

# Fiscal Dominance and the Return of Zero-Interest Bank Reserve Requirements

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## Abstract

As a matter of arithmetic, the trends of US government debt and deficits will eventually result in an outrageously high government debt-to-GDP ratio. But when exactly will the United States hit the constraint of infeasibility and how exactly will policy adjust to it? This article considers fiscal dominance, which is the possibility that accumulating government debt and deficits can produce increases in inflation that “dominate” central bank intentions to keep inflation low. Is it a serious possibility for the United States in the near future? And how might various policies change (especially those related to the banking system) if fiscal dominance became a reality?

*JEL codes:* E52, E62, H63

Federal Reserve Bank of St. Louis *Review*, Fourth Quarter 2023, 105(4), pp. 223-33.  
<https://doi.org/10.20955/r.105.223-33>

Under current policy and based on this report’s assumptions, [government debt relative to GDP] is projected to reach 566 percent by 2097. The projected continuous rise of the debt-to-GDP ratio indicates that current policy is unsustainable.

—*Financial Report of the United States Government*, February 16, 2023

## INTRODUCTION

The above quotation from the Treasury’s Financial Report admits that the current combination of government debt and projected deficits is not feasible as a matter of arithmetic because it would result in an outrageously high government debt-to-GDP ratio. But when exactly will the US hit the constraint of infeasibility, and how exactly will US policy adjust to it? This article considers whether fiscal dominance is a serious possibility for the United States in the near future and discusses how various policies (especially those related to the banking system) likely would change if fiscal dominance became a reality.

Fiscal dominance refers to the possibility that the accumulation of government debt and continuing government deficits can produce increases in inflation that “dominate” central bank intentions to keep

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inflation low. The article begins by showing that the prospect of this occurring soon in the United States is no longer far-fetched. Indeed, if global real interest rates returned tomorrow to their historical average of roughly 2 percent, given the existing level of US government debt and large continuing projected deficits, the US would likely experience an immediate fiscal dominance problem. Even if interest rates remain substantially below their historical average, if projected deficits occur as predicted, there is a significant possibility of a fiscal dominance problem within the next decade.

The essence of fiscal dominance is the need for the government to fund its deficits on the margin with non-interest-bearing debts. The use of non-interest-bearing debt as a means of funding is also known as “inflation taxation.” Fiscal dominance leads governments to rely on inflation taxation by “printing money” (increasing the supply of non-interest-bearing government debt).<sup>1</sup> To be specific, here is how I imagine this occurring: When the bond market begins to believe that government interest-bearing debt is beyond the ceiling of feasibility, the government’s next bond auction “fails” in the sense that the interest rate required by the market on the new bond offering is so high that the government withdraws the offering and turns to money printing as its alternative.

As the money supply is forced to grow by fiscal dominance, inflation rises, which creates a new means of funding government expenditures via “inflation taxation.” Inflation taxation has two components: expected and unexpected inflation taxation. Both are limited in their ability to fund *real* government expenditures. The expected component of inflation taxation (per period) is the product of the nominal interest rate and the inflation tax base, which consists of all non-interest bearing government debt. (Typically, this consists of currency and non-interest-bearing bank reserves at the central bank.) Total real government expenditures that can be financed by the expected inflation tax are limited because the tax base of this inflation tax is determined by the demand for money. The inflation tax earned per period is the product of the nominal interest rate (the inflation tax rate) and the amount of real demand for currency and zero-interest reserves. Unexpected inflation taxation occurs when the nominal value of outstanding government debt falls unexpectedly (thereby taxing government debtholders), and this component is also limited by the ability of government to surprise markets by creating unanticipated inflation.

If the US government faced a fiscal dominance problem, it would have to fund real deficits by real inflation taxation, which is a limited tax resource. Thus, not all real deficits are feasible to fund with inflation taxation.

