

Price Stability: Is a Tough Central Bank Enough?

by Lawrence J. Christiano and Terry J. Fitzgerald

The objective of monetary policy, laid out in the Federal Reserve Act, is to “promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.” Many believe the Federal Reserve’s primary focus should be achieving stable prices, arguing that price stability is essential to attaining the companion goals of maximum employment and moderate interest rates.

How can price stability be achieved? Conventional wisdom offers a simple and straightforward answer: Make sure there is a tough, independent central bank with an unwavering commitment to price stability. According to this view, a tough central bank is all that is required.

Recently, however, an alternative view has challenged the conventional wisdom. In this new view, a tough, independent central bank is not enough to ensure price stability; an appropriate fiscal policy is also required, *no matter how tough the central bank*. Because fiscal policy plays such a prominent role in the theory underlying this view, it has been called the *fiscal theory of the price level*. Thus, we refer to it throughout this *Commentary* as the *fiscal theory view*.¹

Whether one accepts the conventional or the fiscal theory view has significant implications for the way central banks should conduct business. The traditional view has fostered the notion that central banks with a mandate to foster price stability should stay away from the fiscal authorities, to reduce their likelihood of being pressured into making poor decisions.

The fiscal theory view implies that central bankers must do more than just make sure their own house is in order: They must also ensure the fiscal authority adopts an appropriate policy. If this view is correct, then governments that seek to achieve price stability by focusing exclusively on establishing tough central banks may find price stability *impossible* to achieve—unless an appropriate fiscal policy is, fortuitously, in place.

This *Economic Commentary* describes the conventional and the fiscal theory views of price stability, discusses why their conclusions are so different, and examines U.S. inflation behavior in light of the two views.²

■ The Conventional Wisdom³

The conventional wisdom asserts that the price level is determined by the quantity of money supplied relative to the quantity of money demanded. If supply grows faster than demand, the price level must rise—that is, inflation results. Furthermore, inflation can occur only when the monetary authority expands the money supply too rapidly. But there is more to the story.

The Role of Fiscal Policy

At the heart of both the conventional and the fiscal theory views lies the simple observation that today’s government debt must be paid off with future government surpluses. Specifically, the current value of the government debt must equal the expected present value of future government surpluses. As we will discuss, the views differ as to how this condition gets satisfied.

How can price stability be achieved? Conventional wisdom says that a tough, independent central bank is all that is necessary. However, a new view—known as the fiscal theory of the price level—argues that an appropriate fiscal policy is also required, no matter how tough the central bank may be. Whether one accepts the conventional or the fiscal theory view has significant implications for the way central banks should do business.

Under the conventional view, the current real (that is, inflation-adjusted) value of the government debt—the nominal value divided by the price level—is a fixed quantity, because the nominal debt is given and the price level is determined in the money market. The government has two ways of generating surpluses to pay off the debt. It can collect more tax revenues than it spends—referred to as fiscal surpluses—or it can print more money, referred to as seignorage. Increases in seignorage are accompanied by increases in inflation.⁴

A Game of Chicken

The key observation of the conventional wisdom is that the fiscal authority controls one source of surplus, while the monetary authority controls the other. Therefore, a tension exists between the authorities over the amount each will contribute toward paying off the debt. If one authority announces it will collect very low surpluses, then the other has no choice but to collect large surpluses to

ensure fiscal solvency (that is, to pay off the debt). This situation is sometimes compared to the game of “chicken.” If one authority can convince the other that it will collect little surplus no matter what (it will not swerve), then the other authority is forced to relent and collect high surpluses (it must swerve).

Suppose the fiscal authority adopts a “loose” fiscal policy, reflecting a tax cut or an increase in expenditures, so that fiscal surpluses are reduced. Because today’s real government debt is fixed, simple arithmetic dictates the monetary authority must, sooner or later, increase seignorage to counteract the decline in fiscal surpluses. This increase in seignorage is accomplished by increasing the growth rate of the money supply, and thus it is accompanied by an increase in inflation.

Although the monetary authority may wish to maintain low money growth and low inflation, it has no choice but to increase money growth. It does have some discretion over the timing of the increase, so that inflation might rise sooner or later, or it may be spread out over time. But whatever the timing, if the fiscal authority reduces its surpluses, money growth—and thus inflation—must go up at some point.

The Conventional Answer—Yes (A Tough Central Bank Is Enough)

The same arithmetic suggests a solution to the inflation problem: Design central banks so they can credibly commit to not “swerving” when an irresponsible fiscal authority threatens to reduce future surpluses. Governments around the world have sought to implement this solution by making central banks independent and directing them to assign a high priority to inflation. With the monetary authority completely committed to a fixed value for seignorage (it will not swerve), the arithmetic forces the fiscal authority to adopt a consistent fiscal policy (it must swerve). This is the basis of the conventional view.

■ The Fiscal Theory View

According to the fiscal theory view, the conventional framework just described is not always appropriate. In particular, the price level is not always determined in the money market. Instead, the fiscal theory view asserts that the price level is sometimes determined in much the same

way as the price of Microsoft stock.⁵ This alternative view has dramatic implications for achieving price stability.

