International Money and Banking: 10. Monetarism

Karl Whelan

School of Economics, UCD

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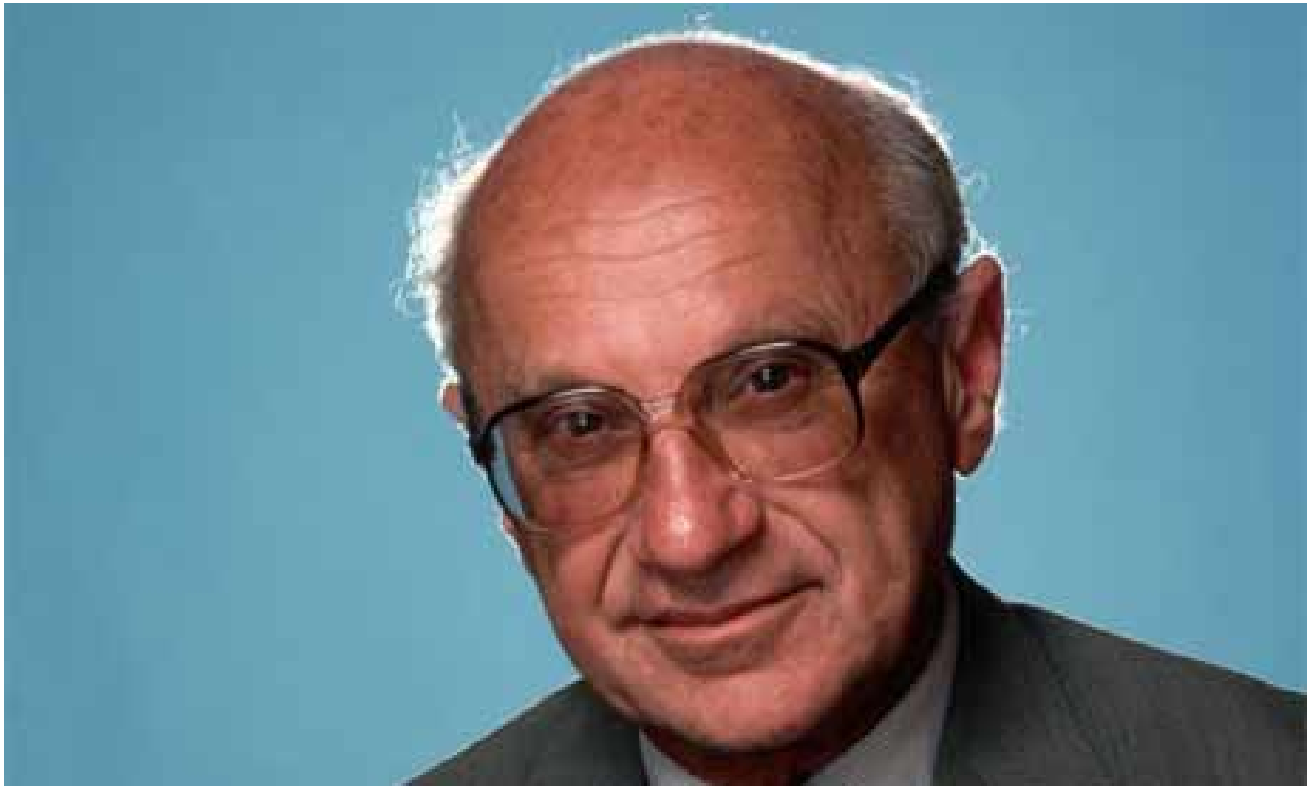
Introducing Monetarism

- Monetarism is a school of macroeconomic thought associated with Nobel prize winner Milton Friedman (1912-2006). Friedman was an incredibly influential figure in academic economics and public debate on economic issues. He was both an outstanding academic and a gifted communicator of economics to popular audiences.
- The essence of Friedman's monetarist thinking was that central banks should seek to control measures of the supply of money (such as M1) so that they grow in a steady predictable manner.
- Friedman's thinking stemmed from his hugely important 1963 book, *A Monetary History of the United States*, co-authored with Anna J. Schwartz.
- The book documented that the Federal Reserve had allowed the money supply to significantly contract during the Great Depression. Friedman and Schwartz judged this to be the reason for the severity of the depression and thus wanted central banks to focus more on controlling the money supply.
- I encourage you to read Friedman's 1970 paper "The Counter-Revolution in Monetary Theory" which provides a succint summary of his thinking about monetarism.

Milton Friedman



Why Care About the Money Supply?

- A useful term when thinking about the role of money in the economy is **velocity**. The velocity of money is defined as $V = \frac{PY}{M}$ where P is the GDP price index, Y is real GDP and M is the money supply.
- So velocity is the amount of spending over a given period (national accounts usually measure GDP over a year) that is supported by one unit of money.
- If velocity is constant, then nominal GDP is proportional to the money supply:

$$PY = MV \Rightarrow PY \propto M.$$

- Most economists believe in **long-run monetary neutrality** meaning the level of real GDP is independent of the amount of money that has been supplied.
- This would mean that, in the long-run, the price level is proportional to the money supply:

$$PY \propto M \Rightarrow P \propto M$$

- This idea is known as the **Quantity Theory of Money** was an important part of monetarist thinking.

Milton Friedman (1970) on Money and Inflation

8. It follows from the propositions I have so far stated that *inflation is always and everywhere a monetary phenomenon* in the sense that it is and can be produced only by a more rapid increase in the quantity of money than in output. However, there are many different possible reasons for monetary growth, including gold discoveries, financing of government spending, and financing of private spending.

Section 3 Examples: The Velocity Equation

If monetary velocity is 5, the GDP price deflator equals 2 and real GDP is 250, what is the money supply?

- The question tells us that $V = 5$, $P = 2$, $Y = 250$ and we know that

$$MV = PY \Rightarrow M = \frac{PY}{V} = \frac{2 * 250}{5} = 100$$

- Nominal GDP is PY. The velocity identity tells us

$$PY = MV = 100 * 5 = 500$$

If the money supply equals 100 and monetary velocity is 5, what is nominal GDP?

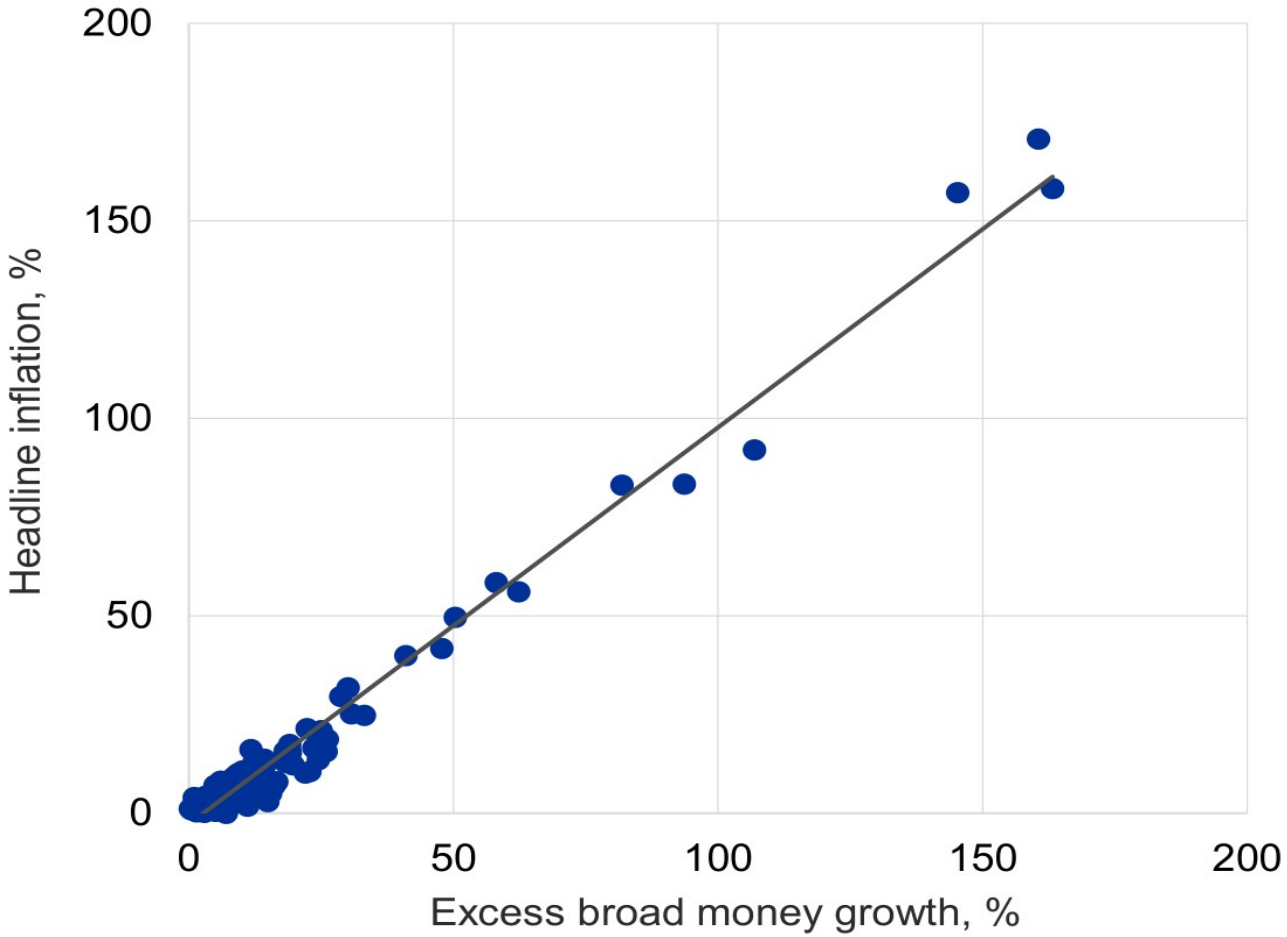
- Nominal GDP is PY. The velocity identity tells us

