Banks *Are* Intermediaries of Loanable Funds

By George Selgin

March 18, 2024

CATO WORKING PAPER

No. 80

Banks *are* Intermediaries of Loanable Funds

George Selgin
Director Emeritus and Senior Fellow
Cato Institute Center for Monetary and Financial Alternatives

Revised
March 23, 2024

Preliminary. I am very grateful to David Andolfatto, Hans Gersbach, David Glasner, Norbert Michel, Nick Rose, Nimrod Segev, and Lawrence White, for their comments and other reactions to earlier drafts of this essay. They are nonetheless not to blame for anything said here.

Banks *are* Intermediaries of Loanable Funds

> "I cannot help thinking that the nature and functions of deposit banking were much better understood forty years ago than they are now."
>
> Edwin Cannan (1921, 28)

Some bad ideas are as hard to kill as crabgrass. In the field of monetary economics, the real-bills doctrine is a notorious example (Humphrey 1982; Laidler 1983).[1] Less notorious, but no less obnoxious, is the claim that banks aren't financial intermediaries. Those who say so maintain that, instead of having to finance their lending by borrowing from others, as genuine intermediaries must, banks can create all the funding they need "out of thin air." James Tobin (1963) once called this the "Fountain Pen" theory of banking, alluding to its implication that bankers only needed fountain pens to be able to lend as much as they like. Since fountain pens are themselves no longer used in granting credit, let's just call it the "Thin Air" theory.

This essay defends the "Intermediary" theory of banking against its lately *de rigueur* "Thin Air" rival. It holds that the supposedly naïve claim that banks are intermediaries, with its insistence that banks must draw upon the public's real savings in order to profitably extend credit, actually comes much closer to describing the workings of actual banking systems than the Thin Air alternative.

In defending the Intermediary theory, I find it especially necessary to stress several points concerning it. They are:

[1] The real-bills doctrine holds that, so long as commercial and central banks confine their lending to the discounting of short-term commercial bills, supposedly representing goods under production, that lending can never result in inflation.

(1) That the difference between it and the Thin Air theory is not a matter of "mere semantics": proponents of each share a common understanding of what it means for a firm to be an intermediary, so that the difference between them is substantive;

(2) That it doesn't suppose that banks must receive deposits of "physical" stuff (e.g., commodity money or fiat currency) to make loans, or (for that matter) that they ever have to deal in physical stuff at all, whether by taking it in or by handing it out;

(3) that it isn't contradicted by the fact that banks can "create" money in the form of their own transferable IOUs, and specifically in the form of current deposit account balances, or by the fact that the quantity of bank-created money is usually much larger than the quantity of base or high-powered money;

(4) that it doesn't require that banks rely *exclusively* upon retail deposits for funding;

(5) that it doesn't require that banks have sufficient funds of *any* sort on hand *before* they arrange loans;

(6) that it is not the same thing as the textbook "multiplier" account of bank lending and deposit creation;

(7) that it doesn't apply to fiat-money issuing central banks, the powers of which are more or less those that the Thin Air theory wrongly assigns to ordinary (commercial) banks.

I stress these points because the popularity of the Thin Air theory depends heavily on its's adherent's failure to appreciate some of them.

What, Exactly, is the Thin Air Theory?

Luis Angeles (2019, 381), one of those adherents, defines an intermediary as a firm that's "in the business of collecting money from savers and transferring it to borrowers." Intermediaries, in other words, hold financial claims on others, which they finance by selling claims on themselves. The Intermediary theory of banks claims that they fit this description. In contrast, the Thin Air theory says that banks "are better viewed as institutions in the business of financing borrowers via money creation," where their ability to create money is "independent of the actions of the general public" (ibid.). According to it, bankers can grant credit simply by tapping away at computer keyboards, without also having to tap into their economy's real savings.

David Graeber (2019, 2), the late anthropologist, summed-up the Thin Air theory, to which he also subscribed, in his usual, colorful language. "Since modern money is simply credit," Graeber says,

> Banks can and do create money literally out of nothing, simply by making loans… . Bankers simply wave a magic wand and make the money appear, secure in the confidence that even if they hand a client a credit for $1 million, ultimately the recipient will put it back in the bank again, so that, across the system as a whole, credits and debts will cancel out.

It is therefore quite unnecessary, Graeber added, for bank loan officers to concern themselves with "their existing funds, reserves, or *anything else*," presumably including their ability to borrow from others (ibid., my emphasis). Since the availability of bank reserves plays no part in regulating bank lending, it follows that, although central

banks themselves create money, "they do not *in any sense* control the money supply" (ibid., 3; my emphasis again).

The Thin Air theory resembles thin neckties in its tendency to become fashionable every few decades. It owes its present popularity, not just among non-economists like Graeber and among various heterodox economists, but among more orthodox economists, in part to its having been given credence in writings by several Bank of England economists. Michael McLeay, Amar Radia, and Ryland Thomas (2014, 15) got things rolling with an article in the Bank's *Quarterly Review* in which they called the belief that banks are "simply…intermediaries, lending out deposits that savers place with them" a "common misconception" that "ignores the fact that, in reality in the modern economy, commercial banks are creators of deposit money." The Thin Air theory got a much bigger boost soon afterwards, when Zoltan Jakab and Michael Kumhof emphatically declared, in the title of a Bank of England working paper, that "Banks are Not Intermediaries of Loanable Funds," "simply" or otherwise. "The only 'resource' banks require to make a loan," they say in the most recent version of that paper (Jakab and Kumhof 2019, 4n9), "is a keyboard or, in earlier times, a pen." Jakab and Kumhof call the the Thin Air theory the "FMC" theory, where FMC stands for "financing through money creation." They call the Intermediary theory the "ILF" theory, where ILF stands for "Intermediation of Loanable Funds." The ILF theory, they say, is "counterfactual, and unrealistic in its implications" (ibid., 2).

Because Jakab and Kumhof offer a particularly strident critique of the Intermediary theory, and a correspondingly uncompromising defense of the Thin Air theory, and because their paper is so often treated as authoritative by other champions

of the latter theory, I pay particular attention to its arguments in the remarks that follow.

Is the Thin Air Theory "Modern"?

Although the two Bank of England papers, and Jakab and Kumhof's paper especially, have helped give the Thin Air theory a new lease on life, that theory had already been around for a century when it first appeared. Back in 1921, it was popular enough for Edwin Cannan to make the first of several better-known attempts to counter it. In "The Meaning of Bank Deposits." Cannan (1921) complained that

> Instead of the old doctrine [that banks] can lend out their own capital *plus* what solvent customers lend to then (*alias* deposit with them), we have journalists and popular writers and chairman of large joint-stock banks persuading the public that banks have themselves created…thousands of millions of pounds by lending something which did not before exist to borrowers, who proceed to pay it to other people, who in their turn deposit it in the banks, and who could not have so deposited it unless the banks had lent.

Despite Cannan's protest, by the early 1960s, many economists were agreeing with the non-economists whose opinions Cannan had complained about. All a bank needed to make a loan, according to James Tobin's (1963, 1) description of what was then an orthodox or "old" view, was "'fountain pen money'—money created by a stroke of the bank president's pen when he approves a loan and credits the proceeds to the borrower's checking account." Bankers, this view held, "possess the widow's cruse," a

"key to unlimited expansion" that has to be artificially restrained.[2] "The preferences of the public normally play no role in determining the total volume of deposits or the total quantity of money" (ibid.). This is, of course, precisely what today's Thin Air theorists maintain.

Tobin himself rejected the then "old" view in favor of a "new" one then being championed by John G. Gurley and Edward S. Shaw (1960)—a view that once again treated banks as intermediaries, much as Edwin Cannan and most other economists had done decades before. Thanks to Gurley, Shaw, and Tobin's efforts, the Thin Air theory of banking fell out of favor again for another half a century.

That there's nothing new about current versions of the Thin Air theory isn't itself a shortcoming of that theory. However, I hope to show that it is also as true today as it was when Tobin wrote that, all things considered, "It would seem well to return to the nineteenth century doctrine that banks receive money from one set of people and lend it to another" (ibid., 35).

What is an Intermediary?

To decide whether banks qualify as intermediaries or not, its necessary to take a closer look at what intermediation entails, and at the ways in which banks do and do not differ from other firms generally considered to be intermediaries.

Financial intermediation can take many forms, and banks might engage in some of them but not others. But in their discourse both those who subscribe to the

[2] A "cruse" is a pottery jar or jug used to store foodstuffs. The expression "widow's cruse," referring to an inexhaustible supply, derives from the Biblical story, in 1 Kings 17, of a widow Elijah was sent to for a meal. Although the widow's cruse had very little in it when Elijah showed up, for the occasion God saw to it that it never run out.