Furthermore, some changes in policy with respect to reserve requirements are likely if fiscal dominance becomes a reality. The existing amount of the zero-interest debt (the inflation tax base) is currently limited to only currency, given that bank reserves bear interest today. Given the small size of the currency outstanding, if the government wishes to fund large real deficits, that will be easier to do if the government eliminates the payment of interest on reserves. This potential policy change implies a major shock to the profits of the banking system.

Second, as the history of inflation episodes has shown, even an inflation tax base of currency plus zero-interest reserves would decline in real terms in the face of a significant increase in inflation. Based on data for the US as of 2023, the resulting inflation rate could be very high. (That rate is derived by calculating the inflation rate that, when multiplied by the inflation tax base, results in inflation taxation sufficient to fund projected deficits.)

For that reason, it is quite possible that a fiscal dominance episode in the US would result in not only the end of the policy of paying interest on reserves, but also a return to requiring banks to hold a large fraction of their deposit liabilities as zero-interest reserves. For example, under one illustrative example, I will show that requiring banks to hold 40 percent of deposits as zero-interest reserves, under

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1. For an example of how fiscal dominance can produce inflation taxation in the steady state, see the study of Brazilian inflation by Calomiris and Domowitz (1989).

reasonable assumptions, would reduce the annual inflation rate to fund likely deficits from an inflation of about 16 percent to only about 8 percent. For that reason, imposing high reserve requirements for zero-interest paying reserves may seem quite attractive to a policymaker interested in reducing the inflationary consequences of fiscal dominance.

The history of inflation taxation around the world has shown that when governments become strapped for resources, they often use zero-interest reserve requirements to tax banking systems and remove their spending constraints. For example, in Mexico during the 1970s and early 1980s, inflation taxation of banks became increasingly relied on as government expenditures rose; eventually, as fiscal problems mounted, the government expropriated first bank depositors and then bank equity holders by nationalizing the banks (Calomiris and Haber, 2014, Chapter 11). The general problem of impecunious governments taxing banks with the inflation tax, credit controls, or other means—which can have major adverse consequences for efficient capital allocation and growth—is the theme of a very large literature, which goes back at least as far as Gurley and Shaw (1960) and includes such landmark contributions as McKinnon (1973), Fry (1988), and Acharya (2020).

Taxing banks with reserve requirements and zero-interest reserves is convenient for two reasons. First, instead of new taxes enacted by legislation (which may be blocked in the legislature), reserve requirements are a regulatory decision that is generally determined by financial regulators. It can be implemented quickly, assuming that the regulator with the power to change the policy is subject to pressure from fiscal policy. In the case of the US, it is the decision of the Federal Reserve Board whether to require reserves to be held against deposits and whether to pay interest on them.

Second, because many people are unfamiliar with the concept of the inflation tax (especially in a society that has not lived under high inflation), they are not aware that they are actually paying it, which makes it very popular among politicians. If, as I argue below, a policy that would eliminate interest on reserves and require a substantial proportion of deposits to be held as reserves would substantially reduce inflation, then I believe it would be hard for the Federal Reserve Board to resist going along with that policy.

Such a policy change would not only reduce bank profitability but also reduce the real return earned on bank deposits to substantially below other rates of return on liquid assets, which potentially could spur a new era of “financial disintermediation,” as consumers and firms seek alternatives to low-interest paying bank deposits. Such financial disintermediation from banks occurred in the US in the 1960s and 1970s as a result of high inflation and regulations (including both zero-interest reserve requirements and ceilings on deposit interest rates) that limited the interest rates banks could pay to depositors. Of course, banks and their political allies might try to oppose financial innovations to allow firms and consumers to exit from banks, which would lead to a potentially interesting regulatory battle over the future of financial intermediation. The need to preserve a high inflation tax base could lead to a political choice to preserve a technologically backward banking system. (This would be a continuation and acceleration of recent political trends to limit Fintech bank chartering, as discussed in Calomiris, 2021.)

