

Towards a theory of shadow money

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Abstract: What does the rise of shadow banking mean for monetary theory and practice? (How) should we change our traditional theories of money to capture the complex practices through which money is created in modern financial systems? To answer these questions, we approach money as provisional promises to pay, promises hierarchical in nature (Minsky 1998, Bell-Kelton 2001, Wray 2003, Mehrling 2012a, Mehrling et al 2013, Pozsar 2014, 2015). Noting that shadow banking is distinctive from relationship banking in that debt relationships are typically organized via marketable securities, we define shadow money as repo liabilities supported by tradable collateral. It is the presence of collateral characterising such private promises to pay that confer shadow money its distinctive character. In modern money hierarchies, market participants have developed an intricate mechanism for maintaining the exchange of money proper (state and bank money) with shadow money, a mechanism that essentially relies on the liquidity of the underlying collateral. We examine the dynamic properties of hierarchies with shadow money, and the systemic liquidity challenges that central banks face in stabilizing shadow money.

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How much of what we know about money and central banking is still valid? This is an important question in the age of extended asset purchases, negative interest rates, lender of last resort at zero rates, against whatever collateral eligible institutions can scrape together, new counterparties from the shadow banking world, and, more obviously political, central banks calling for fiscal stimulus. This, we argue, is a question of money theorizing. The curious case of central banking post-Lehman reflects the challenges raised by the complex practices through which money is created in modern financial systems. Just as a new grammar of money was developed in the course of struggles over banks' special role in money creation in the 19th century (Chick 2013, also Ricks 2011), today we need to develop an idiom that allows us to define and conceptualize new forms of money.

The money view approach provides a radical rethink in this direction (Mehrling, 2012a, b; Mehrling et al 2013; Pozsar 2014; 2015). It captures the institutional contours of what Haldane (2014) termed 'the age of asset managers': institutional cash pools and levered portfolio managers, the first seeking safety and the second risk. For both, Pozsar (2014) argues, (shadow) money begins where the deposits created by banks (M2) ends. To conceptualize shadow money, Pozsar focuses on a crucial attribute of money - *trading at par on demand* - rather than the usual functions of means of exchange, unit of account and store of value (see also Ricks 2011). At par convertibility maps onto a hierarchy of money that closely reflects (cross-border) institutional arrangements: gold as money between central banks, central bank reserves as money between banks, bank deposits as money between firms and households (see Mehrling 2012a). Shadow money, defined as repo claims and constant NAV shares of money market funds (MMF), promise at par convertibility in a new financial landscape (re)shaped by secular stagnation, wealth concentration and inequality, and the shift of social provisioning to the private sector (Pozsar 2015).

We extend these theoretical foundations by elaborating on the role of uncertainty as a fundamental characteristic of (shadow) money creation. Our approach treats money as a balance sheet concept, an operation that records a social relation in the tradition of Keynes, Minsky, Wray and more recent heterodox contributions (Bell 2001, Lavoie 2013). A hierarchy approach offers a powerful theoretical lens to trace new liabilities (promises to pay) created by shadow banks, and banks' activities in the shadows. It organizes monetary liabilities according to the strength of their promise to exchange at par for traditional money created by the state and its banks. If what makes liabilities such as repos 'money' is the credibility of that promise, a key challenge becomes to conceptualize how 'shadow' liabilities may re-order money hierarchies and (de)stabilize them.

We define shadow money as repo liabilities, promises backed by tradable collateral. Our definition is narrower than that used by theorists of shadow money, who typically include other demandable short-term liabilities such as Asset Backed Commercial Paper (ABCP) and MMF 'shares' (Ricks 2011, Pozsar 2014, von der Becke and Sornette 2014). Our approach offers several analytical advantages. It first allows us to capture the distinctiveness of shadow banking, and market-based finance, as a system where debt relationships are organized via tradable securities. It is the presence of collateral that makes (convertibility of) repos distinctive from ABCPs and MMFs. What makes repos money - the *at par* exchange between 'cash' and collateral that

finance has developed over the last 20 years – is what makes finance more fragile. Knightian uncertainty bites harder and faster because convertibility depends on collateral market liquidity rather than implicit public guarantees. Second, it allows us to conceptualize the role of the state in the creation of shadow money, beyond the simple function of guarantor of ‘at par’ that a broad definition of money alludes to. If modern money creation demands of the state to issue debt not because it needs cash, but because private finance needs safe collateral (Garbade 2006, also Pozsar 2011), then the challenges of a social contract between the state and its (shadow) money issuing institutions becomes more readily apparent. Outside the liquid space of US Treasuries, we argue, shadow money instability can damage sovereign bond markets. Third, our approach allows us to put banks at the centre of shadow money creation. The emergent shadow money literature typically contrasts banks’ special role in (deposit) money creation with shadow banks’ issuance of high-quality, highly-liquid IOUs. This treatment, reflecting the institutional peculiarities of US shadow banking (see Martin 2015), downplays banks’ activities in the shadows. By exploring the dual role of banks as money and shadow money issuers, our approach provides a comparative lens to explore shadow money in bank-based financial systems such as the Euroarea and China.

We first trace briefly the theoretical origins of the money hierarchy approach and the central role it assigns to the convertibility of credit claims as defining characteristic of money. We then explore the position of shadow money in modern hierarchies, the role of banks and the state, endogeneity and (cyclical) liquidity. We compare a traditional with a shadow hierarchy to outline the disciplinary constraints governing shadow money. Shadow money changes the systemic liquidity challenges faced by central banks, requiring a radical rethink of their practice, and more broadly, of the terms on which the state defines its relationship to money. We outline directions for future research.

A condensed historical journey: from commodity to hierarchical money

Joseph Schumpeter once quipped that there are ‘only two theories of money which deserve the name...the commodity theory and the claim theory. From their very nature, they are incompatible’. His observation remains pertinent. The commodity theory of money, famously restated in Kiyotaki and Wright (1989, 1991) remains influential. It treats money as means of exchange, and has little interest in tracing the changing shape of monetary spaces. In contrast, the claim approach treats money as a ‘social relation of debt and credit denominated in a unit of account’ (Ingham, 2004 p12). Money embodies a promise to accept each other’s debt (Lavoie 2014), with the greatest credibility, and the widest acceptability, enjoyed by the promises of the state.

In practice however, monetary theorists have long struggled to preserve such neat distinctions (Foley 1987). When examining the relationship of (commodity) money to economic activity, early monetary theorists were confronted with the growing acceptability of private promises to pay (bills of exchange, bank notes and deposits issued by private banks). Adam Smith proposed a ‘market’ based convertibility rule, whereby banknotes issued by private banks could substitute commodity money as means of circulation to facilitate production, as long as at par convertibility was maintained by periodic clearing of debt that would reinforce creditworthiness. Observing monetary matters during the Napoleonic wars, David Ricardo explored the

consequences of Bank of England's decision to suspended convertibility of its banknotes into gold. An overissue of banknotes, he argued, eroded the par exchange between promises to pay and commodity money. Similar to Ricardo, Marx argued that inconvertible paper money issued by the state could 'depreciate' when issued in excess quantities. Thus, the idea of convertibility runs throughout early monetary theory. Enforcing strict at par exchange would subject private claims to the laws governing commodity money.

In contrast, Keynes (1930) treated money as unit of account in his *Treatise on Money* (and thereafter). Having read Knut Wicksell's theories of a pure credit economy with bank-issued money, Keynes stressed that the essential distinction between money and debt is that money extinguishes debt. For instance, in a commodity money system, payment in commodity (gold) settles debt. In an abstract unit of account system, the state settles debts in its own promises, 'money proper'. Bank deposits are simply an acknowledgment of debt, a promise to pay 'proper' money at par, that is, to exchange each unit of bank deposit for a unit of cash.

The *Treatise* raises two important questions that have since been central to monetary theorizing. First, what are the conditions under which (some) private promises to pay become money? The example in Keynes is bank deposits. Current money, he noted, 'is predominantly bank money' (p. 20). Seemingly paradoxical, Keynes accepted that acknowledgments of debt (bank deposits) can and do extinguish debt (1930, p5; also Wray 2006)¹. He attributed this fundamental shift to the pressures in capitalism for new promises to pay that can delay settlement in money proper.

For Keynes, it was no coincidence that, of the range of private promises to pay, it would be bank deposits that become money. Following Knapp, he points to the state: once the state accepts bank deposits in the settlement of taxes, bank deposits become money. This chartalist intuition remains powerful. Best summarized by Ingham (2004:121), it argues that private credit-money remained a dead-end until and unless 'incorporated into the fiscal systems of the state'.

Keynes' contemporary, Hayek (1931), suggested otherwise². He shared Keynes' account of the forces driving the moneyness of new credit forms 'it is necessary to take account of certain forms of credit not connected with banks which help, as is commonly said, to economise money, or to do the work for which, if they did not exist, money in the narrower sense would be required' (p. 114). New forms of credit act as substitutes for money when 'they give to somebody the means of purchasing goods [or securities] without at the same time diminishing the money spending power of somebody else'. However, for Hayek, (sustained) moneyness was a question of convertibility into money proper: 'these forms of credits owe their existence largely to the expectation that it will be possible to exchange them at the banks against other forms of money when necessary'.

Indeed, historical experience suggests the state cannot confer automatic moneyness (liquidity) to bank deposits, as the simple chartalist account would suggest. For bank

1 Wicksell (1936, p.49) similarly noted that 'strictly speaking, we can assert that all money – including metallic money – is credit money'.

2 For a comparative analysis of Austrian and (Post) Keynesian monetary theory, see von der Becke and Sornette (2014).

money to function as a generally acceptable promise, it needs more than the sovereign's tax authority. It needed formal institutional mechanisms to preserve at par convertibility (Goodhart 1989).

That this is the case can be easily glanced from a cursory look at the history of banking. As Victoria Chick reminds us for the UK, after a prolonged period of banking failures in the 18th and 19th centuries, the state had to choose either to

'collaborate with the banks in maintaining the exchange of State money with bank money at par, or regard bank 'money' as none of their business, caveat emptor. They chose the former path. This is the fundamental reason for bank regulation (including reserve and capital requirements), monetary policy, deposit insurance and the lender of last resort, all functions we take for granted (Chick 2013).

The same process, Ricks (2011) notes, can be observed in the US, where the state first imposed constraints on money-claim issuers, then, following Bank of England, adopted lender of last resort and finally deposit guarantees.

Thus, bank liabilities become money once the state explicitly commits to its convertibility. Generally acceptability depends on whether promises to pay can be easily exchanged, without loss of value, for state money. Commitment translates into an institutional framework that anchors fuzzy notions of trust, notions that have long infused reflections on money as an affair of the imagination (Buchan 1997), into a social contract between the state and (private) banks to guarantee at par convertibility via monetary policy and banking regulation.

Keynes raised another important question. What governs the expansion of new monies? Like Schumpeter (see Michell, 2014), Hayek (1931) and Wicksell (Gabor 2010), Keynes rejects the idea that banks are simple intermediaries of savings. Rather, he distinguished between active creation of bank deposits, through the issuance of new loan, and passive, by attracting deposits from other banks³. The distinction matters because it points to an important feature of hierarchical money: that money takes different forms for different economic agents. Put differently, banks settle debts to each other in reserves issued by the central bank. The availability of money issued by the central bank is central to the dynamics of new (bank) money.

