Research Article

European Journal of Economics and Economic Policies: Intervention, Vol. 22 No. 1, 2025, pp. 32–53
First published online: April 2024; doi: 10.4337/ejeep.2024.0131

Banks are different: why bank-based versus market-based lending is a false dichotomy

Carolyn Sissoko
Bristol Business School, University of the West of England Bristol, Stoke Gifford, Bristol, UK
csissoko5@gmail.com

This paper introduces modern readers to 'banking theory', that is, to the understanding of the banking system that was held by academics and practitioners in the early years of the twentieth century. This theory contrasts with the theoretic framework that views banks as intermediaries that receive deposits and invest deposits in assets. The basic elements of banking theory are related to the modern network effects literature, and a bank-centered view of the financial system is derived: all demand and short-term bank liabilities, including contingent liabilities, are potential money and near-money assets; and any non-bank liabilities that have monetary properties derive them from the banking system. This framework is then used to evaluate modern money markets, and the paper proposes that bank-liability–based measures of the money supply be developed, and that regulators recognize that contingent bank liabilities often function as a substitute for deposits and should be regulated similarly.

Keywords: *banking theory, circuit theory, contingent liabilities, money market, network effects*

JEL codes: *B10, B50, E5*

1 INTRODUCTION

A 'commercial theory of banking' developed over the course of the nineteenth century and was the first school of thought to relate fluctuations in the money supply to economic performance (see Schumpeter 2006 [1954]: 698–700, 1076–1078). The fundamental and distinguishing insight of this theory is that money supply in a modern economy is a private-sector phenomenon – and the theory will be called simply 'banking theory' through the rest of the paper. This theory relegated the role of government – and indeed of fiat money itself – to that of supporting and stabilizing the privately issued money supply. This paper argues that the theory's bank-centered view of money is a useful framework for understanding the modern financial system.

Subsequent to the policy failures of the Great Depression, and in particular the failure of monetary policymakers to recognize that they could and should have acted to mitigate the effects of the Depression, banking theory was subject to significant criticism. The goal in this paper is not to dispute that when policymakers view themselves as playing only a supporting role in the fundamentally private-sector activity of issuing money, they will tend to do too little, but rather to argue that banking theory provides a sophisticated framework for understanding the interlocking institutions of banking and money that should inform modern policymakers in their efforts to support the economy and the financial system.

Received 1 November 2022, accepted 26 February 2024

This institutional knowledge can make modern financial regulation more effective: first, the understanding that banks are very different from other financial intermediaries, because they issue liabilities that due to social norms circulate as a means of payment, means that an economy's allocation to bank-issued assets is not determined at the individual margin, but by social norms and network effects, and this in turn has implications for both bank and non-bank liabilities. When analyzing bank liabilities, changing social norms, not the legal form of the liabilities, determine whether or not such liabilities circulate as money and, therefore, all short-term bank liabilities, including contingent liabilities, should be viewed as potential monetary assets. When analyzing non-bank liabilities, because they are not directly supported by the social norm, any non-bank liabilities that function as near-money assets must derive their monetary characteristics from their relationship to the banking system. In short, banking theory provides a bank-centered framework for analyzing the money supply and the effects of its expansion. This framework makes clear – and could have made clear 40 years ago – that the so-called shadow banking system is best understood as an extension of the actual banking system, and this framework has significant implications for the reform of financial market regulation.

Second, the financial structure that was put in place in the U.S. in the 1930s and 1940s was largely founded on this theoretic structure (Sissoko 2019a, 2019b). Thus, the U.S. financial system was built on this framework, and, even though subsequent changes have dramatically altered the financial system, as is shown here, many aspects of it still can only be explained and understood using the framework of banking theory.

This paper exposits how banks are fundamentally different from and more important than other financial intermediaries because of the role they play in the money supply and why this matters. Section 2 provides a brief literature review. Section 3 outlines the most basic elements of banking theory, including the eighteenth-century foundations of the modern demand deposit system. Section 4 explains some implications of banking theory and discusses in turn money market funds, securitization, and the shadow banking system more generally. Section 4 finds that, because a bank deposit, once it has been created, can only be extinguished by repayment of the underlying loan, purchase of bank-issued securities, or non-temporary conversion of the deposit into cash, a change in preferences on the part of the public in favor, for example, of money market funds has the effect of introducing an intermediary between the public and the bank liability and of changing the structure of bank liabilities, but does not effect a fundamental change in the banks' role in the money supply or in lending. In short, from the perspective of banking theory, banks have been disintermediated only nominally by the so-called market-based system of short-term lending. What has happened instead is that the form that the bank liabilities take has shifted – both into wholesale funding and off-balance sheet.

The point of this analysis is that treating money market funds and similar near-money assets as separate asset classes that compete with bank deposits obfuscates the fact that money markets funds lend to the private sector for the most part *through* the banking system, not independently of it. Thus, the availability of money market funds as a near-money alternative for the public should be viewed as the means by which bank liabilities are restructured to favor wholesale lending and off-balance-sheet contingent bank liabilities.

Section 5 discusses policy recommendations. The fact that the shadow banking system has served to increase the variety of bank liabilities that stand on an equal basis with deposits in a bank resolution without changing the role that banks play in the money supply and in the economy, provides guidelines for the regulation of non-bank financial intermediaries. First, bank liabilities should be regulated on the basis of not their accounting classification, but whether they create a claim on bank assets in adverse economic conditions that will be *pari passu* with deposits in a bank resolution. Such a policy would have the

effect of recognizing that contingent bank liabilities can play the same economic role as bank deposits. Second, this analysis indicates that the actual money supply may be measured more effectively when the measure is based on bank liabilities, rather than on assets held by the public. The sixth chapter concludes.

2 LITERATURE

Nowadays it is common to frame the debate over the nature of banking as between a 'neoclassical' view that frames banks as intermediaries which facilitate the movement of resources from savers to borrowers and a 'heterodox' view that emphasizes the ability of banks to create money without reliance on savers' resources (e.g. Realfonzo 1998: 2–12). This debate over the nature of banking dates back, however, to early nineteenth-century England and in particular to Thornton's (1962 [1802]: 88–89, 100–02) critique that Smith (2005 [1776]) did not grasp the extraordinary impetus to economic activity generated by a currency that expands beyond the limits of real underlying assets. Thornton was a banker and his theory reflects an understanding of banking that emphasizes the role of banks in financing commercial activity using a circulating instrument, the commercial bill, that was the liability of the merchant who issued the bill, but that also bore the guarantee of the bank that accepted it. Thus, each bill was simultaneously a bank loan – since without the system of banker's acceptances, the bill would not be received in payment or issued – and a (contingent) bank liability – since the bank would have to pay, even if the merchant did not. Thornton was intimately familiar with the process by which banks could expand the circulation using this currency, and his theory reflects that knowledge.

Because the use of commercial bills in Britain to finance trade would continue well into the twentieth century (see e.g. Gillett Brothers 1952), a banking theory that treats the elastic expansion of bank lending in the form of commercial bills as a core building block of robust economic activity reappears regularly throughout the nineteenth-century British literature on money, and Schumpeter (2006 [1954]) in his *History of Economic Analysis* calls this the 'commercial theory of banking'. In fact, Wicksell's 'pure credit' system of money is explicitly derived from the commercial bill system (Wicksell 1962 [1898]: 62–69). From the nineteenth century through the early twentieth century, however, this theory coexisted with a 'neoclassical' view of banks as intermediaries that was in general embraced by economic theorists who were less familiar with the functional aspects of the banking system (see Realfonzo 1998: 2–12).

In the modern literature, the logic of banking theory, which is discussed in detail in Section 3, is clearly expressed by circuit theory or the 'monetary theory of production' where there are three types of agents: banks, firms and workers. In this theory, the economic process requires that banks lend to firms in order for them to hire the workers who produce the goods, and the process is closed when the workers use their claims on the banks to pay the firms either for consumption of the goods or for savings in the form of securities issued by the firms (Realfonzo 1998: 14–18; Graziani 2003). This theory is discussed further in Section 3.