An alternative policy path, of course, with less inflation taxation, would be for the government to decide to reduce fiscal deficits and thereby avoid the need for rising inflation and its adverse consequences for the banking system. This may be a hard policy to enact, however, given that the main contributors to future deficits are large Medicare and Social Security entitlement payments. Also, defense spending seems likely to rise as the result of increasing geopolitical risks related to China. Increased income taxation is another alternative, but this too may be unlikely, not only because of the lack of political consensus about taxation but also because it would reduce growth in income, which would partly offset any deficit reduction coming from projected increases in the ratio of taxes to income. Ultimately, it seems likely that the US will either have to decide to rein in entitlements or risk a future of significantly higher inflation and financial backwardness.

## WHEN DOES FISCAL DOMINANCE BECOME APPARENT AS A CONSTRAINT?

Historically, high inflation is produced by growth in the supply of money that reflects the pressures of fiscal dominance. Every major inflation in world history is a fiscal phenomenon before it is a monetary phenomenon.

When exactly does fiscal dominance lead to monetization, and how much does that threaten monetary policy's inflation goals? How much dollar inflation might result from excessive US government borrowing?

If a country issues debt denominated only in its own currency (which is true of the US), then fiscal dominance arithmetic requires one to focus on only one equation ("transversality condition"), the violation of which forces inflation to rise. Here, the condition (formalized in McCallum, 1984) characterizes how the total debt held by the public is limited by the present value of prospective future fiscal surpluses. At some point, as the government debt-to-GDP ratio rises sufficiently (for a given real interest rate and rate of real growth of the economy), the real demand for government debt reaches a maximum. Any issues of nominal debt beyond that amount will not be accepted by the bond market as increases in real debt.

Where is the ceiling? If nominal GDP is \$24 trillion, and current interest-bearing debt not held by government agencies or by the Fed is about \$20 trillion, how much higher can the debt-to-GDP ratio go, given our current long-term real interest rate and real rate of growth?<sup>2</sup> First, note that much of the Fed-held debt nowadays pays interest (whether through \$3 trillion in excess reserves to Fed member banks or \$2.4 trillion in Fed reverse repos mainly with money market mutual funds). If the Fed is paying interest on the debt, then this should be added to the Treasury debt held by the public. So that means that the current size of interest-bearing public debt is greater than GDP. This is a historical high in the debt-to-GDP ratio reached only once before, during World War II. Not only that, but the deficit has been running, and is projected to continue running, at greater than 5 percent of GDP per year. CBO projections imply that the debt-to-GDP ratio will reach about 200 percent by 2050, but that assumes that real interest rates will remain at their historical lows; if they rise even by a small amount, the implied debt growth scenario is much worse.

Is an interest-bearing-debt-to-GDP ratio of greater than 100 percent, combined with current and projected deficits of that magnitude, an immediate danger for inflation? The answer is sensitive to your beliefs about future government spending and taxes, about the government's ability to change spending and taxes to avoid issuing new debt if that becomes a problem, and about the path of future real interest rates and economic growth. The current debt-to-GDP ratio is in the range associated historically with the fiscal dominance ceiling. On the other hand, real interest rates are at historical lows, which means that higher debt-to-GDP ratios are feasible. It is hard to say precisely where the fiscal dominance ceiling is because that requires one to forecast economic growth, taxes, government expenditures, and real interest rates.

As a country gets close to the ceiling, the interest rates creditors demand rise (as they demand an inflation risk premium) in anticipation of the risk of hitting the ceiling. That means that the perceived risk of hitting the ceiling (once you are close to it) can become self-fulfilling.

Rather than focus on the ceiling itself, it's better to ask what is the highest ratio of debt-to-GDP that is safely distant from the ceiling so that the government does not stumble into a self-fulfilling fiscal dominance equilibrium. I don't know the answer of where danger will arise, but there is a clear risk now that a rise in global real interest rates could reverse their three decades of decline (which remains poorly understood), which would make even the current debt-to-GDP ratio very risky, especially given that

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2. Government debt held by other government agencies is excluded from the computations below.

large primary deficits are projected to continue and that spending cuts are hard because so much of government spending in the US is from entitlements (not subject to annual appropriations) or from military spending (which is unlikely to be reduced, given the current geopolitical landscape). Taxes could be increased, but it seems unlikely to think that a divided Congress today would be nimble enough to do that to stop an incipient inflation risk problem from emerging.