Keynes stressed that in principle 'there is no limit to the amount of bank money that banks *can safely create provided that they move forward in step*' (p. 23). That is, if cash potentially lost through the active creation of deposits would return through the passive acceptance of deposits, there is no practical limit to new money creation. Bank A must attract deposits from Bank B if it wanted to increase lending without running down reserves. In practice, he noted, banks rarely move in step. Rather, banks

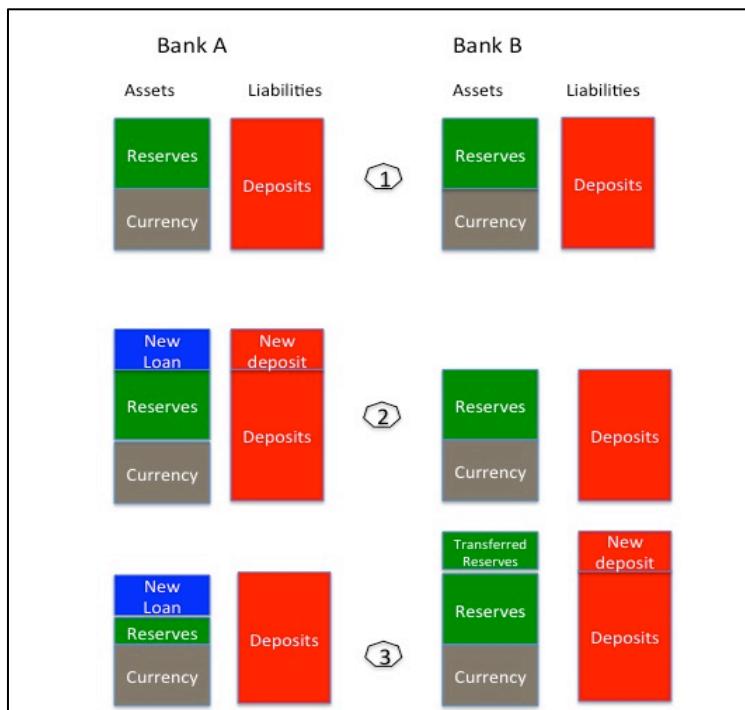
³ Keynes (1930, p.11) put it like this: 'a bank creates claims against itself ... ie what, hereafter, we shall call deposits, in two ways. In the first place it creates them in favour of individual deposits against value received in the shape of either cash or an order – a cheque – authorising the transfer of a deposit in some banks... a second way.. it may purchase assets – ie. add to its investments, and pay for them, in the first instance at least, by establishing a claim against itself. Or the bank may create a claim against itself in favour of a borrower, in return for his promise of subsequent cash reimbursement, ie. it may make loans or advances'.

need to keep track of the complex networks of interbank claims generated by deposits moving from one bank to the other and to settle those claims. While in his times banks occasionally still used cash, convenience dictated that claims be settled by using the liabilities of one, commonly-agreed bank, the central bank.

Consider this example, drawn from Bank of England (McLeay et al 2014). Banks A and B initially hold reserves at the central bank and currency against their promises to pay (liabilities), see Figure (1). When extending a mortgage loan, Bank A simultaneously creates a deposit for the borrower, a promise to pay (2). The creation of money thus affects both assets and liabilities of the issuer (Bell 2001).

The borrower uses that deposit to settle her house purchase. It orders Bank A to transfer that deposit to the house seller at Bank B (2). Bank B assumes Bank A's promise to pay (its liability) as long as Bank A also provides a corresponding asset. This can be cash or the liabilities of the central bank, bank reserves. To settle its obligation to Bank B, Bank A uses either its own reserves (3) or should it not have enough reserves, it can borrow on the interbank money market, where banks with excess reserves lend to those in deficit. The shortfall, since on aggregate net lending increases, can only be met by the central bank.

Figure 1 Bank money creation



The relationship between money issued by the central bank and money issued by banks has since dominated monetary controversies. Monetarists and Post-Keynesians disagreed on the causal relationship⁴, and Postkeynesians with each other on the

⁴ These controversies, at their most hostile, involved Milton Friedman and Nicholas Kaldor (who famously decried the scourge of monetarism). Ironically, like Keynes in the Treatise, Friedman advocated that a tight control of reserves would ensure control over bank money, and prices. Yet Keynes had rather different aims when deploying the money multiplier framework. Faced with strong

accommodative behaviour of the central bank (Dow 1986; Howells 1997; Bindseil and Koenig 2013; Keen 2014, also Lavoie 2014). This disagreement has recently been settled when Bank of England famously recognized that central banks meet commercial banks' demand for reserves at a price consistent with its targets for economic activity or inflation (McLeay et al 2014). Put differently, central banks cannot simply dictate the pace of expansion in bank money by creating additional bank reserves, as some have assumed quantitative easing at the zero bound to work. Commercial banks do not lend out reserves to the 'real economy', nor can reserves 'fund' new loans. Instead, commercial banks create money with price, rather than quantity, constraints from central banks.

Progress in monetary theory has since been slow. Most notably outside monetary economics, Zelizer (1997) provided a fascinating account of the multiple forms that money takes outside formal markets, while Ingham (2004), drawing on Wray (1998), outlined carefully the socially and politically constructed nature of 'promises to pay' issued by banks. With few exceptions, monetary theorising has been dedicated to the controversies around (endogenous) bank money (see Lavoie 2014, Goodhart and Jensen 2015). The remarkable exception, Hyman Minsky, questioned the idea of a 'single, inelastically supplied monetary liability with known and unchanging properties' that runs through discussions of bank money (Foley 1987). He was rather more interested in new liabilities with unknown and changing properties, issued in a monetary space shifting in its properties to meet the needs of structurally changing economies.

These insights from Keynes to Minsky, Foley and Wray (1990) were systematised in an analytical framework of money hierarchies by Stephanie Bell-Kelton (2001)⁵. She proposed to approach promises to pay through a hierarchy (or order) of acceptability. State money (currency) sit at the top of the pyramid, followed by bank money, the debt of firms and of households. The distance from the apex represents the varying degree of acceptability, fundamentally depending on how readily convertible private promises are into state money or in moneys higher in the hierarchy *without loss of value (at par on demand)* (Wray 1990)⁶. In so ordering hierarchies, Bell (2001) recognized the complexity of political and social factors that govern convertibility beyond state's simple tax authority. Market-traded promises made by the state, for instance, vary in market value over time, so that converting a government bond into either currency or bank deposit will generate some loss/gain. Yet by tracing money

resistance from Bank of England to use interest rate policy (given the pressures of the Gold Standard), Keynes decided that the money multiplier theory could legitimize the monetary expansion that he believed essential at that point (Gabor 2010). Furthermore, while using the multiplier framework, Keynes' key message was that discretionary monetary management would stimulate investment, if not by increasing banks' willingness to lend, then by lowering long-term interest rates through the central bank's involvement in bond markets.

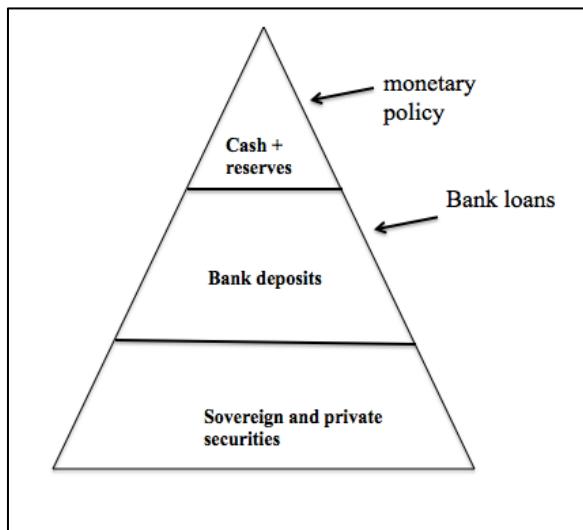
⁵ Hayek (1931) put forward similar ideas in his discussion of new forms of credit that act as substitute for money. He described an inverted pyramid of credit, with cash at its base, followed by central bank credit, credits of commercial banks, and business credits outside banks.

⁶ To be precise, only demand deposits trade at par on demand with currency. However, a la Goodhart's Law, banks can easily 'liquify' time deposits when the state seeks to constrain their access to liquidity. As Simons put it (in Goodhart and Jensen 2015:23) 'Little would be gained by putting demand deposit banking on a 100% basis, if that change were accompanied by increasing disposition to hold, and increasing facilities for holding, liquid 'cash' reserves in the form of time-deposits. The fact that such deposits cannot serve as circulated medium is not decisively important; for they are an effective substitute medium for purposes of cash'.

back to the taxation power of the state, Bell (2001) eschews questions of why new forms of money appear, and how they re-order money hierarchies or (de)stabilize them⁷.

Thus, a simple money hierarchy can be described as follows (Figure 2). Bank deposits sit below state money, both means of settlement. Institutions settle debt with monies issued higher in the hierarchy: central banks in dollars, banks in reserves, firms and households in bank money. Issuers at every level can influence monies below – in order to ease access to liquidity - but not increase directly those above. Since institutions settle debt with monies issued higher in the hierarchy, ‘the availability of money from the level above serves as a disciplinary constraint that prevents expansion’ (Mehrling 2012a, p. 8).

Figure 2 A simple money hierarchy



⁷ These questions remained unanswered as chartalism developed into modern money theory. MMT, or neo-chartalism (Lavoie 2013), focuses on the apex of the money hierarchy, examining the institutional arrangements that shape the dynamics of state money. MMT scholars argue that government spending (taxation) creates (extinguishes) reserves, driving down (up) interbank interest rates. Coordination between monetary and fiscal policy must happen if the central bank is to retain its influence over the short-term money markets where it implements its interest rate decisions. By consolidating the central bank and the Treasury, MMT argues that it is only self-imposed constraints that erode the state’s ability to fund employment (Tymoigne and Wray 2014). Thus, MMT has further popularized Post-Keynesian ideas about endogenous money now routinely espoused by central banks. Yet the contribution that it can make to understanding monetary processes in shadow banking is restricted for three reasons: (a) the focus on monetary sovereignty (Fulwiler, Kelton and Wray 2012:8) excludes money hierarchies structured via central bank’s interventions in currency markets, as in China and other emerging countries; (b) MMT examine a subset of money claims, thus downplaying the analytical relevance of complex intra-financial system relationships that create money-like claims and (c) the controversial consolidation principle (Lavoie 2013) ignores the importance of government debt for shadow money creation, and critical questions of secondary market liquidity. Abstracting from this ‘shadow’ function of government debt prevents MMT from engaging with pressing questions of liquidity, leverage and interconnectedness that dominate policy agendas since the global financial crisis.

New liabilities emerge, as Keynes (1930) and Hayek (1931) noted, to delay settlement in money proper, to economize on money issued higher in the hierarchy. This has been the secret of capitalism, ‘delaying payments and settlements and consistently making these deferrals overlap each other’ (Bloch quoted in Ingham, 2004, p. 140).