Because banking theory is not generally treated as an important element of the history of economic thought, only a few recent authors have discussed the work of early banking theorists in the U.S. Allan Meltzer (2003) reviews this work in his *History of the Federal Reserve* and Perry Mehrling (1988) discusses aspects of this work in *The Money Interest and the Public Interest*.

Meltzer's focus is not on the theory of banking itself, but on the theory of monetary policy. He concludes that instead of developing a theory of monetary policy, at the turn

of the twentieth century, central bankers relied on three rules to determine monetary policy: the discount rate should be raised and lowered so as to protect the gold stock and exchange rates, the central bank should act as a lender of last resort, and the central bank should discount mainly commercial paper (Meltzer 2003: 22). Because this paper focuses on the theory of banking and not on monetary policy, it reaches very different conclusions from Meltzer.

Mehrling's (1998: 104) emphasis is also on money rather than on banking, and he contrasts academic proponents of the quantity theory of money with 'the financial community' which he argues rejected the quantity theory 'without, however, offering any coherent alternative construct'. The focus in this paper is, by contrast, on banking theory, and one goal is to explain why the early-twentieth-century financial community in the U.S. focused its attention on the theory of banking and had a bank-centered view of the economy – that was supported by prominent academics.

This paper relies on textbooks on American Banking written by Charles Dunbar (1909) and H. Parker Willis (1916), as well as the Federal Reserve's (1923) Tenth Annual Report, to represent the general understanding of banking at the turn of the twentieth century in the U.S. Because these volumes present an understanding of banking that, this paper argues, was both coherent and consistent with the important British works on banking theory of the nineteenth century, written by Henry Thornton (1962 [1802]) and Walter Bagehot (1979 [1873]), as well as the twentieth-century work of Ralph Hawtrey (1919, 1938), this paper treats these works as presenting a coherent theory of banking. I acknowledge that the question of whether the analysis in these works is of a quality and consistency that merits the term theory is open to debate and that authors such as Meltzer and Mehrling are probably taking the position that it does not.

Another literature that is related to this paper is the literature on regulatory arbitrage that has developed, in particular, subsequent to the 2007–2008 crisis. Sissoko (2013: 372–373) and Acharya et al. (2010) both discuss how asset-backed commercial paper conduits were designed to arbitrage the differences in regulations governing banks and money market funds. White (2012: 27–28) discusses how regulatory arbitrage of the rules governing risk-weighted assets promoted the development of securitization and contingent bank liabilities. Gerding (2014: 236–275) discusses regulatory arbitrage more generally. Most of these works frame regulatory arbitrage as the growth of a 'shadow' or 'market-based' banking system that relies on market mechanisms to perform many of the same functions as the banking system. This paper provides an alternate framework for understanding regulatory arbitrage and the shadow banking system more generally.

By embracing the bank-centered perspective, this paper is most closely related to the heterodox literature on shadow banking. It builds on Michell (2017) and Bouguelli (2020), both of whom conclude that shadow banks cannot create money. These two approaches are extended by connecting the argument up with historical banking theory and with the economic literature on network effects.

In addition, this paper argues that shadow banking does not represent the growth of a market-based form of banking, but instead a shift in the type of bank liabilities that function as money. Prior to the growth of shadow banking, demand deposits were by far the most important bank liabilities that circulated, but subsequent to the growth of the so-called 'market-based' banking system, the banking system has shifted back to a structure more like the one that existed in the nineteenth century where contingent and off-balance-sheet bank liabilities supported a money supply that is nominally issued by non-banks, but in fact derives its monetary character entirely from the banking system. In short, from the perspective of banking theory, the 'market-based' banking system is just a shift in the type of bank liabilities that support the money supply.

3 AN INTRODUCTION TO BANKING THEORY

In order to understand early-twentieth-century banking theory it is essential to leave behind the theoretic framework that views banks as financial intermediaries that receive deposits and invest those deposits in assets. This framework of banks-as-money-market-funds is not an accurate depiction of the historical and empirical foundations of modern banking, and is unsurprisingly incompatible with the theoretic framework that developed based on the actual historical development of modern banking. This paper shows that an understanding of banking theory with its focus on the reality of how banks function provides remarkable insights into the operation of the modern financial system.

First, the foundations of modern banking in discount banking are explained. Discount banking had the notable characteristic that 'deposits' were entirely unnecessary to the function of the banking system. Then, I set forth the most basic elements of banking theory: when banks make loans they create money by issuing bank liabilities, bank creditors are using money and only incidentally 'saving' and lending, thus the public's portfolio choices affect the composition of bank liabilities, not their quantity.

3.1 Discount banking: the origins of the modern banking system

It is a commonly repeated myth that in Britain modern banking developed from the deposit-taking goldsmith-banks that existed in the seventeenth century. As Temin/Voth (2013: 146) observe, however, during the late eighteenth and nineteenth centuries, the lending of goldsmith bankers was 'heavily concentrated among the elite'. In fact, in Britain through this crucial formative period, the bankers who provided services to the typical tradesman and the general business community were not goldsmith bankers, but discount bankers (Gent 2016). As a result, modern banking in Britain grew out of the discount banking system that was the basis for the payments system that supported economic activity in pre- and early-industrial Britain.

To develop an intuition for what a discount bank does, it is easiest to think of discount banking as the institutionalization of the credit chains that were ubiquitous in European villages in the late Middle Ages.[1] To give a simplified example: John, the blacksmith, shoes the horse of Geoffrey, the farmer, in exchange for an IOU of £1, and Geoffrey sells grain to Arthur, the butcher, for a similar IOU. Arthur, in turn, provides pig meat to John for another £1 IOU. In this simple example it is obvious that no hard cash ever needs to change hands; instead all three villagers can simply cancel their IOUs. In practice, villagers would work through the clearing of such IOUs on regular settlement dates (see e.g. Clark 1981: 267).

An important function of a discount bank is to act as a registrar by maintaining accounts and clearing the local community's debt on an ongoing basis and at very low cost. If a bank's only function is that of a registrar, then the degree to which an individual's bank account balance is negative depends only on the degree to which the local community is willing to lend to that individual. Observe, however, that the banker who acts as registrar gains an extraordinary amount of information about the success of each account-holder's business and his or her ability to manage debt. Thus, the banker

1. One should recognize, however, the historical reality that discount banking developed in Europe's major urban centers where this service was provided to larger-scale merchants and was only extended to towns in Britain over the second half of the eighteenth century.

is best positioned to determine how much debt an account-holder can carry, and to adjust that determination as circumstances change.

The primary function of the discount banker is thus to increase the degree to which the members of the local community are willing to lend to each other by intermediating the debt. The discount banker stands ready to 'discount' or convert into cash the IOUs issued by those who hold accounts with him, and pays out, not gold, but his own bank notes. Thus, a community may benefit from a discount bank's services even if no member of the community has net savings, because it is through the intermediation of the banker that the members of the community all borrow to make purchases from each other and lend the value of what they produce to each other. As Hawtrey (1919: 4) put it, a bank is 'a dealer in debts … The debts of the whole community can be settled by transfers in the banker's books or by the delivery of … bank notes'.

To return to the original example, John may discount Geoffrey's bill with Henry, the banker. In exchange for endorsing Geoffrey's IOU over to Henry, John receives a bank note issued by Henry. When John purchases pig meat from Arthur, he may then choose to pay Arthur with the bank note or to simply write his own IOU to Arthur. If Arthur knows that Henry is willing to discount John's IOU, Arthur can convert the IOU into cash whenever he wants or needs to do so, and is therefore much more likely to accept the IOU in payment.

Indeed it appears that the growth of discount banking successfully created and consolidated enough information that the credit lines available to the members of the various local communities increased significantly when discount banking spread throughout Britain in the late eighteenth and early nineteenth centuries (see e.g. Smith 2005 [1776]: 240–241; Thornton 1962 [1802]: 175–176). During this period a tradesman in Britain did not open an 'account' at a bank by depositing gold or claims on gold, but instead opened a 'discount' with the bank. The discount was a commitment by the bank to discount the tradesman's bills, or in other words to provide cash to the tradesman's creditors when they presented the bank with bills issued by the tradesman as long as the aggregate value of such bills – less any bills deposited at the bank that were owed to the tradesman – did not exceed a specified credit limit. As was noted above, it was not necessary as a rule for the banker to keep sufficient supplies of gold to discount all the bills that were presented to him, since it was common for the local community to accept payment in the banker's own notes. By the start of the nineteenth century, bills in Britain that could be discounted clearly comprised an important part of the money supply (Thornton 1962 [1802]: 92; Meltzer 2003: 38).