$$PY = MV = 100 * 5 = 500$$

Some Long-Run Evidence

- There have been many studies done on the relationship between the money supply and inflation.
- The chart on the next page is from a speech by ECB Executive Board member, Isabel Schnabel.
- It uses data for about 30 countries from 1951-2021 from a 2023 study by Bank for International Settlements economists, Claudio Borio, Boris Hoffman and Egon Zakrajsek.
- Each dot on the chart represents the average inflation rate and excess broad money growth rate for a decade. (Broad money means the M3 measure and excess growth means growth above the growth rate of nominal GDP).
- It shows a strong relationship between money growth and inflation over the thirty year period. Each dot represents the data on money growth and inflation for an individual country.
- One interesting pattern usually reported in studies like this is that regressions show the effect of money growth on inflation to be greater than predicted by the Quantity Theory: The coefficient on money growth is estimated to be greater than one.

Money Growth and Inflation: 30 Countries, 1951-2021



Velocity During Periods of High Inflation

- What explains the coefficient on money growth being greater one? The answer turns out to be that velocity tends to increase as inflation goes up.
- During periods of high inflation, people look to spend money as quickly as possible before it loses value.
- Let's go back to the identity $MV = PY$. This means the sum of the growth rates of money and velocity equals the sum of the growth rates of prices plus real GDP.
- Let the growth rate of a series X be denoted as G_X. Written in terms of growth rates, the quantity equation is expressed as

$$G_M + G_V = G_P + G_Y$$

- The increase in velocity during a hyperinflation explains why inflation increases more than one for one as money growth increases by

$$G_P = G_M + G_V - G_Y$$

As money growth increases, velocity also increases, further raising inflation.

Section 3 Examples: Velocity Growth Equation

Suppose monetary velocity is growing at 2 percent, the rate of change of the money supply is 3 percent and real GDP grows at 4 percent. What is the rate of inflation, as measured by the rate of change of the GDP deflator?

- The question tells us that $G_V = 2$, $G_M = 3$, $G_Y = 4$ and we know that

$$G_P = G_M + G_V - G_Y = 3 + 2 - 4 = 1$$

- Inflation is 1 percent.

Suppose monetary velocity is growing at 3 percent, the rate of change of the money supply is 5 percent and the GDP price deflator is growing at 2 percent. What is the growth rate of real GDP?

- The velocity growth formula tells us

$$G_P + G_Y = G_M + G_V \Rightarrow G_Y = G_M + G_V - G_P = 5 + 3 - 2 = 6$$

- Real GDP is growing at 6 percent.

Fiscal Sources of Hyperinflations

- Hyperinflation is defined as inflation above 50 percent per month.
- In countries with poorly developed tax systems or countries undergoing crises such as wars, central bank money printing often becomes the key source of government funding.
- I have made available a document that puts together information on five different hyperinflations from a nice CNBC web presentation "Top 5 Hyperinflations of All Time."
- I have also put up a link to a short paper by Steve Hanke and Nicholas Krus documenting various hyperinflations from world history.
- Most examples of hyperinflation have stemmed from central banks providing large amounts of financing to fund government budget deficits.

Short-Run Implications of the Quantity Theory

- Recall that if velocity is constant, nominal GDP is proportional to the money supply:

$$PY = MV \Rightarrow PY \propto M.$$

- So an increase in the money supply raises nominal GDP. This could take the form of only the price level increasing, only real GDP increasing or some combination of the two variables increasing.
- The idea of long-run monetary neutrality means that, in the end, only the price level increases after an increase in the money supply.
- However, Friedman accepted that, in the short-run, the supply of money increased real GDP with this increase being gradually reversed over time. See the next page for Friedman's thinking about how increases in the money supply produce a short-term boost to output.
- We will discuss Friedman's views on monetary neutrality more later in the course. For now, though, just understand that Friedman accepted that increasing the money supply was one way to boost the economy in the short to medium-term.

Milton Friedman (1970) on Money and Output

"One of the most difficult things to explain in simple fashion is the way in which a change in the quantity of money affects income. Generally, the initial effect is not on income at all, but on the prices of existing assets, bonds, equities, houses, and other physical capital. This effect, the liquidity effect stressed by Keynes, is an effect on the balance-sheet, not on the income account. An increased rate of monetary growth, whether produced through open-market operations or in other ways, raises the amount of cash that people and businesses have relative to other assets. The holders of the now excess cash will try to adjust their portfolios by buying other assets. But one man's spending is another man's receipts. All the people together cannot change the amount of cash all hold—only the monetary authorities can do that. However, as people attempt to change their cash balances, the effect spreads from one asset to another. This tends to raise the prices of assets and to reduce interest rates, which encourages spending"

Friedman's Skepticism of Activist Policy

- You might imagine that Friedman's views meant he favoured regular adjustment of the money supply in response to the state of the economy.
- However, Friedman was deeply conservative and skeptical of the role of government in the economy. He was the intellectual leader of the "Chicago school" of economists that emphasised the gains from free markets.
- So while he accepted that monetary policy could, **in theory**, be used to "fine tune" the economy in an activist manner, he stressed the difficulties of doing so **in practice**.
- Friedman emphasised how difficult it was to diagnose, in real time, what was going on in the macroeconomy and how tricky it was to design policies to respond to these.
- Ultimately, Friedman proposed that with the exception of responding to major shocks (such as wars and depressions) central banks should focus on increasing the money supply at a constant predictable percentage rate.
- See the next two pages for quotes from Friedman's famous 1967 presidential address to the American Economic Association.

Friedman (1968) on Monetary Policy

I have put this point last, and stated it in qualified terms—as referring to major disturbances—because I believe that the potentiality of monetary policy in offsetting other forces making for instability is far more limited than is commonly believed. We simply do not know enough to be able to recognize minor disturbances when they occur or to be able to predict either what their effects will be with any precision or what monetary policy is required to offset their effects. We do not know enough to be able to achieve stated objectives by delicate, or even fairly coarse, changes in the mix of monetary and fiscal policy. In this area particularly the best is likely to be the enemy of the good. Experience suggests that the path of wisdom is to use monetary policy explicitly to offset other disturbances only when they offer a "clear and present danger."

Friedman (1968) on Monetary Policy

My own prescription is still that the monetary authority go all the way in avoiding such swings by adopting publicly the policy of achieving a steady rate of growth in a specified monetary total. The precise rate of growth, like the precise monetary total, is less important than the adoption of some stated and known rate. I myself have argued for a rate that would on the average achieve rough stability in the level of prices of final products, which I have estimated would call for something like a 3 to 5 per cent per year rate of growth in currency plus all commercial bank deposits or a slightly lower rate of growth in currency plus demand deposits only.[6] But it would be better to have a fixed rate that would on the average produce moderate inflation or moderate deflation, provided it was steady, than to suffer the wide and erratic perturbations we have experienced.