Intermediation theory and that theory's critics have a particular sort of intermediation in mind, namely, intermediation between savers and borrowers, or "investment intermediation." (Recall, for example, Luis Angeles's definition of an intermediary quoted earlier.) In any economy there are people who wish to spend or invest beyond their current earnings and others who wish to spend less. Persons in the first set may borrow to satisfy their wants; those in the second save by accumulating either debt-based financial assets, including informal IOUs, promissory notes, and bonds, or equity-based assets such as common stock. Savings may be invested in these assets either directly or through middlemen or brokers, also known as investment intermediaries.

Savings invested in debt-based assets are *lent*. Investment intermediaries that deal in debt borrow from savers and lend in turn to other borrowers. A venture capital firm that supplies seed money to a startup by purchasing an equity stake in it is an equity-based investment intermediary. A firm that supplies seed money to a startup by lending to it—that is, by supplying "venture debt" rather than venture capital—is no less obviously a debt-based investment intermediary. The same goes for a bond mutual fund. It's generally understood that these firms' investment capacity is determined by their ability to gather real savings from others.

Commercial banks were once considered equally obvious examples of debt-based investment intermediaries. But as I've noted, many people, including quite a few economists, now say that modern banks don't qualify. "Bank financing of investment projects," Kumhof and Jakab (2015, 53) say, in a brief article summing-up their working paper,

> does not require prior saving, but the creation of new purchasing power… Once purchases have been made and sellers (or those further down the chain of transactions) deposit the money, they become savers in the national account statistics, but this saving is an accounting consequence—not an economic cause—of lending and investment.

Note that the "savings" Jakab and Kumhof refer to here—savings that, as a matter of accounting, go hand-in-hand with any increase in bank lending—are *nominal* savings only, not *real* savings. The Intermediary theory maintains, in contrast, that ordinary banks' lending must generally be funded by *real* savings—savings that banks cannot "create," but must instead acquire from others.[3]

Note that critics and defenders of the Intermediary theory all agree concerning what it means to call a bank an intermediary. Rather than being a matter of semantics, the disagreement between them is substantive. It is a disagreement concerning what *real resources* banks require in order to make loans, and make them profitably. It is substantive, and it is also important, for as I hope will become clear, whether or not banks are intermediaries has important implications for both monetary and bank regulatory policy.

Must Intermediaries Deal in "Physical Savings"?

Jakab and Kumhof (2019, 1) suggest that banks aren't investment intermediaries simply because their dealings consist of "purely financial or bookkeeping transactions…as opposed to physical transactions." They insist that, because banks can

[3] This is not to say that there are no exceptions to the general rule. I will refer to these in due course.

make loans without first receiving "physical savings," they don't need to fund their lending with *real* savings of any sort.

But a moment's reflection should make clear that this "physical savings" argument proves too much, for if dealing in "physical" commodities is what distinguishes genuine investment intermediaries from banks, then there have been few genuine investment intermediaries, bank or nonbank, since the days of the gold standard! Today's venture capital firms and bond mutual funds, no less than banks, deal in ledger entries, not commodities; not even paper money. The same may be said of practically all non-bank investment intermediaries. Even during the days of the gold standard, financial firms' dealings in gold were sometimes quite limited. In well-developed financial systems, gold was mainly used in international transfers and to settle interbank dues; and where settlement took place on the books of private clearinghouses or central banks, very little gold was needed even for that purpose.

Jakab and Kumhof's belief that, to qualify as an intermediary, a firm must deal in physical savings, leads them to conclude that "the only possible interpretation" of the Intermediation theory is one that sees banks as "akin to warehouses" (ibid.). But this is a non-sequitur: whether it deals in "physical savings" or not, the one thing an intermediary *isn't* is a warehouse. A warehouse stores, but does not take ownership of, property placed in it; its relationship with those who surrender property to it is that of bailer and bailee, not debtor and creditor. In contrast, a bank receiving an ordinary deposit becomes the rightful owner of the deposited sum, which it pays for with its

IOUs.[4] Jakab and Kumhof's identification of bank-intermediaries with warehouses is therefore incoherent.

Perhaps what Jakab and Kumhof really mean is that, to qualify as intermediaries, banks must pay out every loan they make in cash, meaning gold (in a gold standard system) or fiat currency (in a modern one), at the moment the loan is granted. In that case the banks would have to have ("physical") cash on hand sufficient to cover every loan granted, and they would be correspondingly dependent on deposits of such cash. But they would not have to be "warehouses." This alternative notion of what it takes for banks to be intermediaries isn't incoherent. However, as I hope to show, it also isn't correct.

What's Really Different About Banks?

Unlike the fact that banks deal in ledger entries, the fact that some of those ledger entries—those consisting of bank deposits—are "money," meaning generally-accepted exchange media, really does distinguish banks from firms everyone considers to be investment intermediaries. Most arguments for the Thin Air theory, including Jakab and Kumhof's, treat this feature of bank deposits as the key to banks' supposed ability to lend without borrowing from others. "Because banks' liability to deliver current funds *is* current funds," Jakab and Kumhof (2019, 4) say, "banks create their own funding in the act of lending.... No real resources need to be diverted from other users, by other agents, in order to be able [sic] to lend." The only thing needed is the public's

[4] This is not to deny that banks can offer separate intermediation and warehouse services, as banks do by both accepting ordinary deposits and providing their clients with safe-deposit box services. Nor does it rule out the possibility that banks started out as money warehouses that then discovered that they could get away with lending some of the coin they'd promised to store. That story, so often told about London's goldsmith bankers, appears nonetheless to be a myth (Selgin 2012).

"acceptance of the new purchasing power" banks create in payments, which acceptance "is never in question so long as bank deposits remain the universally accepted medium of exchange" (ibid., 4).

When a bank makes a loan, Thin Air theorists emphasize, it doesn't hand the borrower a sack of coins, or bundles of paper money. Instead, the bank simply credits the borrower's deposit account—a brand new account, perhaps—by the amount of the loan. In my arguments to follow, I also take this for granted. Indeed, I assume that the public holds no currency at all, making all its payments by means of deposit transfers, so that the economy's central bank supplies bank reserves only. Finally, I will also assume, at first, that the total quantity of such reserves is fixed. It follows from these assumptions that banks alone are able to add too or subtract from the money stock, through changes in their lending. However, as I hope to show, it does *not* follow that the public's willingness to accumulate real bank deposits isn't a crucial determinant of the volume of bank lending.

In fact, no subscriber to the Intermediary theory doubts that bank lending involves the "writing up" of deposit credits. Although some Thin Air theorists seem to imagine that this ability is something they've discovered,[5] there are no grounds for such

[5] Werner (2014) is an especially egregious example of this: what he purports to establish for the first time—that a bank "is able to credit the borrower's account with the loan principal without having withdrawn money from any other internal or external account, or without transferring the money from any other source internally or externally"—is something few economists can ever have doubted. Of course banks don't have to "withdraw" money from their (primary) customers' accounts in order to acquire funds from those customers: those customers' account balances represent sums their banks have *already* borrowed from them. Nor do bankers fund every loan they make separately from others, as Werner implicitly supposes: instead they plan their funding in advance, and then make any loans they judge profitable in view of their estimated marginal funding costs (see, for example, Koch and McDonald 396-405). In any case, as

a belief. One need only glance at Edwin Cannan's 1921 article to appreciate this. Cannan and other economists who consider banks intermediaries differ with Thin Air theorists not in assuming that banks make loans by handing out bags of coins or paper money, but in denying that banks' ability to write up loans allows them to profitably extend credit without *also* having to borrow from others to make good on their loan commitments.

How do Payments Happen?

To appreciate how bank lending must usually be funded by real savings, it's necessary to go beyond recognizing that banks don't require such savings to credit borrowers' accounts with their loan proceeds. One must understand what happens *after* they do this, and that means understanding how payments are accomplished using bank deposits.

Although it has long been standard to regard such deposits, and current account balances in particular, as "money," there was a time when they were instead considered money "substitutes," and when the unqualified term "money" was reserved for the stuff banks promised to pay holders of their liabilities if asked. Once upon a time, that stuff consisted of precious metal coins. Today it means fiat paper money or deposits at a central bank.

The modern view is a natural counterpart of the definition of "money" as any "generally accepted medium of exchange." Yet there are times when it's worth recalling the old-fashioned distinction between bank liabilities that serve as such and "money

---

we shall see, they do not and cannot fund their lending solely by crediting borrowers' accounts with loan proceeds!

proper," or what's now referred to as "base" or "high-powered" money, one of which is when trying to understand how modern payments are accomplished.

