) refers to the average time to maturity of all the underlying securities in the fund weighted by their respective proportion on the funds assets, while Weighted Average Life (WAL) weighs their remaining "life", simply defined as the time until a security's principal value is repaid (CESR, 2010).

<sup>57</sup> The UCITS legal framework seeks to establish a single pan-European funds industry where funds qualifying for UCITS-status can market themselves across the EU, thereby possessing a "EU passport". Non-UCITS follow the national law in the country they are domiciled.

In addition, the two sub-categories face different restrictions on the maturity of individual instruments, as well as to the weighted maturity and life measures of the overall portfolio. Short-term MMFs must maintain a maximum portfolio WAM and WAL of 60 and 120 days respectively, while standard MMFs can maintain WAM and WAL of 6 months and 12 months or less. Short-term MMFs must limit their investment in instruments that mature in over 397 days, and standard MMFs to investments in instruments with a residual maturity of 2 years or more<sup>58</sup>.

The guidelines pertaining to short-term MMFs are more conservative, but in return they can choose to impose a constant NAV. Consequently, both CNAV and what is known as “short-term VNAV” funds can be categorized as short-term MMFs.

Standard money market funds, on the other hand, are only permitted to have a fluctuating NAV, and are therefore always VNAVs.

*Table 4 Euro area monetary aggregates, December 2013*

<b>Aggregate</b>	<b>Components</b>	<b>EUR billions</b>
M1	1.1 Currency in circulation	910
	1.2 Overnight deposits	4,487
	M1 (1A + 1B)	5,396
M2	2.1 Deposits with an agreed maturity of up to two years	1,690
	2.2 Deposits redeemable at notice of up to three months	2,121
	M2 (M1 + 2.1 + 2.2)	9,207
M3	3.1 Repurchase agreements	119
	3.2 Money market fund shares/units	418
	3.3 Debt securities with a maturity of up to two years	87
	M3 (M2 + 3.1 - 3.3)	9,831

Source: ECB

The ECB considers MMFs to be part of the money-creating sector along with commercial banks and central banks. In Euro area monetary statistics, units issued by Euro area MMFs and held by Euro area citizens are classified as a component of the broadest monetary aggregate M3 due to their resemblance to bank deposits in terms of liquidity and capital

<sup>58</sup> The reader is advised to refer to “CESR’s Guidelines on a common definition of European money market funds” (2010) for a complete representation of the guidelines that took effect in 2011.



certainty (ECB, 2010). MMF units and bank deposits are regarded as substitutes because they share limited risk, high liquidity and low return characteristics. M3 includes an array of bank deposits, ranging from transaction deposits to deposits that are redeemable within a three-month notice at most, or have a maximum two-year maturity. Although MMF units cannot be seen as a complete substitute to transaction deposits, they carry close economical resemblance to less liquid deposits. MMF units typically generate a higher return than transaction deposits, and cannot accommodate immediate transaction needs like these deposits do. MMF units can, however, be sold within a couple of days, normally without incurring fees.

### ***Risks inherent in MMFs***

Although MMFs propose to be a safe investment option offering instant redemptions, capital preservation, and a high degree of diversification, they are subject to much the same market risks as other investment funds. In particular, they are exposed to interest-rate, credit and liquidity risk (IOSCO 2012 a). A change in interest rates impacts the market-based yields that MMFs obtain from investing in money markets, while credit downgrades or defaults on instruments in a MMF portfolio can adversely affect the price and liquidity of these investments. If the liquidity of a MMF's investments deteriorates, perhaps because of market turmoil and pricing difficulties, the overall liquidity of the total portfolio will be reduced. Relatively small losses caused by these risks may, however, be enough to send the value of the fund below the EUR 1 NAV objective.

Consequently, even though MMF assets predominantly have a short maturity and are of good quality, price fluctuations may still occur, especially during stressed market conditions. A price decline in the assets in which MMFs are invested can lead to investor runs, contagion to banks and other entities reliant on short-term funding, and finally, financial instability.

## **2.4.2 The systemic importance of European MMFs**

### ***European MMFs in the financial crisis***

Since their introduction in the 1970s and up to the 2007-2009 financial crisis, MMFs were thought to have a stabilizing effect on the financial system (Ansidei et al., 2012). This was in part due to empirical evidence that demonstrated MMFs normally received capital inflows during times of financial volatility and market turmoil, rather than experiencing outflows

like the ones seen during the recent crisis (Bengtsson, 2013). Up until 2007, they had provided markets with relatively stable funding and had not been subject to any large-scale investor runs. Yet, research conducted by Moody's (2010) indicates that the industry may have been more troubled than what was formerly assumed. The study exhibits that historically, 146 American and European MMFs have been dependent on sponsor support in order to maintain a stable unit value and prevent investor runs. This figure grew to 200 funds as of end-2009, in the wake of the financial crisis.

In the run up to the financial crisis, MMFs had begun investing in riskier assets such as ABCP issued by special purpose vehicles, which were thought to be relatively safe at the time (Bengtsson, 2013). This was particularly true for "enhanced" or "dynamic" MMFs (referred to as enhanced MMFs hereafter) that pursued a higher return than regular MMFs by investing in riskier assets<sup>59</sup> (European Commission, 2013b). At the time, ABS instruments enjoyed regular income streams, had a low default risk, could be sold in liquid secondary markets and had rarely suffered downgrades (Bengtsson, 2013). This changed in 2006 and 2007 when certain ABS products became subject to an unexpected rate of defaults and delinquencies in the underlying loan markets. The deterioration in collateral quality caused credit rating agencies to issue downgrades and ABS markets to drop. A portion of the MMFs' portfolios now became increasingly illiquid due to falling prices or even difficulties in obtaining prices for such products (European Commission, 2013b).

McCabe (2010) and Jeffrey & Gandia (2013) have demonstrated that MMFs which took on additional portfolio risk compared to that of their peers faced larger redemption pressures during the financial crisis. Most European MMFs did, however, have little or no exposure to subprime-related ABS instruments but some faced escalating redemption requests nonetheless. At the earliest stages of the crisis, MMFs that had large exposures to subprime products were indeed the ones experiencing withdrawals<sup>60</sup>.