Exploring the dynamic properties of traditional money hierarchies, Mehrling (2012a) noted that the moneyness of debt claims fluctuates. Credit is inherently unstable, as debt relationships are inextricably bound up with uncertainty. Money hierarchies expand and contract cyclically, as appetite for risk increases in booms and morphs into lingering risk aversion in downturns. While moneyness embodies a promise to trade at par on demand with money at higher levels, crises test this promise and the credibility of institutions making it. Historically, central banks have stabilized simple hierarchies by using their balance sheet to defend *par convertibility* of bank deposits, providing banks with funding liquidity through the lender of last resort function. Central banks can do so because their liabilities retain moneyness in crisis, since central banks have no liquidity constraint (at least not in their own currency).

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Conceptualizing shadow money

‘Everyone can create money, the problem is to get it accepted’
Minsky, 1986: 228.

If ever there was a private claim that could aptly capture Minsky’s fascination with liabilities of unknown and shifting properties, it is the repo claim. Repo promises to pay, that is promises to pay backed by collateral, have grown rapidly since the 1980s, to reach USD 10 trillion in the US and Europe by 2008. More recently, JP Morgan (2015) estimated that the Chinese repo market roughly tripled in volume between 2011 and 2014, to reach CNY 250 trillion (USD 35 trillion).

In the shadow money literature, it is often assumed that repos can be bundled together with other money market instruments, including MMF shares and ABCPs. Ricks (2011) argued that these function as money by offering a very close substitute to bank deposits. Most can be ‘instantly converted’ into medium of exchange at very little cost, and are issued by financial firms seeking to fund capital market activities.

Similarly, Pozsar (2014) argues that in the ‘age of asset managers’ (Haldane 2014) and money market funding of capital market lending (Mehrling et al. 2013), money begins where bank deposits end. Pozsar distinguishes between public shadow money - repos collateralized with government bonds and constant NAV shares of government-only money funds - and private shadow money - repos with private securities, C-NAV shares of prime funds. Overnight repos and C-NAV shares can be converted in demand deposits at par on demand. Longer-term repos can also be typically converted at par (or very close) for a penalty.

However, we suggest, repos are analytically distinctive from other short-term promises to pay. While the convertibility criteria we apply to define shadow money would also qualify MMF shares and, to a lesser extent, (pace Ricks) ABCPs as money, the presence of collateral renders repo convertibility fundamentally different from other claims issued in shadow banking.

This narrower definition of shadow money allows us to specify the role of banks and the state in shadow money issuance, and to argue that the repo convertibility regime subjects shadow money to radical uncertainty with systemic consequences both up and down money hierarchies. To do so, we outline four key characteristics of shadow money (in our definition) creation that distinguish it from other money market instruments.

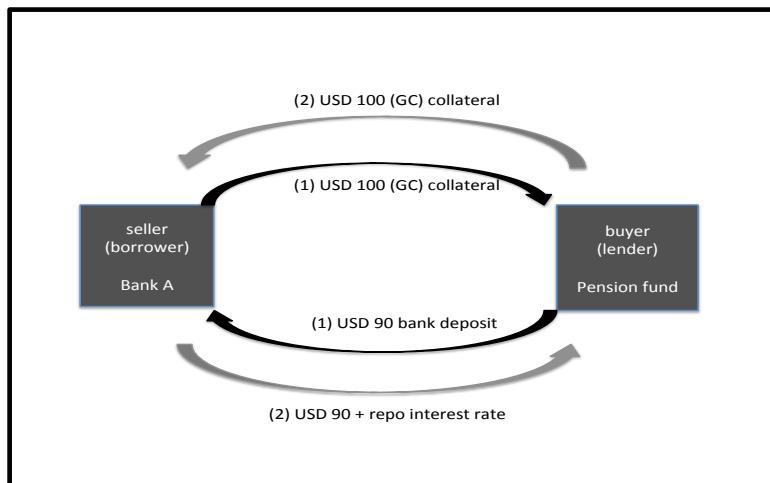
- a) In modern money hierarchies, repo claims are nearest to settlement money, stronger in their ‘moneyness’ than ABCPs or MMF shares.
 - b) Banks issue shadow money. The incentives to issue repos are incentives to economize on bank deposits *and* bank reserves.
 - c) Shadow money, like bank money, relies on sovereign structures of authority and creditworthiness. The state offers a tradable claim that constitutes the base asset supporting the issuance of shadow claims.
 - d) Repos create (and destroy) liquidity at lower levels in the hierarchy of credit claims.
- a) *What distinguishes repos from other (near) money is an intricate collateral valuation mechanism for maintaining at par exchange with settlement money. This involves haircuts, mark to market and margin calls.*

Students of monetary issues would be tempted to note that lending against collateral is neither new, nor particularly exciting. However, the presence of tradable collateral renders this debt relationship analytically distinctive. A promise backed by tradable collateral remains acceptable as long as the lender can trust that, should the borrower default, she can convert collateral into settlement money. It is this promise that makes repos simultaneously attractive for both risk-seeking and risk-averse institutions. To strengthen that promise, market practice has evolved into a complex system of collateral valuation.

Consider this example (Figure 3). A pension fund is looking for a safe placement for its ‘cash’. It could purchase short-term liquid government bonds, but it does not want exposure to credit or interest rate risk. It wants safety. A bank deposit doesn’t fully offer that, since limits on deposit guarantees translate into unsecured exposure to the bank. However, the bank, looking for funding for its portfolio of government bonds,

suggests a secured alternative. It takes the ‘cash’ from the pension fund, and issues a collateralized promise to pay, a repurchase agreement. It sells the pension fund government bonds, and promises to repurchase them at a future agreed date. Those government bonds are collateral for the promise to pay. When the repo expires, Bank A replaces the repo liability with a bank deposit. Shadow money morphs back into bank money.

Figure 3 The mechanics of a repo transaction.



Source: adapted from Gabor and Ban, 2015.

The pension fund has legal rights over collateral for the duration of the repo. In Europe, it becomes legal owner of collateral while in the US it enjoys safe harbor privileges⁸. This is key to shadow money convertibility because the pension fund can sell collateral if Bank A does not meet its promise to convert the repo into settlement money.

While repos may be structured legally as sales and repurchase (of collateral) agreements to ensure convertibility, in economic terms this is a credit relationship. The pension fund does not assume the risks and returns of the assets it owns temporarily, but rather has to send all returns on those assets to Bank A. It earns a repo interest rate, just as it would on an unsecured bank deposit. For this system to work without disruption, the pension fund needs to ensure that the market value of its collateral portfolio remains equal to the bank deposit it swapped it for.

This market-designed *at par* regime has three components: mark-to-market, margin maintenance and haircuts. The three together maintain the market value of collateral the pension fund holds at fixed exchange to the settlement money it lent the bank.

In overnight repos, the exchange parity is automatic⁹. In longer repos, counterparties mark collateral to market daily. Should collateral fall in market value before the repurchase day, the legal right to make a *margin call* protects the pension fund. Through margin maintenance, the pension fund requires Bank A to provide more collateral to make up for the shortfall in value. Even if Bank A was rolling over an

8 For the more complex US case, see Garbade (2006) and Sissoko (2009).

9 In the CCP segment of the European bilateral segment (around 50% of overall outstanding repo volumes), intra-day margin calls have become standard.

overnight repo to fund its securities, a fall in their market value would leave it with a funding gap. Conversely, if collateral increases in price, the pension fund returns the difference (in collateral) to Bank A.

Thus, the mechanics of shadow money convertibility explain its growing acceptability. Rising asset prices free up balance sheet capacity for Bank A, enabling leverage(Adrian and Shin 2010).

Should collateral have a record of significant price volatility, Bank A and the pension fund can agree that the purchase price is less than the market value of collateral. In Figure 3, Bank A provides USD 100 worth of collateral to ‘insure’ a loan of USD 90 – a 10% difference known as a *haircut*. The haircut provides a buffer against market fluctuations and incentivizes borrowers to adhere to their promise to buy securities back. Put differently, the exchange rate between collateral and ‘cash’ can vary.

It should be noted that there are two types of repo liabilities: “General Collateral” (GC)¹⁰ and special repos. The examples have so far discussed GC repos, or funding driven repos. In contrast, special repos reflect demand for specific securities, with cash as collateral. In GC repos, the parties agree what kind of securities can be considered equivalent as collateral and accept any or all those securities. In other words, any security that belongs to a certain agreed-upon category will do. The bank and the pension fund can agree that the GC basket includes both US Treasury and GSE debt rated AAA and AA. The pension fund would accept USD 100 of UST, or USD 100 of AAA GSE, or any combination of the two. Collateral is fungible in that a typical repo contract would allow Bank A to replace some or all of the bonds in the GC portfolio, as long as they are of equivalent market value.

While convertibility practices are identical, differences the legal frameworks have generated distinctive repo market structures across the US and Europe. The US repo market is divided into bilateral and triparty segments, with the later accounting for around two thirds of overall volumes (see Baklanova et al, 2015). In a tri-party repo, the third party provides collateral management services (collateral valuation, settlement of securities etc). This is nothing more than an ‘outsourcing’ of the par convertibility maintainance, on terms already agreed by the two parties, for institutions that do not have backoffice capability for collateral valuations. Securities dealers, often part of a broader banking group, borrow ‘cash’ (bank deposits) in the triparty segment from institutional cash pools (mostly money market funds), against collateral obtained by lending in bilateral repos to hedge funds. In contrast, the European tri-party segment is significantly smaller, amounting to 10% of overall repo volumes. The bilateral market, dominated by banks, is divided into CCP-cleared, and OTC bilateral. The CCP (central counterparty clearing) institution intervenes in a bilateral repo once it has been confirmed, becoming lender to the cash borrower, and borrower to the cash lender. In Europe, CCP-cleared repos have become increasingly important since 2008, amounting by 2015 to roughly 60% of bilateral volumes.

¹⁰ The US tri-party repo facilitates cash-driven GC transactions, as it is not set up to facilitate the use of specific collateral.

Thus, repo claims are mostly short-term¹¹, reflecting the needs of increasingly ‘fluid’, market-based global finance where assets are continuously marked to market, where positions across asset markets (and therefore funding needs) change frequently. Indeed, repo practices have evolved to reduce information demands in lending relationships, substituting them for readily observable market prices of collateral. This is crucial for preserving at par on demand with (central) bank money.

Consider the significant differences to the ABCP market (see Figure 4). It is often, and misleadingly¹², argued that ABCP, rather than repos, provided the most important source of shadow funding for private sector assets prior to 2008 (Krishnamurthy et al 2014, Sunderam 2014). From this angle, ABCP fits better the category of ‘shadow’ monetary liabilities than repo do. A financial institution, a sponsor, sets up a bankruptcy remote conduit that pools together assets and funds these assets by issuing commercial paper backed by the cash flows from underlying assets. MMFs and other institutional cash pools purchase ABCP, Sundaram (2014) argues, because of their money-like nature: short-term, liquid debt carrying high credit ratings. Indeed, before 2008, a large part of the ABCP market enjoyed liquidity support from the originating (sponsor) bank¹³. Yet the convertibility on demand was severely limited. Investors held the paper to maturity, typically under 30 days, and rolled it over. Thus, there was little secondary market trading (Kaperczyk and Schnabl 2010), leaving holders of ABCP with little option to convert into bank deposits on demand before the ABCP matured.