When Jane swipes a debit card though the card reader at her grocer's check-out counter, she may suppose that she's paid for her groceries. But all she has really done is to send instructions to her bank to transfer funds from her account to the grocer's. The actual payment consists of that transfer, which, if the grocer banks elsewhere, isn't complete until Jane's bank settles accounts with the grocer's bank. Such settlement usually takes place at the end of each business day, though it may happen sooner and, with the advent of "real-time" payments, can even happen almost instantly. Were Jane to pay for her groceries by writing a check, on the other hand, her payment might not be completed, or made "final," for several days, depending on how long the grocer takes to deposit the check, whether he does so early in the week or at week's end, how long his bank takes to present the check to Jane's bank for payment, and how long it then takes Jane's bank to settle-up with the grocer's bank. In any event, until interbank settlement occurs the possibility remains that the check will bounce for lack of funds in Jane's account, or even that Jane's bank will go under. However low the odds of either event might be, when they do happen, they drive home the fact that bank-issued money is still in some respects not "money proper," and that payments made using it aren't complete until some proper (base) money changes hands.[6]

It follows from this understanding of payments made using bank deposits that it's only in a very superficial sense that banks "fund" their loans simply by creating such deposits. They also need enough "money proper" to honor the IOUs they create as they

[6] This is, admittedly, a very cursory treatment of rules that can become quite complicated in practice, depending on particular laws. For details concerning payments finality in the United States context, see Geva (2008).

are presented to them for payment. To claim, as Jakab and Kumhof's (2016, 51) do, that banks "fund new loans by creating new deposit money," is hardly better than claiming that, because Jane has a bank account, a blank check, and a pen, she is able to "create" all the "funds" she needs for her purchases. It's of course true that Jane can make a check out for any amount, and that she might succeed in paying for something with it. To that extent, she may be said to exercise her own power to "create" money. But if she makes the check out for more than the value of her bank account balance, it will bounce. Likewise, if a bank writes up a loan without either having on hand, or arranging to acquire in short order, funds enough to back it up, it must fail at settlement.

In short, as James Tobin understood, ordinary banks' no more possess a widow's cruse than Jane herself does.

What Happens When a Bank Lends without Borrowing?

Consider the fate of a bank—call it the Air Bank—that makes Jane a loan with no reserves on hand, and without being able to take advantage of an excess real demand for its IOUs, which for the moment we'll treat as identical to its retail deposits. Let's also continue to assume that the *total* stock of bank reserves is given. Because we are dealing with an isolated bank, we can assume as well that the price level is independent of the bank's lending activities. (Later I'll consider what happens if banks attempt to lend in unison.)

Suppose the Air Bank credits Jane's account to the tune of $5,000. If Jane is like most bank borrowers, she hasn't gone to the trouble of getting a loan for the sake of having money in the bank. Bank borrowers, Edwin Cannan (1921, 31) says, "do not borrow with the intention of retaining the article borrowed till repayment, but with the

intention, which they carry out immediately…of parting with it in exchange for other things." Tobin (1963, 5) likewise observes that "Borrowers do not incur debt in order to hold idle deposits… The borrower pays out the money, and there is of course no guarantee that any of it stays in the lending bank." What Cannan and Tobin say is at least implicitly granted by Thin Air theorists as well, for to the extent that bank borrowers *do* hold on to borrowed bank balances, they are both borrowers from and lenders to their bank—a trivial sort of intermediation. The case does not, therefore, contradict the claim that banks' capacity to lend is constrained by their access to real savings. (It does serve, however, as an example of how bank lending can be supported by real savings yet independent of any acquisition of "physical savings.")

We have in any case assumed there is "no outstanding, excess demand" for the Air Bank's IOUs, thereby ruling out possibility that Jane chooses to sit on the sum credited to her account. So she spends it. Let's suppose that she buys a used Honda from Larry's Lemons for $5,000. Were Jane try to withdraw $5,000 from the Air Bank so as to to pay in cash, it might fail at once. But since the Thin Air theory rests upon the assumption, which I also take for granted, that bank deposits are as good as cash, we'll suppose that Jane instead makes a mobile payment and that the Air Bank approves the transfer. Now the bank Larry's Lemons deals with—call it the Other Bank—has a $5,000 claim against Jane's bank, payable to Larry's account. If its managers are feeling generous, they may allow Larry's Lemons immediate access to the promised funds.

Were *this* the whole story, the Air Bank might lend money 'til kingdom come without going bust. But we aren't finished. Instead, at the end of the business day, it

must settle up with other banks, including *the* Other Bank.[7] Assuming that their gross dues would have netted to zero before Jane got her loan, this means it would have to hand over $5,000 in base money, meaning (to be current) Federal Reserve dollars—money that, by hypothesis, it doesn't have. So, either the Air Bank manages to get a last-minute loan itself, or it defaults. In other words, it faces the same situation it would have faced had Jane simply cash-out her loan.

It's easy to complicate this simple story. But as long as banks routinely settle their interbank obligations in "proper" money, as they must in any competitive banking system in which bank deposits are redeemable on demand, it isn't easy to do so in a way that salvages the Thin Air theory. Suppose, for example, that Larry's Lemons also happens to bank at the Air Bank, and that it is happy to increase its balance there by the $5,000 Jane paid it. Then the Air Bank wouldn't have to worry about being short $5,000 at settlement time; but it wouldn't have to worry because "somewhere in the chain of transactions initiated by the borrower's outlays are found depositors [at the lending bank] who wish to hold deposits equal in amount to the new loan" (Tobin 1963, 6). What's more, it would only avoid having to worry for as long as Larry chose to keep an extra $5000 in his account with it. The complicated story is, in other words, no exception to the rule that the Air Bank's ability to lend is limited by the excess real demand for its IOUs, which is to say, by people's willingness to supply it with real savings by which to fund its loans.

[7] And the central bank: although the Fed and other central banks allow commercial banks to overdraw their accounts (that is, to have "negative" reserve balances) during the day, they usually charge a penalty for overnight borrowing, assuming they allow banks to resort to it at all.

Jakab and Kumhof seem to completely overlook the implications of interbank settlement. In their working paper they use the term "settlement" only once, and then only in noting that central banks supply settlement media. They never suggest that banks actually *need* such media, let alone consider why they might need them.

More temperate critics of the Intermediation theory allow that banks must be prepared to settle accounts with one another without appearing to realize the extent to which this fact weakens their critique. Thus McLeay, Radia, and Thomas (2019, 16), having claimed that, because they create money, banks are not "simply intermediaries," and having also denied that "banks can lend out their reserves," allow two pages later (1) that a bank that creates deposits in making a loan "may well 'lose' the deposits it has created to…competing banks"; (2) that "this is likely to be problematic for the bank since it would increase the risk that it would not be able to meet all of its likely outflows"; and (3) that "if a given bank financed all of its loans this way, it would soon run out of reserves." McLeay, Radia, and Thomas then say that a bank seeking to lend more will "try to attract additional liabilities" (presumably meaning more deposits) because having more will allow it to "increase its lending without running down its reserves" (ibid.). In other words, there is an important sense in which banks *do* "lend out their reserves," by giving claims to base money which, once received by rival banks, entitle them to as many reserves. In other words, "in order to make loans, banks must borrow the necessary funds." In other words, given a fixed supply of central bank reserves, the only sense in which banks might not be "simply…intermediaries, lending out deposits that savers place with them" (ibid., 15) is that they sometimes acquire savings indirectly from other intermediaries instead of directly from ultimate savers. But surely this is splitting hairs, for a bank that serves as a broker between other

intermediaries and ultimate borrowers is no less "simply" an intermediary than one that acquires funds directly from an economy's ultimate lenders.

To conclude, as James Tobin said long ago, instead of equipping them with a widow's cruse, the fact that banks, unlike generally recognized investment intermediaries, can "write up" deposit credits that qualify as money is something "superficial and irrelevant."

How About a Real-World Illustration?

Were banks really able to fund their lending by means of pen strokes and such, Edwin Cannan (1921, 33) observed, then absent strict reserve requirements and other such artificial constraints, "every little bank would soon be a big one."

Some little banks have actually tried to become big banks by doing just what the Thin Air theory says banks can do. The 1772 failure of a real-world "Ayr Bank" (note the spelling), so known because its headquarters was in the town of Ayr, Scotland (its official name was Douglas, Heron & Company) may be the most striking example of this. Founded in 1769, the Ayr Bank was managed from the start much like the fictitious "Air Bank" discussed earlier—and with similar consequences. In just three years, thanks to its generous lending policies, it became a "colossus," accounting for 40 percent of Scottish bank assets (Rockoff 2009, 18).

