



# Should We Worry About Excess Reserves?

*Through fractional banking and high excess reserves, banks can create sudden spikes in financial liquidity, and possibly inflation as well*

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### Introduction

Banks in the United States currently hold \$2.4 trillion in *excess reserves*: deposits by banks at the Federal Reserve over and above what they are legally required to hold to back their checkable deposits (and a small amount of other types of bank accounts). Before the 2008 financial crisis, this amount was essentially zero. To put this number in perspective, the monetary base of the United States (the sum of all currency outside the Federal Reserve System plus both required and excess reserve deposits by banks at the Fed) is \$4 trillion. So, 60 percent of the entire *monetary base* is now in the form of excess reserves compared with roughly 0 percent precrisis.

### Does this matter?

It might. Many of our monetary theories, from those developed by Benjamin Franklin and David Ricardo to those of Milton Friedman and more recent theorists, contend that the amount of liquidity held by economic actors determines prices, or at least helps to. Currently, there is about \$12 trillion of such liquidity in the United States, in terms of currency and easily accessed bank deposits held by firms and households (M2). While the correlation between changes in M2 and prices is not tight in the short run, comparisons

### Executive summary

Banks in the United States have the potential to increase liquidity suddenly and significantly—from \$12 trillion to \$36 trillion in currency and easily accessed deposits—and could thereby cause sudden inflation. This is possible because the nation's fractional banking system allows banks to convert excess reserves held at the Federal Reserve into bank loans at about a 10-to-1 ratio. Banks might engage in such conversion if they believe other banks are about to do so, in a manner similar to a bank run that generates a self-fulfilling prophecy.

Policymakers could guard against this inflationary possibility by the Fed selling financial assets it acquired during quantitative easing or by Congress significantly raising reserve requirements.

across longer time periods and across countries are clearer and more convincing: Greater liquidity is associated with higher prices.

What potentially matters about high excess reserves is that they provide a means by which decisions made by *banks*—not those made by the monetary authority, the Federal Reserve System—could increase inflation-inducing liquidity dramatically and quickly.

In this essay, I argue that this liquidity increase could happen in a manner that resembles a bank

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run (or panic) or an attack on a fixed exchange rate regime. That is, the belief by some banks that *other banks* are (or will soon be) converting their excess reserves to loans could cause them to convert their own: The belief can become a self-fulfilling prophecy.

### Bank actions alone could cause a large increase in liquidity (when banks hold substantial excess reserves) because of the nation's fractional reserve banking system.

Bank actions alone could cause a large increase in liquidity (when banks hold substantial excess reserves) because of the nation's fractional reserve banking system. Since each dollar of bank deposit requires approximately only 10 cents of required reserves at the Fed, then each dollar of excess reserves can be converted by banks into 10 dollars of deposits. That is, for every dollar in excess reserves, a bank can lend 10 dollars to businesses or households and still meet its required reserve ratio. And since a bank's loan simply increases the dollar amount in the borrower's account at that bank, these new loans are part of the economy's total stock of liquidity. Thus, if every dollar of excess reserves were converted into new loans at a ratio of 10 to one, the \$2.4 trillion in excess reserves would become \$24 trillion in new loans, and M2 liquidity would rise from \$12 trillion to \$36 trillion, a tripling of M2.

#### Could this happen (and if so, why hasn't it happened already)?

In a recent paper (Bassetto and Phelan 2015), Marco Bassetto and I provide a theoretical justification for why such a run on the Fed by banks could happen, but is not certain to happen, and we thereby furnish an explanation for why it has not happened yet. The idea is that paying interest on excess reserves sets up a game between banks that has *multiple equilibria*, meaning it can result in more than one stable outcome.

To economists and other game theorists, an equilibrium is an action or behavior that makes sense to each private actor given the behavior of all the other actors. For instance, driving on the right-hand side of the road makes sense to each driver if he or she believes that all the other drivers are doing

the same. By the same token, driving on the left-hand side of the road is also an equilibrium. If every driver believes every other driver will be driving on the left-hand side, it makes sense to drive on the left. Thus, driving side is an example of a "game" with multiple equilibria.

Other examples abound. If no one else speeds on the highway, it can make sense not to speed (since you will get the ticket if you do speed). But if everyone speeds, it can make sense to speed, since someone else will probably get the ticket. Likewise, if everyone else pays his or her taxes, it can make sense to pay your taxes. But if everyone else cheats, it can make sense to cheat. Unlike the side-of-the-road scenario, the speeding and tax compliance issues have historical examples of societies seemingly spontaneously switching from one equilibrium to the other. For instance, tax compliance in Greece has recently plummeted, albeit from a not-very-high initial level.

