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When will the longest expansion end?

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Abstract What might cause the current expansion to come to an end? Without a negative shock, expansions go on and on. The economy is now enjoying even faster growth due to the tax cuts, the bipartisan budget deal, and the increase in the stock market. A reversal of the fiscal stimulus will not bring us to a recession, nor is a stock market collapse patently obvious, and the debt burden is not excessive. However, the Phillips Curve is not dead yet: inflation is on a slow, steady movement upward, and will be above the Fed's overly benign forecast. How the Fed reacts to higher inflation, and how financial markets react to what the Fed does will determine the severity of the next recession, but there will be recession starting sometime in 2021.

Keywords Business cycle · Recession · Productivity · Federal Reserve · Monetary policy

Today's topic is not whether the business cycle is dead, but whether we're going to have another recession. In making this evaluation, we want to distinguish between the factors that cause economic expansions to continue year after year in a regime of self-reinforcement from those factors that cause business cycles to come to an end. What is the process by which business expansions keep going year after year? What might cause the current expansion to come to an end?

Subsequently I shall provide a list of expansion killers and contemplate which of them, if any, will come occur this time. First in Fig. 1, we have the honor roll of business expansions. Over on the left is the current expansion, 112 months. And next to it at 120 months is the record-setting expansion of the 1990s, a full 10 years. Then after that are ranked the expansion of the 1960s and that of the 1980s under Reagan and Bush. We are currently at a golden moment in the economy, with a 3.9% unemployment rate and with both total and core PCE inflation at exactly the Fed's target of 2%.

Unemployment has fallen from 10% in the fall of 2009 to 3.9% currently. It has been at or below 4% for the last half year. How low can unemployment go? The current 3.9% is not the limit. The unemployment rate fell to 3.8% in the spring of 2000 and to 3.4% in 1968–69. There are currently 18 U.S. states that have unemployment rates of 3.5% or below. There are four sizeable states—Colorado, Wisconsin, Minnesota, and Virginia—that have unemployment rates currently of 2.9% to 3%.

Without a negative shock, expansions go on and on. They represent a virtuous circle. Why is that? Because when jobs are created, incomes go up. When incomes go up, people consume and raise income. Saving doesn't suddenly jump and absorb all that extra income. Then when people spend, that creates more expenditure and more jobs. And then we have more income, and more consumption, and more jobs. And it goes on and on. So something has to stop it, in order to have a recession. Figure 2 is a historic record of the last 10 years showing the four quarter growth in employment and the four quarter growth in real personal consumption expenditures. You can see on the left that in the great recession employment went down way more than consumption.

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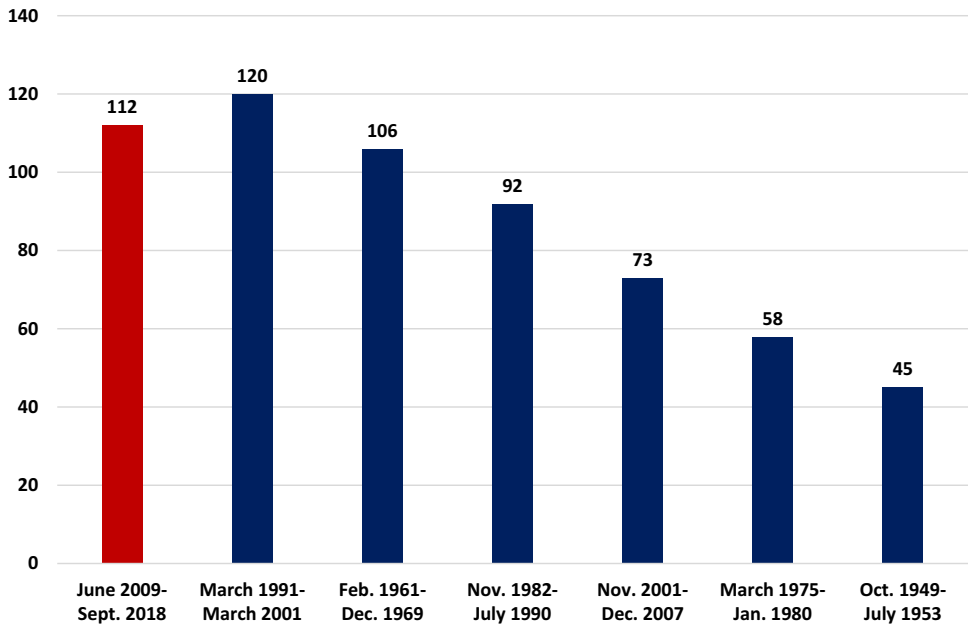

Fig. 1 Length of current expansion (months) relative to six largest recent expansions

