Shadow Money and the Public Money Supply: The Impact of the 2007-9 Financial Crisis on the Monetary System

Pre-publication version
(February 2017)

Steffen Murau
City, University of London
Northampton Square
London, EC1V 0 HB
United Kingdom
steffen.murau.1@city.ac.uk

Abstract

This article explores the effects of the political reactions to the 2007-9 Financial Crisis on the monetary system. It chimes in with the view that shadow banks create 'shadow money', i.e. private substitutes for bank deposits. The article analyses how the three main forms of shadow money—money market fund shares, overnight repurchase agreements and asset-backed commercial papers—were affected by the short-term government intervention and medium-term regulation during and after the 2007-9 Financial Crisis in the United States. The analysis reveals that the measures taken between 2007 and 2014 integrated some shadow money forms in the public money supply. In the year after the Lehman collapse, the initially private shadow money supply was either publicly backstopped or de-monetised as it had broken par to bank deposits. The public backstops took on the form of emergency facilities established by the Federal Reserve and guarantees proclaimed by the Treasury. Those backstops imply that the public institutional framework to protect bank deposits was extended to some forms of shadow money during the crisis. This tendency has continued in post-crisis regulation. Accordingly, the 2007-9 Financial Crisis has triggered a paradigmatic change in the monetary system, attributable to the political decisions of U.S. authorities.

Funding

This work was supported by the European Union's Horizon 2020 research and innovation programme via its funding for the project Distributed Global Financial Systems for Society (DOLFINS) [grant number 640772].

1. Introduction

It has become an established notion in International Political Economy (IPE) that shadow banking played a key role in the 2007-9 Financial Crisis. The centrality of the shadow banking system in the crisis gave rise to a significant body of scholarship that investigates the evolution, characteristics and implications of shadow banking for the global financial system (cf. e.g. Lysandrou and Nesvetailova 2014, Thiemann 2014, Nesvetailova 2015, Ban et al. 2016, Bryan et al. 2016, Gabor 2016 and Helgadóttir 2016).

In the fields of economics, finance and law, the financial crisis has led a range of commentators to theorize that shadow bank liabilities are more than just financial assets but 'shadow money', i.e. money substitutes or—more precisely—substitutes for commercial bank deposits. The rationale is as follows: If banks create deposits as money and if shadow banking is the contemporary version of banking in an unregulated realm, then shadow banks must be creators of something that is money in a functional sense (see e.g. Pozsar 2014). Within this line of thinking, the events ranging from the near-failure of Countrywide Securities to the collapses of Bear Stearns and Lehman Brothers have convincingly been described as runs on the shadow banking system (cf. Gorton 2010, Mehrling 2011). As the runs took place on the wholesale money market, they were not as visible as classic runs on deposit-issuing commercial banks, with long queues of depositors lining up in front of bank branches. Other than that, however, there were barely any functional differences to previous bank runs.

The shadow money literature has produced innovative insights about the implications of shadow bank liabilities for the monetary system and the financial crisis. However, it has a blind spot regarding the politics involved. It does not provide a clear analysis of the role that political measures played in saving the shadow money supply during the crisis and re-designing it afterwards. While we know about individual bail-outs and regulations, we neither have a coherent picture of their combined effect on the setup of the money supply in general nor a theoretically grounded explanation of the institutional changes they brought about. In a nutshell, we lack a systematic understanding of how the political interventions to the 2007-9 Financial Crisis, combined with the post-crisis regulatory reforms, have affected the monetary system.

IPE is the field uniquely well equipped to provide an answer to this question. Still, the IPE literature on shadow banking has barely acknowledged the theoretical perpective that shadow banking is a monetary phenomenon. Hence, whilst IPE has extensively looked at the politics of shadow banking, it has not addressed its implications for the monetary system (see Helgadóttir 2016 for an overview on the current IPE discourse on shadow banking). This article sets out to fill this gap. It studies how the political measures during and after the 2007-9 Financial Crisis have affected the scope of public control over different forms of credit money and what the status of shadow money is in the post-crisis environment. The article thus looks at the U.S. as the centre of the international monetary and financial system and presents an analysis of the three main forms

of deposit substitutes created by shadow banks: asset-backed commercial papers (ABCPs), overnight repurchase agreements (overnight repos) and money market fund shares (MMF shares) (Ricks 2011)—financial instruments that were partly included in the broad monetary aggregate M3, which the Fed ironically stopped measuring and publishing in 2006 for perceived lack of relevance (Gorton 2010: 176). The article then spells out how the measures of the U.S. Treasury, the Fed and various regulatory agencies—over time and across different market segments of shadow banking—have altered the setup of the publicly controlled money supply.

The empirical analysis—based on publications of financial institutions, articles in the financial press, autobiographies, seven expert interviews, and secondary literature—reveals that the public institutional framework that had been created to prevent panics in the market for bank deposits has been extended towards different shadow banking liabilities, thus reinforcing their status as shadow money during the crisis. In the year after the Lehman collapse, public authorities have assumed responsibility to guarantee par clearance for overnight repos and MMF shares. Still, the introduction of public measures that have cemented the status of shadow banking liabilities as shadow money is not uniform, as ABCPs ceased to function as deposit substitutes when authorities let them break away from par. This divergent tendency has continued in the post-crisis regulatory process: On the one hand, regulators made ABCPs and Prime MMF shares lose their status as shadow money for good. For overnight repos and Government MMF shares, in contrast, new regulations strengthen their promise to trade at par to deposits and the emergency backstops remain implicitly in place. In addition, due to an innovative explicit public backstop for the repo market (via the so-called Reverse Repo Facility), the Fed has become a permanent Dealer of Last Resort (cf. Mehrling 2011).

Besides detailing the extent to which the public interventions during and after the crisis have affected the role of shadow money within the monetary system, the analysis contributes towards understanding the origins and causes of these changes. The findings suggest a functionalist view on the role of politics in the institutional transformation of the monetary and financial system: The role acquired by shadow banking liabilities by virtue of their characteristics as deposit substitutes and the endogenous dynamics of the run on shadow banking have influenced the nature of the public intervention. Policy-makers first sought to attain market-based solutions and tried to remain within their conventional logic by granting liquidity and solvency support only to deposit-issuing banks. Only when this approach proved insufficient, they decided to step in more forcefully and directly backstop institutions issuing shadow money. While the exercise of political power was massive and paradigm-changing, the direction was guided by the incidental unfolding of the crisis. The emergency crisis management pre-determined the trajectory for the purposeful institution building after the crisis as it created a path dependency for the continuous backstopping of MMF shares and overnight repos.

The remainder of the article is organized as follows. Section 2 reviews the literature that connects shadow banking with money creation and explains how

shadow money creation worked in the pre-crisis shadow banking system. It introduces the 'Money Matrix' as an analytical tool to grasp the hybridity between public and private credit money and to conceptualise the realm of public control over the money supply. It shows that prior to the 2007-9 Financial Crisis, ABCPs, overnight repos and MMF shares corresponded to the category of private credit money as they were located outside of the publicly protected monetary system. Section 3 studies each of the three market segments in the shadow banking system to understand and explain how political measures affected them during the three waves of the 2007-9 Financial Crisis. Section 4 analyses how U.S. regulatory agencies have pushed on those shifts in the regulatory process since 2009. Section 5 concludes.

2. Shadow money creation in the shadow banking system before 2007

The term 'shadow banking' has been coined by Paul McCulley in a speech at Jackson Hole in 2007 to provide an analytical account of the financial structures which, at that point, were at the brink of collapsing (cf. McCulley 2009). According to the authoritative definition of the Financial Stability Board (FSB), shadow banking is to be understood as 'credit intermediation involving entities and activities outside the regular banking system' (FSB 2011: 1). Pozsar et al. (2012), in a paper by the New York Fed, argue that the shadow banking system—on different connected balance sheets 'through a daisy-chain of non-bank financial intermediaries in a multi step process' (ibid: 10)—does what a classic commercial bank did on its own singular balance sheet. In this, the dominant view in the IPE literature suggests that the origin of shadow banking is best to be explained by regulatory arbitrage (cf. Nesvetailova 2015) as well as tax and credit rating arbitrage (Bryan et al. 2016).

This dominant view treats shadow banking essentially as a non-monetary phenomenon. However, a small but growing literature—coming mainly from an economics, finance and law context—suggests that shadow banking is inherently connected with new forms of money creation. To understand these antagonistic viewpoints, it helps to contrast two theoretical approaches towards 'traditional' commercial banking. The first denies that banks are capable of creating money in the form of deposits at their own discretion. In this logic, banks are either conceptualised as intermediaries that distribute pre-existing money or, following the money multiplier model, create money induced by central banks. The second approach affirms that banks are in the position to autonomously issue credit money. Accordingly, banks are able to issue deposits at their own discretion: They create money out of nothing by swapping debt claims (IOUs) of different maturities (cf. e.g. Werner 2015). The latter view had been largely marginalised in economic thinking during the time of the Great Moderation but recently has become more widely accepted. In 2014, for example, the Bank of England has brought this view to the awareness of the mainstream policy discourse (McLeay et al. 2014). As Jakab and Kumhof (2015) emphasize, it makes a crucial difference if we think of traditional banks as mere intermediaries of existing loanable funds or as actual creators of money.

Hence, if we acknowledge that traditional banking involves autonomous money creation by banks and translate this new economic thinking about money to shadow banking, the mere continuation of traditional banking by other means, we arrive at the analytical position that shadow banking has to go along with money creation as well. The idea of shadow banking as a *monetary* phenomenon has explicitly been introduced and fleshed out in Pozsar (2014), but also plays a role in Pozsar (2011, 2015). This notion is well rooted in the work of Perry Mehrling (see Mehrling 2011, 2013a, 2013b, 2015a and Mehrling et al. 2013), whose 'Money View'—coming from a credit theory of money tradition (Schumpeter 1954: 686)—offers a conceptual lens to regard shadow banking liabilities as a form of credit money. Likewise, Ricks (2011) presents a thorough argument for why the liabilities of shadow banks are functionally equivalent to bank deposits (also see Ricks 2012 and 2016). While this idea was further

developed by numerous authors in recent years (Claessens et al. 2014, McMillan 2014, Moe 2012, 2014, Turner 2012), the latest contribution aiming at establishing a broader theory of shadow money comes from Gabor and Vestergaard (2016). Adrian (2014), in his literature review on the economics of shadow banking, identifies private money creation as one of the key features attributed to shadow banking and points to Gorton and Metrick (2012), Moreira and Savov (2012) as well as Sunderam (2012) as the most relevant papers stressing this point. Gorton (2010) explicitly analyses the quality of repurchase agreements as a substitute to bank deposits and was the first to deliver the interpretation that the Financial Crisis in its essence was a 'run on repo'.

This argument about the monetary characteristics of shadow banking liabilities has been made with regard to ABCPs, MMF shares and overnight repos (Ricks 2011). Figure 1—based on Claessens et al. (2012)—demonstrates how these shadow money forms were issued before the 2007-9 Financial Crisis within the 'daisy chain' of shadow banking. They are high-quality, short-term debt instruments created by different non-bank financial institutions that in this regard function as shadow banks: ABCPs are the liabilities of Special Purpose Vehicles (SPVs)[1]—entities typically set up by large commercial banks, which use them as off-balance-sheet institutions to conduct banking functions while circumventing capital requirements (Covitz et al. 2009: 6-7). Overnight repos are private debt instruments constructed around the sale and repurchase of securities. The repo market is run by Securities Dealers who—as they are willing to buy and sell repos at different prices and maturities—act as market makers (Mehrling 2013b, 2013c). MMF shares are the liabilities of Money Market Funds, which pool the funds of households and institutional investors on the retail money market to invest them in the shadow banking system. Government MMFs invest at least 99.5% of their assets into cash, government securities or fully collateralized repos; Prime MMFs buy predominantly private debt (ICI 2014: 196). The three shadow money forms are produced via two main channels of shadow banking (cf. McMillan 2014: 65-79): that of security intermediation (repo channel) and that of securitisation via structured assets (ABCP channel). MMFs connect both these channels with the ultimate savers, i.e. institutional investors and, to a much lesser extent, households. Taken together, this market-based credit system conducts 'money market funding of capital market lending' (Mehrling et al. 2013: 2).