What does a government that goes above the ceiling, or even gets too close to the ceiling, do to survive? It “prints money,” which you can imagine as using cash to pay for government bills rather than issuing new interest-bearing debt. Mechanically, in the US, that would be accomplished by Fed open market purchases of government debt (so-called deficit monetization). When the Fed buys government debt, the reason that is a useful thing to do is that it reduces the amount of outstanding interest-bearing government debt in the hands of the public. Interest-bearing government debt pays an interest rate that rises with inflation (one for one). But cash (or reserves that pay zero interest) pays no interest. Monetization allows the Treasury to sell debt to the Fed that public bondholders are unwilling to finance.

Before explaining the policy choices the Fed would face in monetizing deficits under fiscal dominance, it is worth noting that, for many other countries, the debt-to-GDP ceiling math is not the only fiscal math to be considered. If a country has issued some of its debt in foreign currency, things become more complicated because foreign debt can be at risk of default even if the first fiscal dominance transversality condition (based on total debt, GDP growth, and the real interest rate) is not violated. A second transversality condition connects the outstanding amount of *externally denominated debt* to prospective future net exports. An increased risk of foreign-denominated debt default due to the risk of violating the second transversality condition may lead to an increase in inflation, too, through an indirect channel: inflation through monetization of debt can be useful as a means of avoiding bond issues that might increase the risk of default on foreign-denominated debts. There is some evidence related to this possibility. Accelerations of inflation tend to precede deteriorations in foreign debt ratings, which may be interpreted as evidence that raising domestic inflation is used to reduce the effects of rising fiscal deficits on foreign debt default (Cantor and Packer, 1996).

For countries like the US, however, which issues debt only in its home currency, the first transversality condition is the only one that matters. For other countries (especially emerging market countries), both conditions are important, and the second transversality condition can be violated even when the first is not at risk (as many believed was the case in Argentina in 2001).

## LIMITS OF INFLATION TAXATION

If the US were forced by debt-to-GDP math to fund itself by “printing money,” how would it do so and what are the limits to how much real government spending can be funded in this way? The real funding of spending from the “inflation tax” (the funding of its expenditures by printing money) is limited. There are two components to the inflation tax: expected inflation taxation and unexpected inflation taxation. The expected component of the inflation tax is limited by the real demand for zero-interest government money. The unexpected component is limited by the one-time gain that comes from surprising people with rising inflation, which reduces the value of existing government debt and the debt-to-GDP ratio, thereby creating new debt capacity for additional future deficits.

The real *expected* component of the inflation tax (the amount of real goods and services that can be paid for by printing money) has an upper bound because real demand for zero-interest money declines as inflation increases (see, for example, Sargent, 1982; Calomiris and Domowitz, 1989). That means that once a government exhausts its ability to fund with the inflation tax, it must reduce spending.

The government also may get another *unexpected* inflation tax related to the decline in the value of its outstanding bonds at the time the fiscal dominance problem arises. When fiscal dominance hits and

leads to monetization, if this is not anticipated sufficiently far in advance, it also causes some or all existing bonds (long-term bonds with existing low coupons that aren't indexed to inflation) to fall in nominal value. This is a one-time gain to the government because, going forward, the government will pay a market interest rate on all new debt issues that incorporates the future rate of inflation. If the average duration of government debt is sufficiently long, and fiscal dominance is not anticipated years in advance, the government could benefit from a substantial capital gain from the unexpected inflation tax, which increases its real capacity to issue new interest-bearing debt by a similar amount.