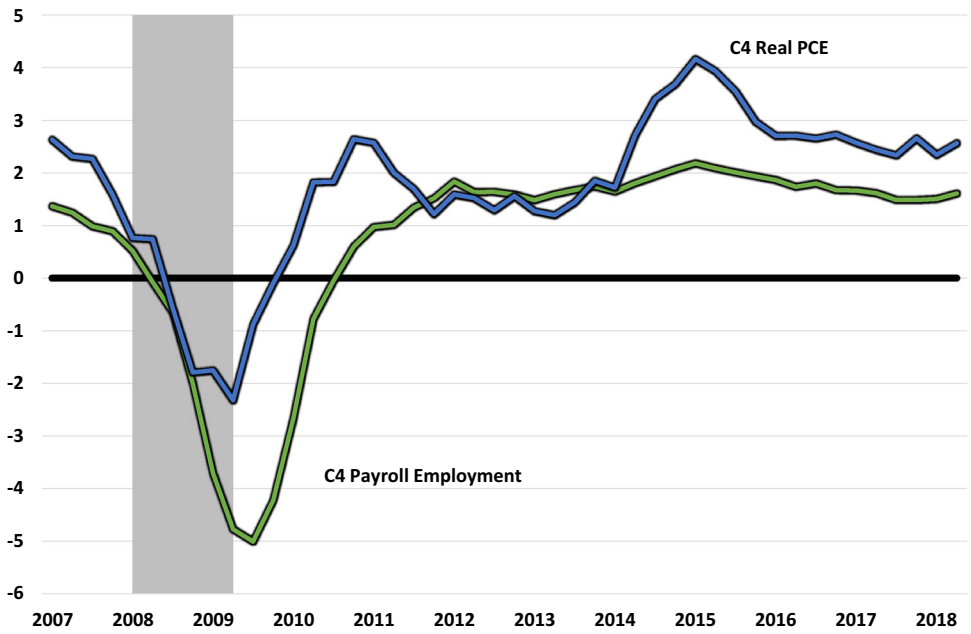

Fig. 2 Payroll employment versus real PCE, four quarter moving average of quarterly growth rate, 2007:1-2018:2

Consumption was buffered by fiscal policy and by automatic stabilizers. Since then, we see the incredibly stable growth of employment and that in the last 4 years consumption has been growing steadily more than employment, implying that consumption per employee has been going up. And the economy is now enjoying even faster growth due to the tax cuts which provided about $150 billion of stimulus.

Apply a relatively low multiplier and that implies an extra GDP growth in 2018 and 2019 of 0.3%. On top of that, we have the bipartisan budget deal, $300 billion spread over the next 2 years, that implies another 0.8% of extra growth. So 0.3% plus 0.8% adds to the steady 2.0% growth we had for so long, and we're up to 3%. But what does the fiscal stimulus do to the deficit? Figure 3 shows that, in past history, typically toward the end of expansions deficits decline, most notably in the late 1990s. What's unique about the current situation is that deficits are getting bigger very late in the expansion. The gray vertical bar in Fig. 3 is the 2007–2009 recession and the black vertical line is where we are now. Projecting out to the right of that thin vertical line is the CBO projection of the deficit-GDP ratio with current policies, and the implications are unprecedented.

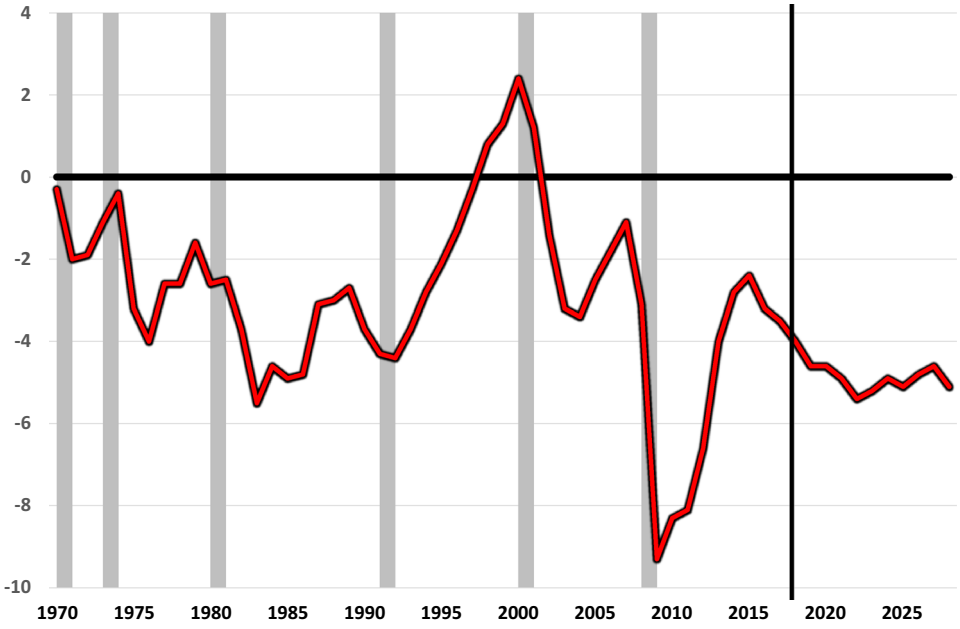

Fig. 3 Federal deficit as percent of GDP, 1970–2017 with 2018–2028 CBO projections

Figure 4 shows the implication, from the current vertical line, for the debt to GDP ratio, defining debt as that held by the public. That ratio is currently 78% of GDP, and the projection points toward 100% over the next decade.

Fiscal policy is not the only stimulus. Let's not forget the stock market.

Figure 5 shows the S&P 500 since 2007. If you look at the numbers, you'll see that the S&P since election day 2016 has gone up by 36%. That's an additional $7 trillion in wealth. How much would wealth have to raise consumption to boost GDP growth by half a point? The answer is 1.5 cents per every dollar of extra wealth. That's lower than many consumption functions suggest.

So as a very conservative number, the increase in the stock market that's already happened will raise GDP growth by half a percent. That brings us up from 2% to 3% for fiscal policy to 3.5% including the stock market stimulus. Now, take off something for net exports, because we know that a fiscal stimulus will tend to raise the dollar and decrease net exports. So let's shave our estimate to 3.25% for real GDP growth over the next four quarters.