FIGURE 1: Shadow money creation in the stylised shadow banking system

Why are ABCPs, MMF shares and overnight repos considered shadow money by proponents of a monetary view on shadow banking? The core argument in the shadow money literature is that, despite different regulatory treatment, shadow money forms are similar to bank deposits in three crucial respects:

First, from a supply side perspective, both deposits and shadow money are short-term debt instruments issued on the balance sheets of financial institutions (cf. Figure 2). The balance sheet mechanics involved have structural parallels as the issuance of both deposits and shadow money involves swapping

IOUs of different maturities (Mehrling 2015a). Following a credit theory of money logic, this balance sheet operation lies at the heart of money creation (cf. Minsky 1986). In the traditional banking system, deposits are created as commercial banks' short-term liabilities when the bank issues a loan or buys bonds as a long-term IOU and credits its customer's account with deposits as a short-term IOU. In the shadow banking system, SPVs swap ABCPs as short-term IOUs against ABSs as longer-term IOUs (Acharya et al. 2010: 1). Securities dealers swap overnight repos—i.e. repos of the shortest possible maturity—against term repos with longer maturities. Viewing repos as shadow money requires shifting the focus away from the exchange of collateral and focusing instead on the issuance of the repo certificate as an IOU. The collateral exchange in the repo transaction is then merely a byproduct of credit creation. MMFs swap their shares with instantaneous maturity against ABCPs in the securitisation channel or repos in the collateral intermediation channel, which have still slightly longer maturities (cf. Jackson 2013: 379).

FIGURE 2: Traditional and shadow money, created as a swap of IOUs

Second, from a demand side perspective, both deposits and shadow money are held by agents who consider them 'cash', i.e. the most liquid form of an asset capable of doing immediate purchases of commodities or financial assets (Pozsar 2014). Deposits and MMF shares are deposited on their respective accounts and can typically be withdrawn instantaneously. For ABCPs and overnight repos, the mechanism works differently but is functionally equivalent: They remain 'deposited' if investors roll them over after maturity, and are 'withdrawn' if the contract is not renewed. While overnight repos have a maturity of one day by definition, the majority of ABCPs issued in 2007 had maturities of one to four days (Covitz et al. 2009: 2). Historically, shadow money has been purposefully developed to provide deposit alternatives. On the one hand, all three shadow money forms were tailored to attract institutional investors as they promised security for cash holdings above the ceiling of deposit protection (cf. Jackson 2013: 379). According to Pozsar (2015: 29), '[f]or institutional cash pools, money begins where M2 ends'. In the case of MMF shares and ABCPs, being a deposit alternative for institutional investors was an idea more or less present from the start. Repos, a historically much older financial instrument, developed into shadow money with the rise of the tri-party repo market in the 1970s (cf. Garbade 2006: 38-39; Jones 1997: 28). On the other hand, MMF shares were also designed for retail customers by offering higher interest rates than commercial bank deposits. MMFs could circumvent the cap of interest rates paid on bank deposits due to 'Regulation Q'. At the same time, to provide the same comforts as bank accounts, MMFs introduced cash management options such as check writing, credit and debit cards (Baklanova 2012: 98).

Third, both bank deposits and shadow money are promises to pay higher-ranking money to which they trade at par or quasi-par and in which they are instantaneously or almost instantaneously convertible. In the contemporary financial system, those hierarchically higher forms of money are central bank liabilities for deposits, and deposits for shadow money (cf. Mehrling 2011).

However, while par exchange between deposits and central bank liabilities is politically induced by the Federal Reserve's discount window and the Federal Deposit Insurance Company (FDIC), par exchange between shadow money and deposits as of 2007 relied on market mechanisms and private guarantees. Accordingly, before the financial crisis, ABCP issuance was based on 'securitization without risk transfer' (Acharya et al. 2010), which implies that the sponsors had to 'pay off maturing ABCP at par independently of underlying asset values' (Acharya and Schnabl 2010: 40). Investors therefore expected 'to be able to access their funds on demand at par value' (Covitz et al. 2009: 2). Overnight repos had such a short maturity that their price fluctuations were negligible and made them trade at quasi-par to deposits (Ricks 2011: 79). In addition, Gabor and Vestergaard (2016: 2, 22) note that the use of collateral in repo transactions enhances the promise to pay par, and that mark-to-market practices of collateral portfolios help maintain par also for repos with maturity longer than overnight. And for MMFs, the promise to maintain a one dollar per share net asset value lay at the core of their business model (Fink 2011: 253). Investors buying MMF shares were guaranteed to be paid back 'one buck on the dollar'. In many cases, MMFs' parent institutions gave implicit guarantees to prevent breaking the buck (Jackson 2013: 379).

In sum, from the perspective of this literature, the liabilities of shadow banks are to be regarded as forms of private credit money that co-exists next to publicly provided forms of money. This 'hybridity' of public and private credit money is perceived as a fundamental property of modern monetary systems (see Ingham 2004, Mehrling 2015a): In absence of commodity money, all money forms today are essentially tradable debt claims issued either by public institutions, notably the central bank, or private institutions such as commercial banks and shadow banks. The fact that public and private money forms trade at par with each other in normal times makes them appear similar and conceals inherent differences, especially as they are all denominated in the same unit of account (Mehrling 2011, 2013b, 2015a). To make the hybridity of public and private credit money explicit, Pozsar (2014) develops the 'Money Matrix' as a heuristic tool, which offers a taxonomy to sketch how publicly and privately created forms of money are intervowen (see Figure 3).

FIGURE 3: The 'Money Matrix' (conceptually)

The Money Matrix also allows to develop a clearer notion of the role that public authorities play in controlling the money supply. Public control is understood here as the state assuming responsibility to guarantee that a given credit money form clears at par vis-à-vis higher-ranking money forms or—in the case of the top credit money form—to the unit of account (see Mitchell-Innes 1914 for the interpretation of the unit of account as an abstract idea to which actual debt instruments correspond). In line with Pozsar (2014: 15), the left column in the Money Matrix displays two different categories of 'public credit money' for which public authorities assume such responsibility. The money-like liabilities of a public institution, typically a modern-type central bank, are *pure public money*. Here, public authorities directly guarantee par by issuing credit money themselves. The money-like liabilities of private institutions that have

public backstops and can tap public institutions' balance sheets via the discount window or insurance schemes are *private-public money*. In this case, public authorities guarantee par clearance indirectly through a public-private partnership for credit money creation. The right column displays two different categories of 'private credit money': The money-like liabilities of private institutions that do not have access to backstops on a public balance sheet are *public-private money* if issued against public assets, and *purely private money* if issued against private assets. For private credit money, par clearance is only sustained by market forces and private guarantors but not the state. Together, public and private credit money forms constitute the general money supply.

Figure 4—following Pozsar (2014: 13-16)—presents an empirical account of the Money Matrix for the U.S. monetary system at the outset of the 2007-9 Financial Crisis—both with regard to the 'traditional' and the 'shadow money' supply.[2] Thus, in the realm of public credit money, *purely public money* is issued by the Federal Reserve in the form of currency and central bank deposits. While currency is available to all economic actors, central bank deposits can only be held by commercial banks. Both form what is conventionally referred to as the 'monetary base' or the monetary aggregate M0. *Private-public money* is made up of insured bank deposits, based on the insurance limit of the FDIC which as of 2007 had been capped at $100,000. According to the Fed's definition, they fall under the aggregates M1 and M2. Shadow money forms, in contrast, are part of the private credit money realm. *Public-private money* was made up of MMF shares and overnight repos in so far as they are issued against public debt, which is true for Government MMFs and the government desk of Securities Dealers. Forms of *purely private money* are ABCPs, overnight repos issued by Securities Dealers' credit desk, shares of Prime MMFs as well as uninsured bank deposits. In terms of the monetary aggregates, retail MMF shares are part of M2 and overnight repos were included in M3, which the Fed ceased to measure in 2006 but is still used e.g. by the European Central Bank (ECB) (cf. Gorton 2010: 176-177, Ricks 2016: 39).

FIGURE 4: The 'Money Matrix' (empirically, before the 2007-9 Crisis)

The literature that regards shadow banking as a monetary phenomenon adds an additional dimension to our understanding of the role and function of shadow banks (see e.g. Ricks 2011), helps systematically integrate shadow bank liabilities into analyses of the monetary system (cf. Pozsar 2014 and the Money Matrix), and offers a convincing narrative of the 2007-9 Financial Crisis as a systemic run on the shadow banking system (cf. Gorton 2010). However, this literature has not developed a systematic account of the role that politics has played in saving and re-designing the shadow money supply during the crisis and in post-crisis regulation. Since 2008 numerous policy measures have been undertaken by public authorities in the U.S. and other key jurisdictions to limit the spill-overs of the run on the shadow banking system, as well as to extend the scope of regulatory oversight to cover these previously unregulated activities. It remains to be understood to which extent the extensive public interventions in response to the crisis have altered the status of ABCPs, overnight repos and MMF shares within the monetary system's hybrid structure.

This article addresses this gap: It adopts the monetary angle on shadow banking and then traces the way in which the interventions of U.S. authorities—primarily the Federal Reserve, the U.S. Treasury and the Securities and Exchange Commission (SEC)—have affected the shadow money supply during and after the 2007-9 Financial Crisis. The next section will demonstrate how the interventions of policy-makers during the crisis have extended public control on overnight repos and MMF shares whilst letting ABCPs break par to bank deposits. The following section will show that two divergent processes have been taking place during post-crisis regulation which broadly followed the path trodden by the emergency crisis intervention.

3. How did the Political Interventions of Public Authorities during the 2007-9 Crisis Affect Shadow Money?

The run on shadow banking during the 2007-9 Financial Crisis occurred in three waves: The first was associated with the near-failure of Countrywide Securities in August 2007, the second with the shutdown and takeover of Bear Stearns in March 2008, and the third with the bankruptcy of Lehman Brothers in September 2008 (Mehrling 2011: 119-121). As in previous bank runs, public authorities stepped in to prevent the worst from happening. How did the interventions of public authorities to those runs affect the status of ABCPs, overnight repos and MMF shares within the hybridity of public and private credit money? To which extend did they alter the scope of public control over the shadow money supply? And what explains the conduct of the public authorities?

As the analysis will demonstrate, the Federal Reserve and the U.S. Treasury first tried to calm down the runs with market-based solutions. When this proved unsuccessful, they created public backstops to tame the run. As a result, the authorities forced ABCPs to break par vis-à-vis bank deposits whilst they sustained par clearance of overnight repos and MMF shares. The emergency backstops induced a temporal, yet substantial increase in the scope of public control over the monetary system. The actions of the U.S. authorities were driven by the crisis dynamics which predetermined the kind of public intervention that was possible and necessary. This points towards a functionalist explanation of the role that politics played for institutional change in the monetary system.

Figure 5 points out in terms of the Money Matrix how the public-private hybridity of money looked like in the year after Lehman's collapse. In effect, the backstops extended core aspects of the public-private partnership for deposit creation, which give deposits the status of *private-public money*, and applied it to overnight repos and MMF shares. This framework for deposits had been established in 1913 with the Federal Reserve Act and in 1933 with the Emergency Banking Act and the Glass-Steagall Act. After the third wave of the crisis, the Fed and the Treasury—with their coordinated decision to guarantee MMF shares and backstop repos—assumed full responsibility for both shadow money forms to sustain par. With ABCPs largely driven out of the market in late 2007, the only truly private money form remaining were uninsured bank deposits, although the insurance limit had been increased from $100.000 to $250.000 per person in October 2008 (FDIC 2008). In the year after Lehman, insured bank deposits, MMF shares and repos —with their backstops on public balance sheets—were all part of the public money supply.

FIGURE 5: The 'Money Matrix' (empirically, in the year after Lehman)

The subsequent discussion will detail how the political interventions affected the three forms of shadow money. It will first address the policy interventions on the ABCP market, which was affected in the first wave of the crisis, followed by an analysis of the intervention on the repo market, which was subject to runs in all three of the waves, and the market for MMF shares that was only affected in the third wave.