This assumes that the public does not see the fiscal dominance problem coming; but in today's world, that does not seem as far-fetched an assumption as it used to be. It is also worth noting that the inflation surprise of the 1960s and 1970s entailed a very large capital gain from the unexpected inflation tax, as Robert Eisner documents in his book, *How Real Is the Federal Deficit?* Still, the ability to surprise the market with an acceleration of inflation is always limited by the fact that market participants monitor political and economic news closely and have knowledge about the processes that give rise to inflation.

It is also worth noting, as Beckworth (2023) points out, that in recent months the *market* value of US Treasury securities has already taken a toll on bondholders (including banks), declining from 108 percent of GDP in 2020 to about 85 percent of GDP today, mainly as the result of inflation surprises since 2021. This unexpected inflation tax has already substantially expanded the ability of the government to issue debt. More surprises may be coming, although the ability to surprise savers will decline going forward: As the saying goes, you can't fool all the people all the time.

What does printing money mean in practical terms? For the US today, the "tax base" for the expected component of the inflation tax does not include the \$3 trillion dollars of reserves held by banks—because those pay interest. Of course, the Federal Reserve could change that policy (and perhaps would have to do so in the event of a fiscal dominance problem); but if it did not do so, the inflation tax would be earned only on the dollars in cash held by the public worldwide (about \$2.2 trillion in nominal terms today).

The big questions about fiscal dominance problems for the US, therefore, are (1) how much would the government gain from surprising outstanding bondholders with fiscal dominance, (2) what would be the tax base of the expected inflation tax, and (3) how much would real demand for zero-interest cash fall (thereby reducing the real tax base of the expected inflation tax) as the result of an increase in expected inflation? Answering these questions is important because it tells us how much inflation would be needed for the government to be able to fund the fiscal costs not funded by interest-bearing debt (as a result of hitting the fiscal dominance threshold). Indeed, it is possible that when answering these questions one might even conclude that it is not feasible for the projected real fiscal deficits to be funded by the inflation tax. In that case, some cuts to governments spending or increases in other taxation would be necessary.

## **CONNECTING THE SIZE OF DEBT INCREASES, MONEY INCREASES, AND INFLATION**

Any attempt to estimate how a fiscal dominance scenario would play out in the US is fraught with uncertainty. What follows is an illustration using an example.

Assume that the US suddenly reaches the maximum for total real government debt demand by the public. What would it do, how much would the price level have to rise, and how limited would its ability to fund spending with inflation be? To be concrete: If deficits required a one-time increase in money printing by, say, roughly 5 percent of outstanding government debts to pay existing bills, how much would inflation rise?

To make things clear in a simplified example, assume that at the time the fiscal dominance shock hits, inflation is zero, the real interest rate is zero, and real growth in the future is zero. Assume (using

current data) that government debt held by the public, not including the Fed (G) is 20, that repo repurchases by the Fed (R) is 2.4, that reserves held by banks as interest-bearing excess reserves (M) is 3, and that cash held by the public is 2.2. I will assume that the annual real deficit that must be funded by the inflation tax is 3 percent of \$24 trillion in 2023 dollars (which is realistic, given that the deficit is over 5 percent of GDP and real growth is roughly 2 percent).

I will assume that fiscal dominance will force the Fed to stop paying interest on reserves, but it must continue to pay interest on reverse repos, so the tax base for the expected component of the inflation tax is  $(C+M)$ .<sup>3</sup>

The real demand for currency and the real demand for bank reserves at the Fed both should fall when increases in their nominal supplies cause prices to rise. In my example, I will assume realistically that if there is no reserve requirement, then the real demand falls more for any increase in inflation because both the public (depositors) and the banks (reserve holders) have incentives and ability to economize on real balances when faced with inflation. But when reserve requirements are set as a fraction of deposits, if they are a binding constraint, then only depositors can economize in reaction to inflation. So, real demand for reserves falls by less than it would otherwise. I also assume that the real demand for cash also falls in reaction to inflation. Judging from prior statistical studies, all these reactions that reduce the real inflation tax base (at relatively low rates of inflation) will reduce the real tax base more slowly than the rise in inflation will raise the inflation tax rate.<sup>4</sup> So a rise in inflation will increase the inflation tax, albeit not as quickly as the rise in the rate of inflation itself.