Redemption pressures did eventually spread to more conservative MMFs because the funds were not as transparent as previously thought, especially when subject to financial

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<sup>59</sup> Enhanced MMFs can no longer market themselves as money market funds within the European Union because their investment strategies conflict with the guidelines laid out by ESMA (Aboulian, 2010).

<sup>60</sup> Fein (2013) has argued that the withdrawals during the financial crisis should not be viewed as an investor run, but rather as reallocation of funds, where "the action reflected prudent investor behavior under unprecedented circumstances".

turbulence. This made it difficult for investors to distinguish between funds with high and low quality assets, causing conservatively managed funds to be affected, too (Bengtsson, 2013).

The Luxembourg-domiciled asset management group, AXA Investment Management, ran two enhanced MMFs, which had 40 per cent of their assets under management (AuM) invested in subprime mortgage products. Although the particular ABS instruments they invested in were not subject to defaults or payment issues, the funds experienced large investor withdrawals (Bengtsson, 2013). German enhanced MMFs also received redemption requests even though they had little money invested in subprime-related securities, and the investments they did have in subprime had been issued before the particularly troubled 2006 ABS vintages. As market conditions deteriorated, investors increasingly sought redemptions from funds that had no exposure to troubled assets (Bengtsson, 2013). While few funds actually closed, the majority of those that faced withdrawals had to rely on sponsor support to continue operating.

Even as the financial crisis came to an end, some MMFs continued to experience difficulties. The low interest rate environment following the ECB's 2012 interest rate cut caused the return on short-term debt instruments to drop. The return decline made it challenging for some CNAV funds to preserve their unit value, and as a consequence, new subscriptions were suspended. Other funds let their NAV float by valuing units at their market value or reducing the number of units outstanding (ESRB, 2013).

### ***European MMFs and financial stability***

The issues in the European MMF industry that were brought to light in 2007 and 2008 have been attributed not only to risky investments, but also to a lack of transparency that inhibited investors from assessing the security and liquidity of their investments (Bengtsson, 2013). Problems experienced by the MMFs were not contained within the industry, but instead crossed over to the already troubled banking sector and short-term funding markets, exacerbating problems there. The close links that MMFs have with banks and corporate entities can create channels of contagion that make them systemically relevant. MMFs' vulnerability to runs is therefore a source of systemic risk that can impact the broader financial markets.

**Susceptibility to runs**

As previously stated, the underlying assets in a MMF portfolio are vulnerable to price movements. A price decline can, especially during stressed market conditions, make it difficult for a fund to preserve the value of its MMF units and fulfil redemption requests immediately. In order to redeem investors, money market funds need to draw upon their bank deposits or sell asset holdings. Initially, funds tend to sell liquid assets that are less affected by the unfavourable market conditions or for which they can obtain a fair price (European Commission, 2013b). If redemptions continue, less liquid assets must be sold, which can result in substantial portfolio losses and consequently an inability to pay investors in full.

The presence of a “first-mover advantage” incentivises investors to withdraw their funding (ESRB, 2013). This is particularly true for CNAV funds since they promise to redeem units at a constant price. Investors that redeem CNAV units early-on, while liquidity conditions are still favourable, generally receive the promised NAV even though the market value of assets is lower than total par value of the units. This results in capital losses being transferred to remaining unit holders that may suffer from redeeming their assets later on through not receiving the full par value.

The first-mover advantage is also present in VNAV funds (ESRB, 2013). A money market fund does not maintain a full, 100 per cent daily liquidity. A considerable share of assets are certainly invested in highly liquid investments that can be sold off at a fair price almost immediately, but parts of the fund portfolio will be less liquid and have a longer maturity. While investors are promised daily liquidity, the on-average lower liquidity of the asset portfolio may not be able to support this commitment. Thus, investors may fear that they will not be able to redeem their units since all redemptions cannot be met simultaneously. Moreover, redemption requests may lead to the most liquid assets being sold first, making it difficult even for VNAVs to satisfy subsequent requests (IOSCO, 2012b).

Run behaviour can also arise, not only from price declines, but also from uncertainty about a funds’ true value due to valuation uncertainty or the quality of its assets (ESRB, 2013).

The composition of a money market fund’s investor base can further impact the likelihood that it will be confronted by redemption pressures. MMFs, especially CNAVs, tend to attract risk averse investors because they offer a low-risk, stable investment (IOSCO, 2012a). In

many European jurisdictions, institutional investors constitute a large portion of the MMFs' investor base, and it was predominantly this type of investor which withdrew funds during the 2007 - 2008 market turmoil in the US financial sector (FSOC, 2011). Institutional investors possess a larger degree of sophistication and rigour, and are possibly less prone to asymmetrical information issues than retail investors, making them capable of monitoring their investments closely (Ansidei et al., 2012). These characteristics, combined with a risk averse attitude, make institutional investors inclined to pull their funding rapidly in response to events that can create losses for MMFs (FSOC, 2011). MMFs that receive a large proportion of their funds from institutional investors may therefore be more vulnerable to runs, and as a consequence, a potentially greater threat to financial stability.

### **Creation of bank-like risks**

As demonstrated in part one of this paper, money market funds can be considered one of the various components in the shadow banking system. A portion of their assets may be invested in longer-dated assets with maturities of one year or more, while being financed with more short-term, deposit-like MMF units (BIS, 2012). In addition, the units within a money market fund may be rated higher than the instruments it invests in (Ansidei et al., 2012). Consequently, a MMF can perform both maturity and credit transformation, creating bank-like risks that can induce investor runs. The resulting maturity mismatch can, however, be regarded as rather modest compared to that of banks since the average maturity of most money market funds is significantly shorter than a year (IMMFA, 2014). The ESRB (2013) also point to MMFs performing liquidity transformation, as purchases of less-liquid assets are financed by MMF units that permit daily redemptions.

To summarise, MMFs create bank-like risks while being less prudently regulated than banks. The funds do not have direct access to the public safety net and their lack of capital buffers reduce their capacity to absorb losses. Hence, MMFs are not risk-free investments that can guarantee a stable unit value.

### **Systemic interconnectedness with the banking sector**

Banks' sponsoring of MMFs and reliance on MMF funding both serve as channels of contagion between banks and the MMF industry.