Discount banks were not, however, just 'dealers in debts', but also actively extended the capacity of their clients to issue debt by providing them with discounts, or in other words credit lines, too. In fact, it was these credit lines that turned privately issued bills into liquid assets. An undrawn credit line is, however, not (yet) a debt, and is not a bank liability. It is a contingent bank liability – that is, a liability that will come into existence only under certain, contingent circumstances. Contingent liabilities are considered 'off-balance-sheet' in modern accounting terminology. Thus, the monetary character of the bills derived from the contingent and off-balance-sheet liabilities of the banks. When the contingent liability (i.e. the credit line) was drawn down by the discount of a bill, the bank issued notes, converting the contingent liability into an on-balance-sheet liability.

Observe that the model presented here of discount banking is closely related to circuit theory. Both models rely on bank money creation to support the issue of debt by producers that is accepted in payment because it is a bank liability, and both models have the property that, in the absence of banks, production/sales would not take place and economic activity would be slowed or stopped. While the models differ in their particulars, the basic approach

to money and banking is the same (Realfonzo 1998: 14–18; Graziani 2003). The approach is also based on the realities of banking in nineteenth-century England.

Under these circumstances it is not surprising that the similarity between bills and checks and between discounts and checking accounts is not at all coincidental: checking accounts developed as an alternate form of bank liability in an environment where the legislature had imposed quantity limits on the issuance of bank notes. General familiarity with this history was one of the reasons that early-twentieth-century banking theorists viewed arguments that policymakers could control the quantity of money with great skepticism.

To summarize, the discount banker not only cleared the debts of the local community, but also issued bank liabilities that circulated as money, determined how much credit the community should extend to local tradesmen, and monetized the debts of tradesmen by standing ready to discount them, thereby making it possible for those debts themselves to circulate by endorsement. This system greatly increased the availability of credit in these communities. Thus, discount banks are the institutions that gather the information necessary to make uncollateralized, reputation-based borrowing incentive compatible for both borrowers and lenders. The fact that bank liabilities are monetized means that the community as a whole is the actual lender – as the relevant creditor changes from day-to-day and moment-to-moment with the exchange of money or bank liabilities.

In short, the distinguishing characteristic of bank lending on discount is that it can take place without any depositor or source of funds. The deposit or issue of bank notes that offsets the loan for accounting purposes is literally created by the loan, and what acts as a source of funds supporting the creation of this deposit is the willingness of the community to circulate the banker's liabilities as money. Needless to say, in the early twentieth century, this was clear to both banking practitioners and banking theorists.

Discount banking, thus, had three implications that are discussed in turn in the next subsection. First, as long as bank liabilities are included in the definition of the money supply, bank lending is the most important determinant of the money supply. Second, the choice made by the members of the community who circulate bank liabilities is not a decision to lend money; instead they choose to use as money an asset that is backed by lending to the private sector, where the choice of a money asset is not in fact an individual decision, but is governed by social norms. Third, because of the monetary nature of certain bank liabilities, whether the issuer of an asset is a bank or a non-bank may play an important role in determining which assets an individual chooses to hold.

3.2 Banking theory basics

3.2.1 Bank lending is an important determinant of the money supply

The discussion above makes clear that when early banking theorists explain that money is created by a bank when it lends, they are explaining quite literally the function of a discount bank. In fact, turn-of-the-century banking textbooks typically opened by explaining discount as the means by which banks lend and put their liabilities in the form of notes and deposits into circulation (see e.g. Dunbar 1909: 9–13; Willis 1916: 22–26). Thus, these textbooks explain how bank lending determined the extent of the money supply.[2]

2. See, for example, Benjamin Strong (1930: 229–230) on the fact that bank notes and deposits should be included in the money supply. Note, however, that neither Dunbar nor Willis used the term 'money supply' in this way.

Indeed, such textbooks explicitly connect the excessive growth of bank liabilities with inflation (Dunbar 1909: 29; Willis 1916: 59).

When this theory was first developed, there was no question of central bank control of the money supply by setting required reserves and then limiting the supply of such reserves, because in Britain, there were no required reserves, and in the U.S, there were required reserves but there was no central bank. In the case of Britain, the Bank of England effectively supplied reserves in the form of high-powered money to the banking system, but limited the availability of such reserves through changes in the interest rate at which they were made available, not by imposing quantity controls on the high-powered money supplied. By setting the price and not the quantity of high-powered money, the Bank of England left the banking system to determine the quantity of money, given the expected price of obtaining reserves.[3]

In the U.S., the National Bank Act imposed required reserves on a large segment of the banking system; however, the fact that reserves were in limited supply caused interest rate volatility that disrupted markets on a seasonal basis, when the annual harvest created an increase in the demand for cash and for reserves. Indeed, an important motivation for the formation of the Federal Reserve was to make it possible for the supply of such high-powered money to expand according to the demands of the banking system. From the start the Federal Reserve Banks put in place a discount policy modelled on the Bank of England. Within its first decade the Federal Reserve added to its toolkit open market operations, which adjust the quantity of high-powered money available to banks. The use of this tool was designed, however, to 'accommodate' the demand for money and to give effect to the Federal Reserve's interest rate policy (Federal Reserve Board 1923: 15–16).[4] Indeed, in its Tenth Annual Report, the Federal Reserve Board (1923: 2–3) observed that the volume of reserve bank credit was not a good indicator of either business activity or the volume of the supply of bank money (see also Strong 1930: 185, 197; Hawtrey 1919: 49).

In short, in the early twentieth century, banking theorists viewed the quantity of money as determined by the banking system. While many understood that a central bank policy rate could – and should – affect economic activity and the supply of money,[5] it was also a tenet of the theory that the central bank could not control the supply of money. Given the experience in the U.S., any central bank effort to control the money supply using its control over the quantity of high-powered money risked generating volatility in interest rates comparable to that which existed prior to the formation of the Federal Reserve.

Notice that in this framework the role played by high-powered money is a supportive one. The money supply that is most important to economic performance is the bank-issued money supply, and the primary role of high-powered money is to stabilize the bank-issued money supply in circumstances in which, for example, requests to convert bank issued money into cash are threatening to cause a significant decline in the bank-issued money supply (see e.g. Federal Reserve Board 1923: 10). This theory of the subordinate nature of high-powered money was explicitly laid out by Ralph Hawtrey (1919: 185).[6]

3. Indeed, the movement away from quantity restrictions and to a policy of lending freely at a given rate is often viewed as a significant advance in British banking policy (see Bagehot 1979 [1873]: 98–100).
4. On the importance of interest rate policy, see also Strong (1930: 196–197).
5. In the Fed's Tenth Annual Report, for example, it is taken as given that discount rate policy should be used to 'influenc[e] the general credit situation' in order affect the growth and/or liquidation of business debt (Federal Reserve Board 1923: 3, 32).
6. Perry Mehrling explains that the debate over whether the quantity of the money supply is subject to the control of policymakers or whether it is determined by bank lending and only subject to indirect influence by policymakers through the policy rate was already clear in the early years of the

Hawtrey also explained the relationship between money and prices using the framework of banking theory: Raising the discount rate affects economic activity, which both restricts the growth of money (including high-powered money) and works to restrain growth in the price level (Hawtrey 1938: 37–39). Thus, the quantity of money and the price level are both effects of the level of economic activity, so all three will be correlated, but the causality in normal circumstances starts with real economic activity.[7] In short, banking theory does not dispute the correlation between high-powered money and the price level, but views both as the effects of the central bank's interest rate policy on the real economy.