Friedman (1960)

From *A Program for Monetary Stability* discussing constant money growth rules: *Like other academicians, I am accustomed to being met with the refrain, "It's all right in theory but it won't work in practice." Aside from the questionable logic of the remark in general, in this instance almost the reverse of what is intended is true. There is little to be said in theory for the rule that money supply should grow at a constant rate. The case for it is entirely that it would work in practice. There are persuasive theoretical grounds for desiring to vary the rate of growth to offset other factors. The difficulty is that, in practice, we do not know when to do so and by how much. In practice, therefore, deviations from the simple rule have been destabilizing rather than the reverse.*

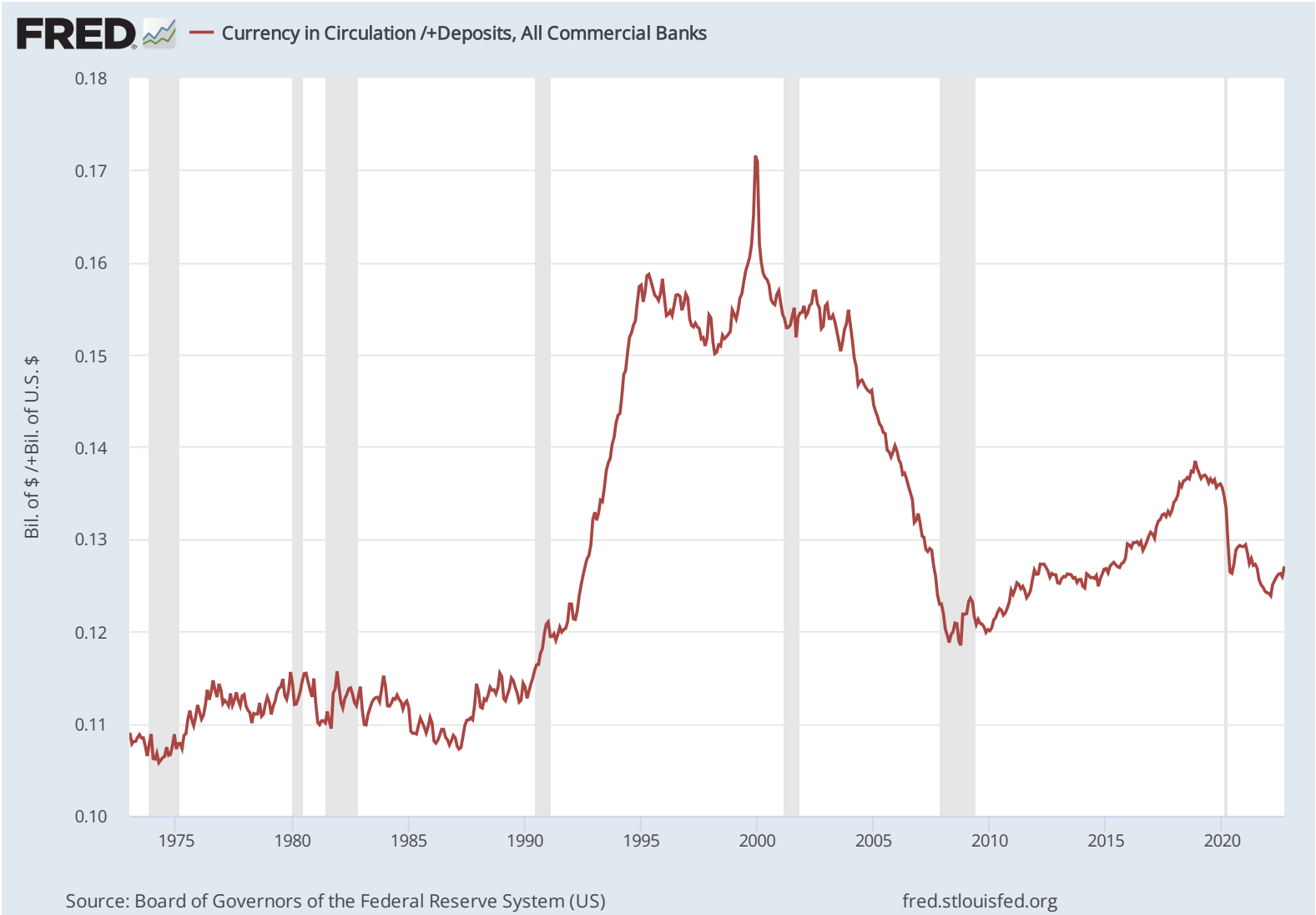
The Three Foundations of Monetarism

- Monetarism's policy recommendations rested on three different ideas
  1. **Predictable Money Multiplier**: It would be wrong to argue that monetarists believed in the simplistic version of the money multiplier presented in the previous lecture. But they did believe that changes in the money multiplier were predictable enough that central banks could adjust the monetary base to control the broader money supply.
  2. **Predictable Velocity**: Again, monetarists didn't necessarily believe the pure quantity theory, in which velocity was constant, but they did believe velocity was predictable enough to allow central banks to link the growth rate of nominal GDP to the growth rate of the money supply.
  3. **Money and Inflation**: For monetarists, inflation "was always and everywhere a monetary phenomenon" and central banks should expect a tight medium-term relationship between money growth and inflation.
- Here, we will show that none of these ideas ended up working well in practice.

The Money Multiplier Model's Banks Are Not Realistic

- The simple models of the money multiplier described in the previous lecture had a strange and restrictive view of the banking sector.
- For starters, the banks in the money multiplier examples never have any equity capital (which would be illegal in the real world.)
- But they also view the process of credit creation as mechanical. In the model, a bank that has excess reserves will always want to loan these to someone. But what if there is limited demand for credit from customers? What if the bank decides it wants to keep the money on reserve at the central bank.
- Many central banks have moved to paying interest on reserves, so the idea these are a bad asset that is worse than loans isn't necessarily always correct. They may earn a low interest rate but they have no credit risk and are useful for coping with potential liquidity problems.
- There may also be variations over time in the tendency of the private sector to use currency rather than deposits, which as we have seen, also affects the money multiplier.
- Taken together, these complications mean the link between the monetary base and the broader money supply is weaker than assumed by monetarists.

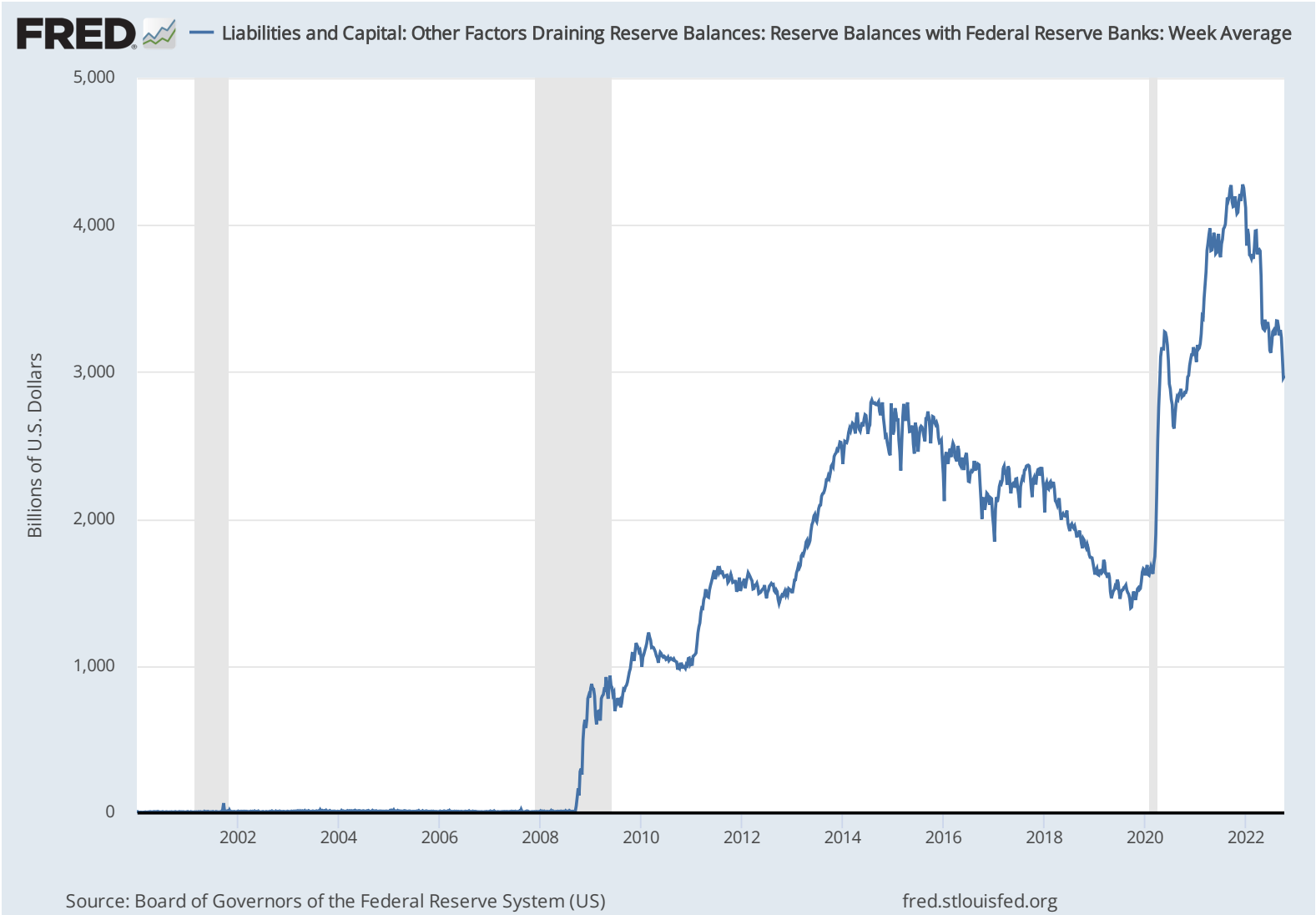
The Ratio of Currency to Deposits in the US



