Why Has Nominal Income Growth Been So Slow?

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Flexible Inflation Targeting as a Benchmark

By law, the Federal Reserve operates with a dual mandate: to stabilize prices and maximize employment. Because monetary policy stands alone as the sole determinant of the economy's long-run inflation rate, it is quite appropriate that the Fed has adopted a specific, numerical inflation target of two percent for its first objective. By contrast, a host of factors work to determine employment and unemployment and, for this reason, monetary policy can influence, but never fully control, the paths for labor market variables over any time horizon. Despite limitations on the ability of monetary policy to influence the unemployment rate, the Fed pursues its second objective by estimating the economy's natural, or long-run, rate of unemployment. And although the Fed acknowledges the considerable uncertainty that surrounds even this very best of estimates, it judges the stance of its monetary policy partly with reference to the gap between the actual rate of unemployment and the natural rate.

Lars Svensson (1999) calls the strategy that brings these ideas together "flexible inflation targeting." Flexible inflation targeting, therefore, is an approach to monetary policy that is consistent with the expressed wishes of the United States Congress and, by extension, the whole of the American people. Moreover, this strategy respects the scientific validity of the natural rate hypothesis, developed by Edmund Phelps (1967) and Milton Friedman (1968) in the 1960s. It recognizes that while inflation is always and everywhere a monetary phenomenon, the same cannot be said for unemployment.

During the 1970s, Robert Lucas (1972) and Thomas Sargent (1976) led a rational expectations revolution in macroeconomics that built on the earlier ideas of Phelps and Friedman. By describing the Phillips curve relationship between inflation and unemployment as a statistical one, Lucas and Sargent explained how unanticipated monetary policy actions drive those two variables in opposite directions but not in a way that offers a mechanical trade-off that the Fed can exploit in pursuit of its policy objectives. Flexible inflation targeting,

both in theory and as practiced by the Fed, acknowledges these scientific insights, too, by emphasizing the distinction between the central bank's constant, numerical target for inflation and its more tentative, and time-varying, estimate of the natural rate of unemployment. It does the same by stressing the importance of keeping inflationary expectations anchored at the long-run target even as the central bank pursues its more modest countercyclical objectives.

Finally, flexible inflation targeting as practiced by the Fed comes remarkably close to adhering to the Shadow Open Market Committee's (2014) own core beliefs. The entire strategy is based on the principle that monetary policy makes its best contribution to economic performance when it focuses first on price stability, defined by an average rate of inflation of not more than two percent per year. But it also acknowledges that monetary policy can and should be somewhat countercyclical, so long as price stability over the long run is not compromised.

The SOMC parts company with the Federal Open Market Committee in emphasizing the considerable advantages that accrue when the central bank announces a specific monetary policy rule and makes consistent reference to that rule when explaining its actions to Congress and the public. I, for one, also wish that FOMC members would place more of their emphasis on the inflation target and less on unemployment, so as to keep their focus on longer-run trends and help themselves resist the temptation to pursue too much fine-tuning. By operating without any known policy rule and by leaving unstated the weights it places on inflation, unemployment, and all other variables in formulating its policies, the Fed now appears to me to be adding to, rather than ameliorating, a widely-shared sense of heightened risk and uncertainty that is damaging our economy.

Nonetheless, I applaud the Fed's decision, under Chairs Bernanke and Yellen, to adopt an explicit, numerical target for long-run inflation because that target, by itself, acts as a

constraint on the discretion behind monetary policy decisions that, in the past, allowed the American economy to suffer through a prolonged period of high inflation during the 1970s and a sustained episode of deflationary stagnation in the 1930s. More broadly, as Taylor (1993) convincingly demonstrates, flexible inflation targeting has imposed a coherent structure on monetary policy debates and decisions for more than a quarter century, extending all the way back into the late 1980s. This is not to say that further improvements and refinements are impossible, but merely echoes Voltaire by warning that, in striving for the best, we should take care not to wreck what might already be good enough.