But, having employed its fountain pens and printing press (for the Ayr was a note-issuing bank) so much more generously than its rivals, the Ayr was also hemorrhaging reserves. As Hugh Rockoff reports (ibid.), it tried replenishing them "by drawing on London, and then redrawing when its drafts came due, thus piling up a large short-term debt in London." But that desperate tactic merely delayed the inevitable by a few weeks, while compounding the Ayr's ultimate losses. By proceeding

as though the Thin Air theory were valid—that is, as if it could create credit "out of thin air," without any need for real resources—the Ayr Bank tested that theory. And the theory failed as spectacularly as the bank itself.

The Ayr Bank case illustrates the general point that, even if it isn't confronted with a run—that is, by depositors' requests to withdraw "physical savings"—a bank can be doomed by reserve losses. This can happen, as it did in the Ayr Bank's case, because the bank is overgenerous in lending. It can also happen simply because depositors choose to bank elsewhere. Finally, though less obviously, if the overall desire for bank deposits declines, the banking system as a whole will suffer, just as any industry must suffer from a decline in the real demand for its products or services. This will be so even if the total quantity of reserves in the banking system doesn't change: in that case, the reduced overall demand for bank deposits implies a corresponding rise in their velocity and, with it, bank's need for precautionary reserves (concerning which more anon). Assuming a fixed stock of reserves, this increased need will compel banks to let their balance sheets shrink.[8]

In short, no bank or banking system can stay in business if no one wants to supply it with real savings, and neither individual banks nor an entire banking industry can escape from this harsh reality merely by creating *nominal* bank deposits. So says the Intermediary theory of banking. And so says any perusal of the history of banks and banking.

[8] If, on the other hand, the banks somehow managed to avoid shrinking in nominal terms, the increased velocity of deposits would lead to a rise in prices, which would reduce the real value of their balance sheets, and their shareholders' wealth, just as much.

What if Banks Lend in Unison?

Some versions of the Thin Air theory aren't so obviously at odds with the stern realities of the banking business. One holds that, while adverse interbank settlements will eventually punish an individual bank that tries to get big by means of nothing but "a keyboard or…a pen," banking systems as a whole are subject to no like constraints. While any solitary bank that tests the Thin Air theory risks going broke, a coordinated expansion won't confront any of them with adverse clearings. Instead, each bank will find the amount due to it from other banks rising just as much as the amount it owes to them; and this will be so no matter how much credit they collectively create.

Thus McLeay, Radia, and Thomas (2014, 19), having admitted that individual banks cannot extend credit safely without borrowing from others, observe that

> if *all* banks simultaneously decide to try to do more lending, money growth may not be limited in quite the same way. Although an individual bank may lose deposits to other banks, it would itself be likely to gain some deposits as a result of the other banks making loans.

Proponents of the Thin Air theory of banking view such "in concert" bank lending, as I refer to it elsewhere (Selgin 2001), not just as a hypothetical possibility but as a routine occurrence. Luis Angeles (2019, 387), for example, assumes that banks *typically* expand credit at the same time and to the same extent. (He also says, absurdly, that this assumption involves no "loss of generality"!) The assumption leads Angeles to conclude that "the aggregate banking system…has no such financing worries" as confront an individual bank lending independently of the rest (ibid., 389).

But in a scarce-reserve system—I will come to the abundant-reserve case shortly—in-concert expansion is both highly unlikely and generally unprofitable for banks that attempt to take part in it. Even if they succeed in coordinating their lending to keep the *mean* of their net settlements at zero, random variations in payments will confront banks with settlement "shocks"—non-zero net settlement obligations around that mean—where the size of the shocks increases with the overall scale of payments: In the simplest case, where the number of payments stays the same but prices increase, the size of both the average payment and of settlement shocks will increase to the same extent. Otherwise—if some of the extra spending instead takes the form of an increase in the *number* of payments—settlement shocks will still get bigger as the overall scale of payments increases, but less than proportionately.

In a scarce-reserve system, banks can and do borrow from other banks to cover adverse clearings they cannot meet using their reserve balances. But even in good times, when they are more inclined to trust one another, banks have only a limited appetite for such last-minute borrowing (Blum, Georg, Krahnen 2016; Blasquesa, Bräuninga, and van Lelyveld 2018; Dietrich and Hauck 2020). Once that appetite has been satisfied, they find it more economical to respond to reserve shortfalls by limiting their lending. Just as one participant in a three-legged race can't stumble without his or her partner stumbling, retrenchment of some banks quickly forces the rest back into line.

Another way to understand the point made here is by noting that, even absent legal reserve requirements, banks' demand for reserves typically includes a "precautionary" component, the purpose of which is precisely that of settling unanticipated adverse clearings. The received microeconomic theory of banks'

precautionary reserve demand implies that banks will seek to hold larger reserve cushions, relative to the total size of their balance sheets, as payment activity increases. This implies that, for any given stock of reserves *and real demand for bank deposits*, they will only lend so much, in-concert or otherwise.[9] (Below I will address the claim that central banks are bound to supply banks with all the reserves they need to expand credit indefinitely.)

Banks can, on the other hand, increase both their lending and the nominal quantity of bank deposits, despite a fixed quantity of reserves, in response to an increase in the public's real demand for bank deposits or, what amount to the same thing, an increase in the public's desire to have banks intermediate their (real) savings. Critics of the Intermediary theory often suppose that this is impossible, on the grounds that the public's attempts "to save more money in bank accounts comes simply at the expense of deposits that would have otherwise gone to companies in payment for goods and services" (McLeay, Radia, and Thomas (2014, 15). Although it's true that the companies whose earnings decline may choose to reduce their own holdings of bank deposits, forcing their banks to lend less and offsetting to that extent the increased lending of banks that experience an increased demand for their deposits, it remains the case that the *total* quantity of funds available for banks to lend depends on the *total* real demand for bank deposits: whenever the real demand for a banks' IOUs grows for any reason, it can take advantage of that fact by lending that much more without adding to its net settlement dues, and its doing so will in turn make it unnecessary for

[9] For the theory of the precautionary demand for money, and banks' demand for precautionary reserves in particular, see Whalen (1966), Tsiang (1969), Olivera (1971), Baltensperger (1974), and Knobel (1977). For a relatively recent and pertinent empirical study, referring to events during 2007-2008, see Ashcraft, McAndrews, and Skeie (2011).

any other bank to shrink.[10] An *overall* increase in the demand for bank IOUs will, on the other hand, manifest itself, in the first instance, in a decline in the velocity or turnover of deposits, which leads, other things equal, to a decline in banks' demand for precautionary reserves. That decline in turn supplies the banking system with surplus reserves, which, in the absence of regulatory restrictions, will suffice to inspire such extra lending and associated deposit creation as will suffice to accommodate the public's increased demand for deposits. In short, the public's excess real demand for bank deposits tends, other things equal, to translate into an excess supply of bank reserves, with additional bank lending serving to once again clear both markets.

Is the Intermediary Theory Inconsistent with Profit Maximization?

It's also unnecessary for a bank to have more savings come its way *before* it arranges a new loan for it to be a strict intermediary. A bank can book a loan and *then* come up with the necessary funding. It might turn to wholesale markets for needed funds. Or it might cover its settlement dues by borrowing from other commercial banks. (As we are assuming a fixed stock of reserves, I leave out for now the possibility of borrowing from a central bank.) As these options all involve *some sort* of borrowing by the lending bank, they are all consistent with its being an intermediary.

Ultimately, of course, what matters to any bank that's considering making a loan isn't whether it has spare reserves on hand to cover a loan, or (to use Jakab and Kumhof's words) whether sufficient "deposits of physical saving" are on hand to cover it, but simply whether it expects the loan to be profitable, that is, whether it anticipates

[10] Because the users of new bank credit will presumably patronize different sellers than those who have chosen to save more, some banks will suffer, while others gain, compared to the original state of affairs. But this doesn't mean that the overall extent of bank intermediation doesn't increase.

a return on its loans that exceeds the costs of making it, including opportunity costs. Some Thin Air theorists seem to imagine that banks' tendency to pursue all such lending opportunities contradicts the Intermediary theory, they're mistaken. Instead, its consistency with that theory becomes obvious once one allows that the most important cost banks must cover in making a loan consists of the costs of *funding* it.

Here again, while appearing to support their claim that banks are not "simply intermediaries," McLeay, Radia and Thomas (2014, 21; my emphasis) actually suggest that they are nothing else. They say that, instead of depending on whether or not they find themselves in possession of excess reserves, banks' decisions to extend credit "are based on the availability of profitable lending opportunities" where "the profitability of making a loan will depend on a number of factors…*one of [which] is the cost of funds that banks face*."

