

Eight Heresies of Monetary Policy

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1 Background

As background, Figure 1 reminds you of the current situation and recent history of monetary policy.

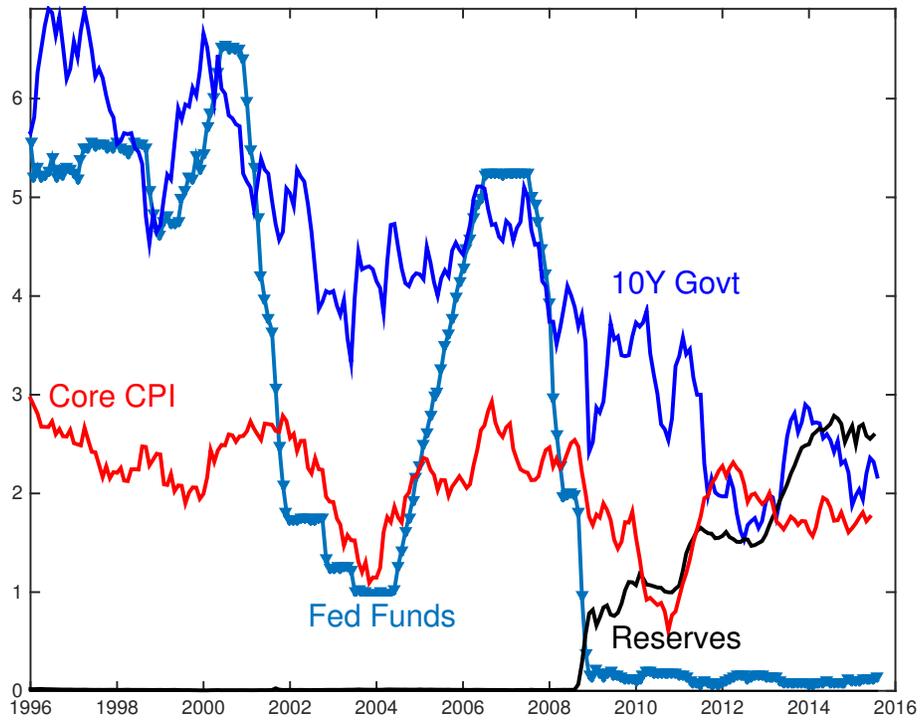


Figure 1: Recent history.

The federal funds rate is the interest rate that the Federal Reserve controls. The funds rate rises in economic expansions, and goes down in recessions. You can see this pattern in the last two recessions. Since about 2012, though, when following history you might have expected the funds rate to rise again, it has stayed essentially at zero. Very recently it has started to rise, but very slowly, nothing like 2005.

The black line is reserves. These are accounts that banks have at the Fed. Crucially, these bank accounts now pay interest. Starting in 2008, reserves grew dramatically from about \$20 billion to \$2,500 billion. The three cliffs are the three “quantitative easing” episodes. Here, the Fed bought bonds and mortgage backed securities, giving banks reserves in exchange.

Inflation initially followed the same pattern as in the last recession. It fell in the recession, and bounced back again in 2012. Inflation has been slowly decreasing since. 10 year government bonds have been quietly trending down, with a bit of an extra dip during the recession.

Figure 2 plots US unemployment and GDP growth.