To find a culprit that might bring the expansion to a halt, consider the list of what killed previous expansions. The

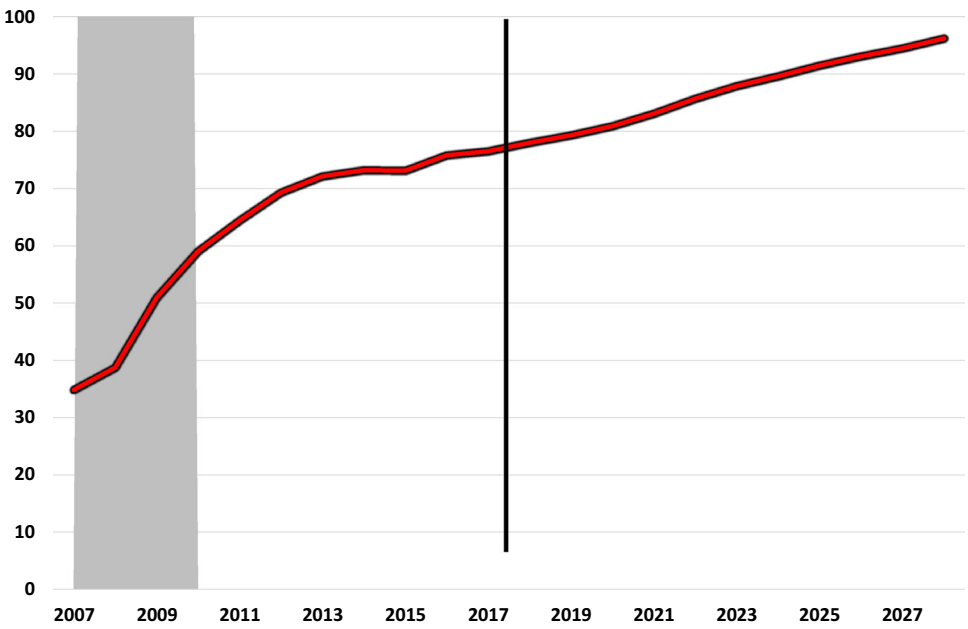

Fig. 4 Federal debt held by the public as percent of GDP, 2007–2018 with 2018–2028 CBO projections

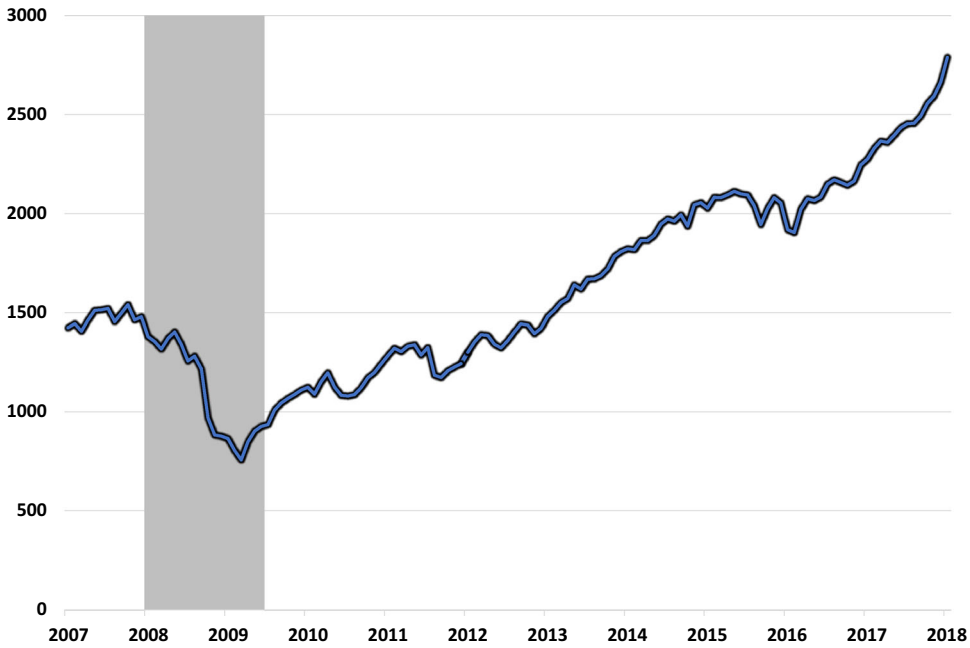

Fig. 5 S&P 500, 2007:1–2018:1

most frequent cause was tight monetary policy in the 1950s, the 1960s, and the late 1980s inflation led to sharp increases in short term interest rates. In addition, we had the oil shocks of the 1970s that caused particularly harsh tightening of monetary policy, most especially in early 1981 with Paul Volcker's 19% federal funds rate.

There were two other expansion killers without marked tightening of monetary policy. One was the end of the dot.com investment boom and the stock market bubble of the late 1990s. And then we had the bursting housing bubble and financial collapse of 2004–2009.

Let's now go beyond history and consider a list of current possible expansion killers. Very conveniently, Nouriel Roubini of NYU, often nicknamed Dr. Doom, has provided us with a list of 10 reasons he thinks that the U.S. economy is on its way to a recession and even a financial crisis. I've rearranged in numerical order his 10 reasons (Table 1).

Table 1 Nouriel Roubini (Dr. Doom): checklist for the next crisis

(1) (2) Fiscal and stock market reversal
(3) (4) Growth weakness in rest of the world
(5) Once growth stalls, risk of illiquidity
(6) Monetary policy and inflation
(7) Tariffs cut growth and raise inflation
(8) Tech transfer, immigration, no infrastructure
(9) Unpredictable Trump responses to slowdown
(10) Fiscal and Monetary Policy are handcuffed

The first two are a reversal of the fiscal stimulus and the stock market stimulus. The current fiscal expansion will be reversed—in the sense that the bipartisan budget deal terminates automatically in late 2019. And a plateau of stock market values would mark an end to that particular form of stimulus.

Then the next two Roubini killers are slower growth in the rest of the world, including the potential for an emerging markets crisis as occurred in 1997–98. This might create a crisis of liquidity, which is number five on Roubini's list. Number six is the interplay between monetary policy and inflation, which I'll discuss subsequently. Number seven is the effect of tariffs on economic growth and raising inflation. Number eight is all the negative things the administration is doing to growth—starting with the interference with technology transfer, plus hindering purchases of domestic companies by foreign companies, the potential harsh limits on legal immigration, and the absence of any constructive plan for infrastructure.