¹¹ The European Repo and Collateral Council, the repo trade body, estimates that around half of European shadow money has an overnight maturity.

¹² Krishnamurthy et al (2014) base their empirical work on a segment of the repo market that connects broker-dealers (banks) with the largest money market funds and securities lenders in the US. They investigate the demand for money-like claims from large institutional cash-pools, and exclude repos between broker-dealers, or broker-dealers with hedge funds. This choice – dictated by data availability rather than theoretical considerations - skews the picture in that ABCP funding appears larger than repo funding, although the overall global ABCP market is smaller than the US repo market. Thus, the ABCP market reached an outstanding USD 1.97 trillion by mid 2007, and fell to USD 350 bn by 2008. In comparison, the US repo market reached, by some estimations, USD 10 trillion by mid 2008 and contracted by roughly half since the crisis (Singh and Aitken 2012).

¹³ While repos are collateralized with marketable debt, ABCP mostly used non-marketable debt as collateral. Covitz et al (2012) show that around 20% of outstanding ABCP (around USD 240 bn) were collateralized with ABS, in securities arbitrage ABCP and SIVs.

Figure 4 Modern money hierarchies



The C-NAV MMF shares, are, on first sight, functionally indistinguishable from bank deposits (Ricks 2011). The MMF promises to pay at par, often backed by investment in very liquid assets such as government bonds and repos. Put differently, while MMFs do not create money endogenously, as banks do, their liabilities are close substitute for bank deposits. However this does not imply that MMF promises should be higher in the hierarchy than repos, or indeed, warrant treatment as shadow money. First, the credibility of MMF promises, tested by the crisis, has prompted regulators to introduce rules that would restrict MMFs ability to promise at par on demand. Put differently, the convertibility of MMF promises into bank deposits may have been, by historical times, a short-lived event that does not deserve much theoretical attention. More important, we argue, from a hierarchy of money perspective, is that MMFs do not issue repos. Rather, like households that hold bank deposits, MMFs hold repo promises (reverse repos) precisely because those repo promises strengthen the credibility of their own promise to pay at par on demand. This is the case in private repos, as well as in the MMF engagement with central banks. Indeed, while the Federal Reserve has since 2014 accepted MMFs as counterparties, this is a one-sided relationship where MMFs can hold reverse repos (lending to the Fed in the RRP program), but cannot borrow from the Fed, that is, MMFs cannot issue shadow money.

b) Banks' special role in (shadow) money creation.

Monetary theorists typically distinguish *money* (means of final settlement) from *credit* (promises to pay money, means of delaying final settlement). Yet as early as Keynes, this dichotomy proved problematic since households and businesses did settle debts to each other in bank deposits, ‘claims on coin’ or promises to pay at par money issued higher in the hierarchy. Rather, ‘what counts as money and what counts as credit’

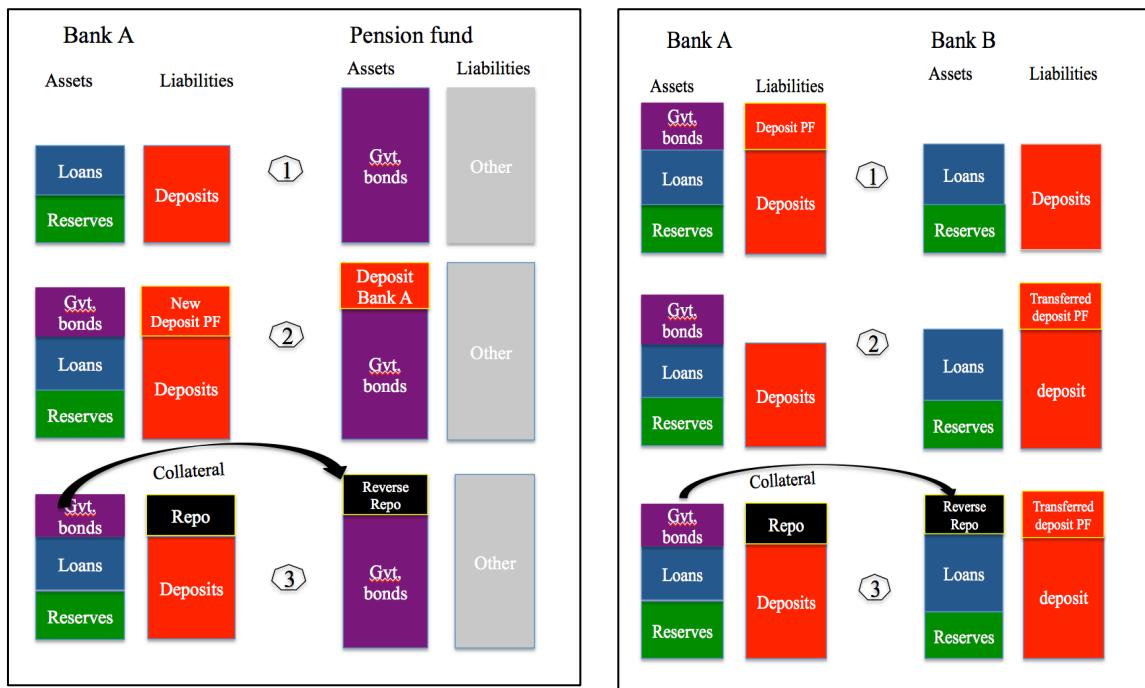
(Mehrling 2012a) varies. Liabilities are issued lower in the hierarchy in order to circumvent constraints on money higher in the hierarchy.

In the shadow money literature (see Ricks 2011, Pozsar 2014), the modern version of this dichotomy depicts institutions that create money (banks issuing deposits) and institutions that create shadow money (broker dealers issuing repos). The dichotomy reflects the institutional arrangements of the US repo market, which has so far provided the empirical terrain for theorizing the monetary implications of shadow banking. In the US, Section 23A restricts the interactions between the securities trading (broker-dealers) arm and the depositary arm of a bank holding company, in order to prevent the extension of the federal safety net (for bank money issuance) to non-depository arms (Martin 2015). Put differently, issuance of bank and shadow money is strictly separated.

Yet this picture does not fit neatly the European repo market, dominated by universal banks. According to figures from ECB and the European repo trade association (European Repo and Collateral Council, ERCC), the European repo market is an interbank market (see also Martin 2015), with 80% of activity concentrated in the hands of the largest 20 credit institutions. Similarly, the largest segment of the Chinese repo market, the interbank segment, is dominated by commercial banks issuing very short-term repos (JP Morgan 2015). Thus, banks' special role in money creation extends into shadows.

Consider a more complex version of the previous example. Bank A buys government bonds (see Figure 5) from a pension fund, and pays for those by creating a demand deposit (2). Thus, the demand deposits tier (settlement money) of the hierarchy expands. However, neither institution wants their debt relationship to involve a deposit. Should the pension fund want to transfer that deposit, Bank A needs reserves to settle. In turn, the pension fund has an uninsured exposure to bank A. The bank issues shadow money, a promise to pay bank money in the future, promise collateralized by government bonds (3). The bank now funds its government bonds with a repo. The pension fund holds a repo asset, known as a reverse repo. Shadow money temporarily extinguishes the deposit, replacing it with a debt relationship anchored in marketable debt. Shadow money delays settlement in bank deposits.

Figure 5 Repo transactions with banks, and non-banks



The same holds for repos against bank reserves. Imagine that the pension fund refuse to hold shadow money. Instead, it transfers its deposit to bank B (Figure 5, right column). Bank A has to settle that deposit loss by transferring reserves to Bank B. But the reserves needed to settle exceed what bank A has available. Instead, bank A issues a repo liability to Bank B, ‘borrowing’ those reserves without any actual movement of reserves between banks. The use of collateral makes repos at once less costly and less risky than borrowing from un-secured money markets. Bank B agrees because it can re-use the collateral posted by Bank A. Shadow money delays settlement in reserves.

Thus, repos allow banks to economize on means of settlement that do not fit modern practices of risk trading and protection (Pozsar 2015).

A powerful illustration of banks’ shadow money issuance can be gleaned from the activities of LCH Clearnet, a modern cross-over between a bank and a clearing house in Europe. Indeed, CCPs play an important role in European repo markets and almost negligible in US repo markets (see Martin 2015). In its CCP (central counterparty clearing) guise, LCH Clearnet intervenes in a bilateral repo once it has been confirmed, becoming lender to the cash borrower, and borrower to the cash lender. For the two parties, involving the CCP makes sense because CCPs engage in multilateral netting, resulting in smaller net exposures, and thus smaller balance sheets¹⁴. LCH’s activity gives a good indication of those netting benefits for its member banks: in 2015, its repo business had monthly volumes of EUR 13 trillion (for comparison, the outstanding repos volumes in the European market reached EUR 7 trillion in 2015).

14 This warrants a cautious reading of balance sheet data to estimate how much shadow money European banks issue. The Liikanen Report (2012) suggests a 10% share of repos in total liabilities, yet this may significantly underestimate gross repos on banks’ balance sheets.

Critically, for its French, Belgian, Dutch and Portuguese operations as CCP, the French arm, LCH Clearnet SA is regulated in France as a bank. This gives it access to central bank reserves. Like a bank, it settles its obligations in central bank reserves¹⁵ (see Table 1). Unlike a bank, it does not issue bank deposits. Its access to the top of the money hierarchy allows it to play a critical role in moving reserves and collateral in the interbank European repo market by *only* issuing shadow money.

Table 1 LCH Clearnet SA balance sheet, EUR million

| Assets | | Liabilities | |
|--------------------------------|----------------|--------------------------------|----------------|
| <i>Treasury and Portfolio</i> | 5,519 | <i>Shareholders equity</i> | 268 |
| Banque de France | 1,169 | | |
| Cash | 4.3 | | |
| Term repos | 3,498 | | |
| O/N repos | 844 | | |
| <i>Clearing house accounts</i> | 248,025 | <i>Clearing house accounts</i> | 256,393 |
| Repos receivable | 246,066 | Repos payable | 246,066 |
| <i>Other</i> | 3,179 | <i>Other</i> | 62 |
| Total | 256,723 | Total | 256,723 |

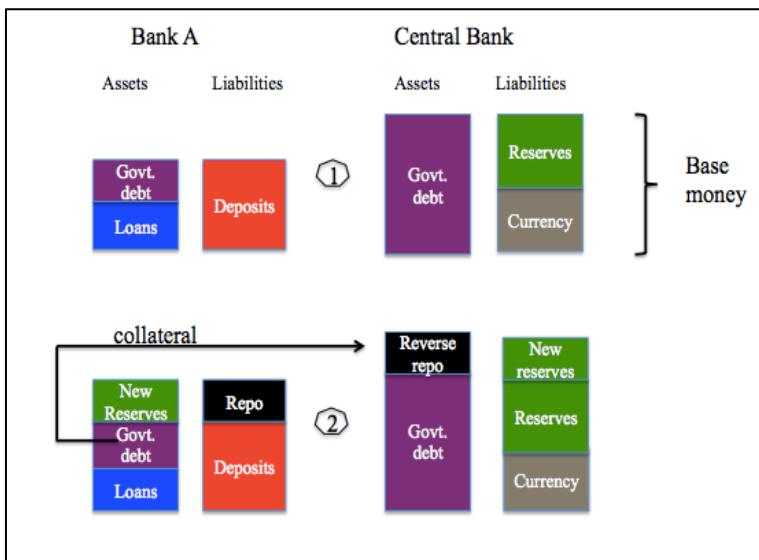
NB: repo amounts on the asset side represent loans for which securities were received, and on the liabilities side deposits for which securities were delivered under repos (shadow money).