"Cost of funds"? Were banks not intermediaries—were they able to fund loans simply by creating deposits—they wouldn't have to *pay* for funds. Instead, being unconstrained by any need for external funding, they'd find it profitable to make any loan that promised to more than cover the *non-interest* costs of lending. As Tobin noted long ago, if those costs are themselves trivial, almost any loan might be profitable, and there might be no "natural economic limit to the scale of the commercial banking industry" (Tobin 1963, 6).

Indeed, it is not stretching a point much to say that, were the Thin Air theory correct, banks would be in a position similar to that of counterfeiters whose operation is so efficient that they face no risk of getting caught. They'd have the same ability to profit by buying any asset worth more than the materials and labor it takes to create the nominal money balances required to purchase it.

Why is there So Much Bank-Created Money?

That banks' ability to lend is constrained by their ability to borrow, that is, by their access to *real* savings, isn't at all inconsistent with the fact that, in scarce-reserve systems especially, the quantity of bank deposits is usually several times the quantity of bank reserves, or with the fact that the deposit creation by one bank can itself be a source of not just nominal but real funding to others. Suppose that Joe is considering investing $100 either by lending it directly to Sam by employing the services of a nonbank intermediary, which will instead lend it to Kate. The direct loan to Sam creates a $100 liability: Sam's IOU to Joe. The indirect one generates liabilities worth $200: Kate's $100 IOU to the intermediary, and the intermediary's $100 IOU to Sam. So intermediation of *any* sort at least doubles outstanding IOUs. But one need only allow that Kate may in turn place some of her borrowings with another intermediary, or that she pays them to someone who does the same, so see how the multiple can get bigger.

In this example with nonbank intermediaries, none of the liabilities created are themselves money. Joe's intermediary might hand him a $100 non-negotiable bond, while acquiring a similar bond from Sam, who then buys a non-negotiable bond from Kate. But its easy to imagine otherwise identical transactions being conducted by banks, where the only difference is that the banks' IOUs *do* function as money. Doing so should make it clear that the mere fact that the outstanding quantity of bank IOUs exceeds the quantity of bank reserves, and may exceed it by a considerable amount, isn't necessarily inconsistent with banks being pure intermediaries. (I'll refer later to some important instances where it *is* inconsistent.) It's for this reason that Edwin Cannan (1921, 3031) and other economists of his era and before who regarded banks as intermediaries

> never supposed…that anyone would make a difficulty about the aggregate of deposits (1) exceeding the aggregate of cash held by the banks, or even (2) exceeding the aggregate of all cash held by all persons and institutions, including the banks.

Does Intermediation Imply a Textbook "Money Multiplier"?

The example of bank intermediation that we just considered resembles the notorious textbook "money multiplier" story, both in describing how bank deposits can can multiply and in assuming that banks fund their lending in advance using only deposits brought to them in the ordinary course of business. The textbook story also assumes that banks keep reserves equal to a fixed share of deposits they receive, mechanically lending the rest, and never lending otherwise—and assumption that makes changes in the total extent of (nominal) bank lending possible only in response to changes in the available quantity of bank reserves. The retail deposits banks receive, according to this mechanical theory, enter banks, and by doing so push out a not-quite-equal sum of bank credit.

Showing that reality often differs from this mechanical textbook story is as easy as falling off a log. But such demonstrations don't prove that banks' aren't intermediaries, because the textbook story is only one of many stories one can tell about bank intermediation. The Intermediary theory is also consistent with others, including stories in which banks' preferred ratio of reserves to deposits varies in time and from bank to banks, stories in which banks "write up" loans before they arrange for the necessary funding, and stories in which banks rely on sources of funding other than retail depositors. In short, it is consistent with any story in which bank lending involves "transferring funds between ultimate savers and ultimate borrowers" (Goodhart 1989).

In fact, any bank that limited itself to behaving in strict accordance with the textbook story would have pass-up all sorts of opportunities for profitable intermediation. Even those critics of the Intermediation theory who bother to distinguish it from the textbook multiplier story often fail to fully appreciate the important differences between them, as when Richard Werner (2014, 9) has both assuming that banks "need to first gather deposits, and then are able to lend these out."

Jakab and Kumhof's ILF model of banking is itself in many respects a version of the textbook multiplier model—one in which the volume of bank lending can only change in response to changes in banks' receipt of retail deposits, where banks have relatively little influence upon the volume of such deposits, growth in which supposedly depends on "accumulation[s] of physical savings" that "should be smooth and gradual" (Jakab and Kumhof 2019, 30). It's mainly for this reason that their ILF model cannot replicate some of the "rapid changes in the size of bank balance sheets" (ibid., 3) that take place in reality—changes that their alternative, FMC model *can* account for. But the fact that Jakab and Kumhof's FMC model outperforms their particular ILF model says nothing about whether it would also outperform a model that allows banks to function as intermediaries, not just by acquiring and lending in turn deposits of "physical savings," but in numerous other ways we've considered. By treating their ILF model as representative of the way real-world bank intermediation works, Jakab and Kumhof throw the Intermediary Theory of banking baby out with the textbook money multiplier bathwater. The same may be said for other writings that, in attempting to counter the textbook story, are too quick to assume that by doing so they are also showing that banks aren't intermediaries.

Is the Quantity of Reserves Irrelevant?

Although the Intermediary theory doesn't require that banks have funds on hand, acquired through customer deposits or otherwise, before they can extend credit, it recognizes that primary, and especially "core" (primary retail) deposits have long been the most important source of bank funding. It also implies that, the more such deposits a bank attracts, other things being equal, the more loans it can make. The Thin Air theory, in contrast, implies that bankers should not care whether deposits come their way or not. Suppose, Jakab and Kumhof (2019, 2) say, that A, who banks at Bank A, receives and deposits a check from B, drawn on Bank B. According to them, this transaction

> does not give Bank A additional funds to lend, because by double-entry bookkeeping the new deposit is automatically lent to Bank B the moment it is received, in the form of an accounts receivable claim for the collection of funds in the form of central bank reserves.

Here once again Jakab and Kumhof go wrong by failing to follow a payment process through to completion. In practice Bank A's loan to Bank B would be of fleeting importance only, because banks don't tend to hold on to demandable claims against their rivals. Instead, they return them routinely, and rapidly, for collection. In this instance Bank A will deliver B's check, or an electronic copy, to the clearinghouse or central bank, which will then debit Bank B's settlement account and credit Bank A's account by the amount of the check. Once that happens, Bank A certainly *will* have "additional funds to lend," because it will have more reserve balances to employ in paying net settlement dues to other banks. It is difficult to see why Jakab and Kumhof

would choose to suggest otherwise, unless they are somehow unaware of how banks handle "accounts receivable" from other banks.

It is, if anything, even harder to understand Jakab and Kumhof's claim that "central bank money deposited with banks" also "does not represent loanable funds" that banks can lend in turn (ibid.). The Intermediary theory holds, in contrast, that until the relatively recent advent of "abundant reserve" or "floor" systems of monetary control (discussed below), commercial bank lending was ultimately constrained by the scarcity of bank reserves, so that any increases in the total quantity of such reserves allowed for more lending, *ceteris paribus,* even if it didn't do so in the mechanical way many textbooks describe. To be sure, the loanable funds in this case may be, and often are, *nominal* loanable funds only, unmatched by any increase in the public's real demand for money balances: the case is one of several exceptions (discussed below) to the general rule that bank lending is constrained by the public's *real* demand for bank deposits. Nevertheless, so far as ordinary banks are concerned, fresh central bank reserves are as good as an increase in the real demand for bank deposits when it comes to allowing them to lend more. It follows from this view—but *not* from Jakab and Kumhof's alternative perspective—that to avoid unwanted inflation central banks must resist creating too many reserves.

Does the Thin Air Theory Apply to Central Banks?

I say "resist" because central banks, and fiat-money issuing central banks especially, *do* possess a widow's cruse. That's to say that, unlike ordinary banks, they are capable of extending credit without heed to the public's limited real demand for their IOUs. In the case of past central banks operating specie standards, this followed—albeit in the short run only—from other banks' ordinary tendency to treat their notes and

deposits as perfect substitutes for specie. In the case of modern central banks that issue free-floating fiat monies, it follows from the fact that, instead of consisting of redeemable claims to "real" money, the economy's final means of payment, the money they create is real money itself.[11]

So central banks really *do* "create their own funding." When a central bank creates more base money balances than the public or ordinary banks wish to hold, given the existing level of prices, instead of being returned to it for payment, the excess base money units become so many "hot potatoes," to be tossed around (and here the textbook story has some merit) until prices rise sufficiently to make the nominal quantity of base money demanded once again equal the nominal quantity in existence. At this point the central bank's credit creation can be said to be "funded" by corresponding *nominal* savings, despite the lack of any lasting increase in real savings at its disposal. But such funding is distinct from what ordinary banks must rely upon, for unless they are themselves responding to inflationary central bank reserve injections, ordinary banks can only increase their lending in response to growth in the public's *real* demand for their deposits and other IOUs.