To make all the above assumptions concrete, assume that, in the *absence* of a reserve requirement, the inflation rate ( $p$ ) solves the following equation (where  $(1 - p)3$  is real reserve demand) and  $(1 - p/2)2.2$  is real currency demand. In this simple formulation, if inflation rises from 0 to 10 percent, then real reserves demand falls by 10 percent and real currency demand falls by 5 percent. These specific “guesses” are realistic, and useful for our example, but of course, they are just guesses. One cannot be sure how real demand for currency or reserves will respond to changes in policy regimes. To solve for the inflation rate that generates sufficient inflation tax revenue to pay the real deficit per year, one solves

$$(1) \quad p(1 - p)3 + p(1 - p/2)2.2 = 0.73.$$

Recall that total reserves in 2023 dollars is \$3 trillion, and currency held by the public is \$2.2 trillion. The total deficit that needs funding is \$0.73 trillion. The coefficient  $(1 - p/2)$  in the second expression captures the rate at which real demand for currency falls as inflation rises. The coefficient  $(1 - p)$  in the first expression captures the assumption that real demand for reserves can fall relatively quickly (by the rate  $(1 - p)$ ) when there is no reserve requirement. The implied rate of inflation that satisfies the above equation is about 16.3 percent.

If a zero-interest reserve requirement of 40 percent is imposed on all deposits, and if that is a binding constraint, then reserve holdings rise to 7.2 (which is 40 percent of \$18 trillion in commercial bank deposits observed in February 2023). Now real reserve demand is assumed to fall more slowly in reaction to inflation than it did without the imposition of the reserve requirement (at the rate  $1 - p/2$ ). Equation 1 can be rewritten as

$$(2) \quad p(1 - p/2)7.2 + p(1 - p/2)2.2 = 0.73.$$

3. It is also possible that the Fed could reduce but not eliminate interest payments on reserves. In my view, given the high inflation rate implied by fiscal dominance, the Fed would choose to eliminate all interest on reserves.

4. Cagan’s (1956) formulation assumed that money demand took semi log form. The semi-elasticity of demand is  $\alpha$  in that model, and the revenue-maximizing rate of inflation is  $1/\alpha$ .

The implied rate of inflation that satisfies this equation is about 8.1 percent. This implies a large reduction from inflation that is possible by raising the inflation tax base by mandating that banks hold zero-interest reserves as a large proportion of deposits.

At the opposite extreme of policy with respect to the inflation tax base, what if in the face of a fiscal dominance shock, the Fed did not eliminate interest on reserves and paid the market interest rate on all reserves? Then the inflation tax would be charged entirely on the inflation tax base of the real demand for currency, which would mean

$$(3) \quad p(1 - p/2)^{2.2} = 0.73.$$

Under this assumed demand function, the result would be a rate of inflation in excess of 41 percent. Clearly, given that prospective outcome, the Fed will be under substantial pressure in a fiscal dominance situation to eliminate interest on reserves and impose a large reserve requirement.

This calculation likely is not correct, however: Past experience suggests that, at high rates of inflation, the real demand for currency falls at a faster rate than the rate of inflation rises and the revenue-maximizing rate of inflation is typically in the range of 30 to 45 percent (Cagan, 1956; Kimbrough, 2006). For example, if currency demand is  $(1 - p)^{2.2}$ , then  $p$  should solve

$$(4) \quad p(1 - p)^{2.2} = 0.73.$$

But there is no rate of inflation,  $p$ , that satisfies Equation 4 because the maximum inflation tax that is feasible (assuming this real demand) is  $0.55 < 0.73$  and the maximum revenue from the inflation tax occurs when  $p = 50$  percent.