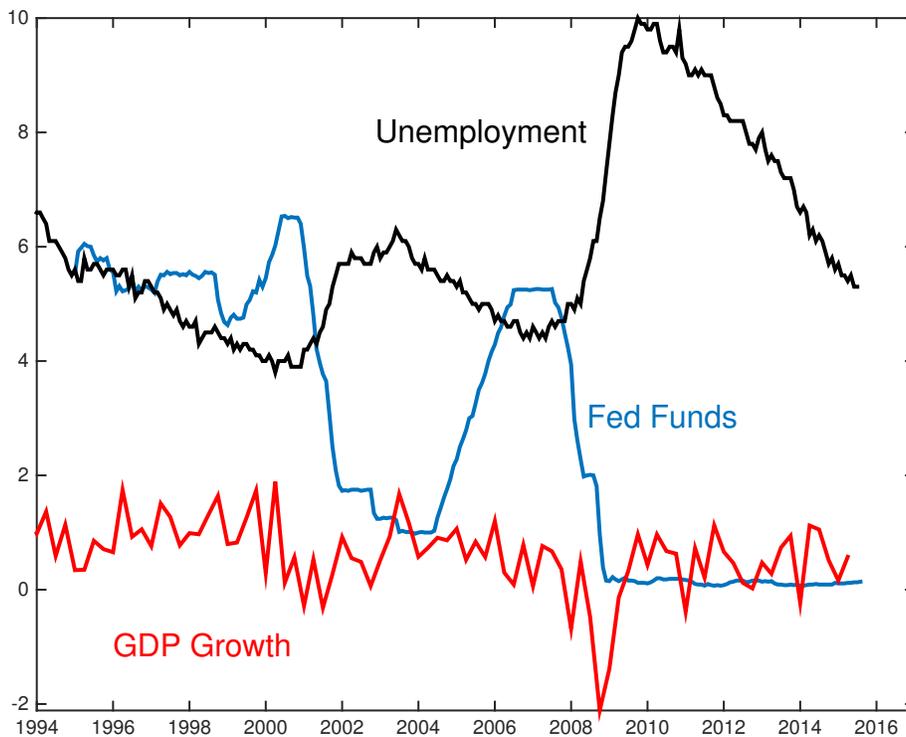


Figure 2: Unemployment and GDP growth

You can see we had a deeper recession, but then unemployment recovered about as it always does, or if anything a little faster. You can see the big drop in GDP during the recession. Subsequent growth has been overall too low, in my view, but it has been very steady. If anything, both growth and inflation are steadier in the era of zero interest rates than they were when the Fed was actively moving interest rates around.

These central facts motivate my heresies: Inflation, long term interest rates, growth and unemployment seem to be behaving in utterly normal ways. Yet the monetary environment of near-zero short term rates and huge QE is nothing but normal. How do we make sense of these facts?

2 Heresy 1: Interest rates

- Conventional Wisdom: Years of near zero interest rates and massive quantitative easing imply loose monetary policy, “extraordinary accommodation,” and “stimulus.”
- Heresy 1: Interest rates are roughly neutral. If anything, the Fed has been (unwittingly) holding rates *up* since 2008.

What does a central bank look like that is holding interest rates down? Such a bank would lend money to banks at low interest rates, that banks could turn around and re-lend at higher interest rates. That’s how to push rates down.

What does a central bank look like that is pushing rates up? Such a bank takes money from banks, offering to pay banks a higher interest rate than they can get elsewhere.

What’s our central bank doing? In bigger format, the top panel of Figure 3 presents excess reserves. This is money that banks voluntarily lend to the Fed, and on which they receive interest.

The bottom panel of Figure 3 is the interest that the Fed pays on excess reserves, along with the Federal Funds rate and the rate on one month treasuries, to give a sense of market rates. As you can see, the Fed pays *more* than banks can earn elsewhere. So, on this basis, the Fed looks like a CB pushing rates *up*, if anything.

Now, as we used to say at the University of Chicago, ok for the real world, but how does that work in theory? How can it be that zero interest rates – lower than we have seen since the great depression – are not an unusual stimulus?

Well, it’s certainly possible. Remember, the nominal interest rate equals the real interest rate plus expected inflation. If the real interest rate is, say negative 1.5%, and inflation is +1.5%, then a nominal interest rate of zero is natural.