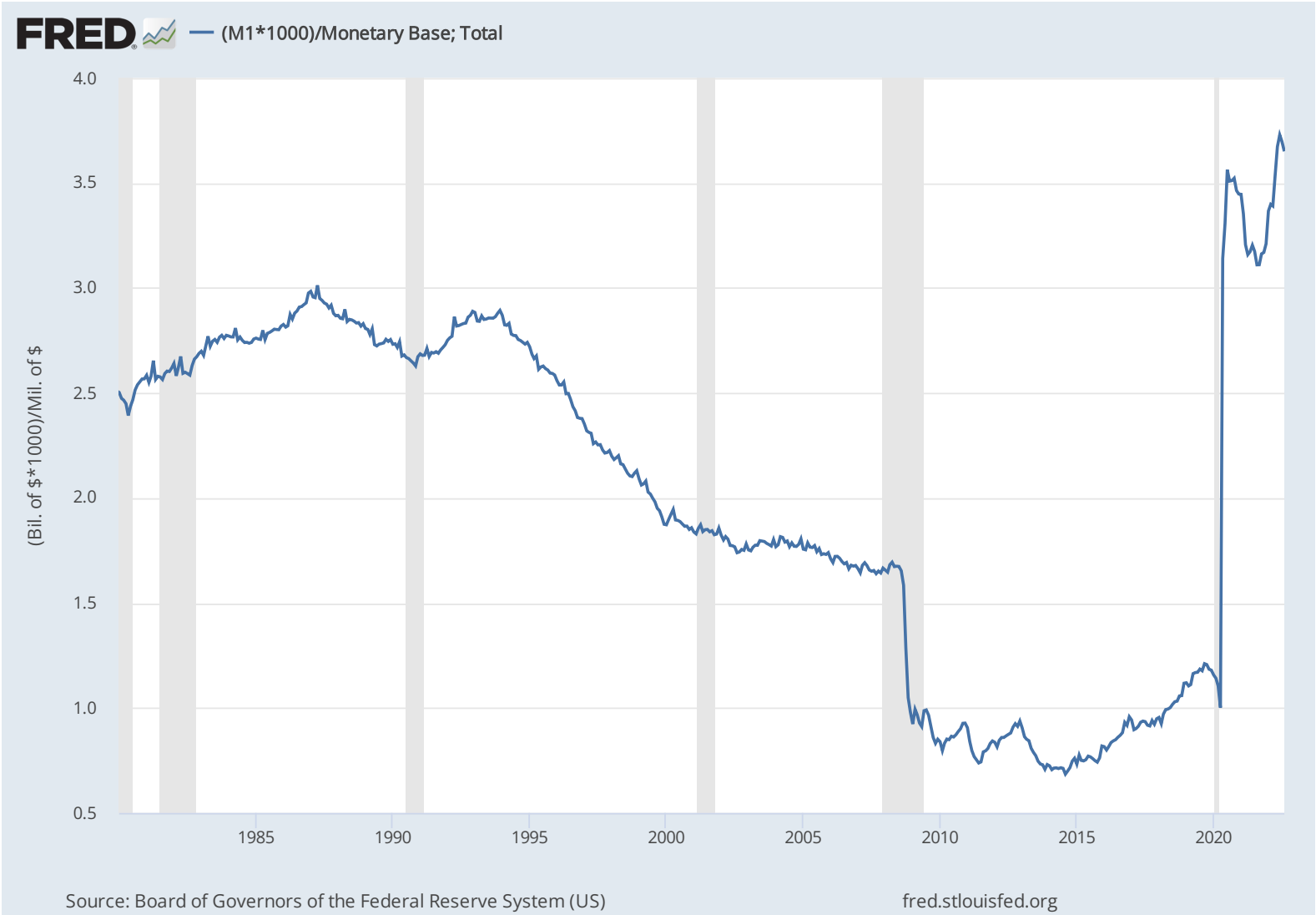
The Money Multiplier After QE

- QE programmes over the past decade have seen huge increases in the monetary base.
- During 2009 and onwards, these were not followed by proportional increases in M1 or other monetary aggregates, so money multipliers fell sharply when QE began, only partially recovering in later years: See the graph for the M1 multiplier in the US.
- One explanation is there was a significant increase in the desire by banks to hold central bank reserves. During the crisis years, this may have reflected a preference for low risk investments over investments with credit risk. Now it appears to reflect tougher liquidity regulations.
- In 2020, the Covid pandemic saw another big increase in reserves. However, in this case, the exact opposite happened. M1 jumped up by more than M0, bringing the money multiplier back above pre-crisis levels.
- The key point here: The money multiplier is not a fixed constant and how it behaves can depend on the circumstances of the economy. We cannot just assume a given increase in the monetary base will simply "multiply up" to give a broader increase in M1 or M2.