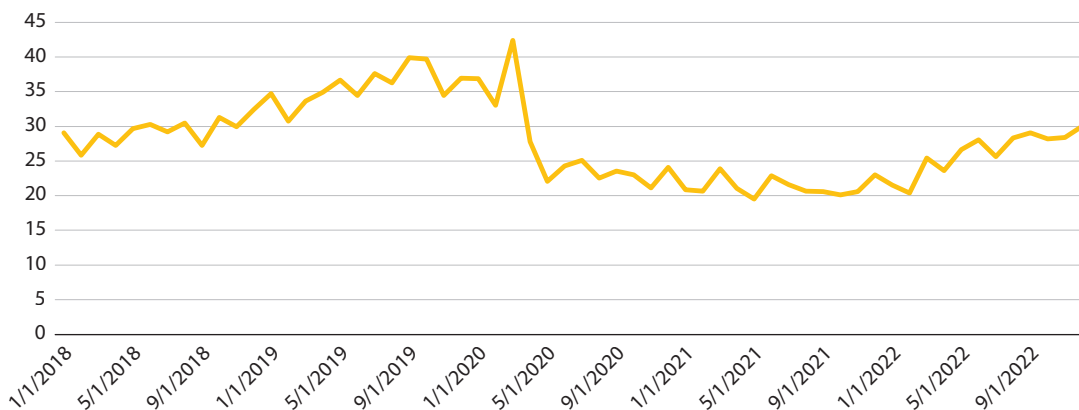
As already noted, there is an additional important caveat that must be borne in mind. If the fiscal dominance shock is a surprise to the market, the good news for government spenders is that a sudden and persistent inflation shock would reduce the nominal value of outstanding government debt, causing the government debt-to-GDP ratio to fall substantially, which implies a one-time increase in the capacity to issue new interest-bearing debt, taking pressure off of the need for inflationary money creation going forward. If this had been factored into the above examples as part of the way of funding the spending, it would have implied less of a need for inflation taxation and therefore, a lower rate of inflation. But it is also possible that fiscal dominance fears could grip the market too soon rather than too late. An early rise in the inflation risk premium would raise real rates prior to hitting the fiscal dominance constraint. A pre-fiscal dominance inflation risk premium would reduce the real value of existing debt, but also raise deficits through the higher interest on new debt and perhaps raise the debt-to-GDP ratio by reducing GDP growth (see Calomiris, 1993). As noted before, that could make hitting the constraint a self-fulfilling prophecy and also raise the amount of inflation tax needed to fund deficits. So expectational errors can cut both ways with respect to the above calculation.

It is very challenging to figure out how the *real* demands for currency and reserves would actually change if inflation rose. There is a lively debate going on right now in the US about which, if any, of the money demand concepts has a well-defined demand. Positing that there is a real demand for money (declining in our example as interest ceases to be paid on reserves) is not the same as asking whether “velocity” of reserve transactions is stable.  $MV = PT$ , or  $M = PT/V$  is always true definitionally.

Furthermore, the fact that  $V$  may move around a lot does not mean that the demand for money is nonexistent. “Velocity” is in fact highly variable as a result of  $PT$  variation. Consider the relationship between total Fedwire transfers and total reserves. First, note that the rise in Fedwire transfers reflects a big increase in the proportion of securities market transactions relative to goods-and-services-related transactions, as Peter Stella (2021) has emphasized. Driven by that boom in securities transactions, the annual value of payments effected through Fedwire, the primary US payments system, increased by



**Figure 1**  
**Monthly Fedwire Transfers / Reserves**



SOURCE: Board of Governors of the Federal Reserve System, Reserves of Depository Institutions: Total [TOTRESNS], retrieved from FRED®, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/TOTRESNS>. Fedwire® Funds Service; <https://www.frbservices.org/resources/financial-services/wires/volume-value-stats/monthly-stats.html>.

about 50,000 percent between 1957 and 2007: from \$1.3 trillion to \$670.7 trillion. At the same time, the reserves held as deposits by banks at the Federal Reserve, the funds used to make those payments, *fell* by about 37 percent: From \$22.1 billion in 1957 to \$14 billion in 2007. It's not just that velocity rose over time, it's that velocity is also highly unstable from day to day, from month to month, and year to year.