More to the point, multiple equilibria exist in some *financial* settings as well, with classic bank runs under fractional reserve banking (and no deposit insurance) as a prime example. If there is a small cost of withdrawing all one's funds from a bank, it makes sense for an individual to leave his or her deposit untouched if he or she doesn't immediately need the funds, *as long as he or she believes* the bank will remain solvent. But if banks hold funds sufficient to cover only a fraction of their deposits, then the belief by any depositor that other depositors will withdraw their money regardless of need can sensibly induce that depositor to immediately withdraw his or her funds as well. Of course, this type of bank run does indeed seem to happen historically, and happen suddenly (although deposit insurance usually helps to successfully counteract this phenomenon).

A second financial example is a run on a fixed exchange rate regime where countries attempt to link their country's currency at a fixed ratio with another country's. If the country attempting the link does not have enough of the other country's currency in reserve to back every unit of its currency at the announced rate, a similar multiple equilibrium analysis applies: If one holder of a country's currency expects the other holders to convert, it makes sense to convert (and before they do), and if one holder expects the other holders to stand pat, it makes sense to also stand pat.

On the question at hand, of excess reserves and liquidity, Bassetto and I consider a central bank that commits to pay a given nominal interest rate on excess reserves, but where banks are free to convert these excess reserves to loans at any time.<sup>1</sup> Within this setting, we consider two scenarios: In the first, households, firms and banks all expect inflation to be low. In this scenario, the interest rate offered by the Fed is sufficiently high relative to the interest rate banks could get by loaning out their excess reserves to induce the banks to leave the excess reserves at the Fed.

In the second scenario, households, firms and banks all expect inflation to be high. Given this expectation, households and firms will be willing to pay higher interest rates to banks for loans since they expect to pay back in cheaper dollars. In this situation, the Fed's interest rate on excess reserves is no longer high enough to induce banks to leave their reserves at the Fed, and when banks convert their excess reserves to loans, they create extra liquidity that generates higher inflation. Thus, the expectation of higher inflation induces the reality of higher inflation.

Is this second scenario realistic? Couldn't the Fed, in the face of an increase in inflation expectations, simply increase the interest rate it pays on reserves to a level sufficient to induce banks not to convert their excess reserves to loans? Not necessarily, either because the Fed can't move quickly enough or because it faces political constraints on how high it can raise interest on reserves. Is the Fed really unlimited on the discretionary payments it can make to private banks? If banks think at some point the Fed won't match the interest rate offered by firms and households, then this self-fulfilling prophecy of inflation expectations applies.

### What now?

Just because another economic equilibrium is possible is certainly no guarantee it will happen, or is likely to. But one job of a central bank is to worry about worst-case scenarios, and this is perhaps a scenario worthy of such concern. Given this, what policy solutions are available? One possible solution would be for the Fed to severely reduce its balance sheet by selling to banks the financial assets it acquired during its quantitative-easing episodes. This would automatically lower the banks' excess reserves.

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Another potential solution is for Congress to make the policy and legal changes necessary to convert *excess* reserves into *required* reserves by dramatically increasing required reserve ratios, perhaps to 100 percent (and possibly compensating banks by paying adequate interest on these reserves).<sup>2</sup> In a separate paper (Chari and Phelan 2014), V. V. Chari and I consider the costs and benefits of implementing a 100 percent reserve requirement and argue that the costs of such a requirement shrink as communications technologies improve, with the usual and oft-cited benefit that bank runs are eliminated. The arguments in this essay and in Bassetto and Phelan (2015) can be interpreted as highlighting an additional benefit to a 100 percent reserve requirement beyond the elimination of bank runs. R

### Endnotes

<sup>1</sup> More accurately, our paper considers only one type of private economic actor, which we call households, but the arguments given there apply to the banks example here.

<sup>2</sup> In Section 19 of the Federal Reserve Act, Congress limits the required reserve ratio the Federal Reserve Board can impose on banks to 14 percent. Raising that ratio would therefore require an act of Congress.

### References

- Bassetto, Marco, and Christopher Phelan. 2015. "Speculative Runs on Interest Rate Pegs." *Journal of Monetary Economics* 73 (July): 99-114.
- Chari, V. V., and Christopher Phelan. 2014. "On the Social Usefulness of Fractional Reserve Banking." *Journal of Monetary Economics* 65 (July): 1-13.