MMFs are operated by management companies that are either independent or sponsored by a bank (European Commission, 2013c). As MMFs in Europe became subject to runs during

the financial crisis, banks that sponsored some of these funds saw the need to either protect the fund as an on-going concern or shield the bank's own reputation (Moody's, 2010). This led banks to either buy outstanding units, thereby redeeming investors and consolidating the MMF assets onto their balance sheet, or guarantee the difference between mark-to-market, the net asset values, and the promised par value. In doing so, banks took on the risks inherent in the MMF portfolios and the accompanying millions of euro in losses (Bengtsson, 2013).

The extent of sponsor support in the US and European MMF sectors during the crisis has led credit ratings agencies to put greater emphasis on whether a fund has a sponsoring entity and the financial strength of such entities (Ansidei et al., 2012). Sponsor support has typically taken the form of implicit guarantees rather than explicit commitments that would have required the supporting entity to set aside funds and account for the resulting liability on its balance sheet (IOSCO, 2012a). If the losses suffered by a MMF are large enough to exhaust a sponsoring bank's available capital reserves, the bank may eventually be forced to request a bailout by public authorities (European Commission, 2013c). According to McCabe (2010), discretionary sponsor guarantees can be regarded as unreliable because the supporting entity does not internalise the cost of the guarantee. Uncertainty about the presence of support and the sponsor's ability to provide it can in turn increase the likelihood of an investor run (IOSCO, 2012a).

Banks were also adversely affected by MMFs exiting commercial paper and repo markets during the crisis, which further aggravated their funding problems at the time (IOSCO, 2012a). Thus, investor redemptions of MMF units can translate into liquidity strains for banks. To the contrary, a reduction in the purchase of bank securities can also be explained by a weakening in a bank's financial condition.

As the Eurozone debt crisis created uncertainty about the condition of European banks in 2011, major US money market funds reduced their exposure to the European banking sector. A study conducted by Fitch, based on the top ten American prime money market funds<sup>61</sup> that held nearly half of all MMF assets under management in the US, has shown that the funds reduced their holdings from 31.6% in the end of 2010 to 10.6% of total AuM in the autumn of 2012 (ECB, 2012). French, Italian and Spanish banks were most noticeably affected.

<sup>61</sup> Prime money market funds are funds that primarily invest in private debt instruments such as commercial paper, bank certificates of deposits, and floating-rate notes (McCabe, 2010).

Exposure to French banks fell from 14.5% to 1% at the end of 2011, but has since recuperated somewhat (Fitch Ratings, 2013). According to the Investment Company Institute (ICI), a trade organization for US investment companies, the decline in investment was part of an on-going market-wide withdrawal from increasingly risky European banks, which was also reflected in long-term markets (ICI, 2013). IOSCO, a regulator's organisation, has on the other hand argued that the sudden pullback may be due to exaggerated risk aversion amongst MMFs rather than proper and more scrutinising evaluation of credit risk (IOSCO, 2012a).

### **Systemic interconnectedness through short-term funding markets**

Fund managers faced with deteriorating credit quality, defaults and liquidity issues in times of market stress, are incentivised to sell assets and change the composition of their asset portfolio (Bengtsson, 2013). This does not only affect the troubled parts of the portfolio, but also other assets that may need to be sold to meet redemptions or alter the overall liquidity of the portfolio. A simultaneous sell-off across the industry can put a downward pressure on both related and unrelated asset markets, adding to the stressed financial conditions (Ansidei et al., 2012). Assets are not only sold to meet current redemptions, but also to free up funds so that they can be allocated into shorter-dated investments which can provide the liquidity needed to make impending redemptions (IOSCO, 2012a).

Money market funds are important participants in the money market and other short-term financing markets, and a considerable reallocation of funding can prove detrimental to markets with longer, albeit short, maturities. During the financial crisis, the commercial paper and tri-party repo markets were particularly affected (Ansidei et al., 2012). Thus, problems experienced by MMFs can spread to entities that depend on money markets and MMFs as financing tools. By impacting banks, corporations, and governments that rely on short-term financing, stresses in the MMF sector can eventually transmit to the real economy.

### **2.4.3 Assessing the European MMF Industry**

The following analysis demonstrates that European MMFs invest mainly in debt instruments and deposits. The majority of portfolio investments are allocated to short-term instruments (maturity of less than one year), and the share has increased in recent years. While 42% of funds are invested outside the Euro area on average, the trend is even more pronounced in

Luxembourg and Ireland where a minority of portfolio funds are placed in domestic assets. The investor base largely consists of institutional investors in most countries, but the share of domestic and non-domestic investors varies across the largest MMF markets. Although the MMF industry is primarily concentrated in France, Ireland and Luxembourg, the exposure created by cross-border positions can impact the European financial system as a whole.

#### **2.4.4 Data sources**

The European MMF industry is largely dominated by Euro area (EA) countries, which account for 94% of assets under management. Together with other European Union members, their market share is nearly 97%<sup>62</sup>. Furthermore, the MMF industry within the EU is highly concentrated within a few countries that have all adopted the euro. ECB statistics will therefore be applied in the analysis, and when these are lacking in scope or detail, statistical data from other sources will be applied. Data on MMFs, other than that published by central banks, is generally available from industry associations and commercial providers.

The ECB statistics only account for money market funds that are domiciled in the Euro area countries. Funds that are registered elsewhere but invest in or base their management group in a Euro area country are not included in the data sample. Hence, the statistics at hand are not exhaustive for the Euro area MMF industry, but are intended to be a representative sample. For example, Morningstar lists 47 money market funds that invest in SEK denominated securities, while ECB statistics for EU members only show 4 funds established in Sweden<sup>63</sup>. Similarly, a paper by Dahlquist et al. (2000) describing the Swedish mutual fund industry during the 1990s, identifies 42 Swedish and foreign-based MMFs that invested exclusively in Sweden, six of which are based in Luxembourg. Although these six funds would be included in the aggregate ECB statistics, other funds may be registered in offshore jurisdictions, such as the Bahamas, Bermuda and Cayman Islands (Ansidei et al., 2012) and would be omitted from the ECB sample.

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<sup>62</sup> The market shares are calculated from ICI's "Worldwide Mutual Fund Market Data 2013 Q4". The data sample is missing EA countries Cyprus, Estonia and Latvia, as well as EU countries Croatia and Lithuania. European countries Iceland, Belarus, Bosnia and Herzegovina, Serbia, Ukraine. Some microstates are also omitted.