3.1 Asset-backed Commercial Papers

The ABCP market was hit early on in the crisis. In August 2007, Countrywide Securities, which funded itself both on the commercial paper and the tri-party repo market, got into trouble with its business model of originating, securitising and selling mortgages. When Countrywide announced disappointing earnings, a number of ABCP programmes had to extend the maturities of their papers and eventually defaulted. Investors became unwilling to continue rolling over ABCPs and yields on newly issued ABCPs increased sharply. This was analogous to a classical bank run during which depositors withdrew their deposits from commercial banks (Covitz et al. 2009: 2, 13). The run had an international dimension; for example, the first insolvencies occurred in Germany by IKB Deutsche Industriebank and Sachsen Landesbank. The losses that SPVs incurred due to their inability to roll over ABCPs had to be primarily borne by their sponsoring institutions which had issued implicit or explicit guarantees (Acharya and Schnabl 2010: 40).

To attenuate the rising panic, the Fed clarified in August 2007 that investment-quality ABCPs would be accepted as collateral for its discount window (Covitz et al. 2009: 42-43) and reacted with traditional expansionary monetary policy from September (Cecchetti 2008: 13). In parallel, Treasury Secretary Paulson pushed towards the introduction of a market-based plan to cushion the credit crunch on the ABCP market. In October, three major U.S. financial institutions—Citigroup, JPMorgan Chase and Bank of America—followed up and suggested to introduce the 'Master Liquidity Enhancement Conduit' as a privately funded liquidity backstop (Covitz et al. 2009: 43). However, the financial industry was not able to agree on joint actions to push through the plan and buried it in December 2007 (Ellis and Rooney 2007).

While the attempted market-based solution turned out ineffective, policy-makers saw themselves forced to intervene more substantially, yet still within the conventional framework of monetary management. The Fed calmed down the run on ABCPs by establishing the Term Auction Facility (TAF) as an extended discount window, which gave additional liquidity support to the commercial banks that sponsored the SPVs and thus had to bear the losses from the run on ABCPs. Effectively, the Fed offered Treasury bills as substitutes for the defaulting ABCPs that the market no longer wanted (Mehrling 2011: 120). In addition, the Fed created reciprocal Swap Lines with the ECB and the Swiss National Bank as an extension of the TAF to other financial systems. The measure was necessary due to the international entanglement of the ABCP market (cf. Cecchetti 2008: 15). The Swap Lines expanded the reach of the Fed's emergency liquidity injections beyond U.S. borders and contributed to cushioning the effects that the run had on the liquidity of non-U.S.-based parent institutions. Later, the Swap Lines were also extended to other major central banks (Mehrling 2015b).

How did this affect the role of ABCPs in the monetary system? The Fed's intervention effectively dried out the ABCP market and led to a disappearance of ABCPs as shadow money because they could no longer sustain par vis-à-vis deposits. The Fed did not support or guarantee ABCPs; instead, it forced the

banks that acted as private sponsors to bear the losses but then helped them out with the TAF. Figure 6—based on Covitz et al. (2009: 34)—visualizes how the intervention changed the setup of the ABCP market. The TAF was used by the Fed to cushion the effects on commercial banks and contributed to the liquidation of ABCPs. Banks had to look for an alternative source of funding instead of ABCPs, and the TAF provided it as a 'robustified' discount window (Mehrling 2011), which allowed investors to shift to other assets. The issuance of ABCPs declined sharply during the first wave of the crisis in the last months of 2007 (Anderson and Gascon 2009: 603).[3]

FIGURE 6: Impact of the public intervention on the ABCP market

3.2 Repurchase Agreements

While ABCPs were only hit in the first wave of the crisis and then lost their relevance, runs on repo occurred in all three waves. In particular, the tri-party repo market was affected. In contrast to the bilateral repo market in which the dealer and its counterparty are processing the repo transaction on their own, the tri-party repo market is operated by JPMorgan Chase (JPMC) and Bank of New York Mellon (BNYM) as custodian banks that facilitate the repo transaction. The custodian banks settle the repo transactions on their balance sheets, offer custodial and collateral management services, and eventually grant intra-day credit (Copeland et al. 2011). Among the financial institutions registered as securities dealers on tri-party repo, which issue repo certificates as shadow money, are all the primary dealers that serve as counterparties for open market transactions with the Fed. In 2007, prior to the outbreak of the crisis, this included the Big Five U.S. investment banks Merrill Lynch, Goldman Sachs, Bear Stearns, Lehman Brothers and JPMorgan.

How did the interventions to the crisis affect public control over overnight repos as shadow money throughout the three waves?

In the first wave, the troubles that Countrywide was facing spilled over on tri-party repo. The bursting of the U.S. housing bubble made the value of securities tied to real estate prices collapse (cf. Covitz et al. 2009: 2). In August 2007, BNYM feared an immediate default of Countrywide, did not want to grant intra-day credit anymore and thus threatened to no longer facilitate Countrywide's tri-party repo transactions (Paulson 2010). The Fed was urged by both Countrywide and BNYM to intervene and stop the rising panic. Yet, corresponding to its preference for market-based solutions, the Fed declined and instead facilitated an agreement between both companies according to which BNYM continued offering its services to Countrywide, while Countrywide upgraded the quality of its collateral (Geithner 2014: 122-126). The Fed thus managed to solve the issue without having to step in, back the tri-party repo market and publicly guarantee par clearance of repos vis-à-vis deposits.

In the second wave, however, the Fed had to change its approach towards protecting the repo market substantially. Bear Stearns—a major securities

dealer in the tri-party repo market—was at the brink of collapse. Again, public officials feared a run on repo. The strategy of the Fed and the Treasury was two-fold: On the one hand, they organized a take-over of Bear Stearns by JPMC, which allowed for a continuation of the systemically relevant functions of Bear as a securities dealer under the umbrella of JPMC (Ennis 2011: 389). Still, this turned out insufficient to ease the financial strains. Hence, on the other hand, the Fed had to invoke its emergency powers provided in Article 13(3) of the Federal Reserve Act, which give it the right to lend to non-banks in 'unusual and exigent circumstances', and established emergency liquidity facilities in March 2008 that allowed tri-party dealers to directly tap its balance sheet: the Term Securities Lending Facility (TSLF) and the Primary Dealer Credit Facility (PDCF).

Creating the TSLF and the PDCF was a pivotal change in the crisis intervention strategy compared to the first wave, advanced by the Fed's top-level officials (Geithner 2014: 143). The Fed now assumed full responsibility to sustain the functionality of tri-party repo by directly providing public backstops to issuers of shadow money: After the burst of the housing bubble, repo market participants stopped lending to each other against collateral connected to mortgage securities and strongly increased haircuts. Dealers struggled to finance their term repos and looked for alternative funding sources, mostly in vein (Fleming et al. 2009: 2-3). In this situation, the Fed created the TSLF to allow securities dealers to exchange their bad collateral against Treasury securities, which were still acceptable for their counterparties. Via the PDCF, the Fed had to compensate the plummeted repo demand, took the lending side in tri-party repo transactions and bought the dealers' overnight repos against a penalty rate (Ennis 2011: 392). The Fed thus 'opened the discount window to investment banks for the first time since the Great Depression' (Paulson 2010: 116). This step had become necessary because the available alternative private funding sources could not provide liquidity at the scale necessary to tame the run on repo (cf. Mehrling 2011).

In the third wave, to avoid systemic meltdown, the Fed had to make up for a system-wide freezing of repo lending and effectively dragged the entire repo market on its balance sheet. The financial crisis reached its peak when Lehman Brothers, another major securities dealer in the tri-party repo market, reportedly was 'only days away' from bankruptcy and threatened to put the entire system at risk (Adrian et al. 2009: 4). Again, U.S. authorities fought on two fronts to prevent the tri-party repo market from collapsing: They had the double strategy of arranging a take-over of Lehman Brothers' securities dealer and supporting market resilience with its liquidity facilities. As the take-over of Lehman by the British bank Barclays Capital failed, the liquidity facilities were the last resort. When Lehman filed for bankruptcy in September 2008, the Fed announced that it would radically expand the collateral acceptability for the PDCF. Initially, it had only accepted high-quality collateral that was also eligible for its open market operations. From then on, loans via PDCF could include anything that was acceptable in the tri-party repo system, e.g. non-investment grade bonds and stocks. As a consequence, the usage of the PDCF skyrocketed (Ennis 2011: 392).

What are the implications of these interventions for the status of repos in the monetary system? Figure 7—based on Copeland et al. (2012)—demonstrates that via PDCF and TSLF, the Fed granted dealers direct access to its balance sheet and stood ready to guarantee the repos that dealers had issued as IOUs. If necessary, dealers could first exchange their bad collateral at the TSLF against good one and then use the good one to borrow deposits from the PDCF. By letting securites dealers tap its balance sheet, the Fed became—in the words of Mehrling (2011)—the Dealer of Last Resort. PDCF and TSLF effectively turned overnight repos into a *private-public money* form. When established in March 2008, the PDCF still had relatively high quality standards for the collateral it accepted. Arguably, this transformed merely those overnight repos into *private-public money* that had high-quality collateral in beforehand, i.e. those issued by dealer banks' government desk. Only when the collateral standards were lowered in September 2008, the overnight repos issued by dealer banks' credit desks became *public-private money* as well. Thus, the Fed's intervention has extended the public framework to backstop privately credit money forms on repos. It exercised its power as a public authority to guarantee that repos continued to trade at par vis-à-vis bank deposits.

FIGURE 7: Impact of the public intervention on the tri-party repo market

3.3 MMF shares

After the collapse of Lehman Brothers, the spreading panic also affected the MMF industry. Investors in MMFs began converting their shares into bank deposits as *private-public money* that was covered by the FDIC. Most MMFs were able to withstand the run and keep up constant net asset value because they had parent institutions supporting them with liquidity as private backstops (Mehrling 2011). However, the Reserve Primary Fund—a family enterprise without a parent institution—was no longer able to sustain a constant net asset value and, by paying only 97 cents on the dollar, 'broke the buck' on 16 September 2008. This further fuelled the run on the MMF market.

Those market developments made the Treasury and the Fed act jointly to publicly backstop the market for MMF shares. The Treasury announced a one-year 'Temporary Guarantee Programme for Money Market Funds' (Temporary Guarantee) as a public promise that MMF shares sustain par vis-à-vis bank deposits to avoid that all investors pull out their money at the same time (Bernanke 2013: 82). Funded via the Exchange Stabilization Fund (ESF), the Treasury insured the holdings of any MMF willing to pay a participation fee. The plan was adopted in a call among Hank Paulson, Tim Geithner, Ben Bernanke and Christopher Cox, head of the SEC, as well as their members of staff. To protect uninsured bank deposits, FDIC chairman Sheila Bair later amended the rules for the Temporary Guarantee and asserted that merely those customer balances were insured that had been in the MMFs before the guarantee was announced (Paulson 2010: 262-263). The Fed, in turn, established the 'Asset-backed Commercial Paper Money Market Mutual Fund Liquidity Facility' (AMLF). Via the AMLF, the Fed lent money to banks, which in turn bought assets from MMFs to

give them the liquidity necessary to convert MMF shares into deposits on demand (Bernanke 2013: 82).

Figure 8 highlights the impact of the two measures on the MMF market. The Temporary Guarantee paralleled the logic of deposit insurance, and was thus a classic response to a classic bank run (Bernanke 2013: 83). It is therefore adequate to say that MMF shares were a form of *public-private money* while the Guarantee Program was in place. While Prime MMFs were mainly subject to the run, the Temporary Guarantee affected all MMF types. The AMLF, in contrast, did not grant MMFs as shadow banks access to the Fed's balance sheet. The funds it supplied in support for MMFs were distributed via banks.