Jakab and Kumhof don't say that modern central banks aren't capable of creating funds *ex nihilo*: it would be odd indeed if they denied the privileged issuer of an economy's final means of settlement a power they attribute to ordinary banks! However,

[11] This last point is true not withstanding that modern central banks' deposits and currency are still classified for accounting purposes as central bank "liabilities." In fact, as Willem Buiter (2023, 16) observes, "Central bank money is a liability of the central bank and the state in name only. It is an undoubted asset to the holder, but it is irredeemable. The holder of central bank money can demand its exchange only for the same amount of central bank money. Central bank money is therefore not in any meaningful sense a liability of the issuer."
.

they insist "that central bank reserves do not quantitatively constrain the ability of [commercial] banks to extend loans" (ibid., 14.), and go on to exclude central banks from their formal models on that ground.[12] This denial of central banks' importance follows from Jakab and Kumhof's assumption that, absent legal requirements, and assuming that paper currency is "dominated" by interest-earning bank deposits, banks have no *need* for reserves ("final means of settlement"), which in turn implies that the extent of commercial bank lending and deposit creation are entirely independent of the available quantity of bank reserves or prevailing central bank lending rates.

So it doesn't really matter, according to Jakab and Kumhof, whether or not central banks themselves possess a widow's cruse, or it matters only in the presence of statutory reserve requirements and other regulations that serve to artificially link commercial banks' lending capacity to central bank actions. In the absence of such artificial constraints, merely making reserves more or less abundant accomplishes nothing, because it doesn't allow banks to do anything they couldn't do anyway, by drawing from their own widows' cruses.[13]

Jakab and Kumhof rest their case that, absent special regulations, banks have no need for central bank reserves, on the fact such reserves "cannot be lent to non-banks, only to other banks" (ibid.).[14] Thus the fact that bank *borrowers* have no need for

[12] Richard Werner (2017) declares, in the same spirit, that "We don't need central banks. Since 97% of the money supply is created by banks, the importance of central banks is far smaller than generally envisaged."
[13] An ironic twist here is that, if the link consists of statutory reserve requirements, the limits to bank lending start looking a lot like those depicted in naive textbook multiplier stories Thin Air theorists scorn.
[14] Although this is mostly true at present, it will cease to be so if retail CBDCs become popular.

central bank money (recall that we are assuming that they don't want currency) is taken to imply that banks themselves have no need for it.

Here again, Jakab and Kumhof fail to appreciate the implications of routine interbank settlement. A more profound understanding reveals that, in a crucial sense, in fiat systems, commercial banks lend nothing *but* central bank money. Of course they don't hand paper currency to borrowers. But by crediting borrowers' accounts, they initiate a process that generally increases their gross settlement dues by the amount of the loan, which is to say that, *ceteris paribus*, their lending results in a transfer of reserves from the lending bank to the bank or banks that end up receiving the payments orders the loan generates. That's why, Jakab and Kumhof's denial notwithstanding, and assuming a scarce-reserve arrangement, banks that have more central bank reserves on hand can lend more, other things equal.

Are Central Banks Passive?

Jakab and Kumhof's argument is actually one of two that Thin Air theorists employ to deny that commercial bank lending is constrained by the scarcity of central bank reserves. The other, which originated in Post-Keynesian writings (Moore 1988; Wray 2001), holds that, while commercial banks may indeed need central bank reserves to support their own lending and deposit-making, that need poses no real constraint because central banks tend to passively supply as many reserves as banks require to support whatever scale of lending they wish to engage in. According to this "horizontalist" view, central banks, and particular central banks that target interest rates, the supply of bank reserves is endogenous in a sense meaning that it is really ordinary rather than central banks that determine the quantity supplied.

Thus Luis Angeles (2019, 391) claims that, instead of "impos[ing] any quantitative limit on bank reserves," central banks that target interest rates, as most of them do, essentially leave the determination of the total nominal scale of bank lending up to the bankers themselves:

> The private banking system and bank borrowers [Angeles says], jointly decide on how much money will be created by entering into loan agreements, which creates a need for additional bank reserves. These will be supplied by the Central Bank on demand.

It supposedly follows that "the capacity of commercial banks to create money is not under the direct influence of the Central Bank." Instead of posing a meaningful limit upon the growth of bank lending, central bank reserve creation is itself controlled by the bankers. "Causality runs from the private banking system to the Central Bank" (ibid.). McLeay, Radia, and Thomas (2014, 21) make the very same argument, as do Scott Fullweiler (2012) and many other Post-Keynesian and Modern Monetary Theorists.

Like the Thin Air theory itself, the "endogenous" or "horizontal" theory of the supply of bank reserves is superficially appealing, yet fundamentally misleading. It is of course true that any central bank interest-rate target implies a reserve supply schedule that's horizontal at the targeted rate. It's also true that, *as long as it remains committed to a particular target rate*, a central bank must allow the stock of reserves to adjust passively with the quantity demanded at that rate.

But if monetary policy means anything in a rate-targeting regime, it means that the central bank routinely *reconsiders* its rate target, shifting the horizontal reserve supply schedule up or down whenever it sees fit to do so for the sake of meeting its

macroeconomic objectives; and this ability leaves it no less in *ultimate* control of the outstanding quantity of reserves than it would be were it to instead target that quantity itself.

Imagine, for example, two central banks that differ only in their intermediate policy targets, with one targeting the overnight interest rate, and the other targeting bank reserves. Suppose they operate in otherwise identical economies, and that both are committed to maintaining a two-percent rate of inflation. Finally, suppose both are confronted by the same change in banks' demand for reserves and that each accurately estimates the change. In theory, the equilibrium values for the overnight rate and outstanding quantity of bank reserves will be the same in both cases. The only difference is that in one case the result is achieved through a central-bank initiated change in the outstanding stock of reserves, while in the other it is achieved through a change in the central bank's chosen interest rate target.[15] It follows that it really makes no difference whether one chooses to *conceive* of what is in practice merely a *short-run* reserve supply schedule as being horizontal, vertical, or upward sloping. Fullweiler (ibid.), for one, more-or-less accepts this conclusion. "Central banks," he says,

> stand ready to provide reserve balances *at some price* always. They can adjust this price up or down if they are concerned about the expansion of credit or monetary aggregates, and this increase in price can be passed onto borrowers who may then not want to borrow. But this means that the manner in which a central bank can exert control over credit expansion is indirectly through its

[15] This is not to deny that interest-rate targeting on one hand and reserve targeting on the other each has its particular practical advantages and disadvantages. I am only making the theoretical point that, *provided* either could be implemented perfectly, with identical policy objectives in mind, they'd have identical outcomes.

interest rate target, not through direct control over the quantity of reserve balances.

But as the example above suggests, controlling the price of central bank reserves and controlling their quantity are really two equally "direct" ways of regulating reserve *scarcity*, and in a scarce reserve system, that scarcity is all that central banks need to control to regulate the extent of commercial bank lending and money creation. Given a demand curve for reserves against its policy rate, the central bank's choice of P implies a choice of Q, and vice-versa.

Angelis (2019, 391) also comes close to conceding this point. "To be sure," he writes, "the target interest rate imposed by the Central Bank is one among several factors influencing bank lending." But, he adds, "This degree of influence notwithstanding, it is far more accurate to say that bank reserves endogenously adapt to the requirements of the private sector rather than the other way around." But just how is it "more accurate"? Changes to central bank interest-rate targets aren't just a "factor" influencing bank lending: in most circumstances (binding zero lower bounds being the notorious exception) they allow central banks as much control over bank lending as reserve targeting might. So, while commercial banks can have all the reserves they want from a rate targeting central banks, so long as they can only have them at whatever *price* their central banks wish to charge, those central banks may be said to rule the roost.

What if Reserves aren't Scarce?

My discussion has so far taken a "scarce reserve" or "corridor" central bank operating regime for granted. In such a regime, the rate of return on bank reserves is set below a central bank's policy rate target. Banks therefore tend to maintain or acquire

only such reserves as suffice to cover their net settlement and precautionary needs. In equilibrium the real quantity of reserves will equal the (well-defined) real quantity demanded, and except in the special cases mentioned above banks will be able to expand credit further as the real demand for their liabilities increases. Otherwise, their attempts to expand will cause the available quantity of reserves to fall short of the quantity demanded.