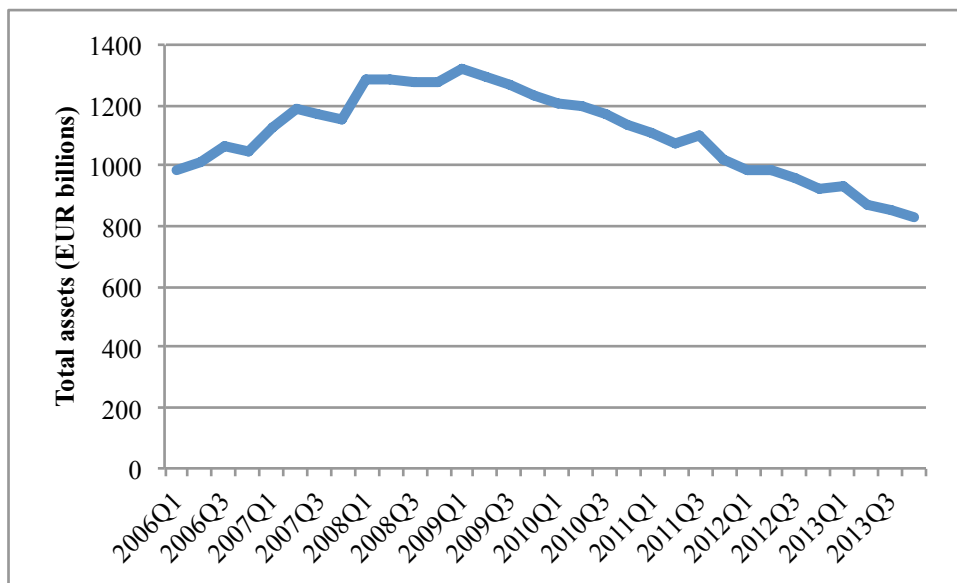
<sup>63</sup> According to Morningstar Quickrank, using SEK Money Market as a category index. Morningstar defines MMFs as funds not having a residual maturity that exceeds 12 months.



## 2.4.5 The size of the European MMF industry

At the end of 2013, Euro area MMFs had EUR 830 billion in total assets under management (see chart 16). This represents a 37% contraction following the peak in the first quarter of 2009. The substantial outflows have largely been attributed to a low interest rate environment, industry consolidation due to decreasing profits, and new classification rules that came into effect in July 2011<sup>64</sup> (ESRB, 2013) (Bouloux & Fourel, 2013). ICI statistics, which accounts for most European countries, sizes the European MMF industry at EUR 912 billion<sup>65</sup>.

Chart 16 Total assets of the Euro area MMF industry, 2006 - 2013



Source: ICI/EFAMA

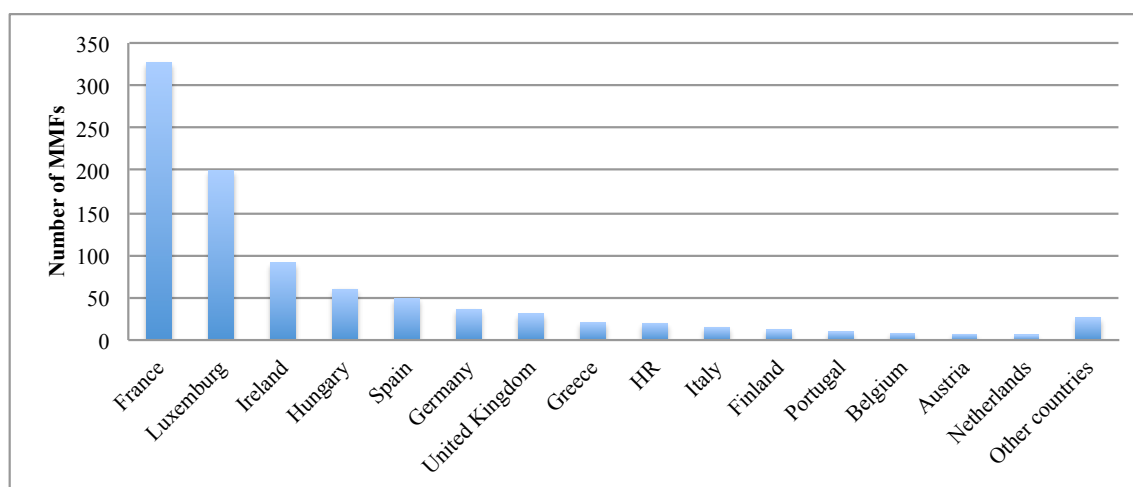
The ECB aggregates the MMF balance sheet data received from national central banks, and a breakdown of assets held in individual euro area countries is therefore not available. In the continuing analysis, ECB data will be supplemented with data from other statistical sources and research papers when needed.

<sup>64</sup> Although the CESR's Guidelines on a common definition of European money market funds came into force in July 2011, funds were given a transitional period lasting until 31st December 2011 (CESR, 2010).

<sup>65</sup> Data are taken from ICI's "Quarterly Worldwide Mutual Fund Market" which incorporates statistics from EFAMA and national mutual fund organisations.

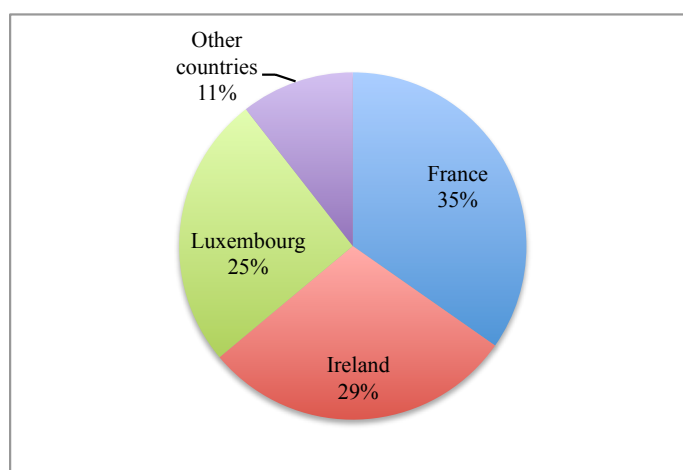
The majority of money market funds domiciled in EU member countries are found in France and Luxembourg, which host 36% and 22% of all funds respectively<sup>66</sup>. When looking at assets under management, which is a better approximation for the industry size in a given country, France, Luxembourg and Ireland account for 89% of total AuM as of end-2013<sup>67</sup>. Although Ireland only accounts for 10% of the total number of funds in Europe, half of these are CNAVs that typically have more assets under management than other funds, resulting in the Irish industry having a 29% market share in terms of AuM (ESRB, 2013) (IMF, 2014).