FIGURE 8: Impact of the public intervention on the MMF market

This empirical analysis makes the case for a functionalist explanation of institutional change in the monetary system (cf. Strange 1996, Porter 2003). Throughout the three waves of the crisis, the Fed and the Treasury were repeatedly forced to intervene in the money market and support the issuers of shadow money. The scope and the level of the interventions increased continuously from wave to wave: In the first wave, the public authorities could still act relatively conventionally. In line with the ideational elite consensus typical for 'disembedded liberalism' (cf. Blyth 2002, Widmaier 2016), policy-makers had initially put up the self-restraint to intervene as little as possible and always mitigate solutions that minimized public intervention. They only abandoned this approach when the run on shadow money had become so systemic that in their subjective perception, they had no other choice but to backstop the remaining shadow money forms (Interviews 5, 7). Hence, in the second and third wave, they had to adopt unprecedented measures that increased the scope of public control over the money supply in a dramatic fashion. In line with functionalism, this paradigm shift was brought about by public authorities merely reacting in response to the endogenous unfolding of the crisis. It is this aspect of timing that explains why ABCPs did not receive public backstops, whilst repos and MMF shares did.

Establishing the shadow money backstops was a unique moment of political power (see Schwartz 2009 for a broader discussion of power associated with the crisis). However, in line with the functionalist reading purported here, the possibilities and the necessities of an intervention had already been circumscribed by the unfolding of events in the runs on shadow money. Political decision-makers had the power to say Yes or No—in a situation when a No, with all foreseeable consequences, was simply perceived as intolerable (Interview 1). At the same time, the Yes of the relevant political decision-makers was likely prejudiced by the fact that they were part of the same epistemic community as their counterparts from the financial industry (cf. Tsingou 2015).

4. The legacy of 2008: What Role for Shadow Money in the Post-Crisis Monetary System?

The backstops for MMF shares and repos had only been established for a limited period after the collapse of Lehman. The Temporary Guarantee was in place from September 2008 to September 2009 (U.S. Treasury 2009). The PDCF and the TSLF, after several prolongations, were finally shut down in February 2010 (Federal Reserve 2010). How has the status of the three shadow money forms within the hybridity of public and private credit money developed since then? What is the scope of public control over the shadow money supply today? And what explains the direction in which post-crisis regulatory process has been going?

Since the heyday of the crisis, two divergent processes have been taking place: On the one hand, the status of ABCPs and Prime MMF shares as shadow money has been abrogated. Both instruments no longer trade at par to bank deposits, hence their function as cash substitutes for institutional investors is gone. On the other hand, overnight repos and Government MMF shares have been consolidated as shadow money under public control. Thus, the process of extending the public-private framework for deposit creation on shadow money, which had been started during the crisis, has found continuation in the post-crisis regulatory process. However, this framework for deposits does not comprise liquidity and solvency backstops but also measures for regulation and supervision. In this, the public-private framework for the creation of Government MMF shares and overnight repos—as tangible regulatory innovations did not materialize—has not reached the same degree of sophistication as that for bank deposits. Still, both shadow money forms constitute an even more integral part of the U.S. money supply than before the crisis (cf. Gabor and Vestergaard 2016). They retain their status as *public-private money* as public authorities continue to assume responsibility for par clearance vis-à-vis deposits (cf. Figure 9).

FIGURE 9: The 'Money Matrix' (empirically, since 2014)

4.1 De-monetising ABCPs and Prime MMF shares

As the result of regulatory reforms between 2009 and 2014, ABCPs and Prime MMF shares have lost their status as shadow money as they are no longer able to sustain par or quasi-par vis-à-vis bank deposits. Regulators 'de-monetised' them and forced them to drop out of the Money Matrix.

In the ABCP market, regulatory changes were introduced regarding accounting standards after the crisis that led to a strong decrease in ABCP issuance. In 2010, the 'favorable risk capital treatment' has been dropped. With this decision, regulators reversed the decision taken in 2003, which had made it possible for sponsoring banks to exclude ABCPs from their risk-weight asset base and had thus facilitated the rise of ABCP as shadow money (Chen 2015: 8-10). The relevant authorities involved in this decision were the Financial

Accounting Standards Board (FASB), the Federal Reserve, the FDIC and the Treasury. With a joint document published in June 2009, they announced the 'exclusion of certain consolidated asset-backed commercial paper programs from risk-weighted assets' (OCC 2010: 1). Hence, banks are not only forced to consolidate the ABCP-issuing SPVs onto their balance sheets, but also have to keep risk capital for the SPVs (Chen 2015: 9, 51). The removal of preferential accounting rules made ABCPs not only lose their status as shadow money *de facto*, but also by regulation (Interview 5).

For MMF shares, the SEC introduced a substantial distinction between Prime MMFs, which predominantly invest in private assets with floating or variable rates, as well as Government and Tax-exempt MMFs, which invest almost exclusively in public debt. The regulatory change for MMFs occurred in two main steps: the Amendments to Rule 2a-7 of the 1940 Investment Company Act in 2010 and 2014. In 2010, the SEC introduced five moderate new rules aimed at limiting the risk-taking of MMFs (SEC 2010: 10060). After the 2010 Amendment, debates emerged about whether the changes were sufficient (Lynch 2013). In November 2012, the Financial Stability Oversight Council (FSOC) suggested on the basis of its authority granted by the Dodd-Frank-Act that the SEC should implement further reforms. In June 2013, the SEC published two alternative proposals: One suggested that all non-government MMFs should introduce a floating net asset value and thus abandon the guarantee to trade their shares at par. The other foresaw the introduction of a two percent withdrawal fee for Prime MMFs if their five-day liquidity dropped below 15 percent of its total assets (SIFMA 2015). In 2014, the SEC adopted both options—floating NAV and withdrawal fees (SEC 2014)—and made Prime MMF shares lose the status of shadow money.

4.2 Sustaining Government MMF shares and Repos as shadow money

In contrast to the de-monetisation of ABCPs and Prime MMF shares, Government MMF shares and overnight repos sustain par vis-à-vis bank deposits. Public authorities continue to support par clearance as the emergency backstops established during the crisis remain implicitly in place and the Fed, via the Reverse Repo Facility, has *de facto* assumed the role of a repo dealer of last resort. There have been initiatives to also extend deposit-like regulations on the remaining shadow money forms, but no comprising measures have been passed.

An apparent consequence of the explicit emergency backstops' expiration would be to assume that public authorities no longer adopt responsibility for par clearance of Government MMF shares and overnight repos. However, as indicated in a number of interviews, scholars, regulators and market participants are of the opinion that the backstops are still implicitly in place and could be re-enacted by the Fed and the Treasury any time if necessary (Interviews 1, 4, 5, 6). While the Dodd-Frank-Act—the main political response to the 2007-9 Financial Crisis—makes it more difficult for the Fed to invoke its Article 13 (3) emergency powers, there is still the possibility to do so. The Fed could not implement measures on the basis of those powers again as a purely technocratic decision

but would require political permission; still, everybody expects that in times of extreme financial strain, it will very quickly receive such permission (Interview 1). As to MacDonald (1996: 8-11), implicit guarantee schemes—though not legally equivalent—are comparable to explicit ones as they have the same economic and functional effects. While an explicit guarantee scheme would be established by a law that lays out in detail who is entitled to what under which circumstances, an implicit guarantee scheme allows public authorities to decide about protection on a case by case basis, leaves flexibility and reduces administrative costs. This applies to the Treasury's guarantee for MMF shares as well as the PDCF and the TSLF. Therefore, as depicted in Figure 10 and Figure 11, due to the precedents created in 2008, Government MMF shares and overnight repos are still implicitly backstopped.

FIGURE 10: Implicit backstops for Government MMF shares

Moreover, the Fed's Reverse Repo Facility (RRP) is an institutional innovation that functions as an explicit permanent backstop for overnight repos. The Fed established the RRP in 2013 as a novel tool to regain control over the federal funds rate at the zero lower bound. It is an overnight, risk-free instrument to which not only banks but also MMFs and securities dealers have access. A transaction via RRP 'is economically similar to the Federal Reserve borrowing from a counterparty, with the loan secured by collateral from the Federal Reserve's security portfolio (Frost et al. 2015: 6). Primarily, RRP was intended to be a monetary policy tool. An alternative, albeit contested (Interview 1), interpretion is that the RRP represents the continuation of the Fed's Dealer of Last Resort function—with the Fed acting as an alternative dealer that tri-party repo counterparties could turn to (cf. Figure 11). As to McCulley and Pozsar (2014), RRP 'gives shadow banks an account at the Fed, similar to the reserve accounts that deposit-taking institutions keep there'. In December 2015, after some experimenting, the Fed turned the RRP into a full-allotment facility (Boesler and Condon 2015) and made the backstop unlimited.

FIGURE 11: Implicit backstops for overnight repos and Reverse Repo Facility

In post-crisis regulation, there were considerations to set much tighter standards for the issuance of Government MMF shares and overnight repos, but the actual regulatory changes implemented remained rather marginal: For overnight repos, on the one hand, some new regulations have been passed, most importantly the introduction of the Supplementary Leverage Ratio which forces securities dealers to keep a minimum ratio of capital to total assets of five percent (Duffie 2016). Still, more far-reaching reforms—e.g. to reduce the possibility of fire sales, to control the setting of haircuts or to manage collateral constraints—did not materialize although the FSB had made repo regulation a priority in their post-crisis reform agenda (Gabor 2016). For MMFs, on the other hand, the Group of Thirty—a private body of financial experts—called for prudential regulation and supervision next to explicit government insurance and access to central bank liquidity if they wanted to issue shares trading at par to deposits (Fink 2011: 254). In 2012, Mary Schapiro—Chair of the SEC from January 2009 to December 2012—proposed to make MMFs more bank-like by

introducing capital buffers. However, the FSOC with its intervention forced Schapiro to drop the proposal (Lynch 2013). As a consequence of the SEC's 2014 decision, Government MMF shares remain functionally equivalent to deposits as they keep their constant net-asset value, but are regulated differently.

The findings demonstrate that post-crisis regulation broadly followed the path trodden by the emergency crisis interventions. The actions of public actors have largely pre-determined the direction for the phase of purposeful institution building after the crisis. That U.S. authorities had assumed the responsibility to guarantee par of overnight repos and MMF shares during the crisis turned out instructive for post-crisis regulation—in particular, as implicit backstops remain in place, no seismic shifts happened in the regulatory fine-tuning and ABCPs have not been revived. This interpretation corresponds to the contribution that Braun (2013) made on institutional change in the moment of a crisis who argues that the emergency phase in a financial crisis is of primary importance for future institutional evolution. Accordingly, the runs on shadow money were a critical juncture for the evolution of the monetary system, the interventions created a path-dependency for its future shape.

5. Conclusion

This article has set out to analyse the impact of the 2007-9 Financial Crisis on the monetary system. To this end, it engaged with the economics literature that adopts a monetary angle on shadow banking and systematically focuses on near-monies created by non-bank financial institutions, i.e. shadow banks. Until 2007, a number of short-term financial instruments have taken on the role of deposit-substitutes or 'shadow money'. The most important shadow money forms were ABCPs, overnight repos and MMF shares. Using the Money Matrix as a heuristic tool, the article contributes to IPE scholarship by pointing out how the crisis—via the political decisions made in reaction to it—has transformed the scope of public control over the money supply in the U.S., with implications for the rest of the world. As demonstrated in the empirical analysis, the emergency interventions of the New York Fed and the U.S. Treasury during the 2007-9 Financial Crisis have effectively established emergency liquidity and solvency backstops for repos and MMF shares, while ABCPs lost their status as private deposit substitutes. In the course of the post-crisis regulatory process, ABCPs as well as shares of Prime MMFs have been further 'de-monetised', while backstops for overnight repos and Government MMF shares remain in place.