Nominal Income Targeting as an Alternative

But even if flexible inflation targeting retains its place as the dominant strategy for monetary policymaking, it can be useful to analyze and evaluate policy from an alternative perspective, if only to run a cross check that guards against serious mistakes. At this particular moment, in fact, nominal income targeting provides an especially valuable framework for taking a second look.

The advantages of nominal income targeting are several. First, the growth rate of nominal GDP can be viewed as an equally weighted average of its two components: real GDP growth and GDP price inflation. Thus, evaluations of monetary policy based on comparisons between the actual path of nominal income and a hypothetical target amount to judging whether the Fed is achieving both sides of its dual mandate. Second and related, focusing on real GDP instead of unemployment seems particularly useful today, when many analysts both inside and outside the Fed remained puzzled by the evolution of key labor market statistics. Specifically, the decline in the rate of unemployment from 10 percent at the depths of the Great Recession to less than five percent today normally would be a welcome sign of considerable improvement in the job market. Much of this decline, however, stems not from increases in the number of people employed but from declines in labor force participation.

Thus, the observed decline in the unemployment rate surely overstates the strength of the ongoing recovery. Dwelling on continued slow growth in real GDP might err in the opposite direction, by summarizing recent economic performance in a way that is too negative or pessimistic. But, this is exactly the point of a cross check: to make sure that policies that look good from one perspective still appear to be reasonable when examined from a different, and perhaps less flattering, viewpoint.

Third and most important, nominal income targeting does not depend on the stability of the Phillips curve relationship that is implicit in a flexible inflation targeting strategy and that, as suggested above, surely summarizes the FOMC's understanding of how inflation and unemployment are related in the short run. Classic work by Finn Kydland and Edward Prescott (1977) and Robert Barro and David Gordon (1983) shows how monetary policymakers can generate suboptimal outcomes, by attempting too much fine-tuning, when they place excessive faith in the Phillips curve as an exploitable relationship between inflation and unemployment. Furthermore, the recent behavior of these variables, both trending lower instead of moving in opposite directions, raises the more basic question of whether a useful statistical relationship between inflation and unemployment exists at present.

It is another advantage; therefore, that nominal income targeting is based on the quantity equation instead of the Phillips curve. By virtue of this fact, nominal income targeting can serve as a framework for examining Federal Reserve policy from an entirely different, monetarist perspective. To this end, Bennett McCallum (1988) credits James Tobin (1983) with the insight that the quantity equation, MV = PY, identifies nominal income as a "velocity-adjusted monetary aggregate." This adjusted monetary aggregate serves as an alternative indicator of the stance of monetary policy that is especially useful in gauging the effectiveness of the various unconventional actions the FOMC has taken to provide additional stimulus while its federal funds rate target has been at or near its zero lower bound since 2008.

An Overview of the Data

The top panel of figure 1 plots year-over-year nominal GDP growth from the beginning of 1990 through the end of 2015. Besides illustrating the severity of the Great Recession of 2007-2009 relative to its much milder predecessors in 1990-1991 and 2001, the graph also reveals that nominal income growth since 2010 has stabilized at a rate that is noticeably slower than its average over the period from 1990 through 2007. Specifically, average nominal GDP growth declines by 1.7 percentage points, from 5.4 percent for the period 1990-2007 to 3.7 percent for 2010-2105.

This comparison of average nominal income growth rates by itself, however, need not be interpreted as evidence that Federal Reserve policy has been insufficiently supportive of its long-run inflation objective. The principal weakness of nominal income targeting as a monetary policy strategy is that, when followed mechanically, it allows the inflation rate to move persistently in the opposite direction from any prolonged shift in real GDP growth. As a matter of fact, the middle panel of figure 1 reveals that the average year-over-year growth rate of real GDP falls by nearly a full percentage point, from 3.0 percent for 1990-2007 to 2.1 percent for 2010-2015. This, of course, reflects the disappointingly slow pace of the recovery much better than anything that can be found in recent data on unemployment.