Number nine on Roubini's list is that Trump panics when he sees the economy actually does slow down and does something unpredictable. And then finally, we have number ten, that is monetary and fiscal policy are going to be handcuffed in the next episode, as compared to their latitude that they had in 2007 and 2008.

What about the reversal of the fiscal/stock market stimulus? If we just have the fiscal stimulus taken away, that's going get us back from 3% to 2% growth, where we were before. By itself that doesn't bring us a recession.

What about a stock market collapse? A lot of people are devotees of Bob Shiller's so-called CAPE price earnings ratio. That is the ratio of S&P price to a trailing 10 year average of earnings. That's a very bad index, because 10 years trailing earnings includes lousy earnings in 2009,

2010, 2011. Instead, let's look at the price earnings ratio with a 5 year trailing price earnings ratio (Fig. 6). This doesn't look so bad, because now we've got earnings from 2013 to 2018 in the denominator. This ratio is very little above where we were in 2007 and is still far below where we were in 1999–2000. So for those who think that we're in the middle of a stock market bubble, it's not patently obvious. Clearly, though, increases in the stock market will be less, if not zero, going forward.

What about the overhang of debt in the economy? This (Fig. 7) is a picture of the ratio of total debt, corporate, mortgage, and consumer, to GDP, going back to 1948. As you can see, it steadily increased for 60 years. But over the last 10 years, total debt is down compared to where it was in 2007. Thus the debt burden is not excessive. What about corporate debt? Consider the ratio of corporate debt compared to profits (Fig. 8). This bar chart shows that ratio in the last year of the last five expansions. The current ratio is not as high as it was in 2000 or 1989. Those who think that overindebted America is going to lead to a financial collapse are crying in the wilderness. What about weakness in the rest of the world? We know that interest rates are going up in the United States, and I will shortly explain why

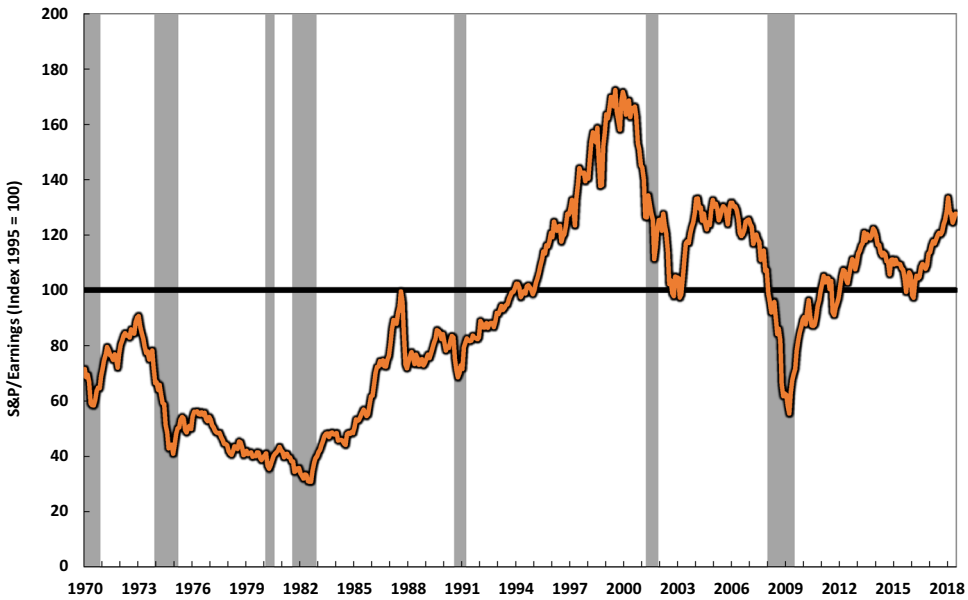

Fig. 6 S&P 500 stock market prices relative to 5-year trailing earnings, 1995 = 100

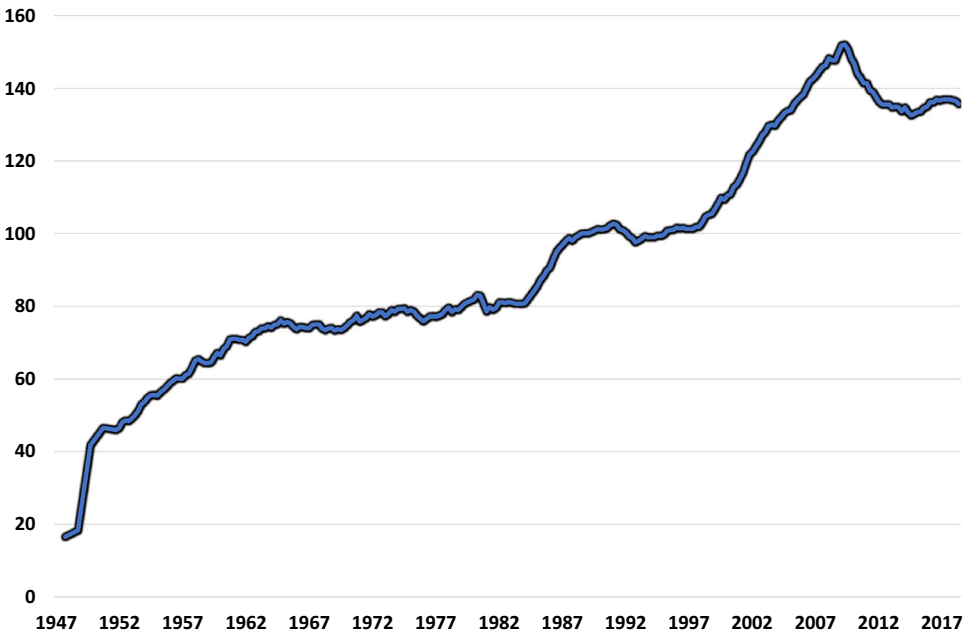

Fig. 7 Ratio of all debt to GDP, 1947–2018 (percent)