This empirical analysis emphasizes the relevance of a functionalist view on the role of politics regarding institutional change in the monetary system. The financial innovations that had led to the rise of shadow money forms from the 1970s onwards—despite some support of regulatory bodies and decisions (see Gabor 2016, Sissoko 2010)—were driven by private enterprise (Ricks 2016), and so was the unfolding of the crisis itself in autumn 2007 (Brunnermeier 2009). Endogenous crisis dynamics directed the political interventions in the crisis, which then altered the setup of the shadow money supply and crucially pre-determined post-crisis regulation At the same time, to fully explain the observed outcome, the proposed functionalist view on the role of politics has to be complemented by other approaches, most notably to explain the regulation of MMF shares. That MMF shares were not treated as bank deposits can well be explained by historical instutionalist scholarship that focuses on the setup of the regulatory system and the integration of the financial industry in it (Fioretos 2010: 699). The SEC, which is in charge of MMF regulation, has an inherent tendency to treat MMF liabilities like those of mutual funds and not like those of banks because this is its mandate. Moreover, as the SEC is not politically independent, lobbying efforts were particulary influential for MMF regulation (Interview 4). In this respect, scholarship that pays attention to coalition-building and conflict among interest groups (see e.g. Pagliari and Young 2014) is best equipped to explain the difference in the treatment of Government and Prime MMF shares—a distinct regulatory novelty that goes beyond the pathway pre-determined by the crisis intervention.

The findings of this article provide the starting points for further research in IPE. On the one hand, they point towards further exploring the international dimension of those changes in the monetary system. That both overnight repos and Government MMF shares continue to be part of the public money supply today and are likely to do so in the future constitutes a major transformation in

the public monetary system, not only domestically in the U.S. but—bearing in mind the transnational scope of the shadow banking system—even on an international scale. As we continue to live in a world of dollar hegemony (cf. Helleiner 2008, Cohen and Benney 2015), changes in the U.S. monetary system have immediate international implications. With the Fed effectively running the international monetary system using its balance sheet as the global backstop, the C6 swap lines established in the first wave of the crisis are likely to predetermine the future trajectory for international public credit money creation via central bank collaboration (Mehrling 2015b). The innovative regulation of inherently international repo markets transcending the old consensus that Gabor (2016) terms the 'impossible repo trinity', will shape the future role of market-based finance for the international monetary system (Gabor and Vestergaard 2016) and is likely to be the backbone of a new era of central banking with a much stronger involvement of public balance sheets in the money markets (Pozsar and Sweeney 2015). Moreover, repos played a key role in Europe's sovereign bond market crisis and their regulatory treatment is of crucial importance for the future of the Eurozone (Gabor and Ban 2016). Thus, to understand how the international monetary system evolves at the moment, we should have the shadow banking system on the radar and pay close attention to the deposit substitutes it creates and how they are regulated.

On the other hand, the findings of this paper point to a more general phenomenon that deserves to be put on the research agenda in IPE: the 'accommodation' of private credit money forms in the public money supply as a recurrent political-economic process. If we look at the history of Western political economies, we see that the main financial instruments which we utilize and consider as public money today used to be private credit money in the past. This is particularly true for bank notes and bank deposits, which—in terms of Pozsar's Money Matrix—were *public-private money* or *pure private money* in the 18th and 19th century, respectively. From today's perspective, we might thus insinuate that both bank notes and bank deposits were the 'shadow money' of a previous epoch. Today, we almost naturally consider them to be part of the public money supply. Bank notes—following Pozsar's taxonomy—are *pure public money*, which can be issued by central banks at their discretion. Bank deposits are *private-public money*, which is protected by an elaborate framework of public backstops, in particular the discount window at the central bank protecting against illiquidity as well as public deposit insurance protecting against insolvency. Improving our understanding of the political and economic determinants of this process of 'private credit money accommodation' will help us better establish the connections of shadow banking and the monetary system, and it reinforces the argument that if we want to become aware of the evolutionary trajectory of the monetary system, we should pay attention to the status of shadow money instruments within the hybridity of public and private credit money.

References

Acharya, Viral V. and Schnabl, Philipp (2010) 'Do Global Banks Spread Global Imbalances? Asset-Backed Commercial Paper during the Financial Crisis of 2007-09', *IMF Economic Review* 58 (1), pp. 37-73.

Acharya, Viral V., Schnabl, Philipp, and Suarez, Gustavo A. (2010) *Securitization without Risk Transfer,* National Bureau of Economic Research, Working Paper 15730.

Adrian, Tobias (2014) *Financial Stability Policies for Shadow Banking,* Federal Reserve Bank of New York, Staff Report No. 664.

Adrian, Tobias, Burke, Christopher R., and McAndrews, James J. (2009) 'The Federal Reserve's Primary Dealer Credit Facility', *Current Issues in Economics and Finance* 15 (4), pp. 1-12.

Anderson, Richard G. and Gascon, Charles S. (2009) 'The Commercial Paper Market, the Fed, and the 2007-2009 Financial Crisis', *Federal Reserve Bank of St. Louis Review* 91 (6), pp. 589-612.

Armantier, Olivier, Krieger, Sandra, and McAndrews, James J. (2008) 'The Federal Reserve's Term Auction Facility', *Current Issues in Economics and Finance* 14 (5), pp. 1-11.

Baklanova, Viktoria (2012) *Money Market Funds in the US and the EU. A Legal and Comparative Analysis,* University of Westminster, School of Law, PhD thesis.

Ban, Cornel, Seabrooke, Leonard, and Freitas, Sarah (2016) 'Grey Matter in Shadow Banking. International Organizations and Expert Strategies in Global Financial Governance', *Review of International Political Economy* 23 (6), pp. 1001-1033.

Bernanke, Ben (2013) *The Federal Reserve and the Financial Crisis,* Princeton: Princeton University Press.

Bernanke, Ben (2015) *The Courage to Act. A Memoir of a Crisis and Its Aftermath,* New York: WWNorton.

Blyth, Mark (2002) *Great Transformations. Economic Ideas and Institutional Change in the Twentieth Century,* New York: Cambridge University Press.

Boesler, Matthew and Condon, Christopher (2015) 'Fed Removes Reverse Repo Cap to Ensure Control Over Rates', *Bloomberg*, 16 December 2015

Braun, Benjamin (2013) 'Preparedness, Crisis Management and Policy Change. The Euro Area at the Critical Juncture of 2008-2013', *The British Journal of Politics and International Relations* 17 (3), pp. 419-441.

Brunnermeier, Markus K. (2009) 'Deciphering the Liquidity and Credit Crunch 2007-2008', *Journal of Economic Perspectives* 23 (1), pp. 77-100.

Bryan, Dick, Rafferty, Michael, and Wigan, Duncan (2016) 'Politics, Time and Space in the Era of Shadow Banking', *Review of International Political Economy* 23 (6), pp. 941-966.

Cecchetti, Stephen G. (2008) *Crisis and Responses. The Federal Reserve and the Financial Crisis of 2007-2008,* National Bureau of Economic Research, Working Paper 14134.

Chen, Jiakai (2015) *Off-Balance Sheet Financing and Bank Capital Regulation. Lessons from Asset-Backed Commercial Paper,* Haas School of Business, UC Berkeley, Job Market Paper.

Claessens, Stijn et al. (2012) *Shadow Banking. Economics and Policy,* International Monetary Fund, IMF Staff Discussion Paper SDN/12/12.

Cohen, Benjamin J. and Benney, Tabitha (2014) 'What Does the International Currency System Really Look Like?', *Review of International Political Economy* 21 (5), pp. 1017-1041.
Copeland, Adam et al. (2011) *Policy Issues in the Design of Tri-Party Repo Markets,* Federal Reserve Bank of New York, Unpublished Manuscript.
Copeland, Adam et al. (2012) *Key Mechanics of the U.S. Tri-Party Repo Market,* Federal Reserve Bank of New York, FRBNY Economic Policy Review.
Covitz, Daniel M., Liang, Nellie, and Suarez, Gustavo A. (2009) *The Evolution of a Financial Crisis. Panic in the Asset-Backed Commercial Paper Market,* Federal Reserve Board, Finance and Economics Discussion Series 2009-36.
Duffie, Darrell (2016) *Financial Regulatory Reform After the Crisis,* European Central Bank, Paper for the ECB Forum on Central Banking in Sintra, Portugal.
Ellis, David and Rooney, Ben (2007) 'Banks to Abandon 'Super-SIV Fund', *CNNMoney*, 21 December 2007.
Ennis, Huberto M. (2011) 'Strategic Behavior in the Tri-Party Repo Market', *Economic Quarterly* 97 (4), pp. 389-413.
Federal Deposit Insurance Corporation (2008) *Press Release. October 7, 2008,* Federal Deposit Insurance Corporation, Press Release.
Federal Open Market Committee (2008) *Minutes of the Federal Open Market Committee. October 28-29, 2008,* Federal Reserve, Minutes.
Federal Reserve (2007) *Press Release. December 12, 2007,* Board of Governors of the Federal Reserve System.
Federal Reserve (2010) *Press Release. January 27, 2010,* Board of Governors of the Federal Reserve System.
Federal Reserve Bank of New York (2008) *Term Asset-Backed Securities Loan Facility (TALF) Terms and Conditions,* Federal Reserve Bank of New York, Fact Sheet.
Federal Reserve Bank of New York (2009a) *Commercial Paper Funding Facility. Frequently Asked Questions,* Federal Reserve Bank of New York, FAQ Website.
Federal Reserve Bank of New York (2009b) *Money Market Investor Funding Facility. Frequently Asked Questions,* Federal Reserve Bank of New York, FAQ Website.
Financial Stability Board (2011) *Shadow Banking. Strengthening Oversight and Regulation,* Financial Stability Board, Recommendations.
Fink, Matthew P. (2011) *The Rise of Mutual Funds. An Insider View,* Oxford and New York: Oxford University Press.
Fioretos, Orfeo (2010) 'Capitalist Diversity and the International Regulation of Hedge Funds', *Review of International Political Economy* 17 (4), pp. 696-723.
Fleming, Michael J., Hrung, Warren B., and Keane, Frank M. (2009) 'The Term Securities Lending Facility. Origin, Design, and Effects', *Current Issues in Economics and Finance* 15 (2), pp. 1-11.
Frost, Joshua et al. (2015) *Overnight RRP Operations as a Monetary Policy Tool. Some Design Considerations,* Federal Reserve Bank of New York, Staff Report No. 712.
Gabor, Daniela (2016) 'The (Impossible) Repo Trinity. The Political Economy of Repo Markets', *Review of International Political Economy* 23 (6), pp. 967-1000.
Gabor, Daniela and Ban, Cornel (2016) 'Banking on Bonds. The New Links Between States and Markets', *Journal of Common Market Studies* 54 (3), pp. 617-635.

Gabor, Daniela and Vestergaard, Jakob (2016) *Towards a Theory of Shadow Money,* Institute for New Economic Thinking, INET Working Paper.
Garbade, Kenneth D. (2006) 'The Evolution of Repo Contracting Conventions in the 1980s', *Economic Policy Review* 12 (1), pp. 27-42.
Geithner, Timothy F. (2014) *Stress Test. Reflections on Financial Crises,* New York: Broadway Books.
Gorton, Gary B. (2010) *Slapped by the Invisible Hand. The Panic of 2007,* Oxford and New York: Oxford University Press.
Gorton, Gary B. and Metrick, Andrew (2012) 'Securitized Banking and the Run on Repo', *Journal of Financial Economics* 104 (3), pp. 425-451.
Helleiner, Eric (2008) 'Political Determinants of International Currencies. What Future for the US Dollar?', *Review of International Political Economy* 15 (3), pp. 354-378.
Helgadóttir, Oddny (2016) 'Banking Upside Down. The Implicit Politics of Shadow Banking Expertise', *Review of International Political Economy* 23 (6), pp. 915-940.
ICI (2014) *2014 Investment Company Fact Book. A Review of Trends and Activities in the U.S. Investment Company Industry,* Investment Company Institute.
Ingham, Geoffrey (2004) *The Nature of Money,* Cambridge and Malden: Polity Press.
Jackson, Patricia (2013) 'Shadow Banking and New Lending Channels - Past and Future', in: Morten Balling and Ernest Gnan (ed.) *50 Years of Money and Finance. Lessons and Challenges,* Vienna: SUERF - The European Money and Finance Forum, pp. 377-414.
Jakab, Zoltan and Kumhof, Michael (2015) *Banks are not Intermediaries of Loanable Funds - And Why This Matters,* Bank of England, Working Paper No. 529.
Jones, Phillipa (1997) 'The Fight for Tri-Party Repo', *iCB* 13 (4), pp. 28-33.
Lynch, Sarah N. (2013) 'SEC Moves to Tighten Regulations on Money Market Funds', *Reuters*, 5 June 2013.
Lysandrou, Photis and Nesvetailova, Anastasia (2015) 'The Role of Shadow Banking Entities in the Financial Crisis. A Disaggregated View', *Review of International Political Economy* 22 (2), pp. 257-279.
MacDonald, Ronald (1996) *Deposit Insurance,* Centre for Central Banking Studies, Bank of England, Handbooks in Central Banking No. 9.
McCabe, Patrick E. (2015) 'Money Market Funds. Reconsidering the Mutual Fund Model', in: Stijn Claessens et al. (ed.) *Shadow Banking within and Across National Borders,* Singapore: World Scientific Publishing, pp. 301-322.
McCulley, Paul (2009) 'The Shadow Banking System and Hyman Minsky's Economic Journey', *PIMCO. Global Central Bank Focus*.
McCulley, Paul and Pozsar, Zoltan (2014) 'Make Shadow Banks Safe and Private Money Sound', *Financial Times*, 16 June 2014.
McLeay, Michael, Radia, Amar, and Thomas, Ryland (2014) *Money in the Modern Economy. An Introduction,* Bank of England, Quarterly Bulletin 2014 Q1.
McMillan, Jonathan (2014) *The End of Banking. Money, Credit, and the Digital Revolution,* Zero/One Economics GmbH.
Mehrling, Perry (2011) *The New Lombard Street. How the Fed Became the Dealer of Last Resort,* Princeton and Oxford: Princeton University Press.
Mehrling, Perry (2013a) 'Financial Globalization and the Future of the Fed', in:

Toshiaki Hirai, Maria Cristina Marcuzzo, and Perry Mehrling (ed.) *Keynesian Reflections. Effective Demand, Money, Finance, and Policies in the Crisis,* Oxford University Press,
Mehrling, Perry (2013b) 'Insights from Walter Bagehot', in: G. Page West III and Robert M. Whaples (ed.) *The Economic Crisis in Retrospect. Explanations by Great Economists,* Cheltenham and Northampton: Edward Elgar, pp. 13-42.
Mehrling, Perry (2015a) *Why Is Money Difficult?,* Barnard College of Columbia University, Blog.
Mehrling, Perry (2015b) 'Elasticity and Discipline in the Global Swap Network', *International Journal of Political Economy* 44(4), pp. 311-324.
Mehrling, Perry et al. (2013) *Bagehot was a Shadow Banker. Shadow Banking, Central Banking, and the Future of Global Finance,* Institute for New Economic Thinking, Shadow Banking Colloquium.
Minsky, Hyman P. (1986) *Stabilizing an Unstable Economy,* New Haven and London: Yale University Press.
Mitchell-Innes, Alfred (1914) 'The Credit Theory of Money', *The Banking Law Journal* 31 pp. 151-168.
Moe, Thorvald Grung (2012) *Shadow Banking and the Limits of Central Bank Liquidity Support. How to Achieve a Better Balance between Global and Official Liquidity,* Levy Economics Institute, Working Paper WP No. 712.
Moe, Thorvald Grung (2014) *Shadow Banking. Policy Challenges for Central Banks,* Levy Economics Institute, Working Paper No. 802.
Moreira, Alan and Savov, Alexi (2014) *The Macroeconomics of Shadow Banking,* National Bureau of Economic Research, Working Paper.
Nesvetailova, Anastasia (2015) 'A Crisis of the Overcrowded Future. Shadow Banking and the Political Economy of Financial Innovation', *New Political Economy* 20 (3), pp. 431-453.
Office of the Comptroller of the Currency (2010) *Risk-Based Capital Guidelines. Final Rule,* U.S. Department of the Treasury.
Pagliari, Stefano and Young, Kevin L. (2014) 'Leveraged Interests. Financial Industry Power and the Role of Private Sector Coalitions', *Review of International Political Economy* 21 (3), pp. 575-610.
Paulson, Henry M., Jr. (2010) *On the Brink. Inside the Race to Stop the Collapse of the Global Financial System,* New York: Business Plus.
Porter, Tony (2003) 'Technical Collaboration and Political Conflict in the Emerging Regime for International Financial Regulation', *Review of International Political Economy* 10 (3), pp. 520-551.
Pozsar, Zoltan (2011) *Institutional Cash Pools and the Triffin Dilemma of the U.S. Banking System,* International Monetary Fund, IMF Working Paper WP/11/190.
Pozsar, Zoltan (2014) *Shadow Banking. The Money View,* Office of Financial Research, Working Paper.
Pozsar, Zoltan (2015) *A Macro View of Shadow Banking. Levered Betas and Wholesale Funding in the Context of Secular Stagnation,* .
Pozsar, Zoltan et al. (2012) *Shadow Banking,* Federal Reserve Bank of New York, Staff Report 458.
Pozsar, Zoltan and Sweeney, James (2015) *The Money Market Under Government Control,* Credit Suisse, Global Money Notes #1.
Ricks, Morgan (2011) 'Regulating Money Creation after the Crisis', *Harvard*

Business Law Review 1 pp. 75-143.
Ricks, Morgan (2012) 'Money and (Shadow) Banking. A Thought Experiment', *Review of Banking and Financial Law* 31 pp. 731-748.
Ricks, Morgan (2016) *The Money Problem. Rethinking Financial Regulation,* Chicago and London: The University of Chicago Press.
Schumpeter, Joseph Alois (1954) [2006] *History of Economic Analysis,* New York: Oxford University Press.
Schwartz, Herman M. (2009) *Subprime Nation. American Power, Global Capital, and the Housing Bubble,* Ithaca and London: Cornell University Press.
SEC (2010) *Money Market Fund Reform. Final Rule,* Securities and Exchange Commission.
SEC (2014) *Money Market Fund Reform. Amendments to Form PF,* Securities and Exchange Commission, Final Rule.
Sennholz-Weinhardt, Barbara (2014) 'Regulatory Competition as a Social Fact. Constructing and Contesting the Threat of Hedge Fund Managers' Relocation from Britain', *Review of International Political Economy* 21 (6), pp. 2140-2174.
SIFMA (2015) *Money Market Reform Resource Center,* Securities Industry and Financial Markets Association.
Sissoko, Carolyn (2010) 'The Legal Foundations of Financial Collapse', *Journal of Financial Economic Policy* 2 (1), pp. 5-34.
Sunderam, Adi (2012) *Money Creation in the Shadow Banking System,* Harvard Business School, Working Paper.
Strange, Susan (1996) *The Retreat of the State. The Diffusion of Power in the World Economy,* Cambridge and New York: Cambridge University Press.
Thiemann, Matthias (2014) 'In the Shadow of Basel. How Competitive Politics Bred the Crisis', *Review of International Political Economy* 21 (6), pp. 1203-1239.
Tsingou, Eleni (2015) 'Club Governance and the Making of Global Financial Rules', *Review of International Political Economy* 22 (2), pp. 225-256.
Turner, Adair (2012) *Shadow Banking and Financial Instability,* UK Financial Services Authority, Speech at Cass Business School, 14 March 2012.
U.S. Treasury (2008) *Treasury Announces Guaranty Program for Money Market Funds,* U.S. Department of the Treasury, Press Report.
U.S. Treasury (2009) *Treasury Announces Expiration of Guarantee Program for Money Market Funds (19 September 2009),* U.S. Department of the Treasury, Press Report.
Werner, Richard A. (2015) 'A Lost Century in Economics. Three Theories of Banking and the Conclusive Evidence', *International Review of Financial Analysis*, doi:10.1016/j.irfa.2015.08.014.
Widmaier, Wesley W. (2016) *Economic Ideas in Political Time. The Construction, Conversion and Crisis of Economic Orders from the Progressive Era to the Global Financial Crisis,* Cambridge: Cambridge University Press.

Interviews

Interview 1: Interview with an official of the Federal Reserve Bank of New York, 5 June 2015, New York.
Interview 2: Interview with a research officer at the Federal Reseve Bank of New York, 5 June 2015, New York.
Interview 3: Interview with an official at the International Monetary Fund, 8 June 2015, Washington D.C.
Interview 4: Interview with an official of the Federal Reserve Board, 8 June 2015, Washington D.C.
Interview 5: Interview with a former member of staff at the U.S. Department of Treasury, 24 July 2015, New York .
Interview 6: Interview with an official of the Federal Reserve Bank of New York, 24 July 2015, New York.
Interview 7: Interview with a former member of staff at the U.S. Department of Treasury, 20 August 2015, online interview.

---

1 Other terms for SPVs that are legally different but functionally equivalent are 'Structured Purpose Vehicles', 'Special Investment Vehicles', 'ABCP conduits' or 'ABCP programmes'.

2 The description of the empirical Money Matrix rests upon the categorization of Pozsar (2014) but adds ABCPs to the picture and leaves out Treasury liabilities whose property as credit money is contested (see Ricks 2016 as well as Gabor and Vestergaard 2016 for a detailed discussion of contemporary credit money forms and hierarchies).

3 After Lehman's collapse, public authorities adopted measures to support the securitisation channel of shadow banking. Those involved emergency liquidity facilities such as the Money Market Investor Funding Facility (MMIFF), the Commercial Paper Funding Facility (CPFF) and the Term Asset-Backed Securities Loan Facility (TALF) (see e.g. FOMC 2008, FRNBY 2008, FRBNY 2009a, FRNBY 2009b). However, those facilities did not primarily affect the ABCP market as ABCPs had already lost their relevance at that point (Mehrling 2011).

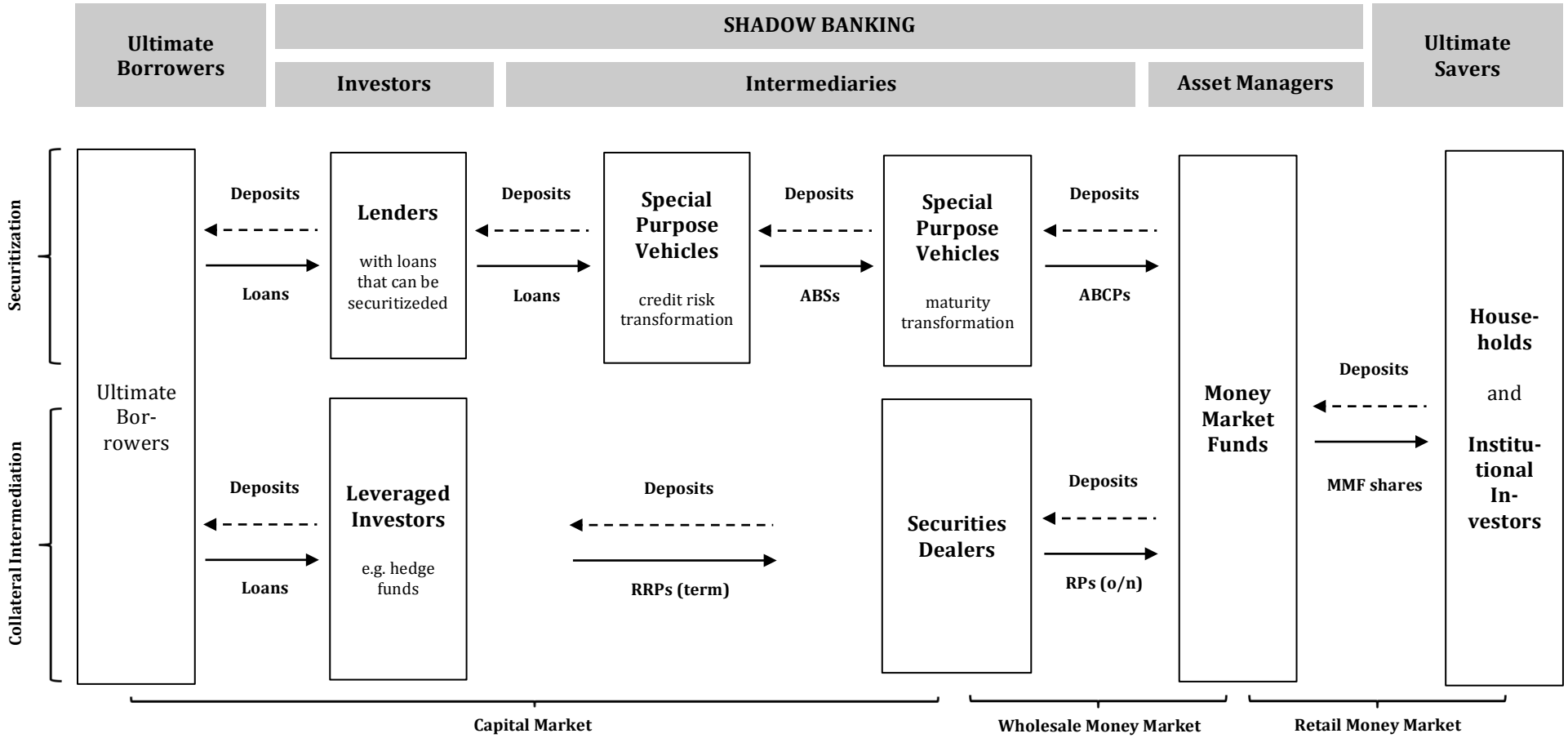

Figure 1—Shadow money creation in the stylized shadow banking system

	Assets	Liabilities
Commercial Banks	Loans and bonds (long-term IOUs)	Deposits (very short-term IOUs)
SPVs	ABSs (long-term IOUs)	ABCPs (short-term IOUs)
Securities Dealers:	Term repos (long-term IOUs)	Overnight repos (short-term IOUs)
MMFs	ABCPs and overnight repos (short-term IOUs)	MMF shares (very short-term IOUs)