3.2.2 Social norms make bank liabilities money

In the banking theory framework, bank lending is the means by which banks put their liabilities into circulation. Thus, the role played by bank lending in the money supply depends on the borrowers' willingness to accept bank liabilities when a bill is brought to the bank for discount. A foundational principle of banking theory is that borrowers are not willing to accept bank liabilities solely because they view the issuing bank as a good credit risk, but in significant measure because a social norm exists that allows those bank liabilities to circulate as money. Thus, a precondition for bank lending to determine the supply of money is that there is a social norm which supports the circulation of bank liabilities as money. Because bank liabilities can take many forms, it is useful to distinguish here between bank money, or bank liabilities that circulate as money such as checking deposits, and bank liabilities more generally which would include, for example, term deposits.

Early banking textbooks remark on the fact that in Britain and in the U.S. the use of checking accounts is a habit that distinguishes their banking systems from those on the continent, where the norm is to make extensive use of central bank notes in payment (Dunbar 1909: 49–50; Willis 1916: 313). The general use of checking deposits as a means of payment in the U.S. and Britain means that most businessmen maintain deposit accounts, and that funds withdrawn from one bank are typically redeposited in another (Hawtrey 1919: 6; Dunbar 1909: 45–46).

To place the concept that bank money is held, not due to a simple individual decision-making problem, but because the behavior of the other members of the economy changes the value of holding such assets, within the modern financial literature, the appropriate framework is a network effects model. A good exhibits network effects when its value

twentieth century. Interestingly, Mehrling also claims that the quantity theory was much better articulated, and apparently does not view Hawtrey, whose work Mehrling is very familiar with, as having laid the theoretical foundations of the banking theory view (Mehrling 1998: 104). It is possible that Mehrling places Hawtrey in the 'quantity theory' school, because Hawtrey believed that price stabilization should be an important policy goal (Hawtrey 1924: 284), in contrast to other banking theorists, who believed that the central bank's role should focus more generally on economic conditions (Federal Reserve Board 1923: 31). In my view, it is Hawtrey's understanding of the constraints on central bank 'control' of money that makes him a banking theorist. See the discussion above and Hawtrey (1924: 285) where he writes 'it is a grave mistake to claim too much for the [price] index-number. A mechanical adherence to it is supported neither by practical experience nor by theory'. Furthermore, perhaps Mehrling underestimates both the influence of academic supporters of banking theory, such as H. Parker Willis, and the quality of their analysis.

7. This was also clearly explained in the Federal Reserve's (1923: 31) Tenth Annual Report, and is fundamental to a Keynesian approach, see Marglin (2021).

to any one individual depends on how many other individuals are using it. Theoretic work has demonstrated the relationship between liquidity and network effects (Pirrong 2002: 405), reflecting the common sense understanding that the choice of trading infrastructure, such as the payment mechanism, is at least in some measure a solution to a coordination problem. The intuition behind this is that once most of the members of an economy have coordinated on the same payment mechanism, the cost to any one individual of deviating from this choice may be high.

To give an example, in a world where only a few merchants accept credit cards in payment, each merchant has a genuine choice whether or not to accept them; however, once almost all merchants accept credit cards – and the social norm is for customers to be able to pay with credit cards – network effects are likely to cause the individual merchant's optimization problem to favor the acceptance of credit cards, not because of the benefits they provide to the merchant, but due to the costs of failing to conform to the norm (Farrell/Klemperer 2007: 2011). Of course, the corollary to accepting credit cards in payment is carrying a temporary merchant account balance with the card issuer during the period between a charge and the posting of the funds charged to the merchant's bank account. That is, the fact that the use of credit cards is a social norm creates a demand to hold funds in merchant account balances – but the solution to the merchant's optimization problem would likely be very different in the absence of network effects and the social norm.

Thus, banking theorists understood that the exceptional status of bank money required some explanation, and found that explanation in the fact that the use of money was a social norm. This social norm made it easier for banks to put their liabilities into circulation – especially in comparison with other financial intermediaries whose liabilities were not supported by a similar social norm. An implication of the banking theory view is that in a world where most payments are made by check, a merchant may not have a genuine choice of whether or not to maintain a checking account.

In short, banking theory includes a strong and theoretically sound riposte to the portfolio view of money and near-money assets, that has dominated bank policy circles for decades. James Tobin purported to critique banking theory in a 1963 article titled "Commercial Banks as Creators of 'Money'". Tobin's (1963: 412) argument for not treating the means-of-payment characteristic as a unique attribute of certain bank liabilities that differentiates them from the liabilities of other financial intermediaries is that this attribute like all other has its price: 'the community's demand for bank deposits is not indefinite, even though demand deposits do serve as means of payment'. The latter statement is, however, flatly wrong in a network effects framework: the producer who is a dominant incumbent firm will typically, like a monopolist, face a range of quantities and prices, before consumers are incentivized to change products (Farrell/Klemperer 2007: 2037–2038). Thus, in banking theory the existence of the social norm means that the community's demand for bank deposits is indeed indefinite,[8] because a whole range of quantities of bank deposits are all potential equilibria. This is not to say that the range of the community's demand is completely unconstrained by competition with competing assets, but only that those constraints are far from sufficient to fully determine the demand for bank deposits.

In short, Tobin's approach and the portfolio view of money and near-money assets more generally are both founded on a misconception about what it means for an asset to be a means-of-payment. The means-of-payment attribute calls for an analysis based on the coordination problem inherent in the concept of money itself. To abstract from

8. See also Realfonzo (1998: 117) discussing circuit theory.

this coordination problem and the network effects that this problem implies is to ignore the essence of the means-of-payment argument.

Additionally, bank deposits pose another problem: the fact that the quantity of deposits created by making loans today is likely to affect the value of such deposits tomorrow. Thus, if one frames commercial banking as a single entity choosing, like a monopolist, the quantity of bank deposits, that monopolist also has some measure of control over the value of its aggregate debt – including both deposits and other liabilities – in future periods. While we must, of course, recognize that a careful analysis of this problem would have to take into account the effects of inter-bank competition, the fact that the changes in the quantity of deposits outstanding can have an effect of the general price level is another reason that comparing bank deposits with non-bank near-money assets based on the interest rate the assets pay fails to take into account the unique attributes of bank deposits.

Not only does Tobin fail to address the essence of the argument that banks are special because their liabilities circulate as a means of payment, but he also embraces the monetarist myth that it is by expanding and contracting the quantity of reserves that the Fed affects the bank-issued money supply, and even claims that it is due to this mythical regulatory construct of quantity controls that banks are 'special'. He writes that all one needs to do to turn 'any other system of financial institutions' into such special intermediaries is to 'subject [them] to similar reserve constraints and similar interest rate ceilings' (Tobin 1963: 419).

As was discussed above, since the earliest days of central banking, central bankers have found that the bank-issued money supply is too unstable for it to be governable by quantity restrictions on the availability of high-powered money. In Britain, Bank Rate, or the use of interest rates to restrict economic activity and therefore demand for both bank money and high-powered money, was one of the fundamental innovations that made the Bank of England a central bank. And, as was noted above, the Federal Reserve from its founding followed a monetary policy that similarly focused on accommodating the privately-issued supply of bank money. Indeed, while the Fed did, in theory experiment with monetarism or quantitative controls from 1979 to 1982, there is significant doubt that those at the Fed with practical experience of the implementation of monetary policy had any illusions about the policy's likely success (Stigum/Crescenzi 2007: 374, 503).[9] As we all know, after this experiment the Fed quickly moved back to using interest rates as a mechanism of constraining the money supply, while accommodating its fundamentally privately-issued character.

Thus, when Tobin (1963: 416) asserts that what makes banks special are legal constraints on their activities, and in particular central bank control over the supply of reserves that banks are required to hold, he errs. Empirically, central banks have found that monetary policy is most effective when interest rates are used to affect economic activity directly and the money supply is then allowed to be demand determined. It is for this reason that the instrument of choice has, since the nineteenth century, been the control of the interest rate at which high-powered money is made available to the banking system.