Reserve Balances of US Banks



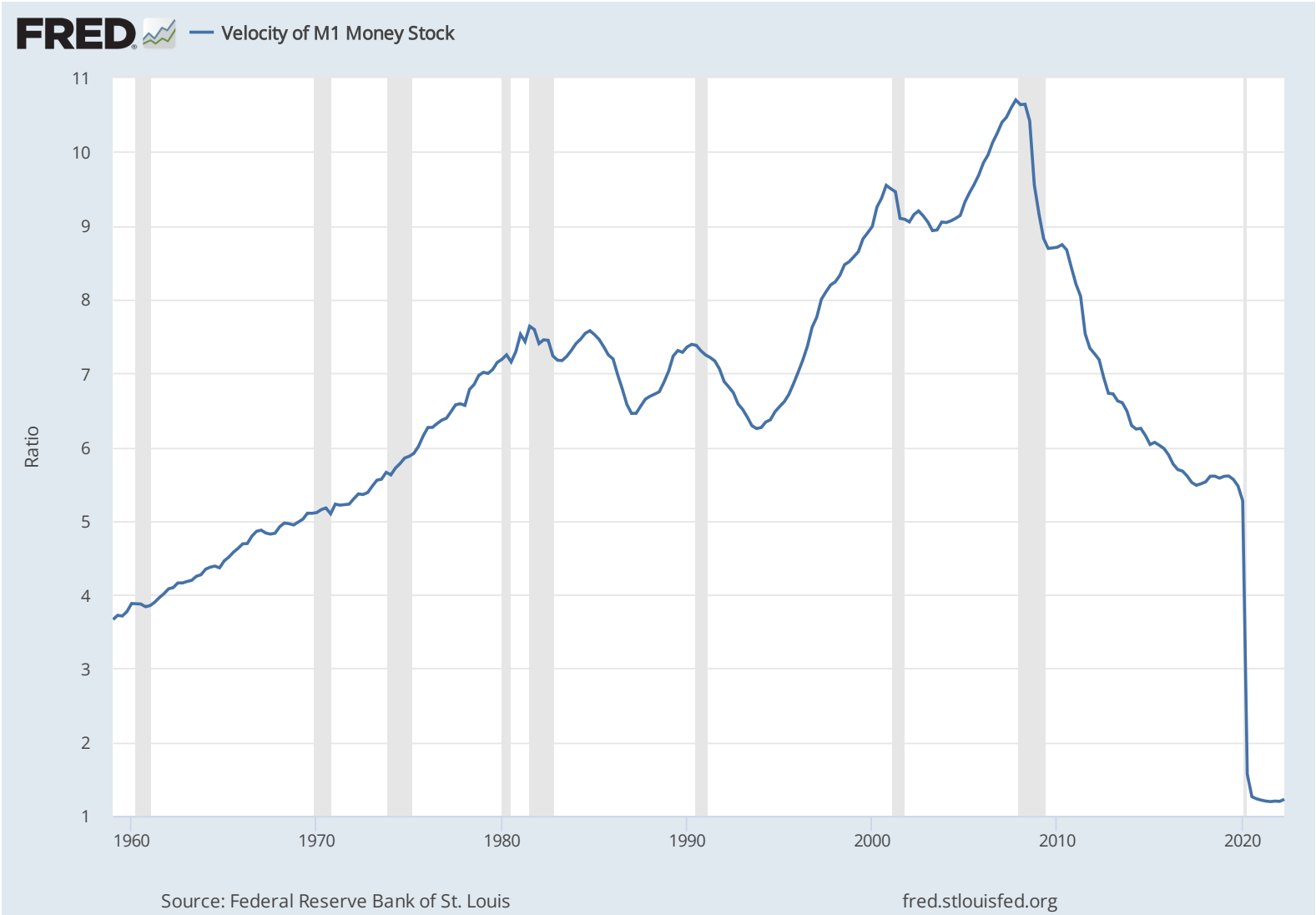
The M1 Money Multiplier in the US



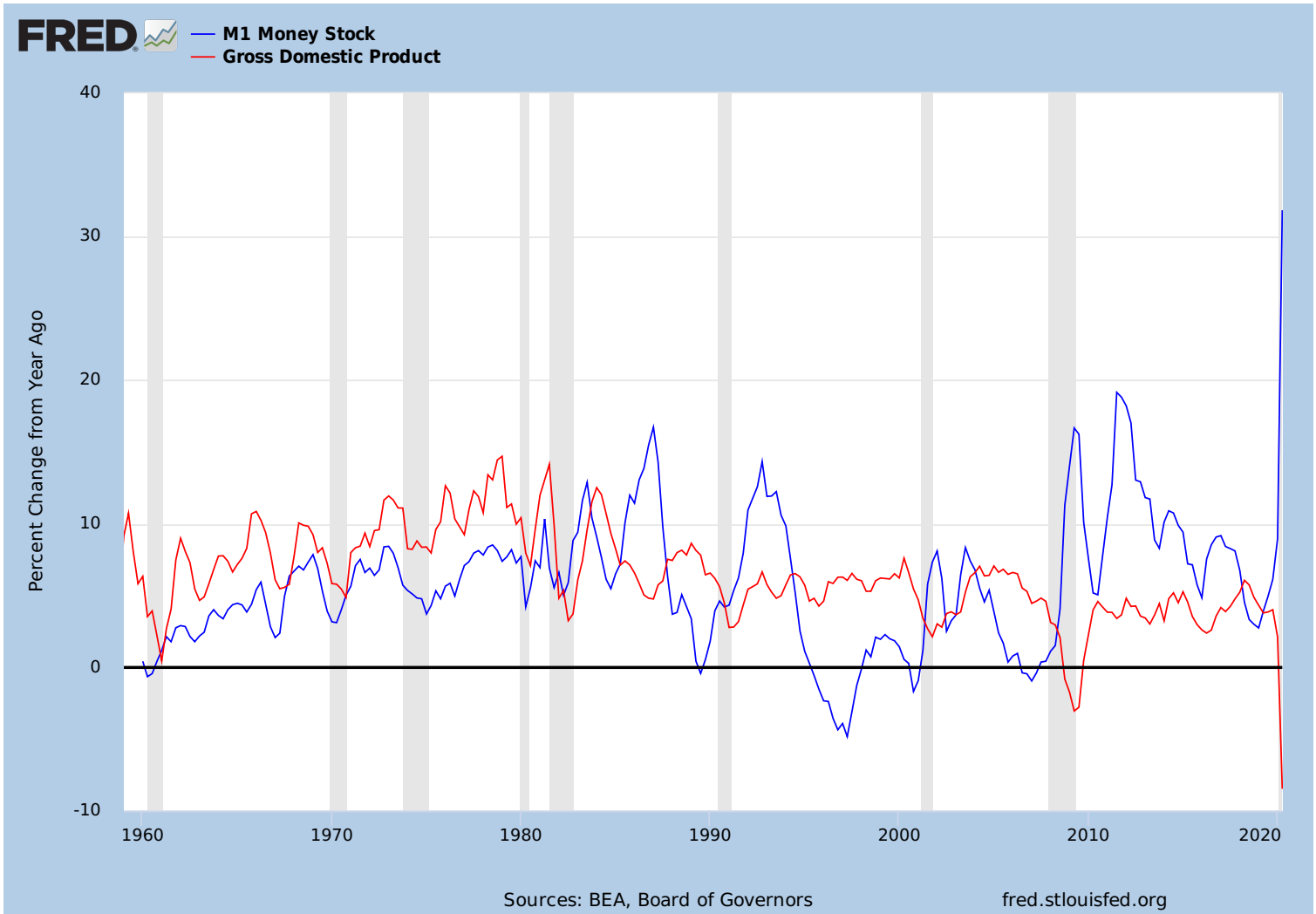
Example: Money and Nominal GDP in the US

- We described the quantity theory previously as based upon the assumption that velocity was constant. Now velocity is not constant but, recalling $MV = PY$, monetarists pointed out that you could control nominal GDP as long as velocity was **predictable**. If I know what V is going to be, then I can set PY by picking the right value for M.
- In the 1970s, M1 velocity was increasing but in a predictable fashion.
- In the early 1980s, the Federal Reserve adopted the monetarist policy of targeting growth in the money supply. However, M1 velocity trends immediately changed and this variable has been tricky to predict ever since, particularly around recessions. Velocity for the broader M2 measure has also been unpredictable.
- The relationship between money growth and nominal GDP growth, reasonably strong in the 1970s, has been weak since.