What remains as yet unknown, however, is the extent to which this continued sluggishness in real economic growth can be attributed to different sources. Perhaps the persistent weakness in real growth stems mainly from supply-side factors, such as an exogenous decline in the rate of total factor productivity growth or an endogenous slowdown in the rates of physical and human capital formation brought about by non-monetary distortions. In this case, where the shocks turn out to be purely real, the Fed would deserve credit, not criticism, for allowing nominal GDP growth to decline as well because, had it not slowed the rate of nominal GDP growth, inflation could have eventually overshot its two

percent target. Alternatively, a persistent shortfall in aggregate demand stimulus, possibly associated with an overly restrictive monetary policy, could explain the lower rates of output growth. In this situation, the Fed could be criticized for not taking a more expansionary path.

To shed some light on these alternatives, the bottom panel of figure 1 shows that the average rate of inflation, as measured by year-over-year percentage changes in the GDP price deflator, has been running persistently *below* its pre-2008 average. By this reckoning, in fact, average inflation falls 0.7 percentage points, from 2.3 percent for 1990-2007 to 1.6 percent for 2010-2015. But because at least some of this inflation shortfall might be attributed to declining energy prices as opposed to monetary policy, figure 2 examines some additional data. The top panel of the figure plots the FOMC's preferred measure of inflation, based on year-over-year percentage changes in the price index for personal consumption expenditures, while the middle panel plots year-over-year percentage changes in the price index for the energy goods and services component of the PCE aggregate. These graphs show that, indeed, the most recent decline in energy prices has been even larger and more persistent that those that previously pushed inflation well below target in 1998 and 2002. Nevertheless, the bottom panel of figure 2, which zooms in on the most recent behavior of the PCE price index, highlights that inflation has run below the two percent target since the second quarter of 2012 – well *before* the collapse in energy prices began.

Thus, while other factors are likely to have influenced real growth and measured inflation as well, insufficiently accommodative monetary policy appears at least partly to blame for the prolonged slowdown in US nominal spending growth from 2010 through 2015.

What Went Wrong? What Needs Fixing?

Following Tobin and McCallum's lead by viewing nominal income as a velocity-adjusted monetary aggregate, the two panels of figure 3 dig more deeply into the contribution

of monetary factors into the shortfall in nominal GDP growth. The top panel plots the year-over-year growth rate of the Divisia M2 monetary aggregate compiled by William Barnett and his associates (2013) at the Center for Financial Stability, while the bottom panel plots the income velocity of the same measure of money. The figure shows that Divisia M2 velocity declined as interest rates fell during 2008 and 2009, a pattern consistent with most theories of money demand. More difficult to explain is the steady downward trend in velocity that has continued while short-term rates have remained at or near the zero lower bound. Richard Anderson, Michael Bordo, and John Duca (2015) attribute velocity's additional fall – correctly, I believe – to flight-to-quality portfolio shifts by savers in the aftermath of the financial crisis. If one assumes, in any case, that the FOMC could have taken further actions to expand the broad money supply without causing velocity to decline even further – which seems reasonable, since theories of money demand associated more rapid money growth with a decline in money demand and therefore, if anything, an *increase* in velocity – the case in favor of these actions becomes a strong one.

What the Fed actually accomplished through its actions after 2008, however, is another matter. The shaded areas in the top panel of figure 3 identify the timing of the three waves of large scale asset purchases, known more popularly as "quantitative easing," conducted by the Federal Reserve in order to call attention to a highly underappreciated fact: that while QE certainty succeeded in expanding the monetary base and the Fed's balance sheet enormously, it failed to generate consistent growth in the broader monetary aggregates. Divisia M2 growth, in particular, rose then fell during QE1, rose throughout QE2, and glided slowly but steadily downward during QE3.