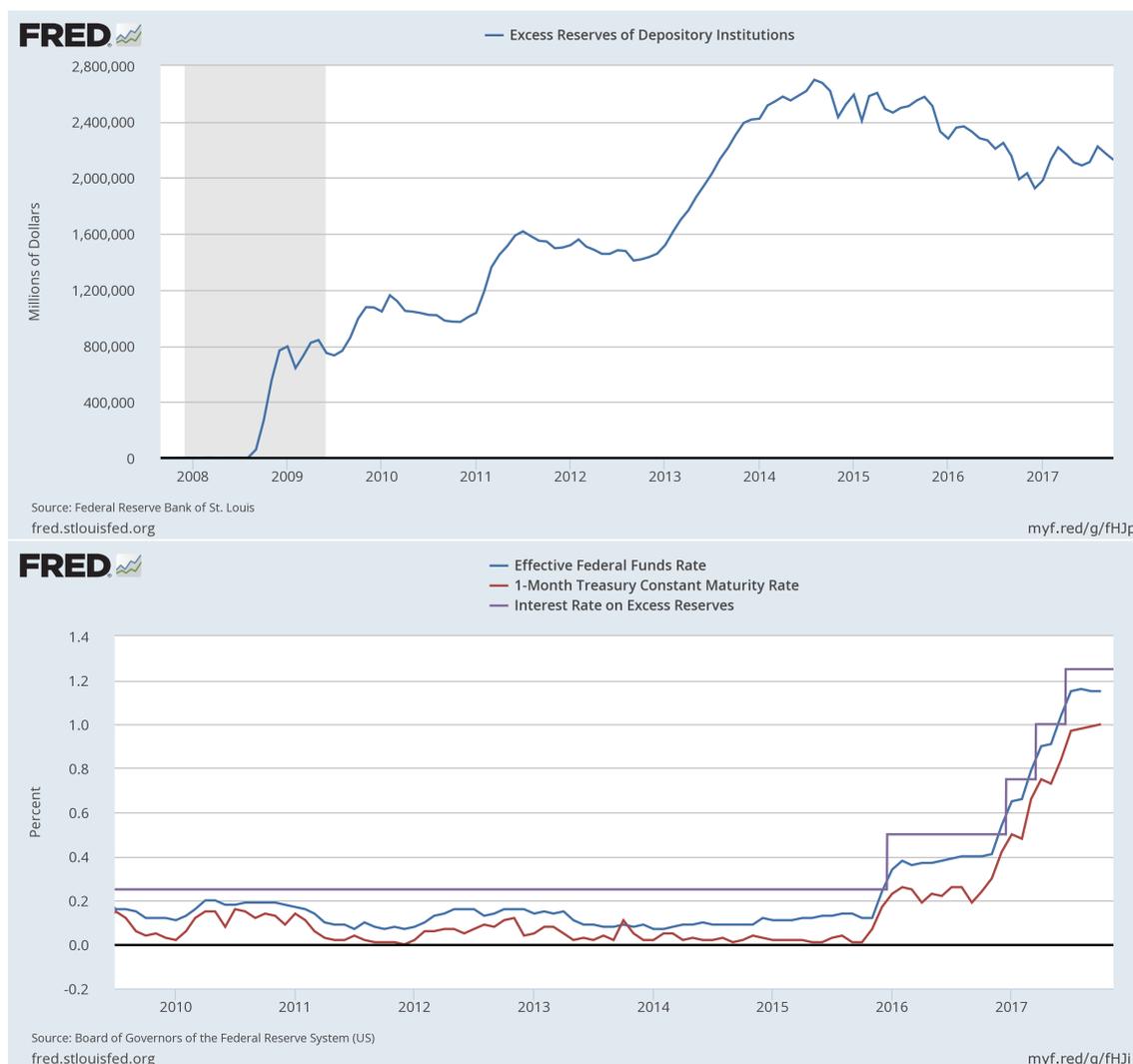


Figure 3: Top: Excess reserves. Bottom: Interest on excess reserves, on one-month treasuries, and federal funds rate.

The question, really, is whether the -1.5% real rate is a natural consequence of supply and demand in the economy – the “natural” or “neutral” real rate, or whether it represents the Fed manipulating interest rates. There are plenty of reasons to suspect that the “natural” real rate has been negative for much of the period since the financial crisis. More supply of saving (demographics, risk, government saving) than demand for investment, low marginal product of capital in a real slow growth environment, and so on are easy stories to tell.

In this view, by the way, as the real rate recovers along with the economy, if the actual nominal interest rate is stuck at zero, then inflation should gently decline. That is also what we see. It is contrary to the historical pattern of rising inflation as the economy recovers, but historically the Fed also raised nominal interest rates as the economy recovers.

Plus, after 8 years, if monetary policy were really “stimulating” quite so much, where is the inflation and boom?

3 Heresy 2: Quantitative easing

As we have seen, in its quantitative easing (QE) the Fed bought nearly \$3 Trillion of Treasuries and mortgage backed securities, giving banks interest-paying reserves in return.