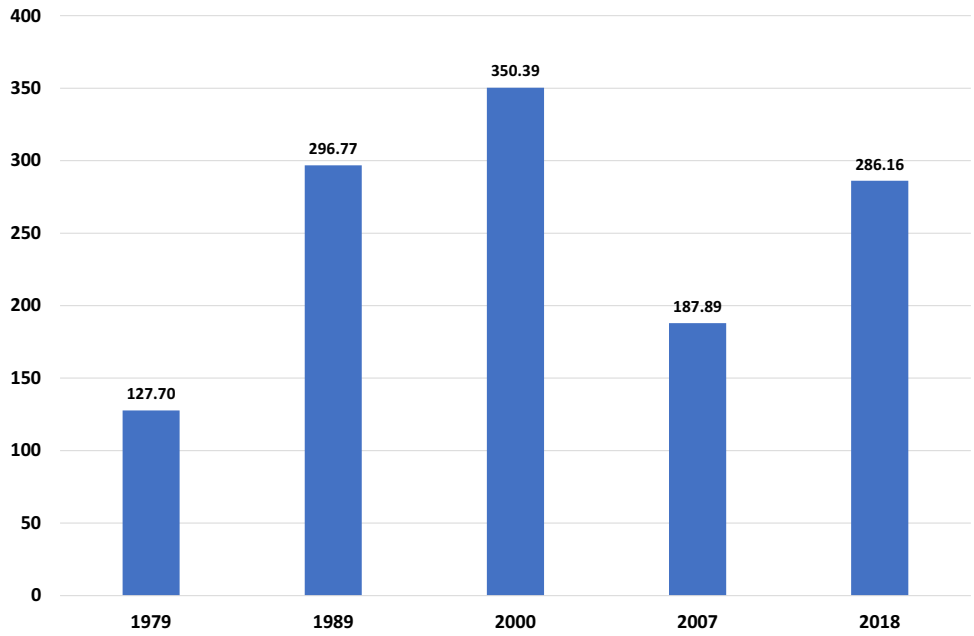

Fig. 8 Corporate debt as a percent of corporate profits (before tax) at business cycle peaks

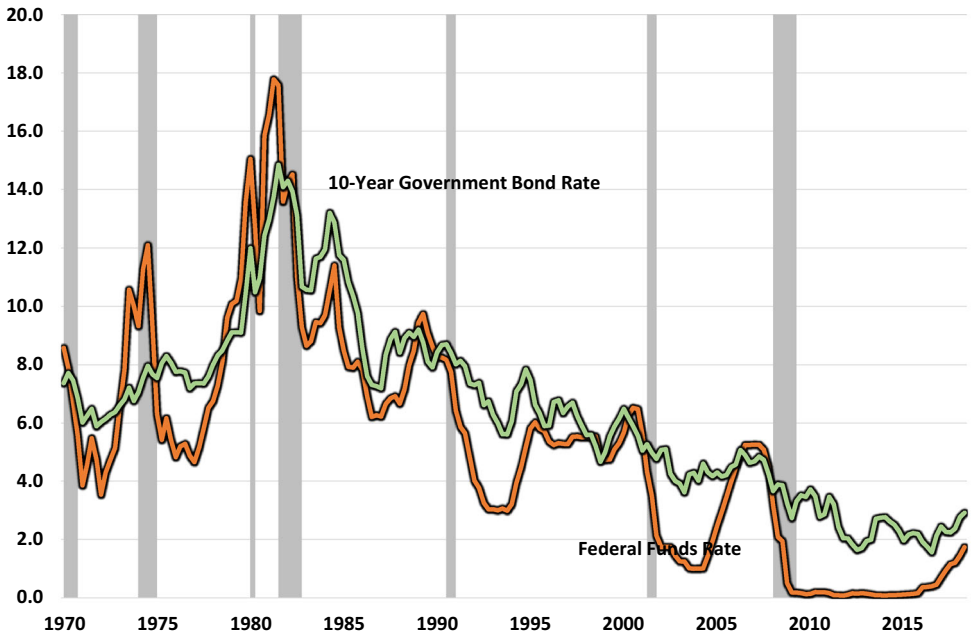

Fig. 9 Effective federal funds rate versus 10-year treasury constant maturity rate, 1970:1–2018

interest rates are going to go up more than is currently in the Fed's current forecast.

Next comes the evolution of the dollar, which as it appreciates causes difficulties through currency depreciation for emerging markets, making their dollar-denominated debt into a heavier burden. That is already happening in Argentina, Turkey, and, to a lesser extent, in India and Indonesia. But we had a larger emerging market debt crisis in 1997 and 1998 without any feedback to the prosperous U.S. economy of the late 1990s. And on top of that, remember that emerging market debt is not something that the Federal Reserve pays a lot of attention to when deciding on the path of U.S. interest rates.

To consider the future of monetary policy, consider where we are now. Figure 9 shows since 1970 the evolution of the federal funds rate and the 10-year bond rate. As before the vertical bars represent recessions. Notice that right before every recession the federal funds rate goes up above the 10-year rate. That is called "the inversion of the yield curve" that attracts close current attention. Without any exception, before every recession there is a negative value of the 10-year rate minus the fed funds rate. What is