How can repos be shadow money when central banks have been routinely using repos to implement monetary policy since the 1990s¹⁶? Here, the distinction between repos and reverse repos is important. Central banks do not (conventionally) issue shadow money, but rather issue new reserves via repo loans (see Figure 6). The borrowing bank uses its portfolio of government debt (or private securities) for refinancing operations. The collateral framework of the central bank, the terms on which it makes reserves available, however, can influence banks' issue of shadow money. What central banks deem acceptable collateral, we argue in later sections, may also change liquidity conditions in collateral markets, and can be used as a (financial) policy tool.

15 According to the IMF (2013), LCH Clearnet uses both central bank money and private settlement bank money for cash processing (margin and settlement). Central bank money is used for 'vast majority of Euro payments, about 85% for cash equity segment, and 100% for other segments', including fixed income (repo and government bonds).

16 We thank Jan Toporowski for this question. See Gabor and Ban (2015) for a discussion of the historical shift in monetary policy implementation from outright interventions to repo loans, and implications for repo markets.

Figure 6 Relationship between central bank and shadow money



c) *Shadow banking, like traditional banking, involves state-facilitated creation of private (repo) money.*

Seemingly paradoxical, most repos are issued against government bond collateral¹⁷. It is thus tempting to conclude that shadow money funds the official segment of capital markets, and have little to do with shadow banking¹⁸.

This view is misleading. Government bonds support shadow-money creation because state debt trades in liquid markets. Liquid collateral market experiences less price volatility, and therefore lower haircuts, less frequent margin calls, and lower costs of funding. Put differently, it is cheaper to issue repo liabilities collateralized with government debt because of its liquidity and ‘risk-free’ status. While banks traditionally held government bonds to ensure access to liquidity in case of a cash drain (Chick 2013), now they can use government bonds for balance sheet expansion. This shadow function reflects the critical role that government debt plays in market-based finance (see Fleming 2000).

The legal right to re-use collateral is critical. It allows several financial institutions to issue repo liabilities against the same government bond, and thus fund portfolios of private securities. (Shadow) banks can thus mobilise their government and corporate bond portfolios to finance less liquid, but higher yielding assets, that again can be reused as collateral¹⁹. Government bonds have ‘velocity’ (Singh and Stella)²⁰, becoming a base asset that supports the expansion of collateralized claims (Fisher 2015). Thus, market-based financial systems place new demands on the state, to issue

¹⁷ In both dollar and euro money hierarchies, government bonds support between 70 and 80% of repo liabilities, both in the pre-crisis period of rapid in repos and since then (see Gabor and Ban 2015, Pozsar et al 2010).

¹⁸ We thank Photis Lysandrou for this point.

¹⁹ Peter Praet, of the Belgian central bank, noted in 2008 that this shift equally applied to European large banks, who were increasingly mobilizing a fraction of their securities portfolio as collateral in repo market (Praet and Herzberg 2008).

²⁰ Singh and Stella (2012) estimated that a velocity of three for US repo markets.

debt not because it needs cash, but because financial institutions need a base asset to support credit expansion via securities and derivative markets (see Garbade 2006).

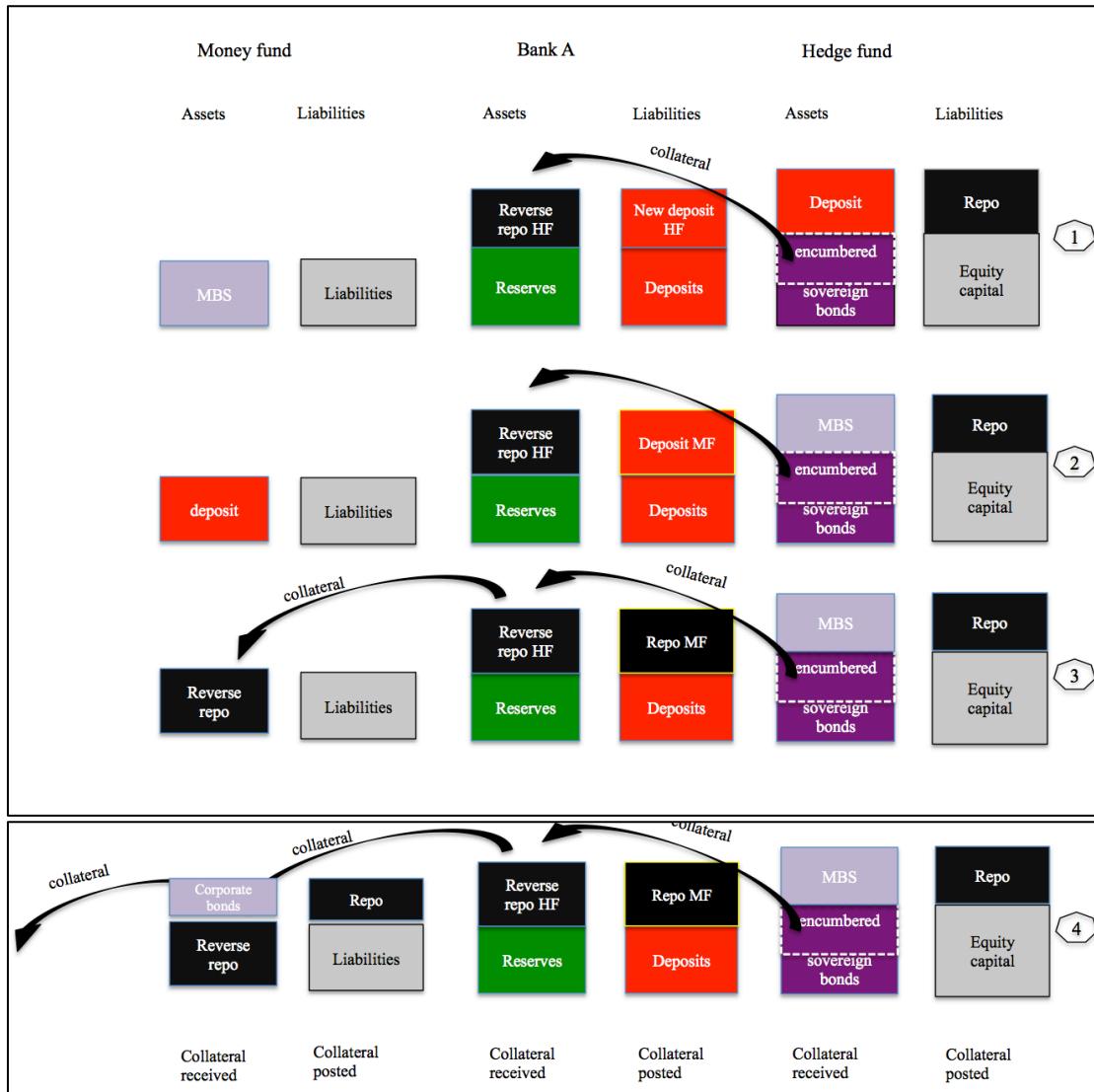
Consider this example of a matched book repo²¹ involving two shadow banks (a hedge fund and a money fund) and a ‘traditional’ bank (Figure 7). The hedge fund wishes to buy MBS from a money fund. To execute this purchase, it first borrows ‘cash’ (a demand deposit) through a repo transaction with Bank A, that it collateralizes with government bonds it holds²² (1). Bank A books a repo loan and issues a demand deposit against it. The hedge fund then uses the demand deposit to settle the MBS purchase (2). To avoid losing the deposit (and reserves with it), Bank A agrees with the mutual fund to issue a repo liability collateralized with the government bonds it got from the hedge fund. It can do so because legally, it is the owner of the repo collateral. The money fund, now legal owner of the government bonds, can also use these to increase leverage, should it wish to. It swaps government bonds for cash (securities lending) and then purchases corporate bonds. The hedge fund in turn can swap those MBS for the same government bonds, and increase leverage as described above²³. In this chain, two institutions - the money fund and the hedge fund – are funding their securities portfolio by using the same government bond. Put differently, lending via capital markets is funded by issuing promises to pay that are collateralized by the same asset.

21 The shadow money literature discusses matched book repos as the activity of US broker dealers (see Pozsar 2015). However, this need not be restricted to broker dealers, as repo markets have grown rapidly across financial systems with different structural characteristics (see Munyan 2015).

22 Even if the hedge fund had started off with mortgage-backed securities on its balance sheet, it can swap those for government bonds in a securities lending transaction and initiate the process.

23 It may seem paradoxical that the hedge fund can borrow from a third party the government bonds that it holds encumbered on its balance sheet. It is one of the quirks of the legal vs. economic status of a repo claim. However, the FSB (2016) report on collateral reuse confirms that this is a possibility: fragmented business practices and IT systems inside (shadow) banks means that market participants do not always have clear information available on whether ‘underlying collateral of a specific transaction is collateral received from another transaction’ (p. 6).

Figure 7 Matched book repos with government bonds



The example above challenges arguments that ‘shadow’ money is not really money because securities trading activities ‘require immediate settlement in money’ (Michell 2016, 5). Collateralized monetary liabilities can and do grow without bank money expanding. Immediate settlement in bank deposits is replaced by a repo (between the bank and the money fund). The hedge fund has autonomy to expand credit to securities sellers without a prior decision not to spend and without the expansion of money on the balance sheet of traditional banks. Hakey’s (1931) observation, that new forms of credit function as money when giving somebody means of purchasing securities without diminishing the money spending power of someone else describes well the hedge fund issuance of shadow money.

The repo liabilities of (shadow) banks are endogenous in the Post-Keynesian sense. In the previous examples, banks issue repos to fund their capital markets activities. In this, the bank rents out its balance sheet to connect the ultimate seller and buyers of securities, and it does so by issuing shadow money. The hedge fund expands its balance sheet, gaining additional leverage, by repo-ing out assets it holds and using the proceeds to buy securities. The hedge fund needs some initial equity capital to buy

government bonds and start the process above. Once it does so, it can increase leverage depending on its appetite for risk. Critically, the demand for assets that it generates may further free up balance sheet space, since it marks to market posted collateral, and receives some back when asset prices are rising (see Plantin, Shapra and Shin 2004).

4) Repos create (and destroy) liquidity at lower levels in the hierarchy of credit claims.

Repos straddle money hierarchies upwards and downwards because the convertibility regime creates a close connection with securities markets. Indeed, repo claims are issued both for funding purposes (GC repos) and for taking positions in securities markets (special repos)²⁴. In special repos, financial institutions borrow a specific security, become temporary owners and short it, facilitating short-selling. In the example above, what looks like a funding-drive repo for Bank A may be securities-driven repo for the money fund, who needs government bonds to meet a short position. Bank A in turn may issue shadow money as part of its market-making activities in government bonds.