- Conventional Wisdom: QE lowered long-term interest rate rates, and provided a big stimulus. QE’s stimulative effect is permanent and continues to this day, so unwinding QE is vital to “normalizing” policy.
- Heresy 2: QE did basically nothing to interest rates, or to stimulus.

Figure 4 is a plot of ten year rates and mortgage rates along with reserves. Again, the steep rises in reserves are the QE episodes.

Maybe the first QE is associated with a one percentage point drop in rates. But it bounces right back. Large transactions can move prices, but in the rest of finance we see these as temporary, not permanent movements. In the second and third QE, interest rates *rise* during the QE episode, exactly the wrong sign.

The bottom panel of Figure 4 takes a longer view of interest rates Here you can see that interest rates have been on a steady downward trend since 1985. Can you see any difference in the behavior of these interest rates during the QE period from the late stages of the last three expansions? I can’t.

Well, again, so much for the real world, how does it work in theory. As Ben Bernanke himself recognized, QE “works in practice” or so he thought, but not in theory. We should worry about any proposition that has no theoretical basis. Sometimes facts are ahead of theory, but not often.

The Fed is in essence a huge money market fund. Banks sell bonds to the Fed, and get a money market account, backed by the Fed’s holdings of the bonds. Just how much difference does it make for banks to hold treasuries through the Fed rather than directly?

(Unlike private money market funds, the Fed holds long-term securities too. But its liabilities, reserves, trade always for \$1 and don’t float in value, like a money market fund.)