An Analogy to Microsoft

How is the price of Microsoft stock determined? According to standard theory, Microsoft behaves in a way that will maximize its profits, and the stock price reflects how much profit Microsoft is expected to generate for its stockholders. The key point is that the price of the stock responds so that it always equals the expected present value of future profits per share of outstanding stock.

According to the fiscal theory, the aggregate price level is determined similarly. Government policies imply a stream of future surpluses, and the price level reflects the expected value of this stream to bondholders. In particular, the price level is the level at which the current real value of the government debt equals the expected present value of future real surpluses.

Recall that under the conventional view, it is also true that the real government debt must equal the expected present value of future surpluses. The key distinction is that under that view, the price level (and thus the value of real debt) is determined elsewhere, so future surpluses must be adjusted with changes in the price level to ensure fiscal solvency. Under the fiscal theory view, the causation between the price level and surpluses runs in the opposite direction. Future surpluses are not calibrated to ensure fiscal solvency, just as Microsoft does not adjust its profits to justify changes in its stock price. Instead, the price level adjusts so that the real debt (stock price) is equal to whatever expected future surpluses (profits) are implied by the current policies (firm decisions).

Suppose the expected present value of real future government surpluses is represented as 10 billion apples. Further suppose the total nominal value of current government debt equals \$1 billion. According to the fiscal theory, the price level today must be 10 cents per apple, so that the real value of current government debt is 10 billion apples (1 billion divided by 0.1).

If the price level were not 0.1, but were 0.05 instead (5 cents per apple), then the current value of the government debt, in terms of apples, would be 20 billion. However, the government would generate surpluses of only 10 billion. People could get more apples by selling government debt and buying apples today (they could buy 20 apples for \$1) than they could by holding the government debt and waiting to collect the government surpluses (\$1 of debt would entitle them to 10 apples). People would choose the former, thereby driving up the price of apples.

Game Over

Consider again the game of chicken. Suppose that of the 10 billion apples owed by the government, the fiscal authority initially agrees to raise 9 billion in future fiscal surpluses, while the monetary authority agrees to raise 1 billion. Now suppose the fiscal authority adopts a loose fiscal policy that reduces future fiscal surpluses to 4 billion apples. According to conventional wisdom, this policy change, combined with the requirement of fiscal solvency, leaves the central bank with no choice but to swerve and increase seignorage to 6 billion apples, thereby increasing inflation.

But the situation is quite different under the fiscal theory. Now there is a third option for achieving fiscal solvency that is not envisioned in the game of chicken—the value of outstanding government debt can be reduced. This is accomplished through a jump in the price level. Rather than increasing seignorage to 6 billion apples, suppose the monetary authority hangs tough and refuses to increase seignorage. What would happen? Total expected future surpluses would fall from 10 billion apples to 5 billion. Nominal government debt would remain \$1 billion. But, unlike under the conventional view, the price level is free to adjust to equate the real value of the debt with expected future surpluses. In particular, this would occur if the price level jumped to 20 cents per apple, so that the current real debt would be 5 billion apples. Fiscal solvency does not require either authority to change its policy (that is, to swerve).

Under the conventional view, the change to a loose fiscal policy means the monetary authority has no choice but to increase money supply growth and, thus, inflation. This game of chicken is not played out in the fiscal theory—the monetary authority is not forced by fiscal solvency to adjust its policy.

Despite the fact that the monetary authority refused to budge in our example, the price of apples doubled! This increase in the price level occurs without the complicity of the monetary authority. That is the crucial distinction from the conventional wisdom—a tough central bank does not prevent the price increase.⁶

The Fiscal Theory Answer—No (A Tough Central Bank Is Not Enough)

Ironically, the disappearance of the game of chicken prevents a tough central bank from being able to achieve price stability on its own. Just as the monetary authority is not forced to swerve by a change in fiscal policy, a tough central bank cannot force the fiscal authority to swerve and increase fiscal surpluses.

In fact, the fiscal theory produces a striking, more general, result. When fiscal surpluses fluctuate unpredictably through time, the theory implies that it is impossible for the central bank to perfectly stabilize the variability of inflation, even though it can control the average rate of inflation.⁷ That is, the central bank cannot insulate the price level from unexpected movements in tax revenues and expenditures, no matter how tough and independent it may be.

How can price stability be achieved, according to the fiscal theory view? One possibility is to design fiscal policy to minimize fluctuations in the present value of future surpluses. Such a policy would limit the amount the price level must adjust from period to period.

A second way to achieve price stability, the one we focus on, makes use of the fact that with an appropriately chosen fiscal policy, a tough central bank can achieve price stability. What is an appropriate fiscal policy? It is a policy that ensures government debt will not grow too rapidly. The key point here is that a tough central bank is not enough for any fiscal policy, but it is enough for some policies. Thus, the fiscal theory view asserts it is crucial to be aware of the nature of fiscal policy.

Which View to Believe?

The key policy assumption of the fiscal theory is that it allows for fiscal policies such that if the real value of the government debt were to grow explosively, no policy adjustments would be made to keep it in line.⁸ In contrast, the conventional wisdom assumes government policy will always adjust to keep the debt in line. We can gain insight into the plausibility of each assumption by observing policies that have actually been in place when government debt has grown rapidly.