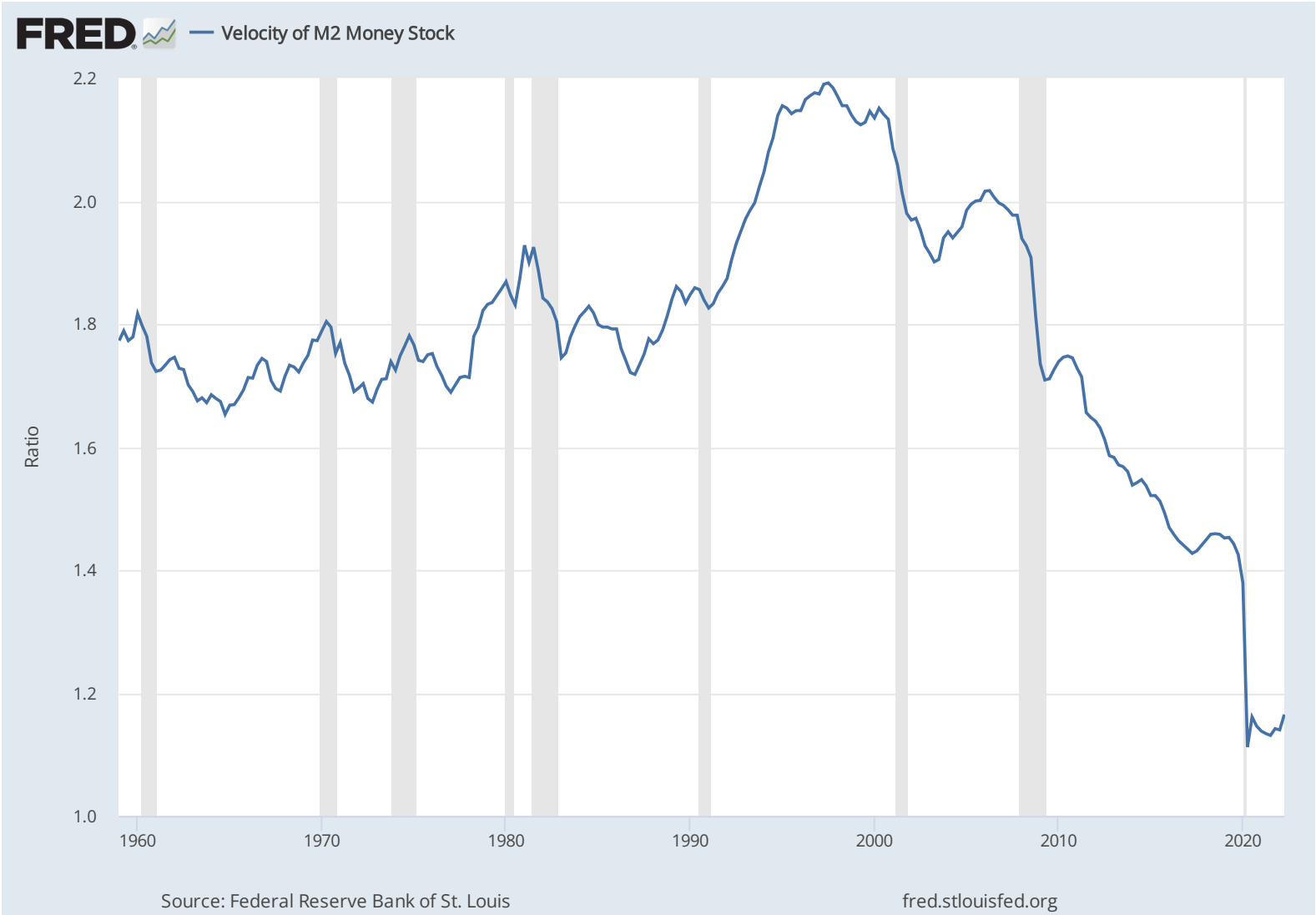
Velocity of M1 in the US



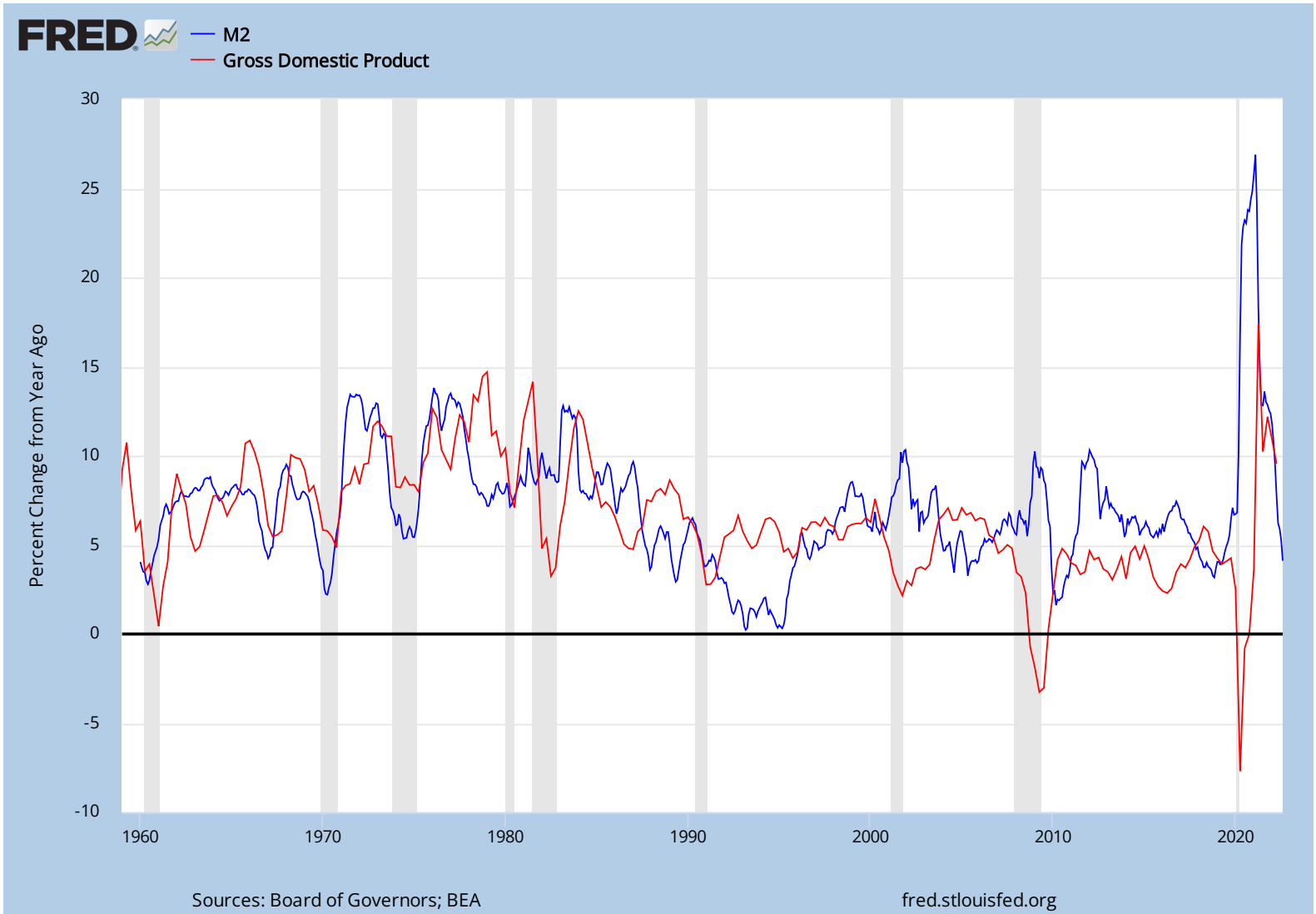
Growth Rates of M1 and Nominal GDP in the US



Velocity of M2 in the US



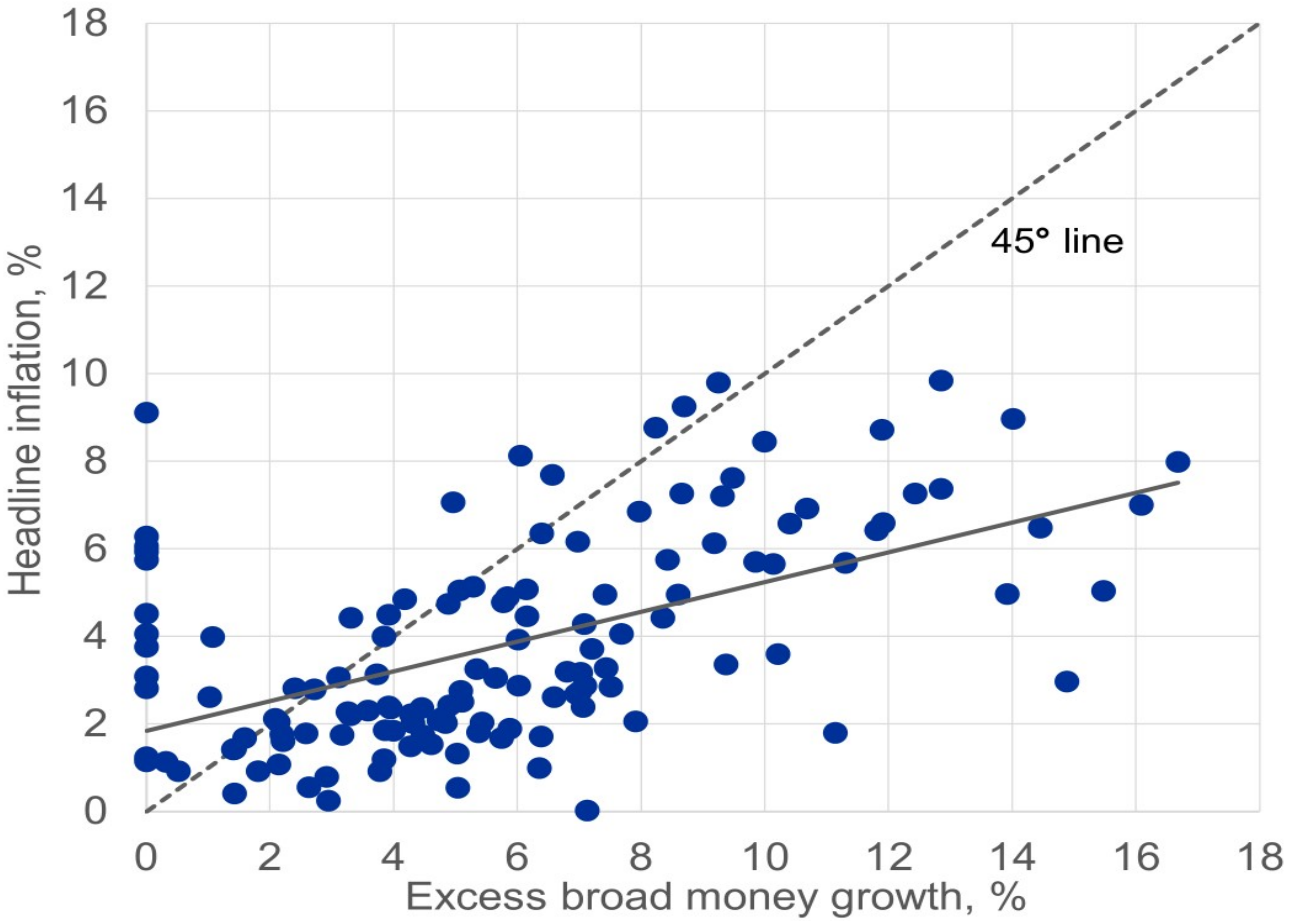
Growth Rates of M2 and Nominal GDP in the US



Excluding High Inflation Countries

- It isn't too surprising that countries that turn on the printing presses to pay for government spending end up with high rates of inflation.
- But is money growth the key to understanding inflation in the more normal environment of countries with proper tax-raising powers and that exhibit moderate rates of inflation?
- The chart on the next page (also from the Isabel Schnabel speech) shows the data from our previous chart restricted to periods with average inflation rates of below 20% per year.
- This relationship does not work so well. The overall fit is not too strong and there are plenty of counter-examples to the idea that money growth drives inflation (countries with high inflation but low rates of money growth and countries with high rates of money growth but low inflation.)
- This weak relationship calls into question whether a policy based on targeting specific growth rates of the money supply is always the right way to control inflation.