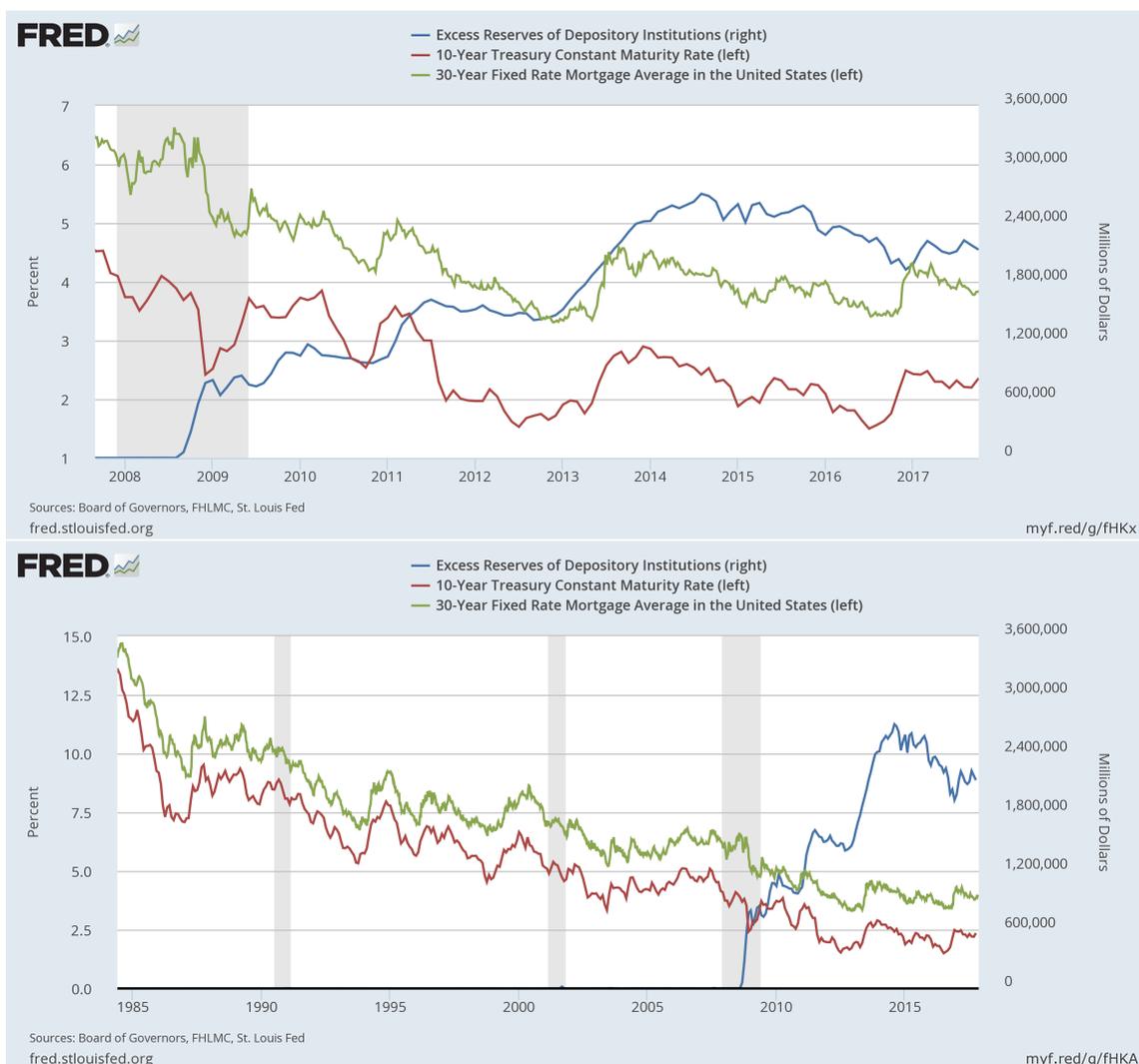


Figure 4: Ten year rates, mortgage rates, and reserves.

We can think of them as open change operations. Reserves are government debt. So it's as if the Fed took a bunch of your \$20 bills and gave you 2 \$5s and a \$10 in exchange. It's hard to see that having a big effect on your spending.

QE is catch 22. The usual story told is that bond markets are "segmented." The 10 year treasury market is cut off from other markets. Then, if the fed buys a lot of them it can raise the prices of 10 year treasuries. But the *point* of QE was not to lower Treasury rates, it was to lower rates that might influence investment. To affect the economy, the markets

must not be segmented. For the Fed to affect the 10 year rates, they must be segmented, and the rates don't spill over to the rest of the economy.

Finally, the Treasury has been selling faster than the Fed has been buying. Figure 5 has all Federal debt, and federal debt less the part bought by the Fed. That bottom line is still growing. So, the Fed did not remove any bonds from the market. Overall, markets held more debt.

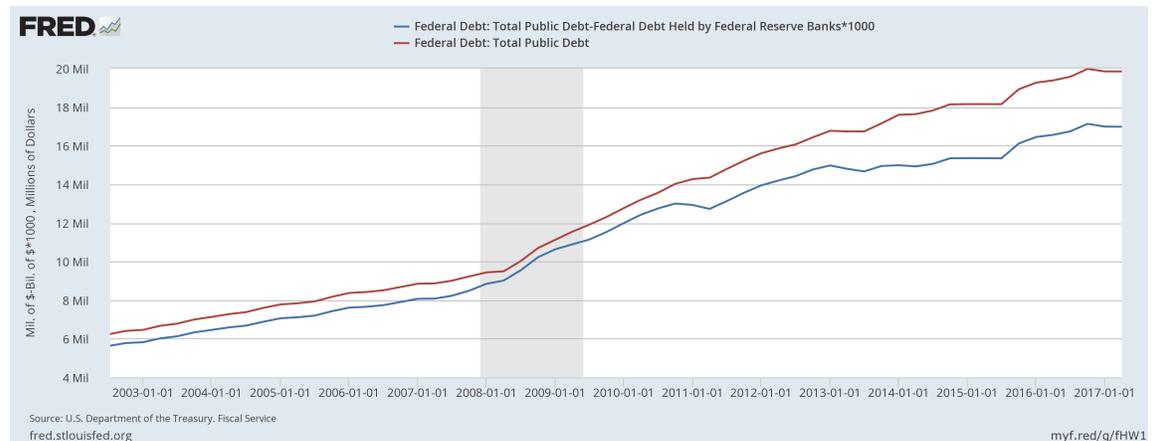


Figure 5: Federal debt with and without Fed purchases.

Moreover, the Treasury was trying to move to a longer maturity structure. Treasury debt is much like your mortgage. If you take the 30 year fixed, you protect yourself against interest rate increases. If you take the floating rate ARM, you get a lower rates, but if rates go up you might be in a squeeze. The Treasury chose the fixed rate, trying to move to longer bonds. The Fed bought those long bonds right back up, issuing short term debt (reserves) instead, and undoing the insurance that the Treasury bought. Fed and Treasury need to get together and decide who is in charge of the maturity structure!