If it had been desirable to support nominal income growth with more rapid monetary expansion but repeated episodes of quantitative easing did not achieve that objective, it is reasonable to ask what went wrong. From my perspective, at least two things explain this failure.

First, the Fed implemented QE at the same time that it began paying interest to banks on their holdings of reserves. The quantitative analysis in Ireland (2014) shows that there can be an enormous expansion in banks' demand for real excess reserves during the transition between an initial steady state in which the central bank does not pay interest on reserves and a new steady state in which the central bank pays interest on reserves at a rate that is below, but still very close to, its federal funds rate target. Because the central bank can accommodate this increase in reserves demand with an equally large increase in reserves supply without creating additional deposit growth or inflation, the implications of an interest-on-reserves policy seem clear. Friedman's (1960) arguments for economic efficiency still justify the payment of interest on reserves to eliminate the implicit tax on banks that hold deposits at the Fed. But, by choosing to initiate its interest-on-reserves policy during the financial crisis, the Fed engineered a large rightward shift of the demand curve for reserves at exactly the same time that flight-to-quality dynamics were already pushing the curve hard in that same direction. Here, traditional economic theory does not fail us. Instead, it makes clear that the Fed could have generated additional growth in broad money and nominal income if it had not chosen to work against itself by paying interest on reserves. But, having chosen this option, the Fed still could have conducted even larger waves of quantitative easing aimed at shifting the supply curve for reserves even farther to the right. Either way, the Fed had the tools necessary to produce faster money growth that would have supported a stronger recovery. And yet, for reasons unknown, it did not use them.

Second, quantitative easing as it was actually implemented and described by Federal Reserve officials often resembled a set of *credit market* interventions much more than a series of large-scale open market operations intended mainly to increase the growth rates of money, prices, and other nominal aggregates. In theory, for example, purchases of US government agency mortgage-backed securities with newly created reserves have the same effects as purchases of US Treasury securities on the monetary base and the broad monetary aggregates. Unlike open market purchases of Treasuries, however, large scale purchases of

mortgage-backed securities work to channel funds to a specific sector of the economy. Thus, QE as implemented allowed the Fed to play a new role that, in more normal times, should have been left to fiscal authorities. In this respect, QE as implemented engaged the Fed in policies of credit allocation, an endeavor that violates another core belief of the SOMC (2014).

These actions, with their fiscal consequences, might have been justifiable if they formed an integral part of a set of policy maneuvers directed at achieving the central bank's primary economic function: to stabilize prices in the long run. But, as shown in figures 1-3 and as argued above, the combination of policies chosen by the Fed does *not* appear to have accomplished that goal – at least not fully. Perhaps this is not surprising because, to the best of my knowledge, no FOMC member ever has described quantitative easing in terms of its effects on the broader monetary aggregates. Instead, the FOMC's emphasis remained squarely on the effects of QE on bond yields, asset prices, and "financial" – as distinct from "monetary" – conditions more generally. And the FOMC's obsession with asset prices continues even now that QE had ended: twice, in the past year, Committee members appear to have delayed their plans to raise the federal funds rate target because of stock price volatility in the US and China.

All this makes the Fed look somewhat guilty of a curious form of neglect. It has overstepped the limits of its mission by providing credit to specific industries and perhaps trying to place a floor beneath equity prices. At the same time, it has fallen short in providing the monetary expansion needed to bring inflation back, more quickly, to its two percent target. But the purpose of this critique is not to provide a complete assessment of what was, or was not, accomplished by the Fed's *credit* policies during and after the Great Recession. Instead, the purpose is to look forward and ask: what aspects of its *monetary* policy strategy needs to be fixed, so that the Fed can hit its inflation target and provide for adequate nominal GDP growth more reliably in the years to come?