Figure 2—Traditional and Shadow Money, created as a swap of IOUs

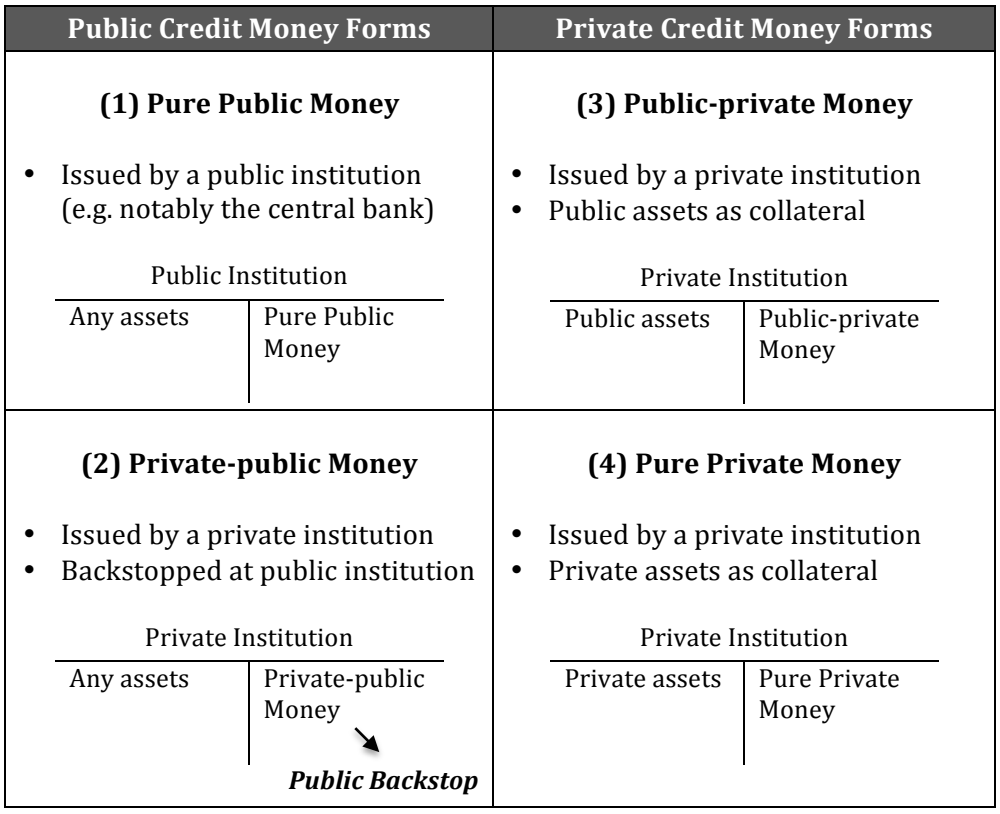

Figure 3—The 'Money Matrix' (conceptually)

Public Credit Money Forms	Private Credit Money Forms
(1) Pure Public Money Central Bank liabilities • Currency (Notes, Coins) • Central bank deposits	**(3) Public-private Money** Securities dealers' liabilities • Overnight repos of government desk MMF liabilities • Shares of Government MMFs
(2) Private-public Money Commercial bank liabilities • Insured bank deposits	**(4) Pure Private Money** SPV liabilities • ABCPs Securities dealers' liabilities • Overnight repos of credit desk MMF liabilities • Shares of Prime MMFs Commercial bank liabilites • Uninsured bank deposits

Figure 4—The 'Money Matrix' (empirically, before the 2007-9 Crisis)

Public Credit Money Forms	Private Credit Money Forms
(1) Pure Public Money Central Bank liabilities • Currency (Notes, Coins) • Central bank deposits	**(3) Public-private Money**
(2) Private-public Money Commercial bank liabilities • Insured bank deposits Securities dealers' liabilities • Overnight repos of government desk • Overnight repos of credit desk MMF liabilities • Shares of Prime MMFs • Shares of Government MMFs	**(4) Pure Private Money** Commercial bank liabilites • Uninsured bank deposits

Figure 5—The 'Money Matrix' (empirically, in the year after Lehman)