4 Heresy 3: Low rates, QE and financial markets

- Conventional Wisdom: QE and low interest rates set off a “reach for yield,” “asset price bubbles,” though artificially low risk premiums.
- Heresy 3: The risk premium is not unusually low for this stage of the business cycle. In any case, the Fed has nothing to do with risk premiums.

A quote from one of my otherwise favorite financial analysts expresses the view nicely:

“QE and negative interest rates manipulated prices of risk-free assets, and by artificially boosting risk-free assets central banks have sent investors on a hunt for yield, which in turn artificially boosted prices of risky assets and significantly distorted prices in financial markets.”

Again, this story gets passed on and on, but does it line up with the facts, and does it make any sense?

Risk premiums are about the spread between borrowing and lending. You take on risk by borrowing to invest. Now, if you borrow at 1 % and lend at 3%, that is exactly the same thing as borrowing at 3% and lending at 5%. Risk taking depends on the *spread* between risky and risk free rates, not the *level* of rates.

Yes, we can cook up stories, involving the affairs of specialized intermediaries. But recognize those are second-order stories, and hard to get risk premiums on widely traded stocks and bonds to go substantially wrong for years.

Let’s look at the facts. Are there unusually low risk premiums or high asset prices, and are those tied to low interest rates or QE?

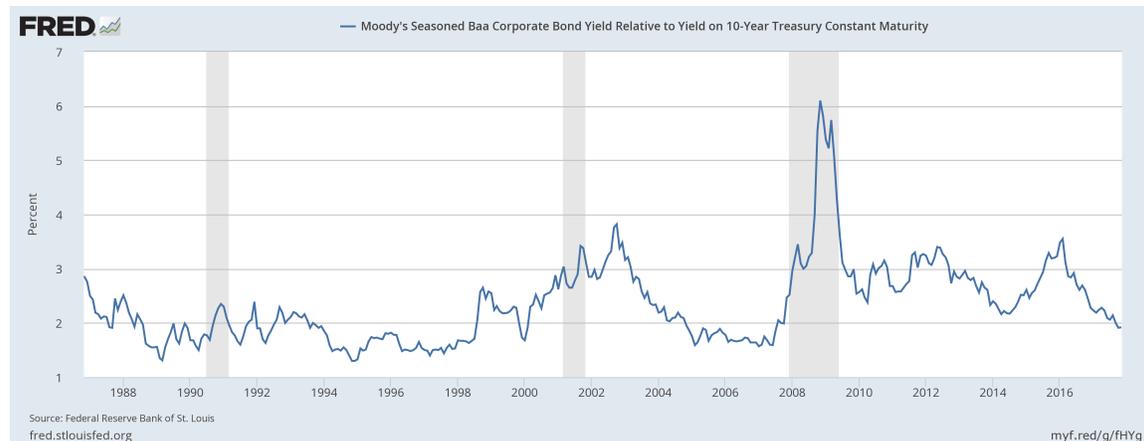


Figure 6: BAA/Treasury spread.

Figure 6 is the interest rate spread between Baa corporate bonds and 10 year Treasuries, a sign of the premium for holding the risk of corporate defaults. The premium is low now. But we are in the late September of the business cycle, and the corporate spread was even lower in each of the last three business cycles.

Risk premiums are always low in late stages of the business cycle. Risk is low, people are doing well, and willing to take risks despite low premiums. In fact, corporate premiums are still if anything surprisingly *high* for this stage of the business cycle, a fact often attributed to bank’s unwillingness to trade much under the more stringent capital standards.

Figure 7 presents Bob Shiller's long-run price/earnings ratio. The price/earnings ratio is high. But it's also always high at the late stage of expansions, as people are more willing to take stock market risk in good times.