Overall, Tobin's article does not address the claim that what makes banks special is the fact that a social norm makes bank liabilities money, and therefore makes them the solution to a coordination problem. Because Tobin's framework does not allow for the special

9. *Stigum's Money Market* observes 'Fed technicians knew that the Fed could not control the money supply with the precision envisioned in textbooks' and the Fed probably 'viewed a public profession of monetarism as a sort of temporary expedient'. Note that this practitioner's handbook was first published in 1978 and was written based on interviews with practitioners (Stigum/Crescenzi 2007: xix).

properties that banking theorists actually claimed for banks, his conclusion that imposing similar legal constraints on other financial intermediaries would cause them to have the same properties is flawed. He would need to explain how imposing similar legal constraints on other financial intermediaries would create a social norm that would make their liabilities circulate as money. The fact that even the closest non-bank near-moneys, such as money market fund holdings, must both be purchased and sold through the banking system as intermediary belies Tobin's claim.

In banking theory the social norm inherent in the concept of money did not just explain why banks are special. The functioning of the banking system itself was premised on the maintenance of the social norm and the absence of the conversion of bank money into cash on a large scale. Not only was this fact evidenced in panics, when the mass conversion of bank money into cash threatened to take down the banking system, but it operated on a day-to-day basis as well: when cash that has been withdrawn from one bank is typically deposited back into the banking system by the individual to whom the cash is paid, the ability to convert bank money into cash will have little effect on the aggregate money supply (Dunbar 1909: 45–46; Hawtrey 1919: 6).[10] In short, the banking system operates because of a social norm that means that bank money is not often extinguished by conversion into cash.

According to banking theory the principal means by which bank money is extinguished (when the social norm is in place) is the reverse of the means by which it is created: paying off loans extinguishes bank money (Dunbar 1909: 46–48; Willis 1919: 58).[11] This point is most obviously true when the instrument used to pay off the loan is drawn on the bank itself, for example, when a check drawn on the bank is endorsed over to the bank in payment of the loan. It is equally true, however, when the payment takes the form of an instrument drawn on another bank. Because the proceeds of the check are paid to a bank they are not redeposited in the banking system, so the payment of the check extinguishes bank money at the draftee bank without creating any new liabilities.

In the modern context, we should observe that another way of extinguishing bank money is for the bank to sell the underlying loan to an entity that is not a bank. This transaction is comparable to the loan being paid in full, although the payer does not happen to be the debtor. On the other hand, to the degree that the bank retains any obligation to repurchase the loan, the bank has arguably just exchanged one form of bank liability for another.

Observe the implication of this theory for the portfolio view of the demand for money and near-money assets. Banking theory points out that it is a mistake to assume that the use of bank money to purchase a non-bank asset will have the effect of extinguishing the bank money claim. All that such a transaction does is transfer the bank money claim to the non-bank. In order for the bank money claim to be extinguished, it must be paid to a bank.

This framework has important implications for financial structure for two reasons. First, this implies that recognizing the difference between banks, which issue liabilities that circulate as money, and non-banks – and putting in place a means of policing the distinction – may be important to the regulation of the financial system. Second, it instructs us not to assume that when a bank depositor transfers a significant portion of her deposits into a money market

10. Note that when an individual bank puts an excess of liabilities into circulation, one function of the banking system is to transfer those liabilities to other banks that then demand payment from the over-issuing bank – and this has the effect of reducing the incentives of the individual banks to over-issue unilaterally (Willis 1916: 56–57).

11. Bank money can also be extinguished by the purchase of bank-issued securities (Bindseil/Senner 2023), but this was presumably rare at the time that these authors were writing.

mutual fund, this transaction has the effect of reducing the stock of deposits and increasing the stock of money fund balances. The immediate effect of the transfer is for the stock of bank deposits to stay constant while the stock of mutual fund balances increases. The stock of bank deposits will fall, only when the deposits are actually returned to the banking system.

In the case of money funds, a significant portion of the deposits that flow to them are indeed returned to the banking system when the money funds invest in bank liabilities, such as financial commercial paper, certificates of deposit, or repurchase agreements. The implications of these relationships will be discussed in Section 4. Before continuing to that discussion, however, the view of banking theorists on the role played by the public in determining the structure of bank liabilities should be addressed.

3.2.3 Portfolio choice determines the liability structure of banks

Although banking theorists argued that bank lending largely determines the money supply and that, as long as the social norm is preventing the conversion of bank money into cash, the public can only extinguish bank money by paying off debt, they also argued that the allocation of bank liabilities was determined by the preferences of the public. Here it becomes important to distinguish between bank liabilities generally, and bank money, or bank liabilities that circulate as a means of payment.

At the turn of the twentieth century, both bank notes and checking deposits were in common use in the U.S. Bank notes had been heavily regulated since the nineteenth century, so their issue was constrained. Indeed, the fact that the popularity of checking accounts grew alongside increasing government restrictions on bank note issues both in Britain and the U.S. is an indicator that the growth of checking accounts was probably a means by which banks circumvented efforts to control the quantity of bank money. Although government constraints on the issue of bank notes played an important role in the development of checking accounts, banking theorists also argued that, because bank deposits and bank notes are both payable at sight, the preferences of the public play an important role in the conversion from one to the other and the allocation between them (Willis 1916: 90, 93; Dunbar 1909: 56, 58).

Banking theorists also argued that the allocation between demand liabilities and term liabilities of the banks will similarly be determined by the desire of the public to hold the different types of assets. In short, banking theory is in accord with the portfolio approach to money and near-money assets as long as the liabilities under discussion are bank liabilities. The essence of the theory is, however, that banks are special, because they are the only financial intermediaries whose liabilities are supported by a social norm that allows them to circulate.

Overall, banking theory's bank-centered view of money gives us a basic framework for evaluating modern money markets. The starting point is that banks are defined by the fact that they issue a liability that due to social norms is used as a means of payment, and this attribute gives the banking system a unique role in the economy. Given this definition of what constitutes a bank, there are two elements to the analytic framework. First, what constitutes bank money is not necessarily determined by the form that the liability takes, but any bank liability that is either payable on demand or short-term can easily become a money or a near-money asset. Second, because the banking system is special, any non-bank issues of near-money assets will derive their monetary properties from the banking system. By tracing how the bank money used to purchase non-bank near-money assets finds its way back into the banking system, one can gain an understanding of the true character of the non-bank near-money assets and how they are related to the banking system.

4 IMPLICATIONS FOR MODERN MONEY MARKETS

Banking theory provides a bank-centered framework for analyzing modern money markets. In this chapter, money market funds, securitization, and so-called 'market-based' money market lending are evaluated using the bank-centered framework. Each element of modern money markets is shown to be heavily dependent on the banking system. This analysis indicates that it may be better to think of modern markets not as offering an alternative to the banking system, but instead as enabling the public to invest in a different portfolio of bank liabilities. Arguably, just as in the nineteenth century, the most important forms of bank money have become contingent off-balance-sheet guarantees that support the circulation of non-bank liabilities that the banks stand ready to purchase.

4.1 Money market funds

What happens when a bank depositor decides not to hold the $3,000 balance in her checking account that is in excess of her spending needs, but to transfer it to a money market fund? Does the stock of bank liabilities fall and the stock of money fund balances rise? The answer to this question is no. Bank liabilities do not fall, and in some cases the stock of bank liabilities rises along with the stock of money fund balances. The bank funds that are transferred to the money fund by the erstwhile depositor are put to use when the money fund lends either (i) to a non-bank, in which case the claim on the deposit will be transferred to the non-bank and the non-bank debt will almost certainly be protected by a contingent bank guarantee, or (ii) to the banking system itself, reducing deposits and increasing the stock of whatever bank liability the fund purchased, or (iii) to the government, transferring the deposits to a government account.

At the end of 2013, the most important categories of prime money market fund investments were certificates of deposit, 36 per cent; commercial paper, 24 per cent; repurchase agreements, 16 per cent; and government liabilities, 12 per cent (ICI 2014: table 44). A decade later, in October 2023, they were certificates of deposit and non-negotiable time deposits, 35 per cent; repurchase agreements, 34 per cent; commercial paper, 25 per cent; and government liabilities 3 per cent (ICI 2023). Using this data on money market fund assets, we can trace the movement of deposits through the agency of money funds back to the banking system.