Some suggest that raising the inflation target from two percent to three or four percent would help by making it less likely that the zero lower bound constrains the Fed's traditional interest rate policy during future cyclical downturns. But this approach also would impose higher costs in perpetuity: larger deadweight losses from the inflation tax itself and magnified distortions working through the rest of our still-not-fully-indexed income tax system. Others suggest that the Fed could do what the European Central Bank and the Bank of Japan have already done, implementing a regime of negative nominal interest rates if necessary during the next recession. Careful analyses by Marvin Goodfriend (2000) and, more recently, Matthew Rognlie (2015) make clear that this idea has merit, but also reveal that careful thought and planning would have to be applied to manage the institutional changes in the payments system that might occur in response to an extended period of negative nominal interest rates.

Perhaps there are more modest changes to existing practices and institutions that would yield many of the same benefits with fewer costs. Belongia and Ireland (2015*a*, 2015*b*, 2015*c*) describe strategies by which the Federal Reserve could use traditional open market operations to control the monetary base and tighten its influence over the broad monetary aggregates. These studies also present evidence that, by shifting its attention to the behavior of the monetary aggregates, the Fed could effectively pursue its standard objectives for inflation, unemployment, and nominal income even when the federal funds rate is at its zero lower bound. And, in more normal times, these strategies retain the advantage of allowing market rates of interest to fluctuate freely, together with all other asset prices, so as to coordinate more efficiently private saving and investment decisions, which are of course the key to rising productivity and living standards in the long run. Finally, these strategies draw on the principal lessons that Marvin Goodfriend (2014) distills from the first century of Federal Reserve history: that monetary and credit policies always work best when they follow simple rules and when they are separated by clear boundaries. These lessons deserve our attention when evaluating *all* proposed changes to FOMC policies and procedures.

Implications for the Near-Term Outlook

The top panel of figure 3 reveals that while repeated rounds of quantitative easing failed to generate consistent monetary expansion over the entire period during and after the Great Recession, growth in the Divisia M2 aggregate has stabilized at a rate of about six percent per year since 2013. With constant velocity, sustained six percent money growth translates directly into six percent annual growth in nominal GDP – more than enough to allow inflation to return to the Fed's two percent target.

The bottom panel of the same figure shows why nominal GDP has not kept pace with the faster rate of money growth: M2 velocity had continued to decline, even after most short-term interest rates reached their zero lower bound in 2008. An *upward* secular trend in velocity might be explained, along lines suggested by Michael Bordo and Lars Jonung (1987) and Ireland (1994), by appealing to institutional and technological changes that allow households and firms to make an increasing range of transactions electronically, without the use of currency or checkable deposits. A secular *downward* trend in velocity, however, seems much less plausible, as it would require the dollar value of monetary assets to grow, forever, at a rate faster than nominal GDP. Instead, Anderson, Bordo, and Duca (2015) probably are right: monetary velocity is likely to stabilize or even reverse course and begin to increase as the economy continues to recover, with interest rates rising and flight-to-quality dynamics unwinding in the years to come.

Thus, looking forward, a monetarist approach to policy evaluation provides reason to be cautiously optimistic that nominal GDP growth will soon accelerate, allowing for both faster real GDP growth and a return of inflation to its two percent target. This optimistic forecast, however, is conditioned on seeing money growth continue at something like its current pace. The top panel of figure 3 also makes clear that money growth has already declined, slowly but steadily, from 7.5 percent in the first quarter of 2013 to 5.8 percent in the

final quarter of 2015. From a monetarist perspective, these data indicate that policy began to tighten well before the FOMC raised its federal funds rate target last December. Further declines in the rate of broad money growth, especially against the backdrop of sluggish real growth and below-target inflation, would provide a clear and early warning that the FOMC needs to pause before raising rates further.