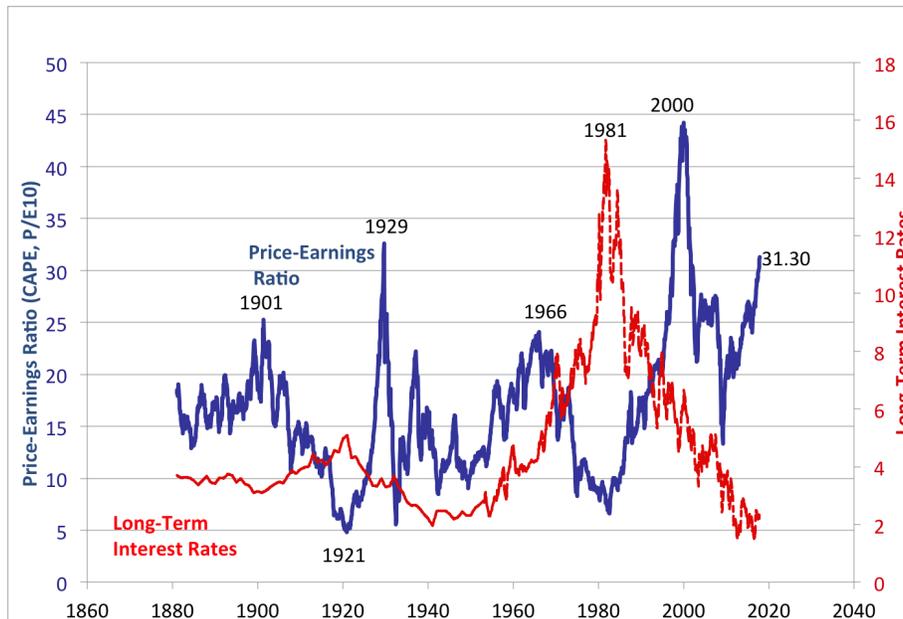


Figure 7: Price-earnings ratio. (Shiller)

Moreover, looking at this century of data, the current time period with zero rates and massive QE does not stand out as particularly different from events we have seen many times before.

Figure 8 makes the connection to the economy clearer. Here I plot the total stock market price-dividend ratio and consumption less a trend fit as a backward looking AR(1). This captures the essence of the habit model John Campbell and I developed. When consumption is high relative to habit, people feel less risk averse, and bid up stock prices. As the figure makes clear, high prices in the late stages of expansions are a regular feature of the data, and the main unusual thing about the recent period is how *well* the relationship fits. (The low frequency deviation in the 80s may represent the influence of real interest rate variation. Habits relate the risk premium to consumption, but a higher real rate will lower the price dividend ratio.)

When thinking about today's price earnings or price dividend ratio, also recall that price earnings ratio reflects the level of interest rates as well as the risk premium. The classic Gordon growth formula states that the price / earnings ratio equals one divided by the stock's rate of return minus the growth rate of dividends. We can also break down the