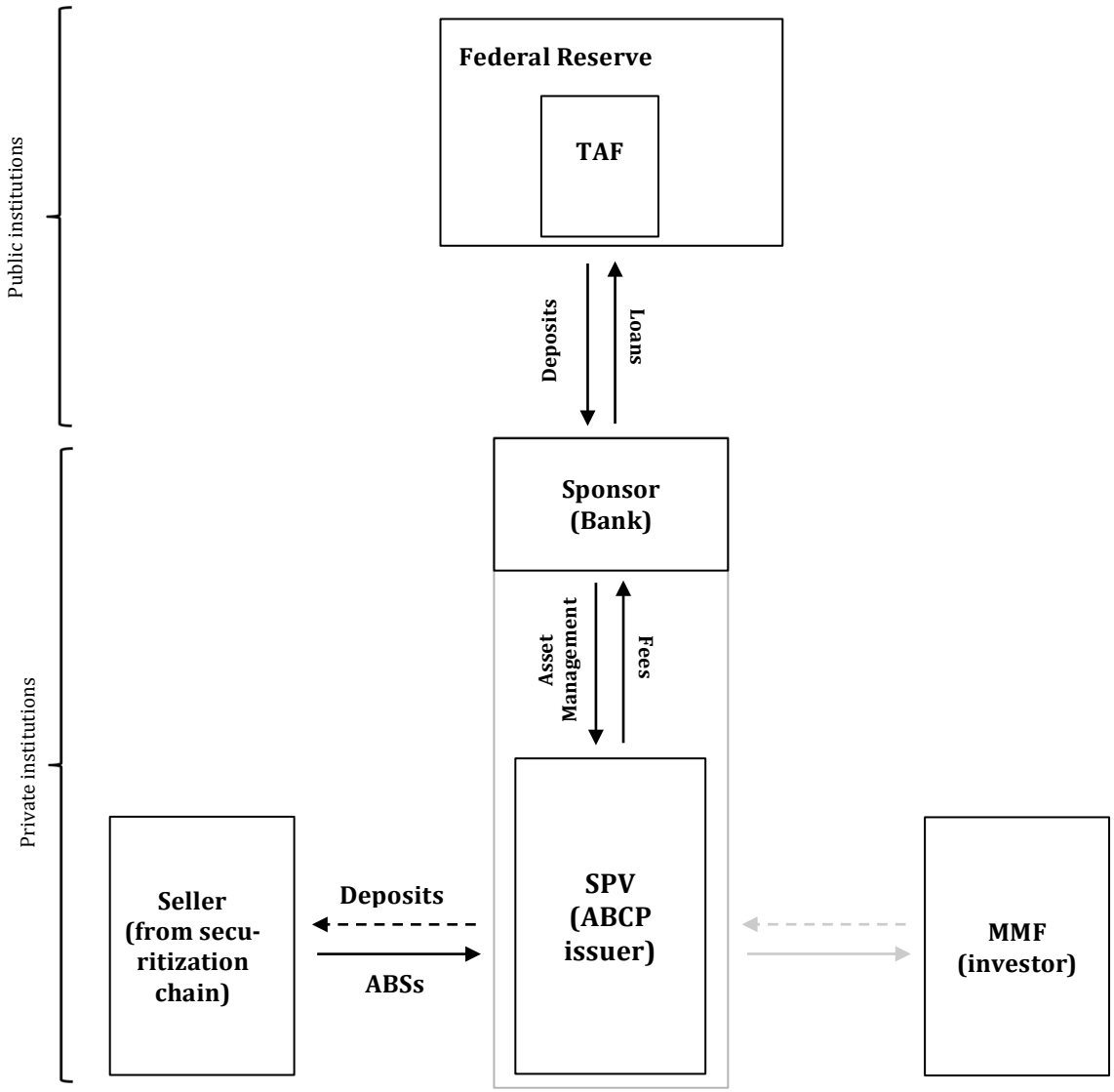

Figure 6—Impact of the Public Intervention on the ABCP market

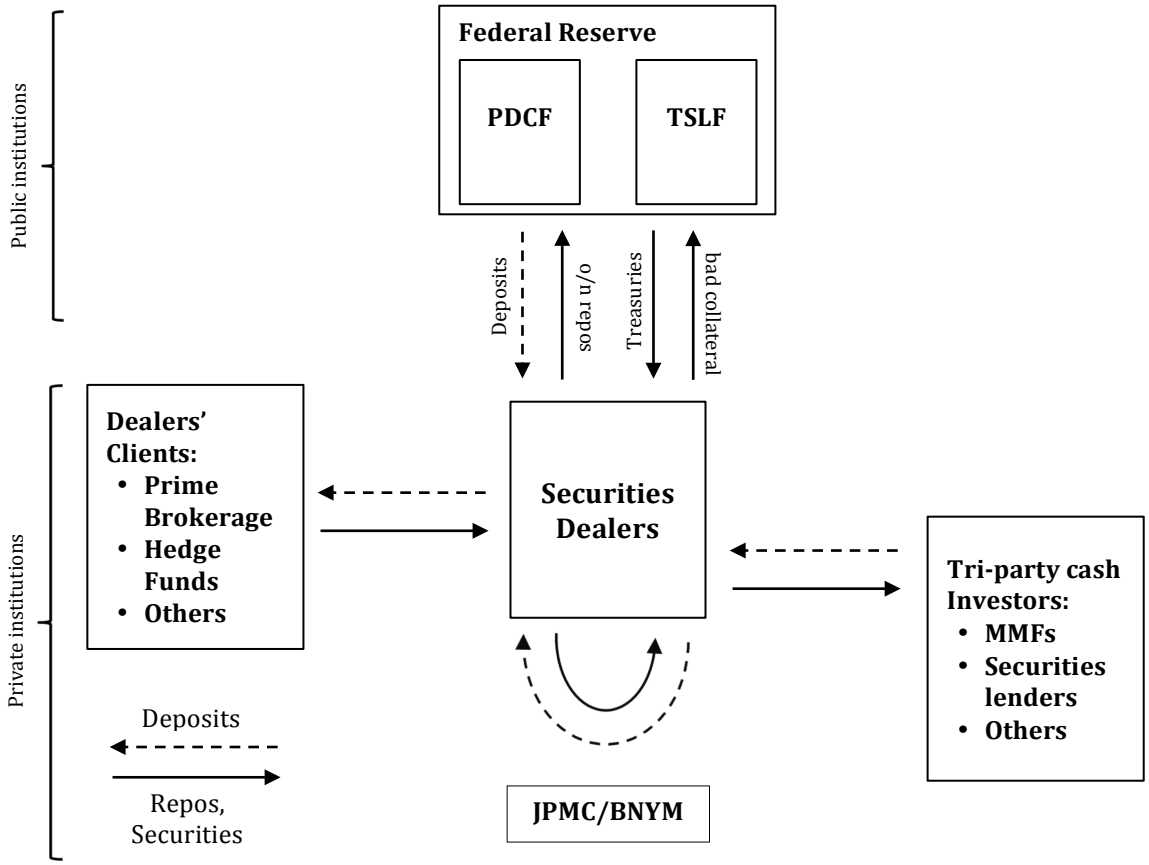

Figure 7—Impact of the Public Intervention on the Tri-Party Repo Market

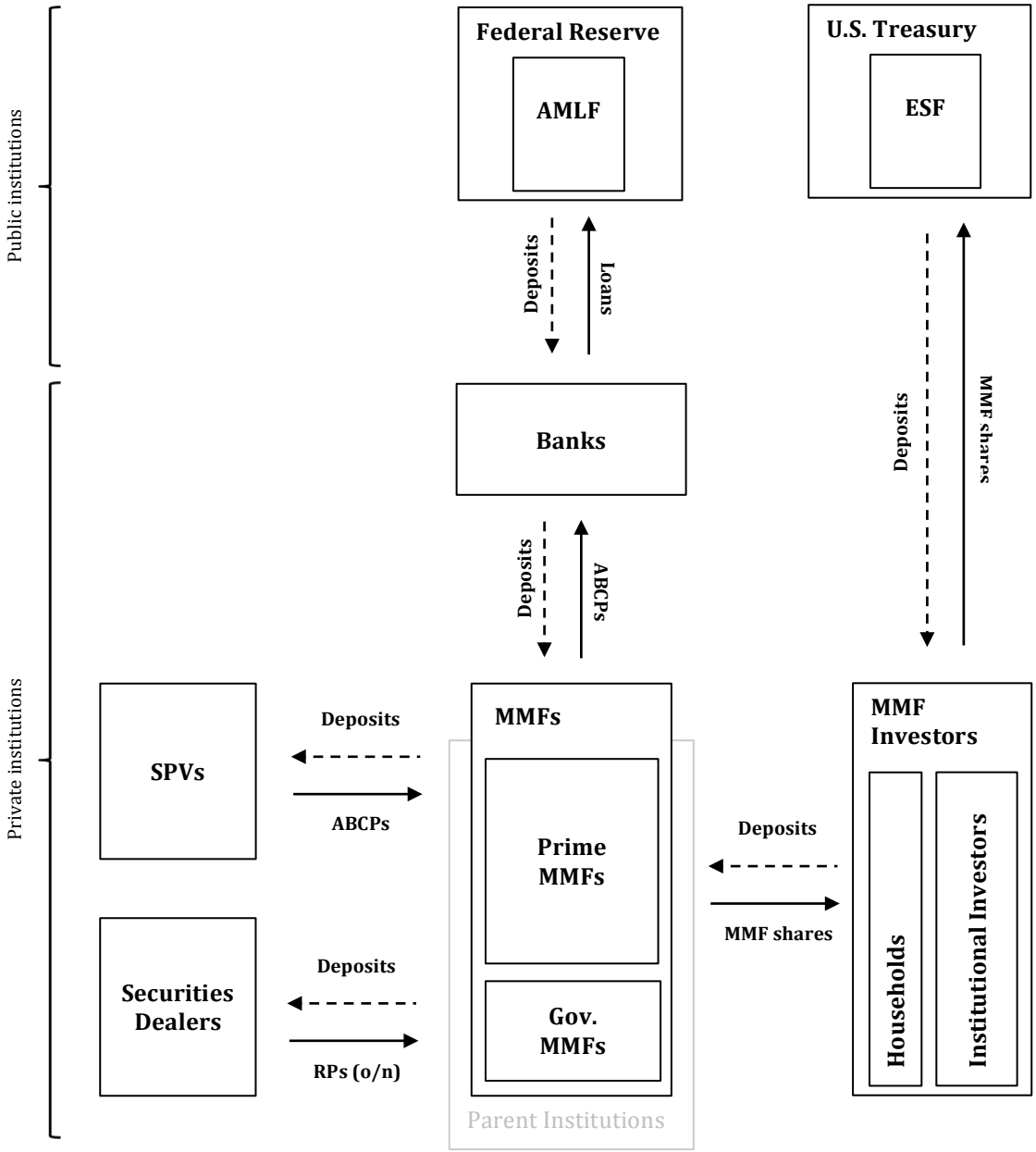

Figure 8 – Impact of the Public Intervention on the MMF Market

Public Credit Money Forms	Private Credit Money Forms
(1) Pure Public Money Central Bank liabilities • Currency (Notes, Coins) • Central bank deposits	**(3) Public-private Money**
(2) Private-public Money Commercial bank liabilities • Insured bank deposits Securities dealers' liabilities • RPs (o/n) of government desk • RPs (o/n) of credit desk MMF liabilities • Shares of Government MMFs	**(4) Pure Private Money** Commercial bank liabilites • Uninsured bank deposits

Figure 9 – The 'Money Matrix' (empirically, since 2014)

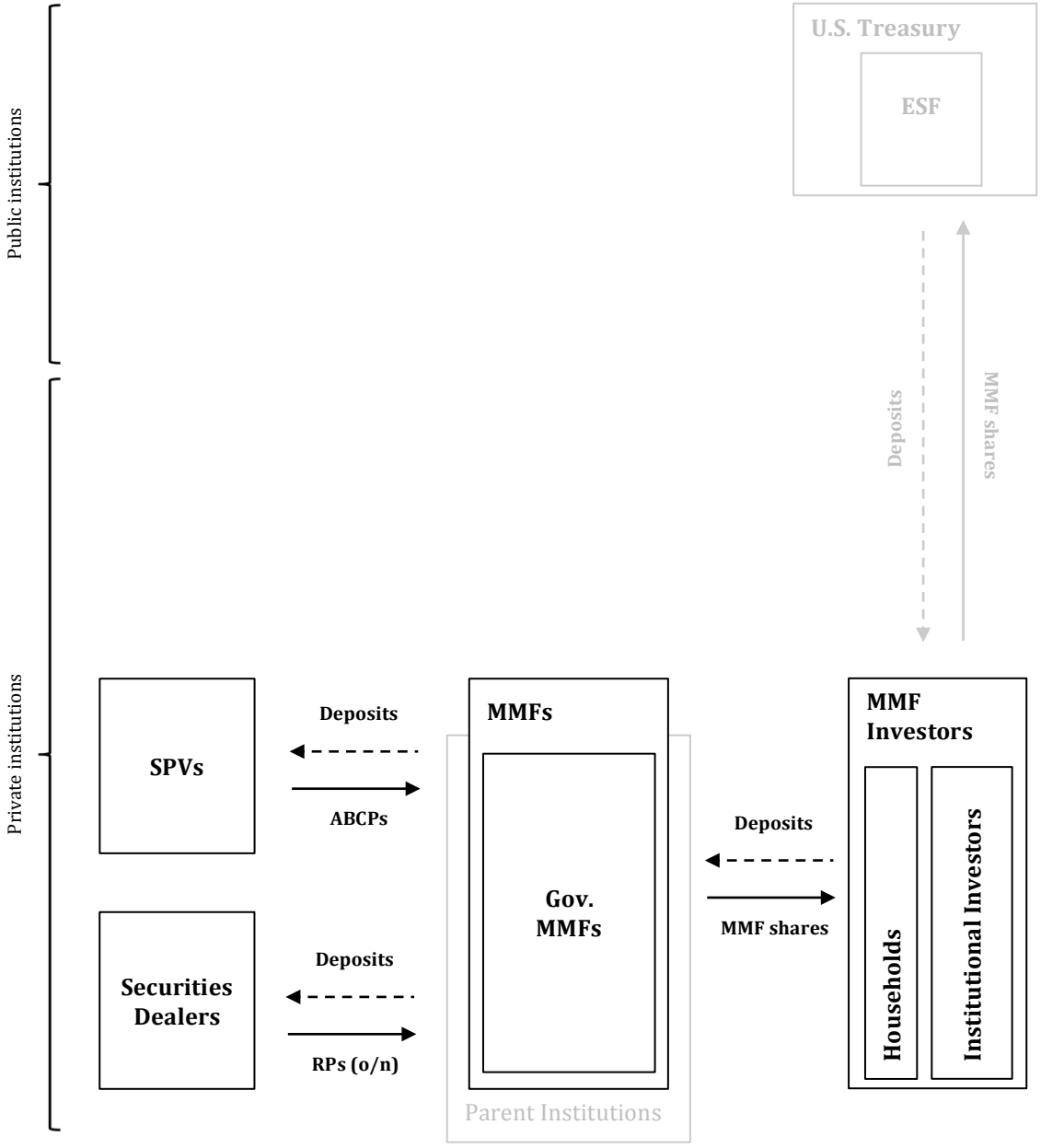

Figure 10—Implicit backstops for Government MMF shares

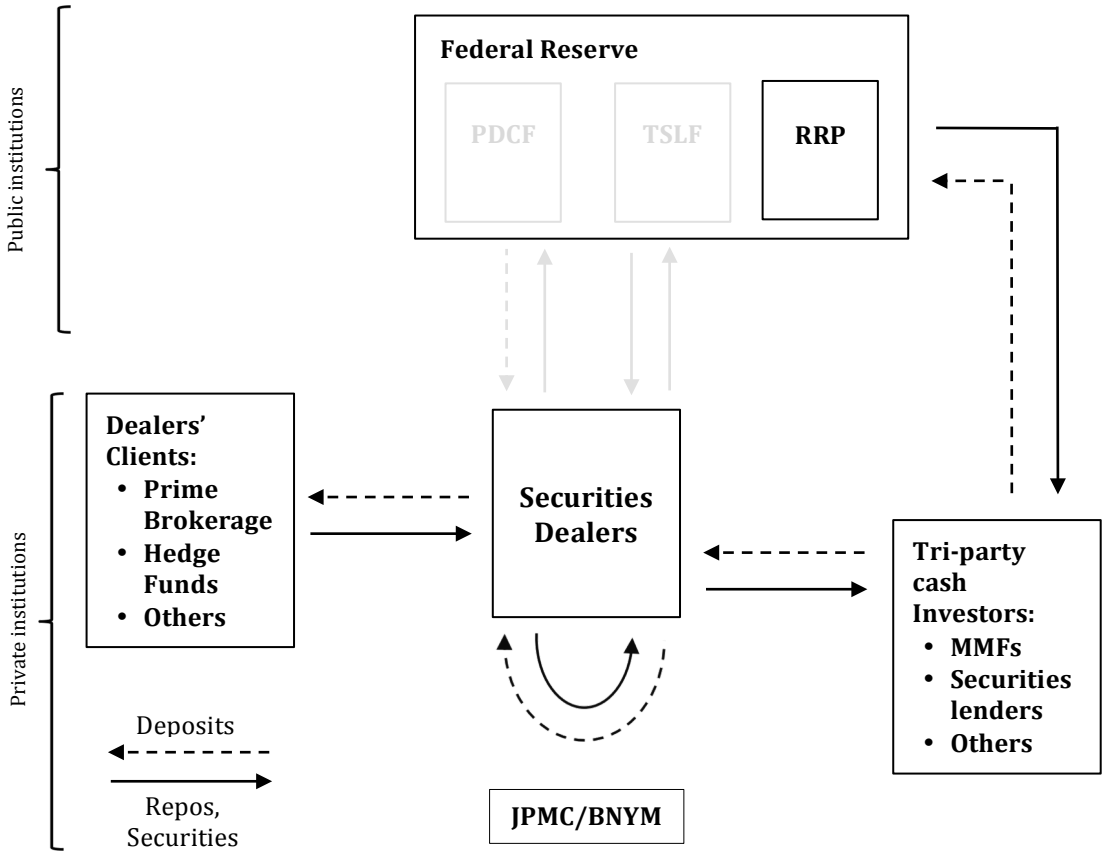

Figure 11—Implicit backstops for overnight repos and RRP