Until the 2008 financial crisis, scarce-reserve arrangements were the norm. But during that crisis many central banks switched to abundant-reserve or "floor" systems (Selgin 2018). In a floor system the return on reserves is set equal to, if not above, the central bank's policy rate target, and the opportunity cost of reserve holding is reduced correspondingly. Banks therefore become willing to accumulate reserves beyond their settlement and precautionary needs. To the extent that they do, they are not reserve constrained in the usual sense of that expression, that is, they might extend credit independently of any increase in the real demand for their liabilities without having to resort to costly overnight loans to cover their settlement dues. On the other hand, under a floor system even large-scale additions to the monetary base and bank reserves might not sponsor any corresponding increase in bank lending and deposit creation.

Noting the inconsistency of post-2008 arrangements with the mechanical multiplier story of money creation told in many textbooks, many commentators saw the fact as proof, not that banks didn't operate the way those textbooks said they ought to, but that banks also weren't investment intermediaries, as if the textbook story were the only one consistent with their being such.

Yet commercial banks operating in a floor system are no-less intermediaries than their corridor system counterparts. The only difference is that, whereas in corridor

systems banks usually find it more profitable to invest savings entrusted to them in assets apart from central bank reserve balances, in a floor system those balances dominate other short-term investments. In both regimes banks are constrained by interest costs they incur when they expand credit arbitrarily. But whereas in a scarce-reserve system that cost consists of the cost of overnight borrowing, either from other banks or from the central bank, at rates exceeding what banks can earn on the underlying loans, in an abundant-reserve system it consists of the interest foregone by having to part with reserves that yield more, at the margin (allowing for risks and the non-interest costs of lending) than loans and investments of like duration. Hiking the rate paid on reserves in a floor system is the counterpart of reducing the outstanding stock of reserves in a corridor system. In both cases, reserves become relatively scarcer. And it is the scarcity of reserves rather than their abundance, that is, rather than the real stock outstanding, that matters. Consequently, banks in floor systems are no more equipped with widows' cruses than those in corridor systems.

It's true, on the other hand, that so long as the interest rate paid on reserves is held constant, an increase in the public's demand for bank liabilities will not tend to elicit any increase in bank lending, because it won't itself make reserves any less scarce. To that extent at least, banks in such a system will not be strict intermediaries. But the same may be said of banks in a corridor system in which the central bank's rate target is kept constant in the face of changes in the public's demand for bank deposits. In that case, any tendency on the banks' part to loosen their lending terms will tend to be countered by corresponding contraction of the stock of bank reserves. In both cases, it is the central banks' insistence upon a fixed policy rate target, rather than commercial bank conduct per se, that drives a wedge between changes in the public's willingness to

fund bank lending and the extent of such lending; and no proponent of the view that commercial banks are intermediaries has ever denied that central banks can influence the extent of their lending independently of the public's savings decisions.

Are Banks Perfect Intermediaries?

I've argued that banks' ability to extend credit is limited by the concurrent real demand for their IOUs, and especially the real demand for deposit balances. But I don't mean that banks are *strict* or *perfect* intermediaries. Not in the short run, at least. Instead, there are circumstances, not all of them rare, in which banks' ability to lend to others isn't strictly geared to the public's willingness to lend to banks.

The fact that central banks, and central banks that issue floating-rate fiat monies especially, are themselves capable of expanding or contracting their balance sheets independently of any changes in the public's demand for money is the most important reason why commercial banks also fail to function as strict intermediaries. While commercial banks aren't themselves able to fund loans with thin air, they *can* fund them with extra central bank reserves that come their way. Central bank actions that alter the scarcity of bank reserves, either by altering their outstanding nominal quantity (corridor systems) or by influencing banks demand for them (floor systems), thus tend to inspire sympathetic changes in bank lending that are also unmatched by like changes in the public's real demand for bank IOUs.

The neoclassical notion of "forced" savings becomes relevant here (Hayek 1932; Hansson 2018). When, starting from a state of overall monetary equilibrium, with a zero excess supply of both bank reserves and broad money at the existing price level, a central bank expands the stock of reserves, those extra reserves can be said to masquerade as an increase in real savings. Banks will respond to their creation by

expanding their own balance sheets much as if the public's real demand for holdings of their deposits and IOUs had increased. But because, *ex hypothesi*, the real quantity of money demanded hasn't changed, the expansion causes a proportional increase in prices. The increase amounts to a "tax" on pre-existing money balances. Forced savings are another name for this tax; and it is such savings, rather than any true increase in the public's real demand for bank deposits, that finances those real investments that occur as a result of additional central-bank sponsored bank lending.

Ironically, although episodes of forced savings are by far the most most important instances in which ordinary banks cease to function as strict intermediaries, they are instances that Jakab and Kumhof *don't* recognize. For as we've seen, those theorists *deny* that the changes in the nominal quantity of central bank reserves have any bearing upon ordinary banks' lending capacity. But were they, and were other, critics of the Intermediation theory to recognize this most important failure of banks to intermediate real savings, they could not take much comfort in it for a simple reason: just as a rising tide lifts all boats, central bank reserve creation that allows banks to expand credit independently of the public's willingness to lend to them allows *all* financial intermediaries to do so. It follows that, to deny that banks are investment intermediaries on account of this particular failing, one must deny that there is any such thing as an investment intermediary!

Modern banks can also fail to properly intermediate real savings that takes the form of a demand for paper currency or token coins, and can do so even if that demand has nothing to do with the public's lack of confidence in them. The simply reason for this is that banks aren't allowed to issued notes and coins of their own, and so must count on public authorities to meet the public's needs instead. It follows that, when this

sort of intermediation failure happens, the fault lies with those authorities, not the banks.

Intermediation can also break down if either the public or commercial banks choose to hoard central-bank money, as happened in the 1930s, and central banks fail to increase their lending sufficiently to accommodate the hoarding and avoid deflation. But here again, it is the central banks rather than the commercial banks themselves that fail to act as strict intermediaries.

Departures from perfect intermediation can and often do occur as a consequence of various bank regulations, obvious examples being statutory liquidity and capital requirements. They can also result from either government-inspired or private-sector payment innovations, such as changes in clearing and settlement arrangements.[16] Finally, they might be due to changes in payments patterns that inform banks' demand for precautionary reserves, including changes that don't involve any change in the public's real demand for bank IOUs.

There are other situations in which commercial banks don't behave as the Intermediary theory suggests. But none has them extending credit profitably without the help of either real public savings or central bank reserve creation. In any event, the question isn't whether that theory is flawless. It's whether it's a better guide to the determinants of bank lending, and to shaping responsible monetary and bank regulatory policies, than the Thin Air alternative, with its implication that banks can

[16] The advent of fractional-reserve banking, which in a closed economy must lead to a general reduction in the demand for reserve money, with a corresponding increase in the quantity of money and other nominal magnitudes unlinked to a corresponding growth in the public's real demand for bank IOUs, was an especially important historical example of such an innovation. The widespread adoption of real-time gross settlement systems since the 1980s is a more modern example.

create all the funding they need to finance their loans and other undertakings, and can do so even without being egged on by central banks.

Is Banking Less "Real" Than Other Businesses?

Some paragraphs ago I pointed out some circumstances in which banks may extend credit beyond amounts consistent with the savings voluntarily placed at their disposal, including situations in which central banks equip them with more reserves or make their existing reserves less attractive. Yet there's a fundamental sense in which, despite these apparent exceptions, banks are *strictly* intermediaries. It is the sense one gains by thinking in terms of real, long run or general equilibrium magnitudes. That is, by thinking of banking in the same way economists think of other industries.

That changes in the nominal quantity money are at least roughly "neutral" in the long run is perhaps the most fundamental tenet of neoclassical monetary economics. It doesn't mean that monetary expansion never has important real short-run consequences: most obviously, it can lower unemployment when the cause of that unemployment is a lack of aggregate demand. But it doesn't generally alter the relative size of particular industries, or of firms within them. Instead of depending on the nominal quantity of money, firms and industry's success or failure depends on the real demand for their products. Danbury, CT, was once a thriving center of men's hat-making. But fashions changed, and the hat factories are long gone. Nor could any amount of monetary expansion alone have saved any of them.

It is the same with banks and the banking industry. No amount of general monetary expansion, as opposed to a direct bailout, can keep a bank alive in the absence of a *real* demand for its IOUs: in nominal terms bank balance sheets may grow willy-nilly; but real (deflated) balance sheets remain stubbornly dependent upon the

public's willingness to supply banks with real savings. Nor is it the case that a bank can only fail if the public insists on converting its deposits into paper money—something only central banks supply nowadays. Funds have only to be redirected electronically from some banks to others to cause the first group to suffer, and this will be so even if no one ever refuses to accept troubled banks' IOUs in payment up to the moment of its demise.