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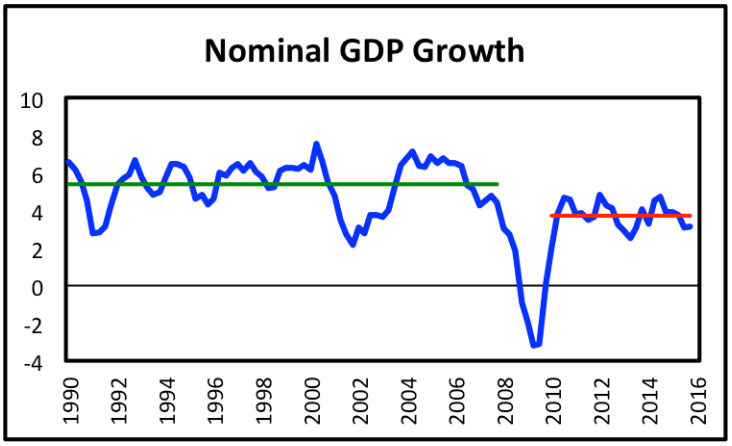
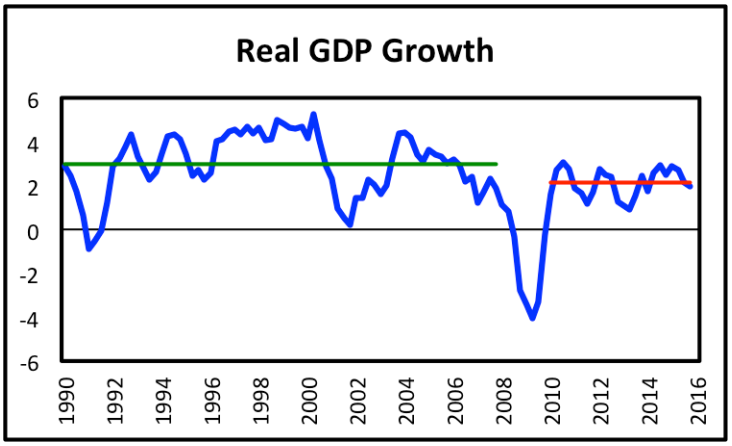




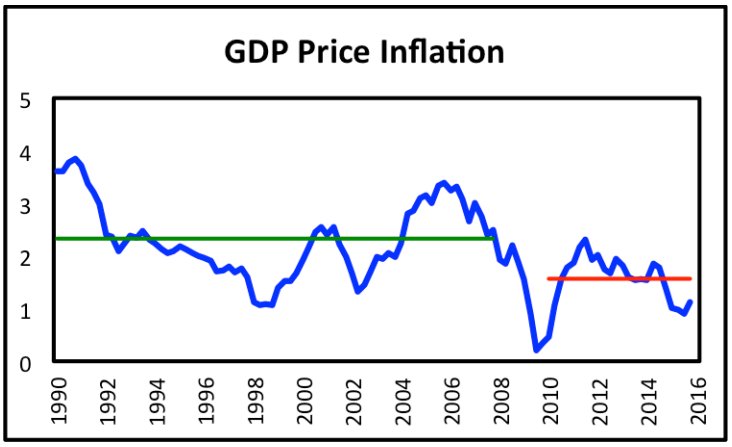
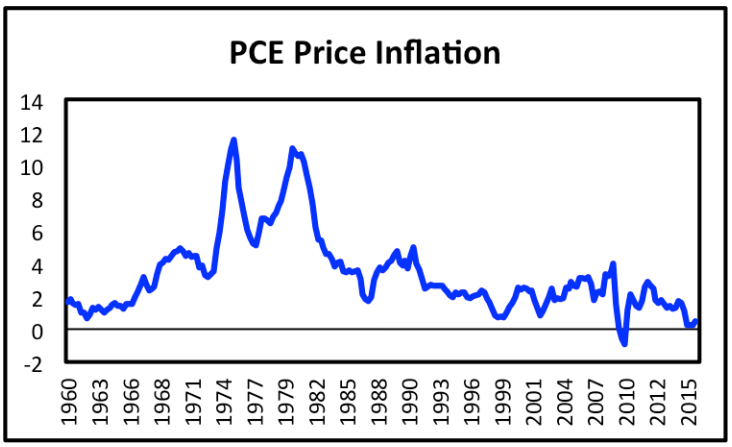


Figure 1. Nominal GDP Growth and Its Components. The top panel shows year-over-year percentage changes in nominal GDP; the middle panel shows year-over-year percentage changes in real GDP; the bottom panel shows year-over-year percentage changes in the GDP deflator. Green and red lines in each panel show averages for each variable from 1990 through 2007 (green) and from 2010 through 2015 (red). All series are drawn from the Federal Reserve Bank of St. Louis' FRED database.