*Chart 17 European MMFs by domicile, end of 2013*



Source: ICI/EFAMA

*Chart 18 European MMFs by assets under management (AuM)*



Source: ICI/EFAMA

<sup>66</sup> Source: The ECB's list of Monetary Financial Institutions in the EU.

<sup>67</sup> Data are taken from ICI's "Quarterly Worldwide Mutual Fund Market".

## 2.4.6 Origins and development

The European MMF industry originated in France, and French MMFs continue to have the largest volume of assets under management throughout Europe. Even though regulatory interest rate caps (one of the drivers behind the development of MMFs in France) were removed in 2005, money market funds still constitute nearly a third of the French investment industry's AuM (IOSCO, 2012a).

As explained in section 2.4.1, regulatory limits on deposit interest rates triggered the establishment of money market funds in France. MMFs could provide investors with competitive market-based yields, while attempting to offer much the same capital preservation and liquidity as regular bank deposits. According to Baklanova (2012), the French government's large-scale issuance of government securities in the early 1980s and an accompanying tax credit that was meant to encourage investor participation can be considered to have accelerated the development of the MMF industry further. As securities became a more attractive form of investment, financial intermediaries such as money market funds were needed to facilitate investor access to the securities markets.

At the same time, the government restricted the diversification possibilities of money mutual funds, as the tax benefits could only be extracted if a majority of the funds' holdings were invested in French assets. Baklanova (2012), in her study of money market funds in the US and EU, identifies this as the rationale for some French MMFs to settle in Luxembourg. There they could achieve greater diversification while benefitting from a favourable tax treatment of investment schemes.

According to Khorana et al. (2005), Luxembourg also gained an advantage from capital flows coming from Germany as the German government in 1997 imposed a 25% withholding tax on interest on investment assets and bank deposits. Klapper et al. (2004) have pointed out that a country's proximity to an offshore fund administration centre, can in fact impair the development of a domestic mutual fund industry. They exemplify this with Germany; the large presence of German banks in Luxembourg paired with the unfavourable German regulatory regime may have hampered the expansion of domestic MMFs, a development that is hard to reverse even after the regulatory environment has improved.

While MMFs in Luxembourg originated in the early 1980s, the Irish equivalent industry did not develop until the 1990s. Baklanova (2012) traces its creation to US asset managers who

catered to the increasing cash management needs of multinational corporations and other institutional clients, resulting in the emerging industry to be heavily influenced by US-style MMFs.

Ireland and Luxembourg both support offshore fund industries<sup>68</sup>. While Ireland's industry growth can be attributed to an educated workforce and an advantageous tax regime, Luxembourg's expansion is founded on favourable bank secrecy and tax laws (Khorana et al., 2005). Both have taken advantage of EU market integration, being two of a few countries to adopt the UCITS directive into national law at an early stage so that their domiciled funds could be sold across Europe (Lipper FMI, 2010). Their popularity as fund administration centres in Europe is further underlined by the large degree of non-resident investors (Klapper et al., 2004).

Common to all these three countries is the presence of large mutual fund industries, which the MMF market segment belongs under. According to ICI statistics (see appendix A), assets under management in Luxembourg (10%), France (5.1%) and Ireland (4.8%) are only subordinate to that of the US (50%), as a total of the global mutual fund assets. The growth of domestic mutual fund industries within these economies can be attributed to strong laws and regulation (protection of investor rights, regulatory approval, disclosure requirements, transparency), well-developed financial markets, the presence of defined contribution pension plans, as well as wealthy and educated populations (Khorana et al., 2005) (Klapper et al., 2004).

## **2.4.7 Assets, investors and cross-border connections**

### *Portfolio holdings*

MMFs, especially those that seek to classify as one under US and EU regulatory regimes, have funds placed in short-term instruments such as debt instruments, bank deposits and repurchase agreements. Some funds may pursue higher returns by investing in longer-dated and more volatile instruments (Buisson et al., 2013). ECB statistics allow for a breakdown in terms of counterparty sector, maturity, and geography for certain asset and liability classes.

<sup>68</sup> The term "offshore" refers to financial centres that largely sell their domestic funds to non-resident investors. According to Khorana, Servaes and Tufano (2005) "fund industries in Luxembourg and Ireland hold assets that are 484% and 82% of their country's domestic primary assets".

**Type of assets and sectorial breakdown**

Balance sheet statistics provided by the ECB show that Euro area MMFs hold 76% of their assets in “securities other than shares”. This category includes tradable securities such as bonds and bills issued by governments and corporations, commercial paper and certificates of deposit (ECB, 2010). Another 18% of MMF assets are held in loan and deposit claims. Consequently, 94% of assets are invested in debt securities and deposits.

An analysis conducted by Buisson et al. (2013) shows that Luxembourg MMFs primarily hold money market instruments issued by banks, government securities and cash deposits. CNAVs, being short-term MMFs, tend to have larger cash deposits than other funds, and also invest in repos where mainly banks serve as counterparts. Standard MMFs, on the other hand, invest a larger part of their assets in money-market instruments on average.