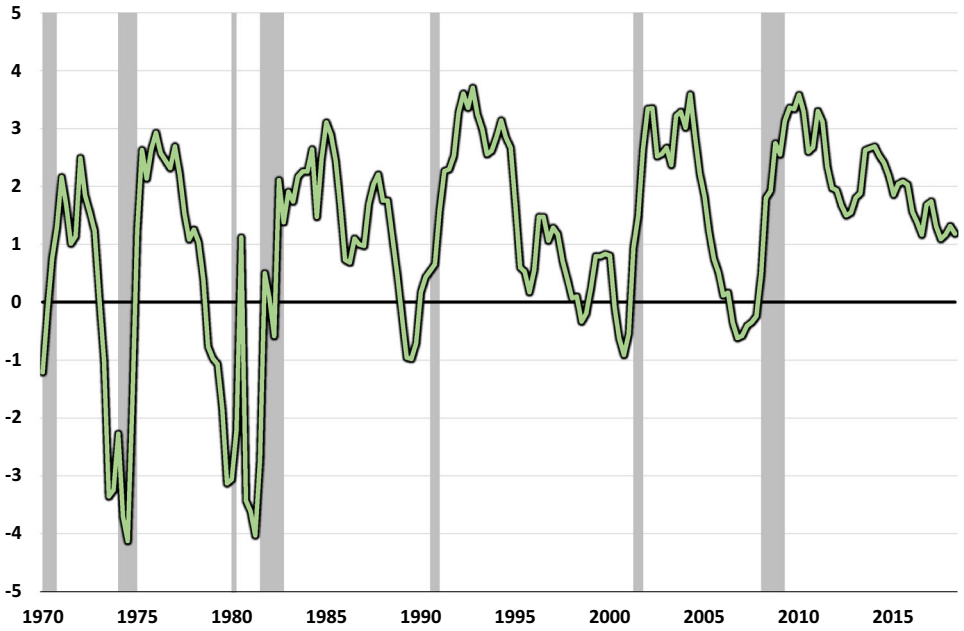

Fig. 10 Effective federal funds rate versus 10-year treasury constant maturity rate

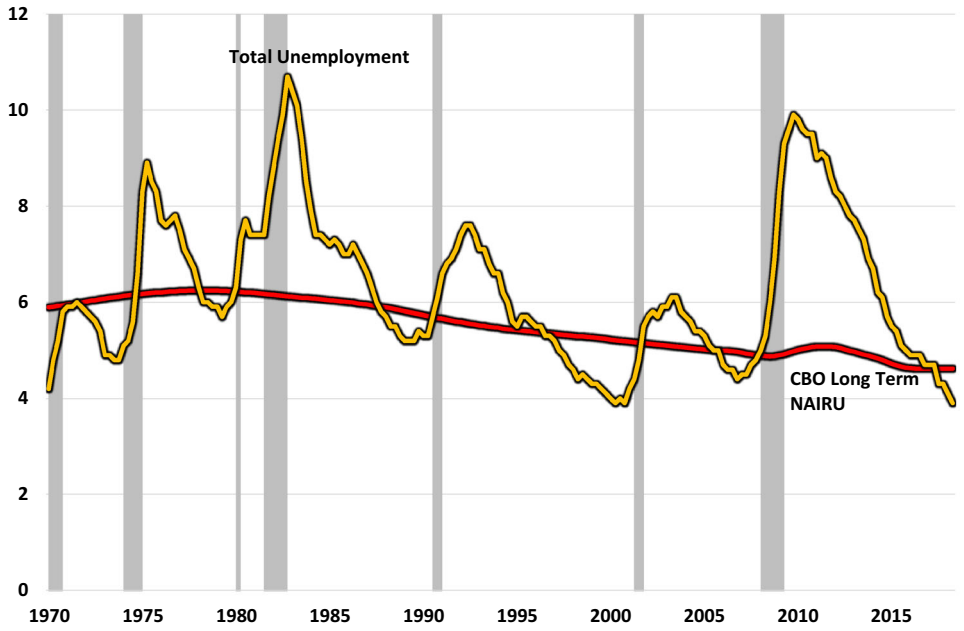

Fig. 11 Total unemployment rate versus CBO long term natural rate of unemployment, 1970:1–2018:2

an exception is the timing. When the yield curve inverts, sometimes this happens immediately prior to the start of the NBER recession, but sometimes the lag is 2 years. So an inversion will not tell you whether we're going to have a recession starting in 2019, 2020, or 2021. And look at the last observation. Most commentators show the inverted yield curve in terms of the 10-year rate versus the two -year rate. That's too pessimistic. Instead Fig. 10 shows the 10-year rate versus the federal funds rate. The final observation on the right shows that the yield curve is still far from inverting. And the Fed is running down its bond portfolio as it reverses quantitative easing, which will push up long term rates and further postpone the yield curve inversion.

What then is the outlook for monetary policy? Under Janet Yellen policy was relatively loose with a negative real federal funds rate and primary emphasis on maximizing employment and creating enough demand pressure in labor marks to draw back into the labor force those who had previously dropped out. In the absence of significant upturn in inflation above the Fed's forecast there will be a modest continued rise in short term rates up to the 3% range. But that's contingent on a Federal Reserve inflation forecast that is quite unbelievable—that PCE core inflation