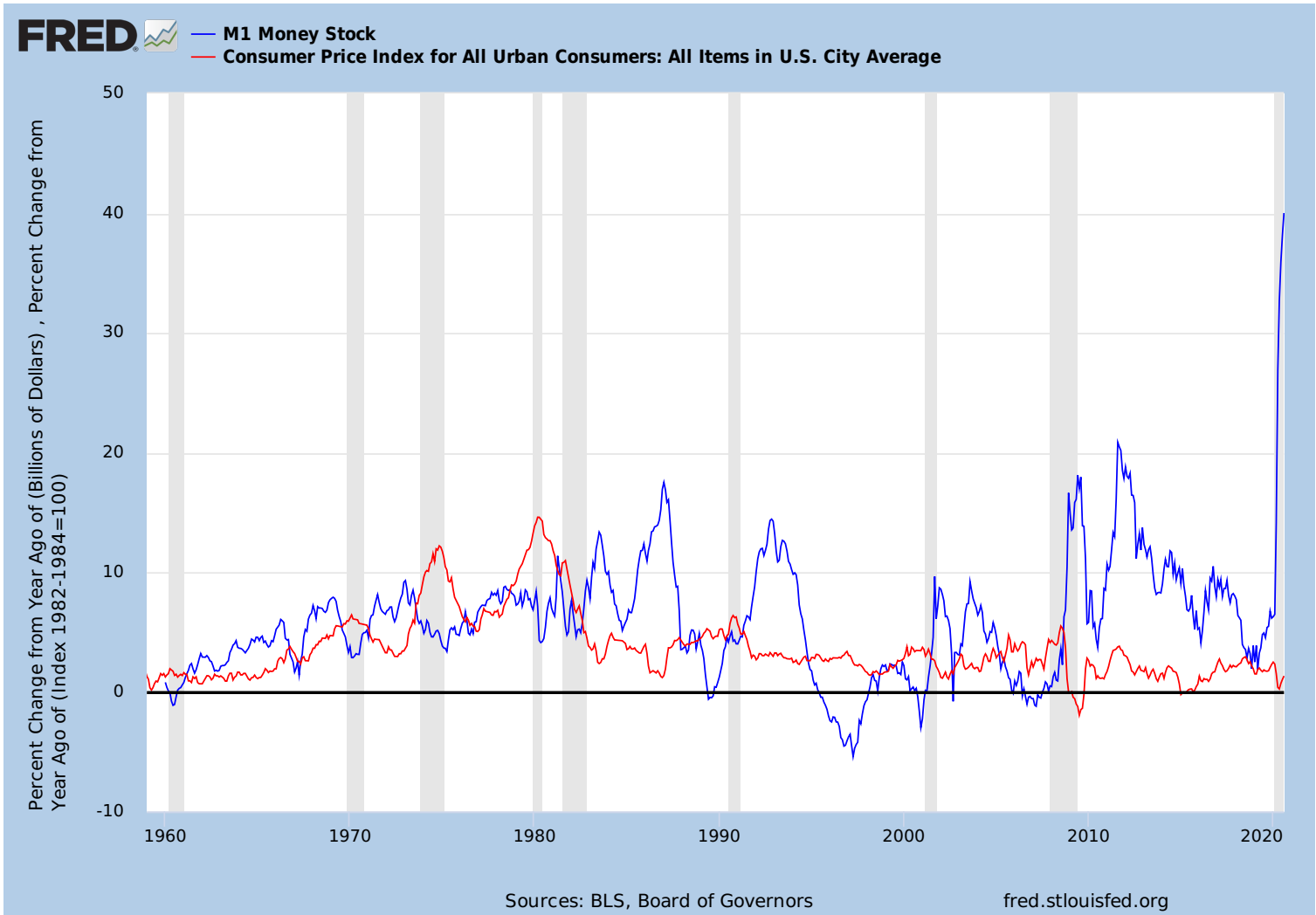
Money Growth and Inflation Below 20%



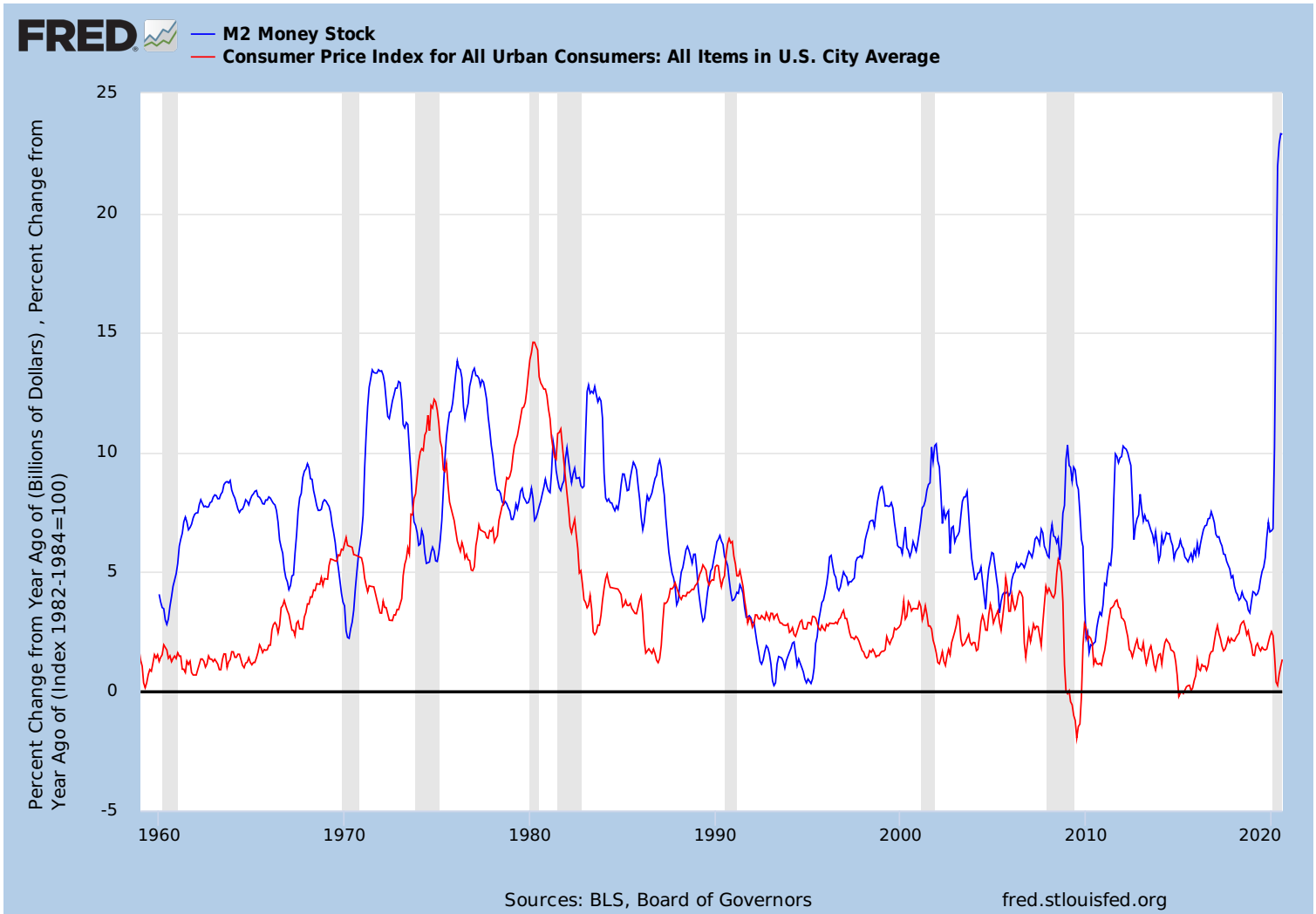
Example: Money and Inflation in the US

- Monetarists believe that central banks can control nominal GDP via setting the correct rate of money growth.
- In relation to how nominal GDP movements break down into real GDP growth and inflation, Milton Friedman was sceptical of the ability of governments to "fine-tune" the economy by controlling real GDP growth.
- He recommended steady growth in the money supply at a constant rate, believing that real GDP would tend to return to its natural level, so that money growth would determine the average rate of inflation.
- Friedman believed that variations in the rate of money growth also tended to destabilise the real economy, so that a constant money growth rule would also deliver a more stable path for real GDP.
- We now know that the link between money and nominal GDP growth is pretty weak these days.
- As for the relationship between money growth and inflation, the charts on the next few pages show that it is hard to find a good relationship between inflation and any US measure of money growth.