Certificates of deposit are bank liabilities, as are non-negotiable time deposits. Thus, at least 35 per cent of the funds invested in prime money market funds were placed directly in the short-term liabilities of banks. The category of prime money fund direct investment in short-term bank liabilities is, however, much greater than 35 per cent, because both commercial paper and repurchase agreements are also comprised largely of short-term bank liabilities.

Based on Federal Reserve commercial paper data, at the end of October 2023, prime money market funds held about a quarter of all financial company commercial paper outstanding in the U.S., one-fifth of asset-backed commercial paper and one-twentieth of non-financial commercial paper (Federal Reserve Board 2023). About 17 per cent of prime money market fund investments are in financial commercial paper, 7 per cent in asset-backed commercial paper and 2 per cent in non-financial commercial paper.

Banks are typically the issuers of financial commercial paper, so this is another direct means by which money funds finance banks. Money funds also lend to non-banks using non-financial commercial paper, asset-backed commercial paper and a portion of financial

commercial paper. In the process of such lending money funds transfer deposits – or claims on banks – to non-banks.

First, observe that only a fraction of the money that is invested in prime money market funds is actually used to finance non-bank, non-government issuers. In addition, a deposit used to purchase the interest in the money fund does not stop circulating when it is used to finance non-bank lending. Instead, the claim on the bank gets transferred to the non-bank. Such transactions may appear to be examples of money funds increasing the money supply by lending just like a bank. This is a misconception, however, because these loans take place only because banks guarantee them.

Non-bank commercial paper borrowers do not, as a rule, have the liquid funds to pay off their commercial paper borrowings when they come due, so borrowers issuing either non-financial commercial paper or asset-backed commercial paper rely on rolling over their commercial paper issues in order to honor their obligations in the commercial paper market. By definition, this means that these instruments have liquidity risk. Banks do not face the same liquidity risk problem, because they will typically be able to pay off their debt by issuing deposits – or bank money. Because non-banks are different from banks in this way, investors will only purchase non-bank commercial paper if it is supported by either a contingent line of credit or a liquidity facility provided by a bank (Stigum/Crescenzi 2007: 977, 995). Such bank liabilities are contingent and do not need to be reported on the bank's balance sheet, so they are classified as off-balance-sheet liabilities. Thus, in the case of non-bank lending on commercial paper, the money fund does not hold a short-term bank liability, but instead a non-bank liability that is accompanied by an off-balance-sheet contingent bank liability.

Overall, not only do money funds engage in minimal direct lending to the non-bank private sector, but the banking system is intermediating even the small fraction of assets that fit in this category. By contrast, when a money fund purchases government liabilities, no bank guarantee is required.

A repurchase agreement (or repo) takes place when a sale of a financial asset is simultaneously accompanied by an agreement to repurchase that asset at a future date and price. Thus, repos are different from collateralized loans only in their form. Because money market funds are, in general, not equipped to manage the collateral that is posted in a repurchase agreement, they lend on the tri-party repo market, where a clearing bank, the Bank of New York Mellon, intermediates between borrowers and lenders. The principal borrowers in the tri-party repo markets have historically been the dealer banks.[12] The dealer banks are investment banks and the vast majority of them are controlled by bank holding companies.

Under Tobin's (1963) legal restrictions view of banking, investment banks that are affiliated with commercial banks should be considered different entities and such repurchase agreements would not be treated as bank liabilities. However, under banking theory's social norm view of banking, this distinction is not obvious for two reasons. First, commercial banks are extremely important participants in the repurchase agreement market and in the closely related market for over-the-counter derivatives collateral.[13] To the

12. In fact, since the COVID-19 crisis the Federal Reserve has offered an unlimited Reverse Repurchase Facility and it is likely that in recent years money market funds have been lending on repo mostly to the Federal Reserve. Quantitative tightening, or the reduction in the Fed's asset portfolio, is however reducing the Fed's capacity to borrow using repos and is likely over time force the money market funds to lend once again to the dealer banks.

13. For example, JP Morgan Chase Bank, N.A. was the most significant U.S. participant in over-the-counter derivatives in December 2007, December 2013, and June 2023 OCC Derivatives Report Table 1, and is an important lender in the repo market, as (reverse) repos comprised 17 per cent of its assets in 2007, 12 per cent in 2013, and 9 per cent in September 2023. Note that JPMorgan more than doubled in size from December 2007 to September 2023 (FFIEC 2023).

degree that the largest commercial banks in the U.S. stand ready to lend against assets in the repurchase agreement market, the supply of bank money expands with the repurchase agreement market as a whole. Just as the entire discount market in the nineteenth century, including those bills that were discountable, but never brought to a bank, was understood to be underwritten by the standby guarantees of the banking system, so the entire repo market today should be viewed as underwritten by commercial banks and the willingness of these banks to lend on repo.

Second, as long as there is a presumption in the market that the resources of a commercial bank will be available to support the affiliated investment bank's liabilities – perhaps only after the bank has requested and the Federal Reserve has provided an exemption to restrictions on such support (see Omarova 2011: 107–108) – then the investment bank's liabilities may be treated as the liabilities of the commercial bank with which the investment bank is affiliated. Under this scenario, borrowings via repurchase agreements would be treated by the market as bank-issued near-money liabilities.[14]

Despite the strong arguments in favor of treating the entire repo market as the product of implicit bank guarantees, the term quasi-bank liability will be used to indicate that the entity borrowing from the money market fund is not legally a commercial bank, but only affiliated with a bank.

This analysis indicates that close to 52 per cent of prime market funds assets are composed of the short-term liabilities of banks in the form of wholesale funding, a category that includes certificates of deposit and commercial paper. When quasi-bank liabilities, such as repos, are included in this measure of wholesale funding, the proportion rises to 85 per cent. Another 9 per cent of prime money market assets are formally the liabilities of non-banks, but are protected by contingent bank guarantees. The remainder is composed of lending to government and other liabilities, most of which are similar in character to those just discussed.[15]

This analysis shows that it is a misconception to think of prime money market funds as disintermediating banks. Transferring funds to money markets is a means by which the public reallocates its holding of bank liabilities from deposits to wholesale funding and to off-balance-sheet contingent liabilities.

4.2 Securitization

Securitization takes place when a bank sells loans to an investment vehicle that is funded by issuing securities. Payments on the underlying loans are used to make payments on the securities. While in some cases the securities issued also carry an explicit guarantee of payment from the entity setting up the vehicle,[16] in recent years it has become common for private-sector securitization to take place without such explicit guarantees. Here the focus will be on the latter.

Because securitization removes assets from bank balance sheets for accounting purposes, it is often represented as a market-based means of financing assets that traditionally

14. Note also that prior to 2014, an additional short-term bank liability protected money funds that lent on the tri-party repo market: the tri-party clearing bank that intermediated the transaction provided an intra-day guarantee on the loan that was contingent on non-payment by the borrowing bank. The elimination of the contingent guarantee provided by the tri-party clearing banks was an important policy goal for the Fed subsequent to the 2008 financial crisis.
15. Other liabilities include corporate notes, bankers acceptances, municipal securities, and cash reserves (ICI 2014).
16. Agency mortgage-backed securities are an example of this type of securitization.

sit on bank balance sheets. This framing of securitization ignores the fact that the process of securitization is accompanied by a number of contingent guarantees provided by banks, some of which are implicit and some of which are explicit.

Asset-backed commercial paper, which is mentioned above, is a type of securitization vehicle that is financed using commercial paper. As was discussed above, such securities can be issued only when they are protected by off-balance-sheet contingent bank guarantees. The provision of some form of contingent bank guarantee is the norm in securitization.

Securitization is premised, conceptually at least, on the idea that if a bank sells a loan, it is no longer exposed to losses on that loan. Thus, in theory the sale of a loan should have the same effect for the bank as the receipt of the expected payment on the loan: just as in banking theory paying off a loan extinguishes not just the loan, but the bank deposit that was created when the loan was created, so the sale of a loan might be expected to reduce bank liabilities along with bank assets.

The reality of securitization is much more complicated than this simple version of a sale. A bank could probably eliminate most or all contingent guarantees on the sale, if the bank were to sell the assets on an 'as is' basis. This, however, is not the norm in securitization.