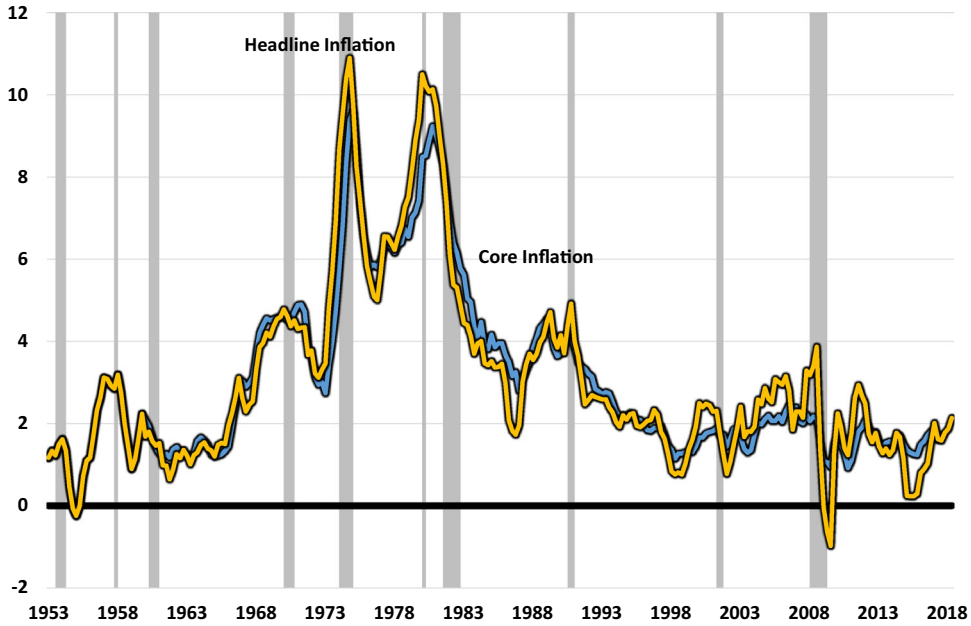

Fig. 12 Headline inflation versus core inflation, change from year ago, 1970:1–2018:2

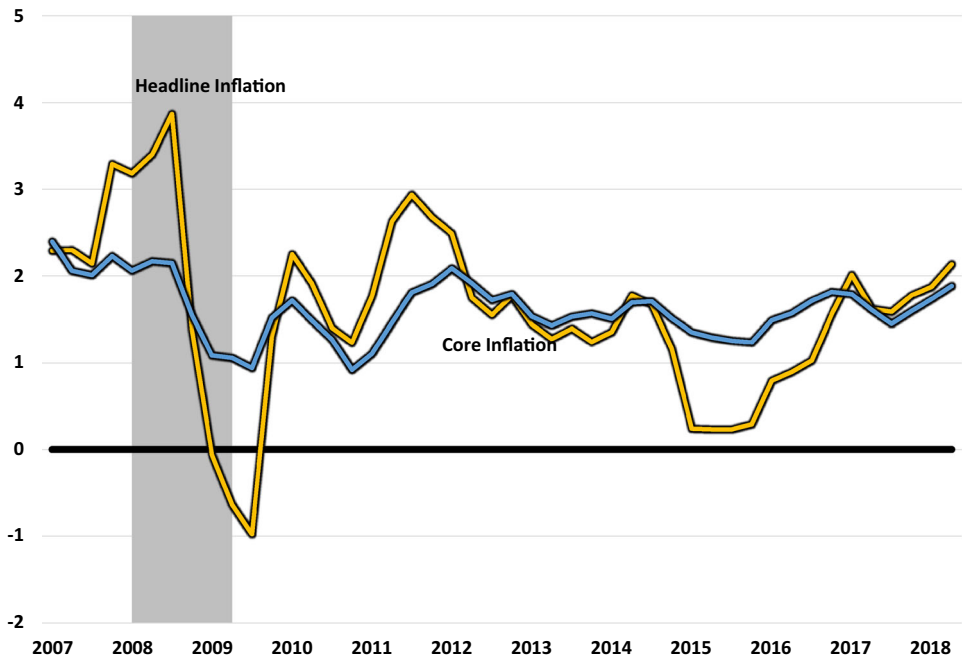

Fig. 13 Headline inflation versus core inflation, 2007:1–2018:2

will be no higher than 2% for 2018 and 2.1% for 2019 and 2020.

Figure 11 shows the unemployment rate compared to the CBO's NAIRU, or non-accelerating inflation rate of unemployment. The economy is already considerably below the CBO's non-inflationary unemployment rate. Over the last eight years, unemployment has been falling at two-thirds of a percent per year, to sustain GDP growth of an average of 2.2%. How are we going to get 3.5% GDP growth? Unemployment's going to have to fall at least as fast as it has been falling. That brings it down 2 years from now to 2.6%. Do you consider credible the Fed's forecast of inflation of 2.1% for the next 2 years in an environment when unemployment is going down to 2.6%?

The Phillips curve has been quiescent, but it's not dead yet. Figure 12 shows headline inflation, including oil prices, as well as core PCE inflation—what the Fed looks at, excluding food and energy prices. Evident are the twin peaks back in the 1970s that caused so much trouble, as well as the apparent quiescence of the Phillips curve over the last 20 years. But notice that inflation did steadily move up in the 2000–2007 period.

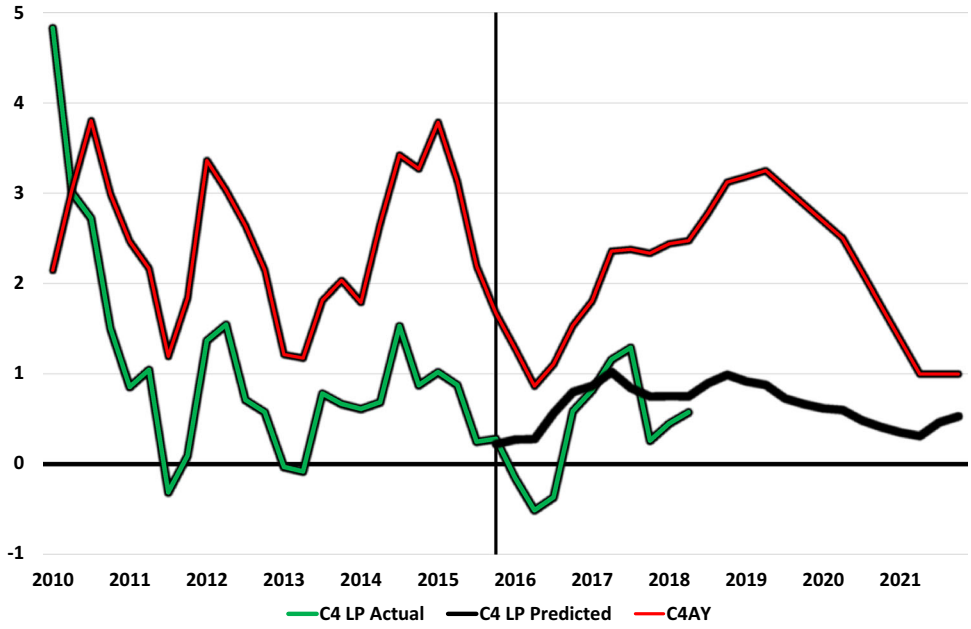

Fig. 14 Actual and assumed productivity change with assumed output change, 2010:1–2021:4