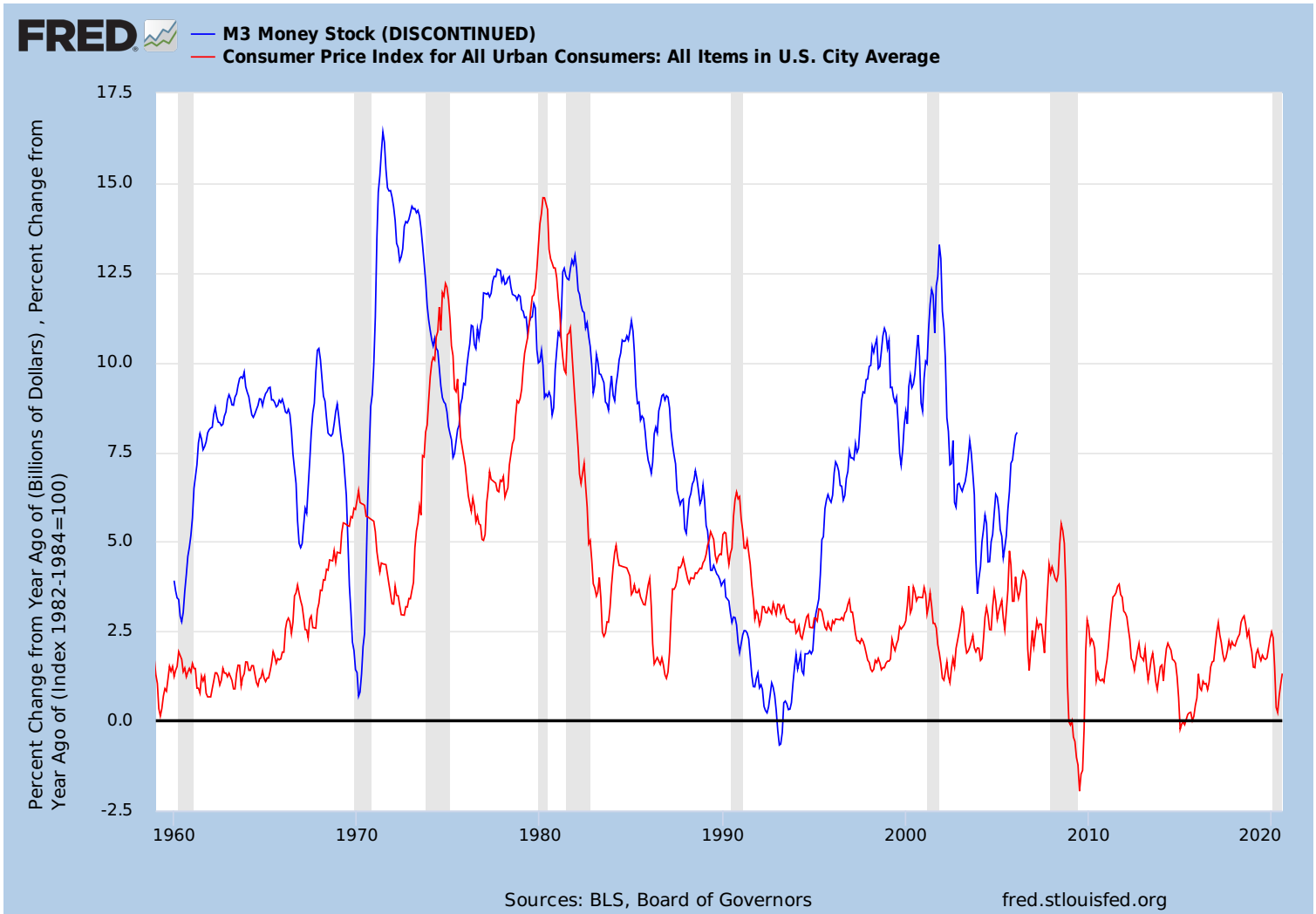
US Inflation and M1 Growth



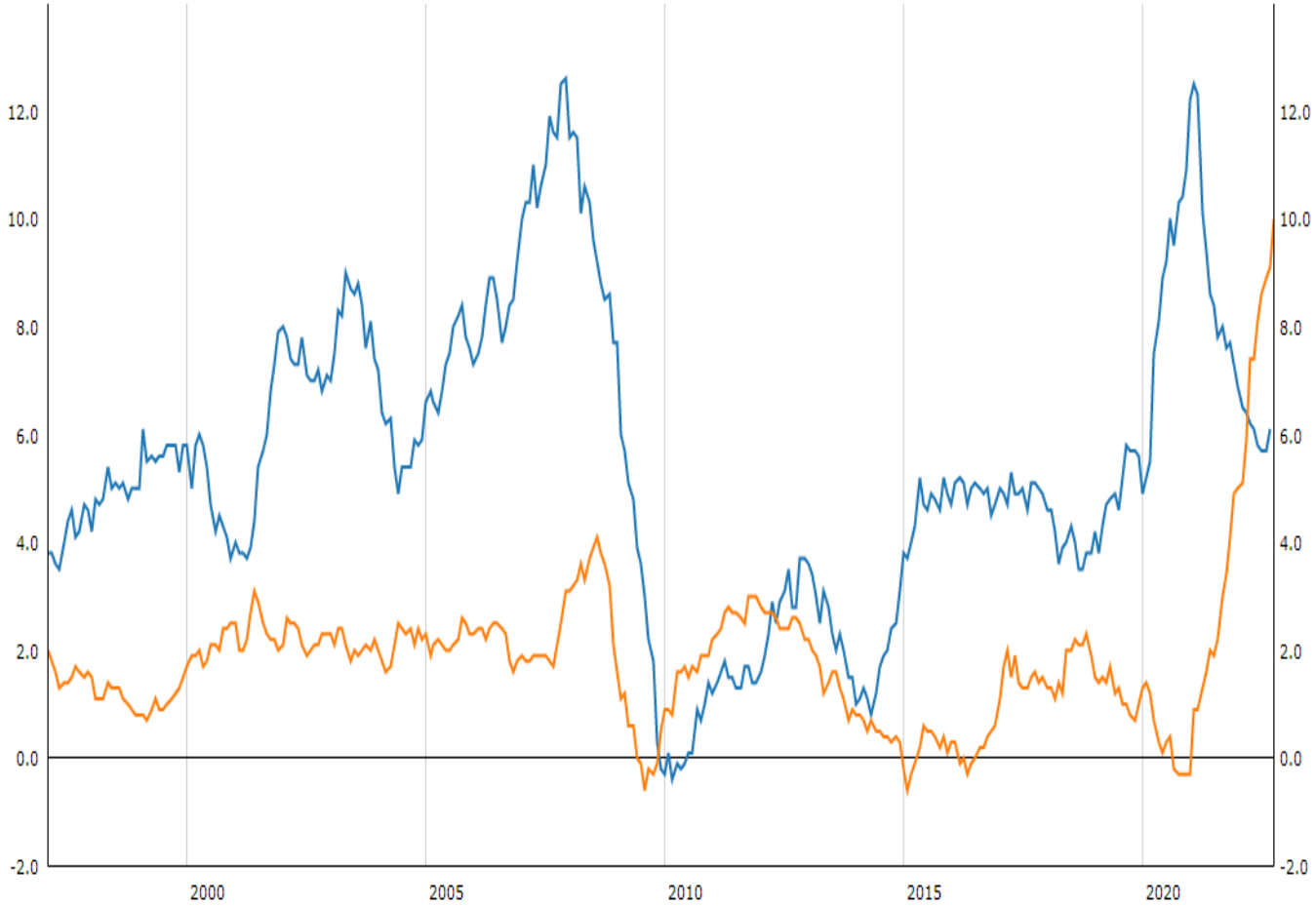
US Inflation and M2 Growth



US Inflation and M3 Growth



Euro Area Inflation (Orange Line) and M3 Growth (Blue Line)



Summary on Monetary Targeting

- To summarise, a policy of manipulating the monetary base with the aim of targeting the growth rate of the money supply is now generally considered a poor strategy for central banks for a number of reasons:
  1. **Uncertain Money Multiplier**: While central banks can control the monetary base, the relationship between this base and the money supply is uncertain and depends upon unpredictable behavioural elements in the banking system.
  2. **Uncertain Monetary Velocity**: Even if the central bank could control the money supply, the link between this and nominal GDP posited in the Quantity Theory requires that velocity be predictable. In reality, velocity has often been unpredictable.
  3. **Weak Link Between Money and Inflation**: Stable velocity and long-run monetary neutrality are supposed to lead to a tight relationship over time between inflation and the growth rate of money. In most modern economies, this relationship just isn't there.
- In addition, as we will discuss soon, evidence from the early 1980s showed that a policy of monetary targeting leads to sharp and volatile movements in short-term interest rates.

Key Points

1. Definition of monetary velocity.
2. The Quantity Theory of Money.
3. Cross-country evidence on money growth and inflation.
4. Milton Friedman's policy recommendations.
5. The three foundations of monetarism.
6. Why the money multiplier is not stable.
7. The evidence on money and inflation across countries at lower rates of inflation.
8. The behaviour of velocity in the US.
9. Evidence on money growth and inflation in the US and the Euro area.
10. Reasons why central banks do not apply monetary targeting.