Banks generally focus on making sure that their sales are 'true sales' for accounting purposes, so that they can remove the loans from their balance sheets. Not only do they provide implicit guarantees on such sales by not selling on an 'as is' basis, but they generally provide some explicit warranties on their sales. These explicit warranties have been the grounds for a large number of lawsuits that claim that banks misrepresented to the buyers of the securities the quality of the assets that they were putting into securitization vehicles. Such lawsuits caused the largest banks to enter into multi-billion dollar settlements in the years after the 2008 financial crisis (see e.g. Finkle 2014; Stempel 2014). Furthermore, in the interests of preserving their ability to continue to sell and securitize assets, banks have sometimes honored guarantees that were not contractually required (Calomiris/Mason 2003).[17]

Overall, it is clear in retrospect that an important function of securitization is the creation of off-balance-sheet contingent bank liabilities. Just as money market funds are a means by which the public reallocates its exposure to bank liabilities from deposits to wholesale funding and off-balance-sheet contingent bank liabilities, securitization is another means by which the liability structure of banks is altered, reducing deposits and increasing off-balance-sheet contingent bank liabilities.

4.3 Market-based money market lending

Banking theory starts from the presumption that banks are special because social norms support the circulation of their liabilities as money. Under this theory non-bank financial intermediaries can issue near-money assets only if those assets are – at least indirectly – supported by banks. The analysis in this paper indicates that banking theory is correct: genuine market-based money market lending does not appear to exist. Instead, money market lending by its nature depends on bank guarantees, and almost all of the major near-money asset categories are considered investable assets only because they either have access to the support of the banking system or are government liabilities.

17. In general, credit card securitizations provide many more contractual guarantees than the securitization of longer term assets (Levitin 2013: 831 ff.).

Money market funds, which issue assets that do, in fact, compete with bank deposits, use the resources they receive, not so much to compete with the banks for opportunities to lend to the private sector, but to lend through the banking system. Even the small fraction of direct lending which takes place in the form of non-financial commercial paper is purchased by money funds only when it is supported by a bank line of credit or liquidity facility.

The other major near-money asset categories were discussed in Section 3.1:

- Commercial paper is either a direct bank liability or a contingent bank liability: since investors do not trust non-banks to have the liquidity necessary to roll their commercial paper over, they require that non-bank issuers obtain a line of credit or a liquidity facility from a bank;
- Repurchase agreements are quasi-bank liabilities, because under a social norm theory of banking as long as the major commercial banks stand ready to lend on repo, repo is an asset class that is underwritten by the commercial banking system. Furthermore, in the tri-party repo market the liabilities of the investment banks that borrow using repo are likely to be considered by the market to be the indirect liabilities of the commercial bank affiliate.

In addition, securitization itself is founded on contingent bank guarantees, because when assets are securitized, they are not sold on an 'as is' basis. Thus, from a banking theory viewpoint, securitization is just a means of transforming deposits into contingent bank liabilities.

Overall, banking theory allows us to view the so-called 'market-based' system from a new perspective. In an economy where the money supply is provided by banks, government has never been able to constrain the growth of bank money. Such attempts almost invariably lead to the growth of bank liabilities that are not the focus of government attention. Thus, in the nineteenth century quantitative restrictions on the issue of bank notes led to the development and growth of checking accounts. In the late twentieth century, the growth of checking accounts was constrained by a government policy that promoted competition between banks and entities that were not regulated as banks, that is, with money market funds. The end result of this policy was the growth of wholesale funding and off-balance-sheet contingent bank liabilities. Thus, just as in the nineteenth century, the bank issued money supply moved out of the bank liabilities that were the focus of regulatory attention, and into forms of bank liabilities that were subject to much less regulation.

From this perspective, the growth of money market funds may be viewed most accurately as a shift in the bargaining power of depositors, who are no longer are left to 'bargain' as individuals and for the most part accept whatever the banks are willing to offer, but now engage through mutual fund managers in collective bargaining, forcing banks to offer depositors better terms they could receive before their aggregate interests were represented by a fund manager. The shift in the bank liability structure from deposits to wholesale funding thus represents a shift in the allocation of the returns from banking from banks to their erstwhile depositors, who are now indirect investors in bank liabilities (and, of course, also to the fund managers who represent the interests of this group).

While the 'market-based' lending system is often framed as having developed due to regulatory arbitrage, this paper points out that the mechanism of regulatory arbitrage is the restructuring of bank liabilities. Thus, 'market-based' money market lending does not represent market-based competition with the banking system, but rather an aspect of the banking system itself. In the twenty-first century, we find that bank money is once again taking the form of contingent guarantees similar to those that existed when

discount banking was the principal form of banking. Just as contingent bank guarantees made possible markets in commercial bills in the nineteenth century, such contingent guarantees are used to make possible markets in commercial paper and repurchase agreements today.

5 POLICY RECOMMENDATIONS

Based on this bank-centered analysis of modern money markets, two policy recommendations are proposed. First, some broad measures of the money supply that are composed of bank and government liabilities, instead of assets held by the public, should be developed. Second, for regulatory purposes accounting norms – and in particular whether a liability sits on or off the balance sheet – should play a relatively small role in the treatment of bank liabilities. Instead, the position of the bank liability – once it becomes payable – in the capital structure should play an important role in the regulation of the liability.

Current measures of the money supply are composed of assets held by the public: M1 consists of currency held by the public and checkable deposits, while M2 consists of M1 plus savings accounts, small denomination time deposits, and retail money market mutual funds.

This paper proposes that policymakers use a measure of the money supply that 'looks through' assets such as money market funds and measure the underlying bank and government liabilities as components of the money supply. Thus the new measure N1 would be identical to M1. N2 would consist of N1 plus savings accounts, small-denomination time deposits, bank-issued commercial paper, and bank-issued repurchase agreements.

The point of this re-definition of the money supply is to shift the focus on money from the assets held by the public to the liabilities issued by the banks. In short, this re-definition would acknowledge the bank-centered view of money.

Two broad liability-based measures of the money supply should also be considered: N3 would include all the non-bank-issued short-term liabilities that banks stand ready to lend against including commercial paper that is supported by a bank credit line or liquidity facility, tri-party repurchase agreements, and treasury bills outstanding minus treasury bills repo'd. An alternate (and overlapping) broad measure, NC, would expand N2 to include contingent bank liabilities that become payable immediately upon realization of the contingency. This measure might be classified into different categories based on the type of contingency that triggers the liability.

These measures of the money supply take into account the fact that one role played by banks is to support broader markets in near-money assets by providing guarantees or standing ready to trade on those markets. When banks underwrite markets in this way, they make it possible for non-bank-issued assets to circulate as money. It is far from clear that these markets could continue to exist in their current form in the absence of bank participation.

The purpose of this alternative measure of the money supply is to provide a more accurate measure of money supply growth in order to facilitate the analysis of the effect of monetary expansion. Instead of a misguided focus on the relationship between money and consumer price inflation, this measure – along with analysis that looks closely at the underlying components of the measures – would allow the study of the relationship between growth of the bank-based money supply and asset price inflation. Drawing these connections is very important to understanding some of the drivers of financial instability. It would also make clear the misleading nature of claims about 'market-based' finance as distinct from bank finance.

A second recommendation that can be drawn from this application of banking theory to modern money markets is that regulators need to recognize that there can be an equivalence between contingent liabilities and deposits – and that contingent liabilities may need to be regulated as strictly as deposits. This after all is the lesson of discount banking: credit lines – or contingent liabilities – were recharacterized as deposits when policymakers started to constrain the issue of bank notes. In the modern world, deposits are strictly regulated, and bank money has re-emerged in the form of contingent liabilities.

Here, accounting norms may have had the effect of blinding regulators to the true nature of contingent liabilities. Because accounting norms only require that a contingent liability be brought on balance sheet when the contingency becomes 'probable', contingent liabilities usually lie off of a bank's balance sheet for accounting purposes.

While this framework may be appropriate for accountants, regulators need to take into account the fact that contingencies are likely to be triggered in adverse circumstances. Because banks are likely to be asked to honor contingent liabilities when it is extremely costly for them to do so, they should probably be viewed as more risky than federally insured deposits. After all, insured deposits are unlikely to run in almost any circumstances, whereas contingent liabilities may appear equally as safe as deposits when the contingency is improbable, but then will have the same effect as a run on deposits as soon as the contingency is realized or near realization.