It seems clear that governments often stand ready to adjust fiscal policy when the debt gets large. For example, the Maastricht Treaty records the intention of European Union members to adjust fiscal policy in the event their debt grows too rapidly. Likewise, the International Monetary Fund uses an array of sanctions and rewards to encourage its member countries to keep their debt in line by suitably adjusting fiscal policy.

This may seem like the end of the story—toss out fiscal theory. But fiscal theory advocates do not claim that fiscal policies never respond to exploding debt. Instead, they argue that debt limitations such as those imposed by the Maastricht Treaty and the IMF are precisely the types of fiscal policies that allow the conventional wisdom to hold. The fiscal theory view provides a rationale for such policies—because without them, countries would run the risk of substantial price instability regardless of the central bank’s toughness and commitment.

Which View Explains U.S. Inflation?

Which view explains the historical and recent behavior of inflation in the United States? Inflation increased steadily through the 1960s and 1970s, peaked in the early 1980s, and has declined fairly steadily since. In fact, it has remained relatively low and stable since the mid-1980s. Conventional wisdom argues that the slowdown in inflation can be attributed to the policies of a tough, committed Federal Reserve—initially led by the unquestionably tough Paul Volcker and currently led by the equally committed Alan Greenspan.

The fiscal theory view does not dispute the Federal Reserve’s commitment to price stability over this period, nor its important contribution to achieving price stability; rather, it asserts that developments in fiscal policy have also played an important role in stabilizing prices. Some research supports the notion that the fiscal theory characterizes the behavior of inflation in the 1960s and 1970s.⁹ During the 1980s, however, fiscal policy changed dramatically as government debt increased rapidly and pressure mounted for tax increases or expenditure cuts to bring the debt back in line. The fiscal theory view can be used to argue that this change represented a shift to an appropriate fiscal policy under which a tough central bank could achieve price stability. Without the change in fiscal policy, price stability may not have been possible under any monetary policy.

Conclusion

Is a tough central bank enough to achieve price stability? Both the conventional wisdom and the fiscal theory view agree that it is a necessary ingredient. They differ in their analyses of whether a tough central bank alone is sufficient to achieve price stability, as in the conventional wisdom, or whether an appropriate fiscal policy is also necessary, as in the fiscal theory view. Resolving this disagreement will be of primary importance as nations worldwide seek to achieve and maintain price stability.

As for the United States, the fiscal theory view provides a warning that the current environment of low and stable inflation may not have been achieved by a tough central bank alone. If the fiscal theory view has merit, a renewed emphasis should be placed on “locking in” an appropriate fiscal policy.

Footnotes

1. A more thorough discussion of the issues presented here can be found in Lawrence J. Christiano and Terry J. Fitzgerald, “Understanding the Fiscal Theory of the Price Level,” Federal Reserve Bank of Cleveland, *Economic Review*, vol. 36, no. 2 (2000 Quarter 2), pp. 3–38.

2. In this *Commentary*, we assume that complete price stability is desirable. Some research suggests this may not be the case—some price variability may be desirable. In fact, one argument in the fiscal theory literature is that it may generate an optimal degree of price instability. See Christiano and Fitzgerald (2000) for a discussion of this point.

3. This discussion is based on the classic analysis in Thomas Sargent and Neil Wallace, "Some Unpleasant Monetarist Arithmetic," Federal Reserve Bank of Minneapolis, *Quarterly Review*, vol. 5, no. 3 (1981), pp. 1–17.

4. Here we assume the economy is on the "right" side of the Laffer curve, where seignorage is an increasing function of the inflation rate.

5. The Microsoft example is taken from John Cochrane, "Money as Stock: Price Level Determination with No Money Demand," National Bureau of Economic Research, Working Paper no. 7498, January 2000.

6. We follow Sargent and Wallace in thinking of the game of chicken as reflecting that the actions of the fiscal authority can force, as a matter of feasibility, the monetary authority to increase the money supply. Under the fiscal theory, the fiscal authority's actions may also affect the actions of the monetary authority, but this is a matter of the monetary authority's preferences and not feasibility. For example, the monetary authority may want to swerve in our example, even though it is feasible not to, because it may not like the outcomes when it does not swerve. Fleshing this out requires specifying the preferences and objectives of the monetary and fiscal authorities.

7. This result is due to Michael Woodford.

8. Exploding debt is not envisioned under the fiscal theory. The idea is that as long as there is absolutely no doubt about the government's commitment to not adjusting policy in the face of exploding debt, prices will respond so that the debt does not explode in the first place.

9. John Cochrane argues that the fiscal theory can explain the behavior of inflation over the entire postwar period in "A Frictionless View of U.S. Inflation," in Ben S. Bernanke and Julio Rotemberg, eds., *NBER Macroeconomics Annual*, Cambridge, Mass.: MIT Press, 1998. In a comment on that article, Michael Woodford indicates the fiscal theory may provide a good explanation for the 1970s, but he is more skeptical that it characterizes the 1980s and 1990s, in part for the reasons given in this *Commentary*.

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