Shadow money connects money markets with securities markets and derivatives markets. An expansion of the shadow layer of the money hierarchy improves the liquidity of securities markets²⁵ (Fleming 2000, also BIS 1999). This made repo markets attractive for states across the world since the 1980s. Having (some reluctantly) accepted central bank independence, states became wedded to the idea, initially promoted by the US, that in an increasingly globalized financial system, the success in competing for liquidity in government bond markets critically depended on free repo markets (Gabor 2016, also CGFS 1999). It was this promise of liquidity that led to the deregulation of repo markets in Europe and the US in the late 1990s (Gabor and Ban 2015, Garbade 2006).

Yet the collateral valuation regime that renders repo promises increasingly acceptable ties securities market liquidity into appetite for leverage. Put differently, what makes repos (shadow) money is what makes money hierarchies more fragile in a Minskyian sense. Here, Keynes' concerns with the social benefits of private liquidity become relevant. It is important to note that Keynes voiced strong doubts about the idea that

24 The ECB's (2002) first long feature on repo noted that 'repos, because of their hybrid nature (cash and securities legs), provide a link between several markets (the securities markets, the unsecured money market and the derivatives and swap market) and contribute to increasing their liquidity'.

25 As states liberalized finance and central banks turned independent in the late 1990s, it rapidly became common wisdom that governments needed deeply liquid government bond markets. Funding costs, and the sustainability of public debt, depended on it. The US government bond market provided an institutional blueprint to which countries (some rather reluctantly) converged: regular auctions, market-making based on primary dealers and deregulated repo markets. The US Treasury and the NY Fed conceived repos as a significant innovation in government bond markets that increased market liquidity and allowed dealers to finance securities portfolios (Fleming 2000). Yet Bank of England provides an interesting case of a central bank reluctant to liberalize repo markets. For ten years after the 1986 Big Bang, it only allowed a handful of institutions to borrow and short gilts. These restrictions made entry difficult for foreign banks and securities houses, which typically used repos to take (short) positions in securities. Ease of entry via repo markets concerned some market participants, fearful that 'only international speculators like George Soros, who think they will be able to make money speculating on gilts, will benefit from the introduction of a repo market. They will be able to short gilts without actually buying them'. Under pressure from the UK Treasury during the Debt Management Review published in 1995, Bank of England agreed and liberalized the repo gilt market in 1996 (Gabor 2016).

‘the more liquidity the better’ in stock markets. Very liquid markets are more fragile, he argued, by giving investors the ‘illusion’ that they can exit markets before prices turn against them. Long-term expectations about fundamentally unknowable asset prices no longer matter, as the investor no longer directs her attention ‘to the long-term prospects and to these only’ (Crotty and Epstein 2014). The combination of uncertainty and excess liquidity makes the system more fragile.

Repo claims are critical to the generation of excess liquidity in securities (collateral) markets, understood in a Keynesian sense. The convertibility rules construct the illusion that repo risk practices could circumvent the uncertainty inherent to financial assets²⁶. Instead of fallible Keynesian expectations, investors may view repos immune to uncertainty since in liquid markets, repo-reliant institutions could always convert collateral into settlement money.

But it is precisely this convertibility regime that subjects repos to radical uncertainty: the moneyness of repo claims depends on collateral valuations. Uncertainty in the shadow layer of money hierarchies means uncertainty about the collateral qualities of securities. Keynesian uncertainty bites harder and faster as market liquidity becomes systemic, so that the criteria for formulating expectations about asset liquidity may unhinge from issuer’s credibility altogether. Loss of confidence in expectations about near-term collateral price movements translates into loss of confidence in the moneyness of repo claims backed by those assets.

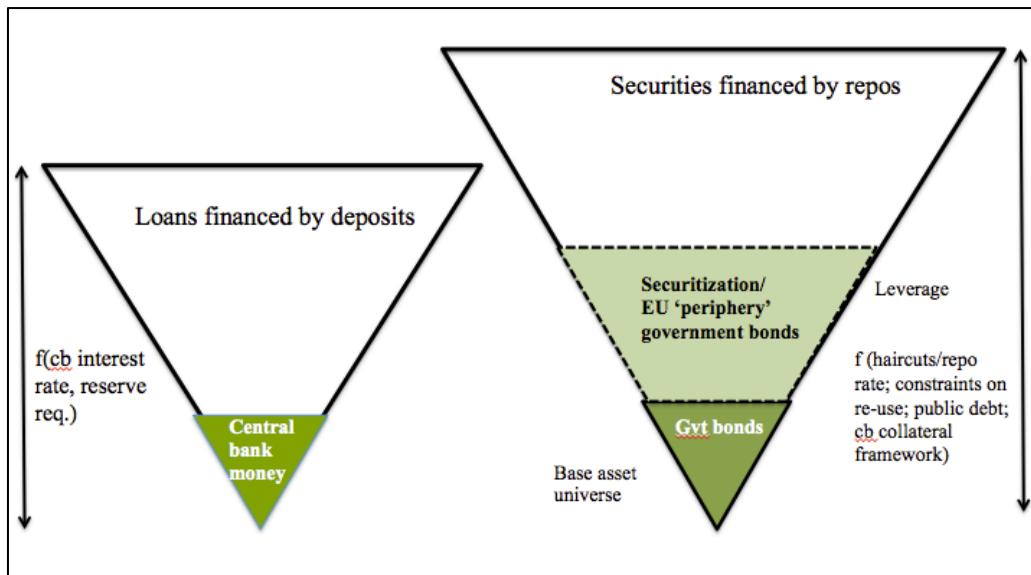
Shadow money: a comparative hierarchy

We compare a simple (‘relational’) hierarchy of state and private bank money with a simple ‘hierarchy’ of shadow money backed by tradable assets (see Figure 8). We show it inverted to capture dynamics via leverage, and to acknowledge that convertibility at par runs from shadow to bank money. The distinction between the two hierarchies is artificial. Shadow money is accepted because of the promise to trade at par on demand with (central) bank money. For repos with maturity beyond overnight, the risk management practices maintains par (if not on demand) via mark-to-market of collateral portfolios. In case of default, the repo lender liquidates her collateral portfolio, converting shadow money in settlement money. However, the distinction is useful to map disciplinary constraints and to explore crisis dynamics.

The relational hierarchy expands as banks meet demand for credit, pricing credit as mark-up on central bank’s policy rate (implemented in overnight money markets). Reserves adjust endogenously as the central bank, in turn, meets banks’ demand for reserves at the policy rate. There is no automatic relationship between the quantity of reserves and quantity of bank money in the system, since banks economize on ‘money proper’, including reserves. Instability arises when depositors loose trust in banks, demand at par conversion into state money. The central bank supports par exchange.

²⁶ Gertrude Trumppell-Guggerell, then on the Executive Board of the ECB, argued in 2005 that ‘one can indeed imagine that collateral allows restoring the perfection of financial markets, regardless of the uncertainty and information asymmetry that is prevailing amongst market participants’, should collateral be abundant and legal frameworks working perfectly.

Figure 8 Hierarchies of (shadow) money



Expansion in the shadow ‘hierarchy’ is captured by leverage²⁷. Since balance sheets are continuously marked to market, demand for leverage pushes up asset prices, lowering the cost of financing and creating additional balance sheet capacity via margin calls (Plantin, Shapra and Shin 2005).

There are several constraints on issuing repo liabilities: (a) haircuts, (b) public debt issuance, (c) legal barriers on reuse and (d) collateral framework on central banks’ own repo operations. These together draw the contours of the base asset universe, and their relative importance will vary with specific structural features of distinctive money hierarchies.

Haircuts reflect perceptions of collateral liquidity, since haircuts provide a cushion of safety against volatility in collateral markets. Low haircuts make for cheap leverage, as the cost of financing securities portfolios fundamentally depends on haircuts. Conversely, higher haircuts require additional collateral, making leverage more expensive. In the example above, the hedge fund prefers to fund the MBS portfolio with government bond repos because government bonds trade in (more) liquid markets, have lower haircuts and less frequent margin calls. As long as repo interest rates and haircuts (the cost of funding) remain below the return on the portfolios of securities financed via repos, (shadow) banks can increase leverage.

Reuse gives collateral velocity. The incentives for reusing government bonds are straightforward, as repo claims collateralized with government bonds provide cheap leverage for risk hunters and a safe money claim to cash pools. The more repo transactions government bonds support, the more leverage-driven demand for

²⁷ Discussing the rapid growth of shadow banking before Lehman, Bank of England’s Paul Tucker noted in 2012 that ‘anyone holding a securities portfolio can build themselves a shadow bank using the securities lending and repo markets. One simply lends out the securities at call for cash, and then employs that cash for making loans or buying credit assets with longer maturity. Thus is leverage and maturity mismatch’.

securities it generates. With zero haircuts on government bonds and no limits on reuse, it is tempting to infer that there can be infinite credit creation (and leverage) on government collateral, regardless of actual supply of government bonds.

In practice, however, there are limits to collateral velocity. Repo markets are segmented along bilateral and tri-party segments, there are operational obstacles for clearing collateral across different trading platforms and the US regulators set limits on broker-dealers' re-hypothecation activities. Foreign official demand for Treasuries (from say China) may also reduce the availability of government collateral if foreign owners do not lend these in repo transactions (see Pozsar, 2015). This reduces collateral velocity significantly, leaving demand for low haircut assets unmet. Thus, fiscal policy and public debt management matter for the pace of shadow money expansion.

Ministries of Finance can do for market-based finance what the central bank does for bank-based finance, creating the 'base asset' that accommodates the growth of shadow money (Fisher 2015). The base asset concept should not be interpreted in a 'multiplier' (monetarist) framework. Just as increased central bank reserves do not cause higher bank lending, higher supplies of government debt do not automatically lead to the expansion of shadow money. Rather, shadow money issuance reflects the twin forces of demand for safety and demand for leverage, in turn determined by a broader set of economic variables (including the central bank's policy rate, see Pozsar 2015).

Given that treasuries have no mandate to manage sovereign debt as base asset, it is plausible that the supply of government debt will not meet demand for either safety or leverage. While the base asset issued by governments does not adjust endogenously to meet demand for shadow money, endogenous responses to expand the base asset universe involve turning high-haircut assets into low haircut assets. The expansion reflects financial system structures, via two avenues: market innovations and central bank collateral frameworks.

In private credit markets, credit enhancement through tranching and derivatives generated low-haircut AAA tranches of securitized products (see Mehrling et al 2013). The constraints that fiscal policy (unwittingly) impose on shadow money creation are relaxed via securitization.

But this is not the only avenue. The collateral framework of central banks, that is the terms on which they inject base money, has monetary implications. As the European experience suggests, central banks' repo practices can also generate collateral upgrades that redraw the contours of the base asset universe (Gabor and Ban 2015, also Bindseil 2013). Over the last 30 years, when implementing monetary policy, central banks have increasingly replaced outright purchases of government bonds with repo transactions. In doing so, the terms on which central banks lend reserves – their own repo collateral framework – can influence market practice. The central bank's collateral framework sets out the terms on which the central bank is prepared to accept shadow money issued by banks.

For example, upon its creation, the ECB defined a GC collateral portfolio that included all Euroarea government bonds on the same terms. With this, the ECB

explicitly sought to encourage private markets to ‘upgrade’ lower-rated government bonds to German quality collateral (see Buiter and Sibert 2005 for a critique). Demand for government debt issued outside the ‘core’ would improve liquidity, and diffuse the threat²⁸ of the Eurozone becoming a German bund area, instead creating a ‘synthetic’ European base asset via GC portfolios²⁹. Indeed, by 2008, the supply of shadow euro money backed by euro sovereign collateral grew to a similar size to US shadow money.