In short, given that in most cases the realization of the contingency is likely to coincide with an adverse environment for bank performance, regulators evaluating the risks of a contingent liability should probably focus on the question of where the liability will stand in the bank's capital structure once the contingency is triggered rather than on the accounting treatment of the liability. Any contingent bank liability that will be treated in a bank resolution on an equal basis with deposits if the contingency is triggered is likely to undermine the return received by depositors or by the federal insurance fund in a bank resolution. Such contingent liabilities should probably be regulated in a manner comparable to deposits. By contrast, contingent liabilities that sit below deposits in the bank's capital structure when they are realized may be regulated less stringently than deposits.

6 CONCLUSION

In this paper the basic elements of banking theory are introduced. This framework emphasizes the idea that a social norm both supports the circulation of bank liabilities as money and explains why banks are special. The result is a bank-centered view of the economy.

The bank-centered framework is used to analyze modern money markets and to show that so-called market-based money market lending is not an alternative to the banking system at all. Instead it is just a different way of accessing bank-provided liquidity.

Because efforts to regulate the bank-issued money supply often have the effect of causing a shift in the form taken by the bank liabilities that circulate as money, this paper argues that measures of the money supply should focus on measuring the stock of bank liabilities, instead of measuring the stock of monetary assets held by the public. In addition, this paper argues that regulators should place little weight on the accounting analysis of contingent liabilities and should instead regulate those contingent liabilities that will be treated on the same basis as deposits in a bank resolution in a manner very similar to the regulation of deposits. Overall, this paper shows that banking theory provides a very useful framework for understanding the modern financial system.

ACKNOWLEDGEMENTS

I thank Marc Lavoie, Jo Michell and the two anonymous referees for excellent comments that improved the paper. All errors are my own.

REFERENCES

Acharya, V., Schnabl, P., Suarez, G. (2010): Securitization without risk transfer, NBER Working Paper, No 15730.
Bagehot, W. (1979 [1873]): *Lombard Street: A Description of the Money Market*, Westport, CT: Hyperion Press.
Bindseil, U., Senner, R. (2023): Destabilisation of bank deposits across destinations–assessment and policy options, SSRN Working Paper, SSRN: https://ssrn.com/abstract=4534754.
Bouguelli, R. (2020): Is shadow banking really akin to banking? A critical analysis in light of monetary theory, in: *Journal of Post Keynesian Economics*, 43(1), 1–27.
Calomiris, C., Mason, J. (2003): Credit card securitization and regulatory arbitrage, Federal Reserve Bank of Philadelphia Working Paper, No 03-7.
Clark, E. (1981): Debt litigation in a late medieval English vill, in: Raftis, J.A. (ed.), *Pathways to Medieval Peasants*, Toronto: Pontifical Institute of Mediaeval Studies, 247–279.
Dunbar, C. (1909): *Chapters on Banking*, New York: G P Putnam's Sons.
Farrell, J., Klemperer, P. (2007): Coordination and lock-in: competition with switching costs and network effects, in: Armstrong, M., Porter, R. (eds), *Handbook of Industrial Organization*, Volume 3, Amsterdam: North Holland,1968–2072.
Federal Reserve Board (1923): Tenth Annual Report, Washington DC: Federal Reserve.
Federal Reserve Board (2023): Commercial Paper Release, URL: https://www.federalreserve.gov/releases/cp/.
FFIEC (2023): Call report data, URL: https://cdr.ffiec.gov/public/ManageFacsimiles.aspx.
Finkle, V. (2014): Push for more details on bank settlements likely to intensify, *American Banker*, August 29.
Gent, J. (2016): *Abundance and Scarcity: Classical Theories of Money, Bank Balance Sheets and Business Models, and the British Restriction of 1797–1818*, Dissertation, London School of Economics and Political Science.
Gerding, E. (2014): *Law, Bubbles, and Financial Regulation*, London: Routledge.
Gillett Brothers (1952): *The Bill on London: or, the Finance of Trade by Bills of Exchange*, London: Chapman and Hall.
Graziani, A. (2003): *The Monetary Theory of Production*, Cambridge, UK: Cambridge University Press.
Hawtrey, R. (1919): *Currency and Credit*, London: Longmans Green.
Hawtrey, R. (1924): Tenth Annual Report of the Federal Reserve Board, in: *Economic Journal*, 34(134), 283–286.
Hawtrey, R. (1938): *Century of Bank Rate*, London: Longmans Green and Co.
ICI (2014): *2013 Factbook*, Washington DC: Investment Company Institute.
ICI (2023): Monthly taxable money market fund portfolio summary, URL: https://www.ici.org/research/stats/mmfsummary.
Levitin, A. (2013): Skin-in-the-game: risk retention lessons from credit card securitization, in: *George Washington Law Review*, 81, 813–855.
Marglin, S. (2021): *Raising Keynes: A Twenty-first Century General Theory*, Cambridge, MA: Harvard University Press.
Mehrling, P. (1998): *The Money Interest and the Public Interest*, Cambridge, MA: Harvard University Press.
Meltzer, A. (2003): *History of the Federal Reserve Volume 1: 1913–1951*, Chicago: University of Chicago Press.
Michell, J. (2017): Do shadow banks create money? Financialisation and the monetary circuit, in: *Metroeconomica*, 68(2), 354–377.

Omarova, S. (2011): From Gramm-Leach-Bliley to Dodd-Frank: the unfulfilled promise of Section 23A of the Federal Reserve Act, in: *North Carolina Law Review*, 89, 101–188.
Pirrong, C. (2002): Securities market macrostructure, in: *Journal of Law Economics & Organization*, 18, 385–410.
Realfonzo, R. (1998): Barber, M.C. (trans.), *Money and Banking*, Cheltenham, UK and Lyme, NH, USA: Edward Elgar Publishing.
Schumpeter, J.A. (2006 [1954]): *History of Economic Analysis*, London: Routledge.
Sissoko C. (2013): Is financial regulation structurally biased to favor deregulation, in: *Southern California Law Review*, 86(2), 365–420.
Sissoko C. (2019a): The dismantling of the economy's legal infrastructure I: Background, *Synthetic Assets blog*, URL: https://syntheticassets.wordpress.com/2019/01/10/the-dismantling-of-the-economys-legal-infrastructure-i-background/ (accessed 5 December 2023).
Sissoko C. (2019b): The dismantling of the economy's legal infrastructure IV: the 1930s restructuring of the banking system, *Synthetic Assets blog*, URL: https://syntheticassets.wordpress.com/2019/02/05/the-dismantling-of-the-economys-legal-infrastructure-iv-the-1930s-restructuring-of-the-banking-system/ (accessed 5 December 2023).
Smith, A. (2005 [1776]): *Wealth of Nations*, Electronic Classics Series Publication, Pennsylvania State University.
Stempel, J. (2014): JPMorgan to face U.S. class action in $10 billion MBS case, *Reuters*, September 30.
Stigum, M., Crescenzi, A. (2007): *Stigum's Money Market*, New York: McGraw Hill.
Strong, B. (1930): Randolph Burgess, W. (ed.), *Interpretations of Federal Reserve Policy in the Speeches and Writings of Benjamin Strong*, New York: Harper and Bros.
Temin, P., Voth, H.J. (2013): *Prometheus Shackled*, Oxford, UK: Oxford University Press.
Thornton, H. (1962 [1802]): *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain*, London: Frank Cass & Co.
Tobin, J. (1963): Commercial banks as creators of 'money', in: Carson, D. (ed.), *Banking and Monetary Studies*, Homewood IL: Richard D. Irwin, Inc., 408–419.
White: W. (2012): Ultra easy monetary policy and the law of unintended consequences, Federal Reserve Bank of Dallas Globalization and Monetary Policy Institute Working Paper, No 126.
Wicksell, K. (1962 [1898]): Kahn, R.F. (trans.), *Interest and Prices*, New York: Sentry Press.
Willis, H.P. (1916): *American Banking*, Chicago: LaSalle Extension University.