**Geographical breakdown**

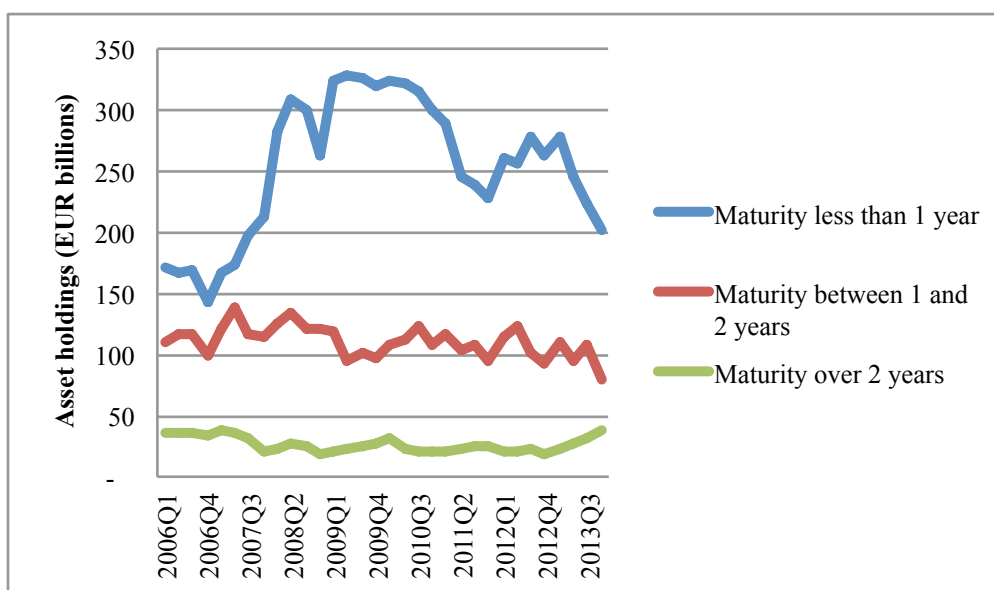
As of end 2013, 42% of the MMF industry’s aggregated holdings are invested outside the Euro area. This trend is even stronger in countries that have a large degree of non-domestic investors. In Luxembourg, only 2% of assets are invested in domestic assets, while 33% is invested in US financial assets (Bouloux & Fourel, 2013). The same holds for Ireland, where MMF portfolios only consist of 4.4% Irish assets in aggregate (Godfrey et al., 2010).

***Portfolio Maturity***

Details on asset maturities can only be extracted for “securities other than shares”, which make up the majority of the average MMF’s asset holdings. The ECB statistics also allow for a distinction amongst different counterparties.

In terms of the aggregate holdings of MFI debt instruments, 79% have a maturity of less than one year while 15% have a maturity ranging between 1 and 2 years. Another 6% of debt instruments have a maturity of more than two years.

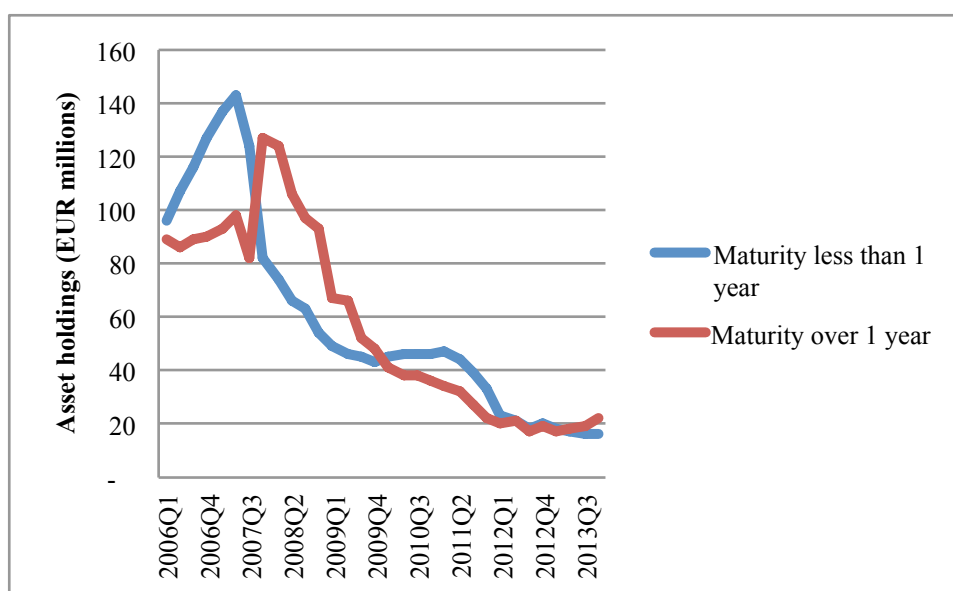
Chart 19 Investments in the Euro area MFI sector by maturity, 2006 - 2013



Source: ECB

A majority of the MMF assets in question are issued by unspecified counterparties, other financial institutions and non-financial corporations<sup>69</sup>. Out of these securities, 78% have a maturity of less than one year and 22% carry maturities of more than one year.

Chart 20 Investments in "other sectors" by maturity, 2006 - 2013



Source: ECB

<sup>69</sup> In this analysis, non-financial corporations, other financial institutions, insurance companies, pension funds, households and non-profit institutions serving households, and other unspecified counterparties are combined into a category called "other sectors".

MMFs in France, Ireland, and Luxembourg have shifted their asset allocations in recent years to safer, more liquid assets such as bank deposits and securities with shorter maturities. These developments can be traced back to changes in European legislation (introducing stricter and more specific portfolio requirements for those funds that want to label themselves MMFs), provisions made in the wake of increasing investor redemptions, and the low interest rate environment (Bouloux & Fourel, 2013).

In the period 2008 – 2012, French MMFs increased their holdings of short-term debt securities from 61% to 72%. At the same time, their holdings of long-term debt securities (having a maturity of more than one year) were reduced from 19% to 13% of holdings. Godfrey et al. (2010) have demonstrated that during the financial crisis, Irish MMFs reduced their holdings of debt instruments, which had had an average 90% share of portfolios in 2003 – 2006, in favour of bank deposits and loan claims. The authors propose that MMFs did this to allocate funds away from riskier assets.

Results from Luxembourg show that CNAVs keep a majority of their funds invested in securities that mature within one month (2012: 60%), while short-term and standard VNAVs do so to a lesser extent (2012: 40% and 25%, respectively) (Buisson et al., 2013). This resonates well with the ESMA guidelines, which dictates that short-term CNAVs and VNAVs must operate with shorter weighted-average maturity and weighted average life than regular VNAVs. They are also prohibited from investing in securities with a residual maturity over 397 days, compared to 2 years for VNAVs (CESR, 2010).