How does one model the real demand for reserves under today's policy environment? Banks need reserves today even though they are not required to hold a certain amount of reserves. The reason is that reserves are uniquely useful to clear all Fedwire transactions and remain scarce on the margin. This scarcity is clear on days when there are not enough reserves to clear all of Fedwire transactions, which has led to major headaches in global markets. Banks currently tell us that they face big penalties if their reserves fall short and are required to go to the Fed for additional reserves. In the current regime, reserves earn interest that is typically above the interest paid on Treasuries.

But the reserve demand function would change if the policy environment shifted. If interest on reserves were eliminated, the demand for reserves would likely become more stable, implying less volatility of reserve velocity. Paying market (or above-market) rates of interest on reserves makes reserves close substitutes for Treasuries: They differ only in their usefulness to execute payments, such as Fedwire transactions. In my opinion, this is a major contributor to the observed instability of the demand for reserves. Banks would seek to economize on reserves as much as possible and hold them only for the purpose of exercising transactions. The history of reserve demand in the 1930s (when Treasuries had near-zero interest rates) supports my view that the demand for reserves becomes much less empirically definable when there is little interest rate difference between Treasuries and reserves (Calomiris, Mason, and Wheelock, 2023).

Given the powerful inflation reduction that a large reserve requirement would imply (in our example, a decline from 16 percent to 8 percent), I think it is likely that a fiscal dominance shock would be accompanied by both the elimination of interest on reserves and a substantial reserve requirement (perhaps lower than 40 percent, but not so much lower that the implied rate of inflation would be permitted to rise too much).

If fiscal dominance results in a large increase in the reserve requirement, that means that the real shock to the profitability of the banking system would be greater than the shock related to the elimination of interest on reserves alone.

## CONCLUSIONS

As the result of the high current US government debt-to-GDP ratio and continuing projected deficits, we face a possible dollar inflation uncertainty nightmare: Continuing deficits, if unchecked, eventually will lead to a fiscal dominance problem. This problem seems likely, given the way Congress has behaved in recent years. A significant rise in long-run real interest rates also seems quite possible, given that the three decades of decline in real interest rates are poorly understood and may reflect temporary demographic influences. Such an environment would hasten the triggering of a fiscal dominance problem, leading to a messy monetization in the US, with ramifications worldwide.

Many things would likely change in a fiscal dominance scenario to make the inflation tax base larger to facilitate the funding of continuing deficits with less of a rise in inflation. Interest on reserves would likely be eliminated—otherwise, monetization would do little to relax the constraint on the government. Inflation would rise, potentially by a large amount, if that is the only policy used to create inflation taxation. If the elimination of interest on reserves were accompanied by a new large reserve requirement, inflationary consequences could be much lower.

If the bond market does not anticipate a fiscal dominance shock sufficiently far in advance (where the definition of “sufficiently far” is determined by the duration of bonds held by the public), then bond investors would be caught with losses on high-duration bonds. All of these changes imply that the effects on banks and mutual funds and pension funds and others would be potentially quite dramatic.

In the 1970s and 1980s, major financial disintermediation from banks accompanied the rise in inflation taxation because rising inflation reduced the real rate earned on bank deposits. Similar pressures to disintermediate banks could rise again as the result of a rise in inflation taxation. If that occurs, however, banks and their political allies will redouble their efforts to use regulation to protect the banking system from innovation and competition, as they have already been doing (see Calomiris, 2021). Ultimately, the US may face a political choice between reforming entitlement programs and tolerating high inflation and financial backwardness.

What bearing does the most recent debt ceiling agreement have on the prospects for fiscal reform to avert monetization and inflation? The agreement was largely beside the point because it focused on government expenditures that are not related to Medicare, Social Security, or defense spending. Indeed, by doing so, it reinforced the view that there is no appetite for addressing the exploding deficits that are being driven by those categories of spending.

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