It is perhaps less obvious, but no less true, that the real size of an economy's banking *industry* depends on the real, and not simply the nominal, extent of the market for bank liabilities. "Given the wealth and the asset preferences of the community," Tobin says (1963, 6-7),

> there is at any moment a natural economic limit to the scale of the commercial banking industry. … Eventually the marginal returns on lending and investing, account taken of the risks and administrative costs involved, will not exceed the marginal cost to banks of attracting and holding additional deposits.

Thus even if commercial banks' ability to create deposits weren't constrained by the real demand for those deposits, their deposit-creating ability would not suffice to allow them to thrive except by virtue of that demand: show me a bank that no one wants to bank at, and I will show you a failed bank. Show me a country where people no longer care to hold bank deposits at all, and I will show you a dying banking industry that cannot possibly lift itself by its bootstraps.

To repeat: these conclusions are mere instances of the doctrine of long-run monetary neutrality. But when applied to banking, and allowing that the "market" that matters in banks' case is the market for bank-created IOUs, that doctrine *implies* that,

whatever they may be in the short run, banks are ultimately intermediaries. Whatever their other shortcomings, theories that deny banks' status as intermediaries inevitably fail to consider the long-run, equilibrium disposal of real resources, harping instead on short-run relationships or nominal magnitudes or both. That is, they look only at the veil of money, instead of looking behind it, thereby missing the fact that it is ultimately savers' willingness to grant bankers access to real resources that allows bankers to grant their borrowers the ability to lay claim to those resources.

What's the Bottom Line?

The bottom line is that, although banks are money creators, they are also intermediaries. Arguments that assume that banks must either be one thing or the other are fundamentally unsound. The fact that banks can technically create money with some keystrokes, if not "out of thin air," doesn't mean that they can generally extend credit without borrowing from others, where "borrowing from others" means borrowing not merely nominal but *real* savings—savings that banks aren't capable of creating themselves.

Although there are important exceptions to the rule that ordinary banks are intermediaries, these are not so important as to justify an alternative theory suggesting that such banks are as able to expand credit independently of the public's willingness to direct real savings their way as central banks are. Indeed, many of the most important historical exceptions to the rule that ordinary banks are intermediaries have occurred in response to unwarranted central bank reserve creation (Selgin 1992). And in these exceptional cases the problem isn't that ordinary banks can create credit out of thin air: it's that central banks supply them with resources beyond what the public would provide them on its own. Confusing the powers of central banks with those of ordinary

commercial banks makes for bad monetary *and* bank regulatory policies and policy proposals, including proposals to altogether dispense with fractional reserve banking, which is wrongly understood to signify that banks have been engaging in (wasteful) credit creation rather than (valuable) intermediation.

The Thin Air theory's champions imagine that, because they've "discovered" that bankers make loans by crediting borrowers' accounts, they've arrived at a more profound understanding of the workings of modern banking systems than that possessed by Edwin Cannan, James Tobin, and countless other fuddy-duddies. But their theory, and the false "intermediaries or money creators" dichotomy it rests upon, aren't deep: they are shallow, and they belong in the same mulch heap as the real-bills doctrine.

References

Angeles, Luis. 2019. "On the nature of banks. *Kyklos* 72, no. 3 (August): 381-399. [I refer to a working paper, with different pagination, at https://eprints.gla.ac.uk/190972/1/190972.pdf]

Ashcroft, Adam, James McAndrews, and David Skeie. 2011. "Precautionary Reserves and the Interbank Market." *Journal of Money, Credit and Banking* 43, no. 2 (October): 311-348.

Baltensperger, Ernst. 1974. "The Precautionary Demand for Reserves." *American Economic Review* 64, no. 1 (March): 205-210.

Blasquesa, Francisco, Falk Bräuninga, and Iman van Lelyveld. 2018. "A Dynamic Network Model of the Unsecured Interbank Lending Market." *Journal of Economic Dynamics and Control* 90 (May): 310-342.

Blum, Marcel, Co-Pierre Georg, and Jan-Peter Krahnen. 2016. "Interbank Intermediation." Deutsche Bundesbank Discussion Paper No. 16, March 29.

Buiter, Willem H. 2023. "The Widespread Failure of Central Banks to Control Inflation." *Economic Affairs* 43, no. 1 (February): 2-31.

Cannan, Edwin. 1921. "The Meaning of Bank Deposits." *Economica* 1 (January): 28-36.

Dietrich, Diemo, and Achim Hauck 2020 "Interbank Borrowing and Lending between Financially Constrained Banks." *Economic Theory* 70 (July) 70:347–38.

Fullweiler, Scott. 2012. "Krugman's Flashing Neon Sign." *New Economic Perspectives*, April 1. Accessed March 4, 2024. https://neweconomicperspectives.org/2012/04/krugmans-flashing-neon-sign.html

Geva, Benjamin. 2008. "Payment Finality and Discharge in Funds Transfers." *Chicago-*

Kent Law Review 83, no. 2 (April): 633-675.

Gurley, John G., and Edward S. Shaw 1960. *Money in a Theory of Finance*. Washington, DC: The Brookings Institution.

Hansson, Björn. 2018. "Forced Saving." In *The New Palgrave Dictionary of Economics*. Palgrave Macmillan, London. Accessed March 8, 2024. https://doi.org/10.1057/978-1-349-95189-5_28.

Hayek, F.A. 1932. "A Note on the Development of the Doctrine of 'Forced Saving'." *Quarterly Journal of Economics* 47, no. 1 (November): 123-133.

Jakab, Zoltan, and Michael Kumhof. 2019. "Banks are not Intermediaries of Loanable Funds — Facts, Theory and Evidence." Bank of England Staff Working Paper No. 761, June.

Knobel, Abraham. 1977. "The Demand for Reserves by Commercial Banks." *Journal of Money, Credit and Banking* 9, no. 1 (February): 32-47.

Kumhof, Michael, and Zoltan Jakab. 2015. "The Truth about Banks." *Finance and Development* (March): 50-53.

Koch, Timoth W., and S. Scott McDonald. 2015. *Bank Management*. Boston: Cengage Learning.

McLeay, Michael, Amar Radia, and Ryland Thomas. 2014. "Money Creation in the Modern Economy." Bank of England *Quarterly Review* Q1: 14-27.

Moore, Basil J. 1988. *Horizontalists and Verticalists: The Macroeconomics of Credit Money*. New York: Cambridge University Press.

Olivera, J.H.G. 1971. "The Square-Root Law of Precautionary Reserves." *Journal of Political Economy* 79, no. 5 (September-October): 1095-1104.

Rockoff, Hugh. 2009. "Upon Daedalian Wings of Paper Money: Adam Smith and the

Crisis of 1772." NBER Working Paper 15594, December.

Selgin, George. 1992. "Bank Lending 'Manias' in Theory and History." *Journal of Financial Services Research* 6 (August): 169–186.

Selgin, George. 2001. "In-Concert Overexpansion and the Precautionary Demand for Bank Reserves." *Journal of Money, Credit and Banking* 33, no. 2 (May): 294-300.

Selgin, George. 2012. "Those Dishonest Goldsmiths." *Financial History Review* 19, 3 (December): 269 – 288.

Selgin, George. 2018. *Floored! How a Misguided Fed Experiment Deepened and Prolonged the Great Recession*. Washington: The Cato Institute.

Tobin, James. 1963. "Commercial Banks as Creators of 'Money'." In *Banking and Monetary Studies*, edited by Deane Carson, 408-419. Homewood, Illinois: Richard D. Irwin.

Tsiang, S. C. 1969. "The Precautionary Demand for Money: An Inventory Theoretical Analysis." *Journal of Political Economy* 77, no. 1 (January-February): 99-117.

Werner, Richard A. 2014. "Can Banks Individually Create Money Out of Nothing?—The Theories and the Empirical Evidence." *International Review of Financial Analysis* 36 (December): 1-19.

Werner, Richard A. 2017. "Shifting from Central Planning to a Decentralised Economy: Do we Need Central Banks?" *professorwerner.org* (blog), January 15, 2017. Accessed March 9, 2024. https://professorwerner.org/shifting-from-central-planning-to-a-decentralised-economy-do-we-need-central-banks/.

Whalen, Edward J. 1966. "A Rationalization of the Precautionary Demand for Cash." *Quarterly Journal of Economics* 80, no. 2 (May): 314-324.

Wray, L. Randall. 2001. “The Endogenous Money Approach.” CFEPS Working Paper No. 17. University of Missouri Kansas City.