## *Investor base*

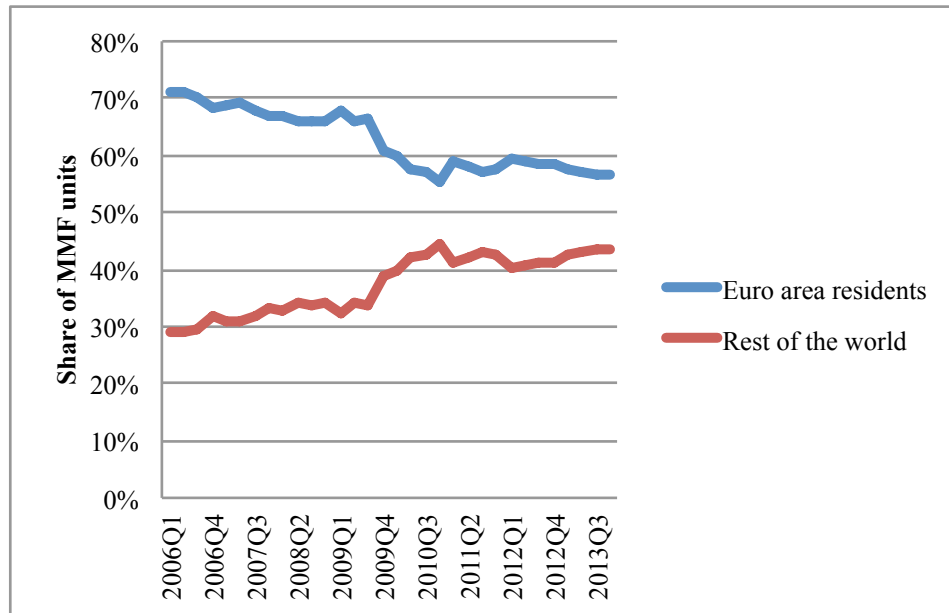
### **Geographical breakdown**

Although a majority of MMF units are still held by Euro area residents, their share has declined from 71% in 2006 to 57% in the end of 2013. Meanwhile, non-euro area residents have increased their MMF unit holdings relative to Euro area residents.

This does, however, contrast with the geographical allocation of the investor bases in France, Ireland, and Luxembourg. According to a study conducted by Bouloux and Fourel (2013) based on data sourced from Banque de France, the three major MMF markets differ in terms of their investors' nationality. While French and Euro area citizens hold 95% and 99% of the MMF units issued in France, domestic and Euro area investors are minority investors in

Ireland and Luxembourg domiciled funds. Residents outside the euro area held 62% and 84% of the Luxembourg and Ireland based MMF units.

*Chart 21 Geographical breakdown of the investor base in Euro area MMFs*



Source: ECB.

### **Sectorial breakdown**

The investor base in the European MMF industry is primarily dominated by institutional investors, a part from a few exceptions like Sweden where retail investors dominate (ESRB, 2013) (Gunnarsdottir & Strömqvist, 2010).

A survey conducted by ESRB demonstrate the general prevalence of institutional investors<sup>70</sup>. MFIs supply 32% of investor funds, non-financial corporations 21%, other financial intermediaries 12%, insurance companies and pension funds 13%, and finally households, 8% of funds (ESRB, 2013).

The investor base in Luxembourg domiciled MMFs consists largely of institutional investors such as banks, non-financial corporations, insurance companies and pension funds (Buisson et al., 2013). In France, as of end-2012, most units were held by financial corporations, of which insurance companies held most. Further, one quarter of units were held by non-

<sup>70</sup> The ESRB survey covers 71% of the firms in France, Ireland, Luxembourg, Italy, Spain and Germany in terms of assets under management.



financial institutions while households only comprised 6% of the investor base (Bouloux & Fourel, 2013).

### ***Interconnectedness***

Despite 89% of European MMF assets under management being concentrated in only three countries, the MMF industry can still have an impact on the overall financial stability of Europe. Financial integration in the EU has allowed for portfolio diversification and risk sharing across regions, but this has also led to stronger interconnections between countries' financial markets (Baele et al., 2004).

Due to the MMFs' high proportion of non-domestic portfolio holdings and funds received from non-resident investors, the cross-border interconnections in Europe are substantial and create contagion links between countries. According to the European commission (2013b), MMFs hold 38% of the short-term debt securities issued by European banks and 22% of the short-term debt issued by European corporates and governments. Adverse developments in the MMF industry of one country may therefore impact not only domestic banks and corporations, but foreign ones too which the MMFs have invested in.

Furthermore, a large number of MMFs are sponsored by banks that are domiciled in a different country than the funds themselves. Losses in a foreign-based MMF can therefore cause stresses for the national banking system and necessitate a bailout by national authorities where the bank is domiciled (European Commission, 2013c).

### **2.4.8 EU MMF reform proposals**

Since the ESMA guidelines were effectuated in 2011, the European Commission has published another proposal that might be approved in 2014<sup>71</sup>. The proposal goes further in specifying eligible assets, diversification requirements and minimum requirements for holdings of liquid assets. The element that perhaps can have the most impact on the industry is the call for CNAV funds to maintain a cash reserve. The capital buffer, calculated as 3% of AuM, is intended to mitigate any discrepancies between the stable NAV and the market

<sup>71</sup> See Proposal 2013/0306 (COD) of the European Parliament and the Council of the European Union (4 September 2013).

price of the underlying portfolio assets<sup>72</sup>. EFAMA, a representative organization for the European funds industry, has argued that imposing a capital buffer can destabilize the CNAV business model and lead to funds being directed into other MMFs instead (EFAMA, 2013a) (Blows, 2013). Alternative capital buffer measures have also been suggested by the US Financial Stability Oversight Council, but was later deemed by the Securities Exchange Commission to be too expensive compared to alternatives (Lewis, 2013).

A mandatory conversion to VNAV had been suggested by organisations such as IOSCO and the Eurosystem, but this was not included in the European Commission's current proposal. The Commission worried that investors with a clear preference for CNAV funds will stop investing in the MMF industry should such a regulation be put into effect. A mandatory conversion will affect nearly half of the European MMF industry and thereby also the short-term markets they operate in (European Commission, 2013c). Whereas all US money market funds fall into the CNAV category, the French industry has supplied VNAV funds historically, and continues to do so<sup>73</sup>. A majority of the European CNAV funds, often favoured by non-resident investors, can be found in Ireland and Luxembourg (ESRB, 2013).

<sup>72</sup> The 3% threshold has been set on the basis of worst case scenarios predicted by the European Commission. Out of 123 recorded sponsor support cases in the US during the crisis, only three exceeded more than 3% in capital backing (European Commission, 2013b).