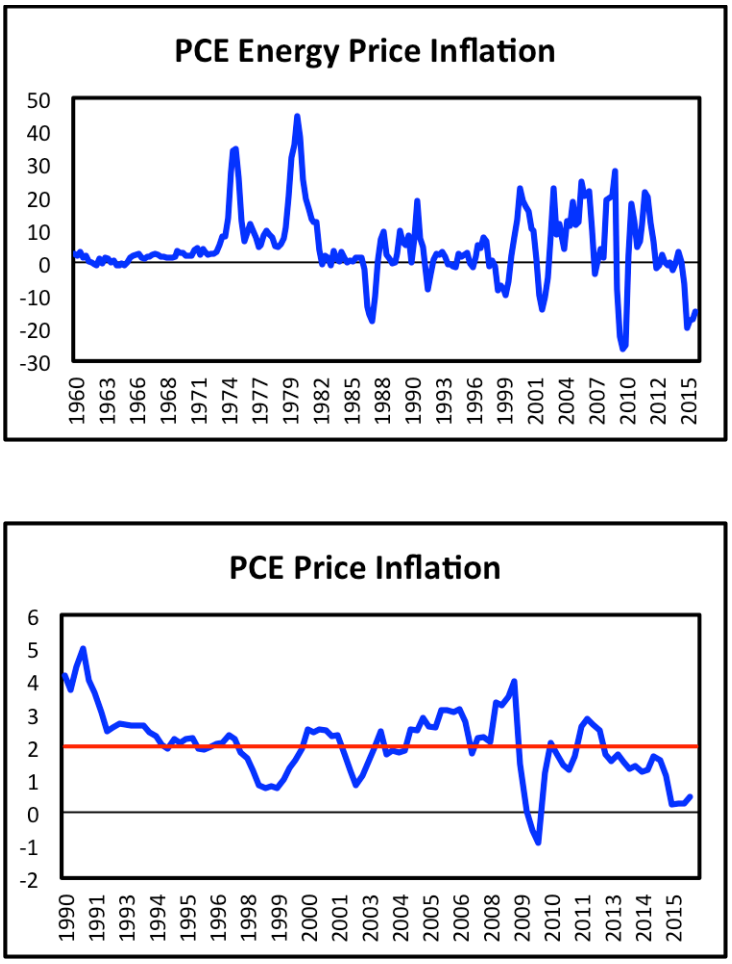


Figure 2. PCE and Energy Price Inflation. The top panel shows year-over-year percentage changes in the price index for personal consumption expenditures; the middle panel shows year-over-year percentage changes in the price index for the energy goods and services component of the PCE aggregate. The bottom panel shows the same data plotted in the top panel, but with focus on the period since 1990; the red line in that graph corresponds to the Federal Reserve's two percent inflation target. All series are drawn from the Federal Reserve Bank of St. Louis' FRED database.