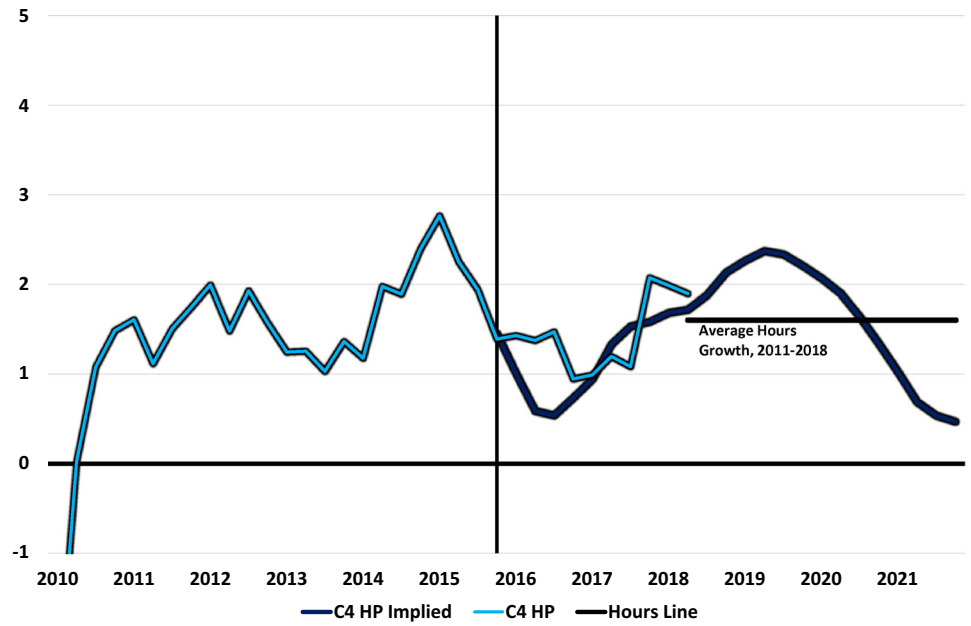

Fig. 15 Actual and simulated hours responses

Figure 13 is a closeup of core and headline inflation over the last 10 years. Over the 5 years up to December 2017, core PCE inflation grew at 1.55%. Over the last 6 months, it's grown at a 1.9% rate. That is a slow, steady upward movement. And what if that continued to 2.3%. 2.7%. 3.0%? You can be sure the Fed would start raising interest rates faster than its current forecast. The result would be a market tantrum.

The last topic is whether supply growth will be sufficient to match demand growth. If we look at total economy productivity growth, which is GDP and GDI averaged together divided by total economy hours, the average of that in the last 8 years is 0.7%. So somehow we've got to do better than that in order for the universal consensus demand forecast to come true.

In Fig. 14 the vertical line marks the end of 2015. The data extend from 2010 to 2021. The top line shows the four quarter moving average of GDP and GDI growth up until now, then an assumed 3.25% for the next year, 2.5% for the year after, and then 1% after that. Down at the bottom after the vertical line, the smoothly drawn line shows the post-2015 forecast of my cyclical productivity model showing how productivity growth would react to the assumed GDP growth path. The zigzag line at the bottom represents

actual productivity growth, which is quite close to the simulation. The conclusion is that productivity growth does not yet show any sign of rising in response to faster output growth, and if this continues it will require that extra output growth is supplied by faster growth in labor input.

This is shown in Fig. 15, which has the forecast for what would have to happen to hours in order to get the consensus GDP forecast. The horizontal black line is the average of the last 7 years. We would have to have hours actually growing considerably faster than what has happened coupled with predicted productivity growth in order to get the consensus GDP forecast. What we've got here is a real clash. One of the following two things will happen: Either a substantial revival of productivity growth, or so much tightness in the labor market that the Fed's inflation forecast just cannot come true.

My forecast is that productivity growth will revive somewhat but not enough to prevent the unemployment rate from falling below 3%. Achieving a 3.5% growth path requires a continuous decrease in the unemployment rate as well as requiring a 100 basis point revival of productivity growth from where it was. And this will surely bring with it an increase of the inflation rate above the Fed's overly benign forecast that inflation will not speed up at all over the next two and a half years.

My conclusion is that bad things are going to happen in financial markets. There's going to be a recession sometime in 2021. Its severity depends on how much inflation rises above the Fed's forecast, how the Fed reacts to faster inflation, and how financial markets react to what the Fed does. There is still a lot of uncertainty but I would bet that the recession will be on the mild side, more like 2001 than 2007–09.

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Robert J. Gordon is a macroeconomist with a particular interest in unemployment, inflation, and both the long-run and cyclical aspects of labor productivity. He is the author of a textbook in intermediate macroeconomics, now in its 12th edition, and has completed a new book, *The Rise and Fall of American Growth*, published by the Princeton University Press in January, 2016. He is a Fellow of the Econometric Society and the American Academy of Arts and Sciences. In 2014, he was elected as a Distinguished Fellow of the American Economic Association. In 2016, he was named by Bloomberg as one of the 50 most influential people in the world. For more than three decades, he has been a member of the National Bureau of Economic Research's Business Cycle Dating Committee, which determines the start and end dates for recessions in the United States.