Uncertainty in crises of shadow money

Crisis in money hierarchies materializes in attempts to convert claims into money proper, moving upwards. Here repo liabilities are distinctive in the sense that the ability to move upwards, exchanging repo claims for higher forms of money at par on demand, hinges on collateral valuation. When converting repo liabilities, the holders of shadow money inadvertently exert a downward pressure on collateral valuations. This radical form of uncertainty does not apply in the same way for other money claims. In a crisis period, converting repo claims amounts to climbing up a ladder that is gradually sinking – the faster you climb, the more it sinks.

What does crisis look like? Since credit creation is organized around securities markets liquidity, crisis connects funding and collateral market liquidity. Funding liquidity captures banks’ ability to ‘settle obligations with immediacy’ (Drehmann and Nicholau 2010), that is, to convert their promises into state money on demand. The systemic need for liquidity involves raising cash/reserves at short notice by new borrowing in interbank markets or from central banks (Borio 2000; Strahan 2008). However, the systemic need for liquidity manifests differently when (shadow) banks have to ‘make good on the promised monetary qualities’ (Mehrling 2012a, p. 11) of shadow money. Because repo debt relationships are organised via marketable debt, moneyness in the shadow hierarchy depends on the ‘moneyness’ of collateral assets that back shadow claims. This includes interbank markets where a growing proportion of transactions take place via repos. Interbank funding becomes increasingly dependent on collateral market liquidity.

28 Such a threat became apparent in 2005, in the context of the French vote on the European constitution. In ‘spread widening’ or ‘euro-break up’ trades, leveraged investors sold low-rated government bonds (Greece) and bought high-rated government bonds (Germany). Although investors did not take positions large enough to reverse yield convergence in Euro government bond markets, the euro-break up trade provided early warnings that Member States with weaker finances/illiquid sovereign bond markets may come under speculative pressure in times of crisis, and that such pressure could only be addressed by the ECB. Thus, the Financial Times warned that ‘positioning against weak euro governments would be a one way bet’ for hedge funds and macro-traders unless the ECB intervened to buy those government bonds and ‘crush short-sellers’ (Gabor and Ban 2015). The episode also indicated a potential ‘exorbitant privilege’ that German bunds derived from the institutional architecture of European shadow money, since tensions/speculative pressures in ‘periphery’ government bonds would automatically benefit Germany as ‘safe heaven asset’. Indeed, in 2011, LCH Clearnet introduced a sovereign risk framework that effectively institutionalized that exorbitant privilege in its shadow money issuance. Thus, LCH Clearnet decided to tie convertibility criteria for shadow money issued against government collateral to a spread against German bunds. In practice, every time the spread goes above 450 basis points, LCH Clearnet increases haircuts.

29 The encouragement proved effective. Throughout the 2000s, euro GC repo portfolio of major repo players in Europe treated all Euro sovereign debt as equal collateral.

Thus, the *par regime* governing repo claims renders collateral market liquidity fundamental to shadow money stability. Should collateral fall in market value, repo borrowers are faced with margin calls on longer term repos, funding gaps and higher haircuts when rolling over short-term repos. Both scenarios require either additional collateral or raising cash via borrowing/asset sales. When borrowing becomes prohibitive or altogether unavailable, asset sales can easily morph into fire sales, and evaporating market liquidity. Fundamental uncertainty may also prompt repo borrowers to increase haircuts on collateral where confidence in future liquidity disappears. Haircut spirals and asset sales generate liquidity spirals, that is, a toxic combination of deteriorating funding liquidity and market liquidity reinforcing each other (Brunnermeier and Pedersen 2009).

The global financial crisis illustrated well shadow money instability. In the US, Lehman Brothers and Bear Sterns lost access to tri-party repo funding, as ‘tri-party repo arrangements were at the centre of the liquidity pressures faced by securities firms at the height of the financial crisis’, but haircuts barely moved (Task Force 2009, also Khrisnmurtty, Nagel and Orlov, 2011). The run on bilateral repos manifested through dramatic increases in haircuts, pushing up repo funding costs (Copeland, Martin and Walker, 2009; Gorton and Metrick 2012). The base asset universe contracted rapidly, as volatility in structured securities markets rendered the demands of par exchange impossible to meet³⁰. In Europe, the range of securities functioning as base assets also contracted, as private finance and the ECB became increasingly reluctant to accept shadow money issued against Portuguese, Irish, Greek, Italian and Spanish government collateral, at least until the ECB promised to do whatever it takes (Gabor and Ban 2015).

When the shadow layer of money hierarchies contracts, the stampede up the hierarchy erodes the liquidity of tradable claims that supported its expansion. The intricate interconnections along the hierarchy of promises to pay render market liquidity complex, contingent and volatile. Keynes’s ‘fetish of liquidity’ – the increasing preference for ‘liquid’ securities – gains systemic proportions. Shadow moneyness is procyclical, rendering market liquidity the most important social institution in market-based finance.

Crises of shadow money play out as crises of collateral. Asset liquidity depends on whether ‘vulnerable counterparts have substantial positions that need liquidating’ (Praet and Herzberg, 2008, p.23). No asset in the base universe is spared, despite claims to the contrary that ‘information-insensitive’ securities, the ideal base asset, are immune to pro-cyclicality (Gorton and Ordóñez 2013). Rather, the European experience shows that no tradable asset, including government debt, is automatically safe (Gourinchas and Jeanne 2012). After 2010, (shadow) banks in Europe, such as LCH Clearnet, raised haircuts on periphery government bonds and tightened the terms

30 Bindseil (2013) points out that ‘an attempt by a bank to raise liquidity from lower quality assets under conditions of severe market stress would entail acceptance of a large fire-sale discount or haircut to compensate for high market risk. That may not only erode the market’s confidence in the bank, but would also generate mark-to-market losses for banks holding similar instruments and add to the pressure on their liquidity position, thus encouraging further fire sales and declines in prices and market liquidity’. William Dudley (2013), of the New York Fed, in turn, narrated the Lehman contagion ‘higher margins on repo and increased collateral calls due to credit ratings downgrades reduced the quantity of assets that could be financed in repo markets and elsewhere, prompting further asset sales’.

on which shadow money was issued (Gabor and Ban 2015). By 2012, few financial institutions were prepared to hold shadow money issued against Portuguese, Greek and Irish sovereign collateral.

Stabilizing shadow money

Stabilizing bank money required the state to preserve par exchange. The institutional framework for stabilization emerged through a historical struggle where banks sought to minimize the (expensive) assets held for meeting par demands while the state, accepting the importance of bank lending for the productive economy, and the social utility of bank liabilities, gave up its monopoly over issue of means of settlement. In return for (partially) guaranteeing bank liabilities and providing lender of last resort, the state created a complex set of instruments to manage the competing forces of profitability and safety characterizing banking.

However, what makes shadow liabilities money greatly complicates stabilization. It requires an almost wholesale abandonment of many powerful and persuasive ideas in monetary economics and practices of central banking.

First, central banks cannot rely on lender of last resort to support shadow money convertibility. Their collateral framework can perversely *destabilize* shadow money. The central bank independence literature suggests that central banks lend freely, against good collateral and at high rates (Grossmann and Rockoff, 2015). By these standards, large central banks, particularly the ECB, have been more generous than Bagehot would have advised, accepting low-quality collateral in loans with very low interest rates and at long maturities after 2008. However, Bagehot defined good collateral ‘what in ordinary times is reckoned as good security rather than attending to current market valuations’ (Moe, 2012; Mehrling et al, 2013). Central banks’ valuations of collateral should support rather than follow collateral market prices. Setting a floor on price is important since ‘what cash an institution can borrow in repo markets depends on the current market value of the collateral it posts’ (Mehrling et al, 2013).

Where central banks provide LOLR liquidity through repos that mark collateral to market, they may reinforce a liquidity spiral rather than contain it. Banks have to borrow reserves against collateral that central banks mark-to-market and on which they make margin calls (Gabor and Ban 2015). LOLR provided via repo loans thus tightens, rather than eases, monetary conditions (as ECB’s Bindseil (2013) recognizes). In other words, central banks cannot mitigate convertibility risk for shadow money where they use the same fragile convertibility practices.

This implies that central banks should be prepared to lend unsecured, or at least without seeking to preserve collateral parity, in order to avoid that shadow money be converted, in a stampede, to bank deposits or high-powered money³¹. The political economy obstacles and moral hazard issues that central banks would be running into

31 Buiter (2016) noted that ‘unsecured lending by the central bank to the commercial banks is the straightforward expression of credit easing in the relationships-oriented or banking model of financial intermediation. There is an even more aggressive version of this, which has the central bank lending directly and unsecured, to non-bank counterparties, bypassing the banks completely’.

should they follow the first strategy are significant (especially in the Eurozone), but in theory this would be one avenue for preserving par convertibility of repo liabilities. The second strategy raises fewer concerns, as central banks only introduced collateral valuation techniques in the early 1990s and could thus revert to earlier practice (see Gabor and Ban 2015).

Second, since bank money stability created a special relationship between private banks and central banks, the question becomes whether institutions with significant presence in the shadow money layer should get direct access to central bank backstops (Pozsar 2014). Put differently, central banks would allow some institutions to move up the money hierarchy, as Banque de France allowed LCH Clearnet SA to do in the early 2000s. Reserves are no longer money between commercial banks, but also for non-bank financial institutions. For instance, if central banks give cash pools access to the reserve layer, the effect would be a contraction in privately-issued shadow money. It would see central banks beginning to issue issuing shadow money when borrowing against collateral, as the US Federal Reserve does from money market funds. Bank deposit ‘cash’ pools would become central bank reserve ‘cash’ pools, holding shadow money issued by the central bank. The central bank’s balance sheet absorbs unwanted bank deposits.

The US Fed moved recently in this direction, allowing money market funds access to its balance sheet. The move would help it leave the zero-lower bound, since MMFs have large pools of liquidity that the Fed needs to absorb in order to enforce higher money market rates. In doing so, the Fed is contracting the ‘private’ component of shadow money, moving these off the balance sheet of broker-dealers or banks onto its own balance sheet. In parallel, Bank of England has since 2014 allowed access to its balance sheet to CCPs and broker dealers, two systemic issuers of shadow money.

Third, the central bank needs to define the base asset universe that it is prepared to support in crisis. In a market-based financial system where risks show ‘on market-to-market balance sheets every day’ (Haldane, 2014), backstopping *institutions* is not sufficient (Mehrling 2012b), even if LOLR and the hierarchy of access are modified as suggested above. Collateralized debt relationships can withstand a systemic need for liquidity if repo lenders are confident that collateral values would not drop sharply, forcing margin calls and firesales. The critical role that collateral market liquidity plays in the convertibility of shadow money implies that central banks need to backstop *markets*. How and which markets become important questions.

Here, the emerging scholarship on safe assets provides conflicting responses. On the one hand, it is tempting to conclude that shadow money issued against sovereign debt preserves at par convertibility in all states of the world, and therefor does not require central bank support. After all, the US experience shows that repo liabilities issued against USTs did not come under pressure, as the US government bond market remained liquid (see US Federal Reserve 2009³²). Rather, it was the collateral upgrades, the AAA rated ABS and MBS, that lost base asset status.