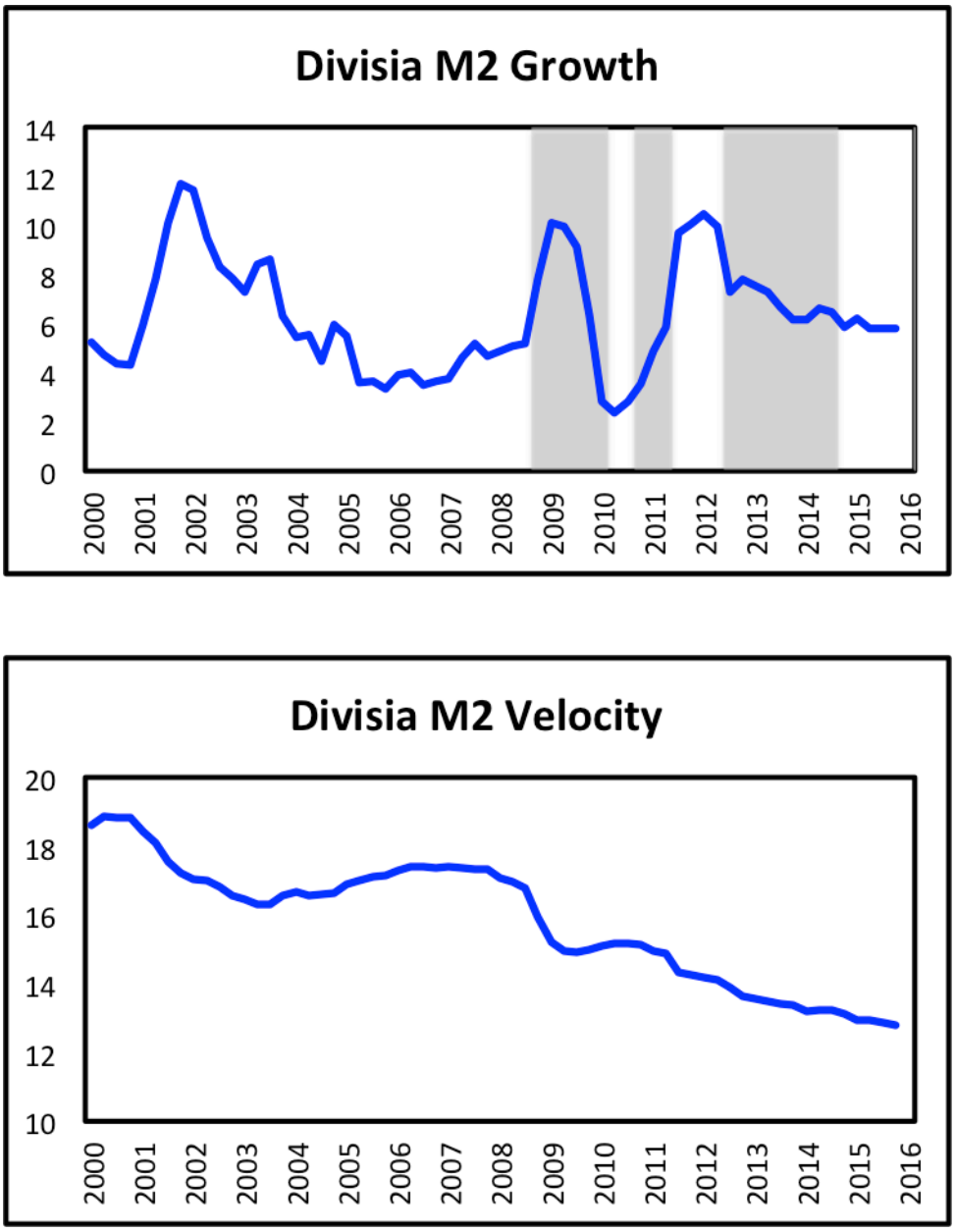


Figure 3. The Divisia M2 Monetary Aggregate and Velocity. The top panel shows year-over-year percentage changes in Divisia M2, with shaded areas corresponding to periods of Federal Reserve large-scale asset purchases, or "quantitative easing." The bottom panel shows the velocity of Divisia M2, computed by dividing nominal GDP (Figure 1, top panel) by Divisia M2 (this figure, top panel). The Divisia M2 series can be downloaded from the Center for Financial Stability's website and nominal GDP from the FRED database.