<sup>73</sup> Although they are VNAV funds, French MMFs are commonly managed so as to provide a constantly growing net asset value, which would also be the predominant focus for a CNAV fund (Le Coz, 2009).

### 3. Conclusion

This thesis has analysed institutions and markets considered to be part of the European shadow banking system. It is important to recognise that these financial intermediaries have only recently been labelled shadow banking institutions, and cannot be considered as a uniform system with a collective purpose. What the different intermediaries do have in common is that they supply the financial markets with diverse and innovative financial products. In the past, some of these intermediation activities have taken on an aggressive character, resulting in complex structured products or unexpected counterparty exposures.

This thesis has sought to examine the origin and developments of shadow banking, and therein the rationale behind the emergence of the system. A common feature for all the institutions covered in the thesis is their intent to satisfy a growing demand for liquid, short-term debt-instruments that can be used as a safe placement option or as collateral in other financial transactions. On the supply-side, shadow banking appears to have been motivated by a drive for lower-cost financing, either by way of regulatory arbitrage or through a diversification of funding sources. Regulatory restrictions have also put the conventional banking model under pressure, which has inspired competition from new financial products that can constitute a competitive alternative to bank deposits.

Chapter two demonstrated that shadow banking institutions have gained a significant presence and important function in the European financial markets. The repo and securities lending markets supply secured short-term funding to both financial and non-financial corporations, and facilitate a multitude of financial transactions. These markets thereby enhance price discovery and market liquidity, and are critical to the functioning of the European financial system. Money market funds channel capital received from institutional investors and corporations into secured repo transactions and unsecured short-term instruments. Thus, these intermediaries are important suppliers of short-term financing. Although securitisation markets continue to be marked by the outfall of the financial crisis, they can prove to be a valid financing vehicle for banks and other loan originators in the future, thereby providing markets with longer-term financing.

Although there is limited empirical evidence to enable a complete analysis of interconnections and exposures in the shadow banking system, the proportion of cross-border transactions within the Euro area is prevalent. This is particularly true for money

market funds, where the major domestic markets tend to receive funds from foreign investors and invest in assets outside their jurisdiction. Also, only a quarter of electronically traded repo transactions in the available sample are conducted with identifiable, domestic counterparties. Thus, the European shadow banking system, along with the other segments of the financial markets, causes European countries to be more strongly interconnected. Adverse developments in some parts of Europe may thereby transmit more easily into the European financial system, which is also the consequence of the general trend towards a more globally integrated financial system.

Contagion is not only possible across countries but also between different sectors of the economy. First, banks increasingly use the secured funding markets to attract and extend interbank funding, and they also receive a portion of their funding from European and non-European money market funds. Repo markets and money market funds are key elements of short-term funding sector, and therefore provide credit to financial institutions, non-financial corporations and governments.

The possible systemic relevance of shadow banking cannot only be inferred from its links with other countries and sectors, but also from its stability. These credit intermediation systems may prove unstable during market turmoil due to their procyclical nature or susceptibility to runs. Although cash reinvestment is practiced to a lesser extent than in the US, regulatory limits on rehypothecation are largely absent, which allows collateral intermediaries to create opaque chains of counterparty exposure. Finally, in Europe securitisation appears to be used more as a funding tool than a vehicle of regulatory arbitrage, and has been less prone to misprice credit risk in the past. At the same time, many of the securitisations issued in the global securitisation markets and utilised as collateral prior to the financial crisis have now disappeared or become ineligible as collateral assets.

Shadow banking may simply be considered as one of the most recent evolutions in financial intermediation, part of a natural development where changing market conditions lead to the development of innovative products and services. Technology has allowed non-bank institutions to compete with banks in providing financial services, in many cases doing so more efficiently and at a lower cost. The shadow banking institutions which served as the focus for this thesis already make an important contribution to the European financial system, and future regulations should focus on making the system more resilient in order to harness its benefits, rather than abolishing it.

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## Abbreviations

ABCP	Asset-backed commercial paper
ABS	Asset-backed security
AFME	Association for Financial Markets in Europe
AIMA	Alternative Investment Management Association
AuM	Assets under management
BIS	Bank for International Settlements
BoE	Bank of England
CCPs	Central counterparties
CDO	Collateralised debt obligation
CESR	Committee of European Securities Regulators
CGFS	Committee on the Global Financial System
CIUs	Collective investment undertakings
CMBS	Commercial mortgage-backed security
CNAV	Constant net asset value
CNAVs	Constant net asset value money market funds
DNB	De Nederlandsche Bank
EA	Euro Area (18 member states)
EAs	Euro area accounts
ECB	European Central Bank
EFAMA	European Fund and Asset Management Association
EIB	European Investment Bank
EIF	European Investment Fund
ERC	European Repo Council
ESCB	European System of Central Banks
ESMA	European Securities and Markets Authority



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ESRB	European Systemic Risk Board
ETF	Exchange-traded funds
EU	European Union (28 member states)
EUR	Euro
FSB	Financial Stability Board
FSOC	Financial Stability Oversight Council
FVCs	Financial vehicle corporations
GC	General collateral
GDP	Gross domestic product
ICI	Investment Company Institute
ICMA	International Capital Market Association
IMF	International Monetary Fund
IMMFA	Institutional Money Market Fund Association
IOSCO	International Organisation of Securities Commissions
Ltd.	Limited
LTROs	Longer-term refinancing operations
MBS	Mortgage-backed security
MFI	Monetary financial institution
MMF	Money market fund
mREITs	Mortgage real estate investment trusts
NAV	Net asset value
NBFIs	Non-bank financial intermediaries
OFIs	Other financial intermediaries
OTC	Over the counter OFI
REITs	Real estate investment trusts
Repo	Repurchase agreement
Reverse repo	Reverse repurchase agreement

RMBS	Residential mortgage-backed security
SEC US	Securities and Exchange Commission
SIVs	Structured investment vehicles
SMEs	Small-and-medium sized enterprises
SPVs	Special purpose vehicles
USD	US dollar
UCITS	Undertakings for collective investment in transferable securities
VNAV	Variable net asset value
VNAVs	Variable net asset value money market funds
WAL	Weighed average life
WAM	Weighted average maturity
WBS/PFI	Whole business securitisation / Private Financial Initiative securitisation