32 The US Fed described its efforts to stabilize repo liabilities as follows: ‘another problem emerged as a shortage of Treasury securities in the marketplace threatened to interfere with the process of reducing leverage. In more tranquil times, both U.S. Treasury securities and triple-A rated private mortgage-backed securities serve as collateral in private borrowing arrangements. Not so in today’s environment. Many lenders will now accept only Treasury securities as collateral, and shun the triple-A rated

However, the particular experience of the US, largely shaped by the status of the US dollar as international reserve currency, may provide limited insights. The liquidity implications of shadow money cannot be understood solely from the asset market that is a safe haven for the entire global financial system, the US Treasury market. Rather, the lesson from Europe is that liquidity waves batter the shores of government bond markets, changing the terrain on which states' ability to fund is determined. Market access is no longer simply a question of fiscal probity, but rather mediated by the exposures of (shadow) banks that issue shadow money against sovereign collateral. Thus, promises of the state can become vulnerable when supporting shadow money creation. The political economy of shadow money starts with the political economy of central bank interventions in government bond markets.

Indeed, the broader theoretical point is that the state, as base asset issuer, becomes a *de facto* shadow central bank. Its fiscal policy stance and the accompanying debt management decisions matter for the pace of (shadow) credit expansion, and for financial stability. Yet, unlike the central bank, the state has no means to stabilize shadow money. It has to rely on its central bank.

Thus, the quantitative easing measures implemented after Lehman can be understood as ad-hoc policy innovations to support at par convertibility for shadow money. While initially resorting to the theoretical framework of New Keynesianism (Gabor 2014), slowly central banks have acknowledged this view³³. Shadow money stabilization took longer in Europe precisely because the ECB hesitated, under strong political pressures, to define clearly the base assets it was prepared to defend. Only when repos issued against Italian sovereign bonds, the second largest issuer of government bonds in Europe, came under threat, did the ECB finally react. Through a shadow money lens, the ECB's 'whatever it takes' committed to put a floor on sovereign bond prices, and prevent the safe asset universe in Eurozone from shrinking to German bunds. Whatever it takes saved shadow euro money.

The ECB's hesitations expose a fundamental contradiction at the core of the market-making model: backstopping core markets can easily be mistaken for fiscal dominance, as the several German members of the ECB board argued before resigning since 2008. Yet in a system of credit claims built on a base asset issued by the state, the distinction between fiscal and monetary policy becomes increasingly blurred.

The new policy regime is ridden with contradictions. Central banks have to walk a fine line between protecting shadow money convertibility and creating base asset shortages. Purchasing assets to support market liquidity may create a shortage of high-quality collateral (Singh 2012), setting a contractionary policy stance while

mortgage-backed securities. Some creditworthy borrowers are shut off because they do not have Treasury securities. To deal with the shortage of collateral, the Federal Reserve introduced two new policies: the Term Securities Lending Facilities (TSLF) and the Primary Dealer Credit Facility (PDCF)³³.

33 Mark Carney (2014), Bank of England's governor, announced a new age: 'just as there will be times when central banks must backstop the banking system, there are also times when they should backstop core markets in a way that supports their contribution to the real economy but doesn't encourage excessive risk taking'.

banks are deleveraging. How fine a line depends on the fiscal policy stance. An aggressive countercyclical fiscal stance may raise doubts about base asset quality, but in turn allows central banks to intervene without fearing shortages. A contractionary (pro-cyclical) stance aggravates the dilemma, since it requires central banks to judge carefully how to balance direct support and potential shortages.

The ECB, for instance, decided to lend QE securities out, and thus alleviate shortages. In contrast, after Lehman, Bank of England and the US Fed adopted a range of policies destined to improve the good/bad collateral ratio available to shadow money issuers. This required a broad view of base asset markets that included securitization markets and government bond markets³⁴. It also critically required close coordination with debt management offices, to ensure an adequate supply that would meet the shortage of high-quality collateral. Effective coordination between the central bank and Treasuries restored the moneyness of shadow liabilities.

Beyond stabilization: a social contract for shadow money

The footprint of shadow money, we argued, extends well beyond aggressive hedge funds and passive institutional cash pools. It is to be found in government bond markets, in private securities markets, in regulated banks and new systemic institutions (CCPs).

Our theoretical approach offers some promising research avenues. The first is a comparative analysis of shadow money creation across different financial structures. The contours of shadow money's footprint, we have suggested, depend on specific characteristics of national money hierarchies, and cross-border interconnections. For instance, the Chinese money hierarchy is deeply and intricately connected to both US and Euro shadow money, in that the reserve managers of the People's Bank of China hold a significant share of the portfolio of government bonds that supports shadow money issuance in the US and Europe. Our framework stresses the importance of comparing how shadow money issuance is organized, the role of banks and the state (as base asset issuer), and the disciplinary constraints governing the expansion of shadow money, recognizing the potential cross-hierarchy interactions.

Drawing on this comparative angle, the second avenue explores the changing terms of the relationship between the state and shadow money issuers. In the 19th century, Victoria Chick (2013) has shown, the state eventually accepted to support bank money parity, and in return, introduced bank regulation and formalized a set of rules that would govern the expansion of bank money. A similar struggle over the terms on which the state is prepared to collaborate with shadow money issuers has been taking place since 2008.

³⁴ The Securities Lending Facility (in UK) and the Terms Securities Lending Program (US Fed), introduced in early 2008 and unwound by 2011, saw central banks offer Treasury debt in exchange for illiquid securitization instruments (mostly mortgage-backed securities). This upgrading of collateral allowed (shadow) banks to tap repo markets with 'cheap' (high-quality) collateral. At its peak, the US facility injected USD 250 bn of US Treasuries, around a fourth of the QE purchases (Fleming et al, 2009). In UK, by January 2009, the SLF volumes reached £185 bn, doubling the pre-crisis balance sheet and close to the £200 bn QE programme announced in March 2009 (John et al, 2012).

At global level, in Basel III liquidity and leverage rules for financial institutions, and in the Financial Stability Board rules for the repo market, the state sought to define the terms of shadow money issuance. For instance, by defining what constitutes high-quality liquid assets in the Liquidity Coverage Ratio, the state sought to preserve base asset status for sovereign bonds, well aware of its inherent fragility. Indeed, the LCR makes shadow money issued against private collateral more expensive. For example, a short-term repo financing corporate bonds would force the dealer to hold HQLA equivalent to the value of corporate bonds financed. Rather, it would be cheaper to finance private securities with sovereign-backed repos that carry no HQLA requirements. Put differently, at global level, states have so far regulated shadow money by encouraging the greater use of sovereign collateral. This is confirmed by the Financial Stability Board proposals on repo markets. Originally, the FSB(2012) proposed to tighten disciplinary constraints on all shadow money issuance, including against sovereign collateral. By 2015, it changed its position. Mandatory haircuts would only be applied on shadow money issued by non-banks against non-sovereign collateral, in the face of fierce resistance from states concerned about the liquidity of government bond markets.

The concept of a social contract implies actors coming together, each surrendering some self-interest in the pursuit of arrangements that benefit all parties overall. While states and central banks are invested in efforts to stabilize shadow money – even if none of them is formally responsible and the profundity of the challenge is yet to be fully understood – the contribution of the financial sector towards stabilizing shadow money is less clear. An effective social contract for shadow money would consist of three key elements: a clear allocation of the formal mandate for shadow money stability; formalized coordination between the Treasury and the Central Bank on government bond issuance and debt management; and a model for a substantial contribution of the financial sector, in exchange for the public backstopping and implicit subsidies of its shadow monies.

It is thus possible to examine how states have defined the terms of the new arrangement along these three lines by comparing distinctive money hierarchies. As we have suggested, shadow money generates new connections and potential conflicts between fiscal, monetary and macroprudential policies. For instance, the Euroarea has generated the most visible debates about shadow money when the European Commission decided to include repos in the scope of the Financial Transaction Tax. The most predictable opposition came from European banks, the most significant from the European Central Bank, concerned about the impact on monetary policy (Gabor 2015). More recently, Germany, the undisputable winner of the Euro shadow money process, is using its ‘exorbitant’ collateral privilege to push for changing the special status of sovereign collateral (see Briancon 2016). Should it succeed, it would change fundamentally change shadow money issuance.

In parallel, European and Chinese states have intensified efforts to transform shadow banking into market-based finance. Repo markets, and therefore shadow money, are critical to those efforts, with the European Commission describing ‘collateral fluidity’ as a necessary condition for the success of its Capital Markets Union plans. Shadow money, it seems, is here to stay.

Conclusion

The rise of shadow banking has profound implications for monetary theory and practice. Efforts to appreciate its challenges must take point of departure in an examination of forms of short term lending supported by tradable collateral, known as repurchase agreements (repo). A convincing account of modern money creation requires a firm grasp on the tectonic shifts of modern-day finance, central banking and financial policy.

By examining shadow money as repo liabilities supported by tradable collateral we strip market-based finance to its core. We find that shadow money is defined by four distinctive features: it is issued to delay settlement in money proper; its growing acceptance (as means of deferred settlement) is dependent on an intricate collateral valuation mechanism that preserves par convertibility; its convertibility is inextricably bound up with issues of sovereign authority and creditworthiness; and it cyclically shapes moneyness lower in the hierarchy, including for tradable debt issued by the state.

Aside from conceptual clarity and analytical purchase, adopting a narrow definition of shadow money creation allows us to grasp clearly the policy challenges of post-crisis central banking. Stabilizing shadow money requires an almost wholesale abandonment of many of the most powerful and persuasive ideas in monetary economics and practices of central banking. Lender of last resort may perversely destabilize shadow money. The Bagehot rule of lending freely, against good collateral and at high rates, offers little guidance not only because rates cannot easily be high in the current conjuncture, but also because the issue is not so much whether high or low quality collateral is accepted by central banks. If central banks are to contribute to financial stability, the crucial issue is whether their valuations of collateral support or follow collateral market prices. Collateralized debt relationships can withstand a systemic need for liquidity only if repo lenders are confident that collateral values will not drop sharply, forcing margin calls and fire sales. The critical role that collateral market liquidity plays in the convertibility of shadow money implies that central banks need to backstop *markets* (not just institutions).

The state, as base asset issuer, becomes a *de facto* shadow central bank. Its debt issuance decisions matter for the pace of (shadow) credit expansion, and for financial stability. Yet, unlike the central bank, the state has no means to stabilize shadow money. It has to rely on its central bank (if it has one).

The political economy of shadow money is nothing short of radical. Shadow money erodes the Great Moderation institutional arrangement that celebrates independent central banks preserving price stability (and growth) and suspiciously demands fiscally prudent governments informed by neoclassical growth ideas. Rather, in the age of shadow finance, the Treasury can no longer be guided by orthodox ideas of balanced budgets and market-neutral sovereign debt management. Coordination between the Treasury and the central bank becomes essential if the fragilities underpinning the creation of shadow money are to be contained, and some social utility (supporting credit creation via capital markets) to be derived. For coordination

to become possible, and legitimate, the state needs to define the contours of the social contract that would support shadow money convertibility.

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