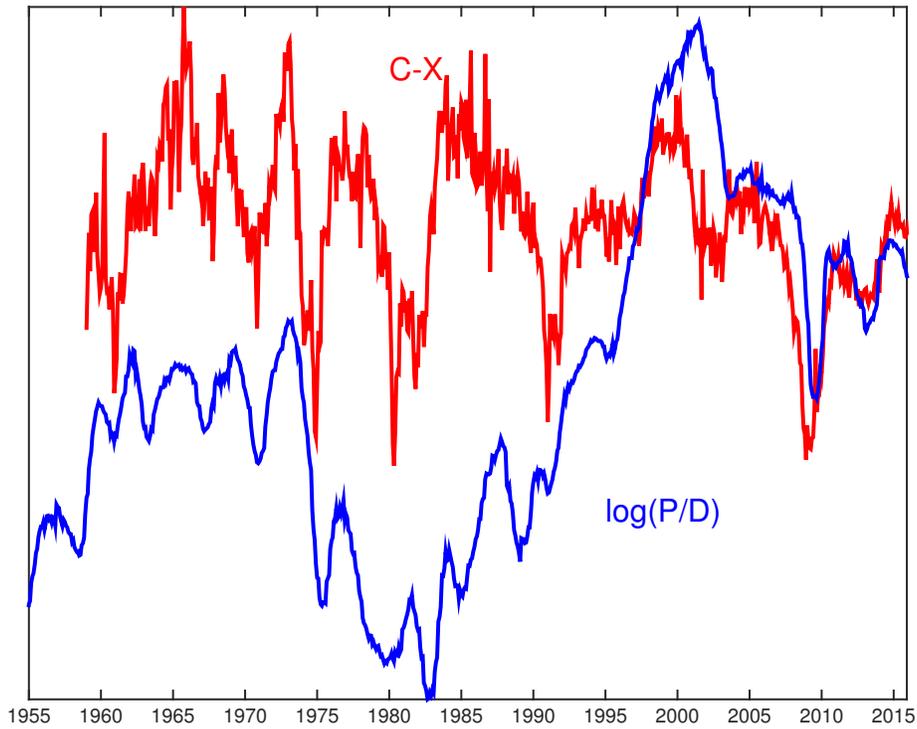


Figure 8: Consumption less trend and market price/dividend ratio. The trend is calculated as $X_t = 0.9X_{t-1} + (1 - 0.9)C_t$. The graphs are stretched vertically to fit on the same scale.

stock rate of return into a real risk free rate and a risk premium.

$$\frac{P}{E} = \frac{1}{E(r) - g} = \frac{1}{r^f + E(r - r^f) - g}$$

Now, suppose the real risk free rate goes down by one percentage point, leaving the risk premium alone. If the price/earnings ratio starts at 25, or expected returns four percentage points above growth,

$$\frac{P}{E} = 25 = \frac{1}{0.04}$$

a 1% decline in real rate gives

$$\frac{P}{E} = 33 = \frac{1}{0.03}$$

with no change in risk premium. That's just about the amount by which the price/earnings ratio is unusually high

5 Heresy 4: Real rates

All of my heresies revolve around the question of low interest rates, and you might object that yes, interest rates are low, but that's because you think the Fed is keeping interest rates low.

- Conventional Wisdom: The Fed is the primary force behind movements in the real rate of interest and GDP growth rates.
- Heresy 4: The Fed has little to do with real interest rates or economic growth rates (past ≈ 1 year).

This is just economics 101. The two most basic economic descriptions of interest rates are

$$\text{real rate} = \text{impatience} + (\approx 1 - 2)\text{growth rate}$$

$$\text{real rate} = \text{marginal product of capital}$$

If people are impatient, you have to pay them higher interest rates to get them to save. If the economy is growing quickly, and people know they will be better off in the future, you have to pay them higher interest rates to get them not to consume today. And the interest rate is determined in the end by companies' ability to make real returns from borrowed money.

As we go in to an economic expansion, with higher growth, real interest rates will naturally rise, Fed or no Fed. As we go into a period of low or no growth and poor investment opportunities, real interest rates will be low, Fed or no Fed.

And after a few years, growth comes from productivity only, not anything the Fed can arrange.

Now, there are many stories told for low growth and low "natural" real rates – a "savings glut," a demographic bulge of middle age savers, low investment productivity from distorting taxes and regulation, and so on.

Moreover, real rates are low everywhere in the world. It isn't specific to the Fed.

In sum, the Fed is nowhere near as powerful as conventional wisdom suggests.



Figure 9: The Fed, in an unstable vs. stable world.

6 Heresy 5: Is the economy stable?

- Conventional wisdom: If interest rates are stuck or pegged, inflation or deflation will spiral out of control. The economy, on its own, is *unstable*. The Fed must constantly move interest rates, like the seal must move his nose, to keep inflation under control.
- Heresy 5: The economy is stable. If interest rates don't move, eventually inflation will adjust to that interest rate minus the natural real rate of interest.

Conventional wisdom makes a clear prediction. When the interest rate gets stuck at zero, deflation will spiral out of control. Figure 10 gives a simulation of a standard (adaptive expectations, ISLM) model. A deflationary shock hits, and inflation declines. The Fed lowers interest rates, but soon runs in to zero. When the interest rate hits zero, the deflation spiral breaks out.

The model in this figure is:

$$\begin{aligned} x_t &= -\sigma(i_t - \pi_{t-1} - v_t^r) \\ \pi_t &= \pi_{t-1} + \kappa x_t; \\ i_t &= \max[i^* + \phi(\pi_t - \pi^*), 0] \end{aligned}$$

The facts deny this central clear prediction. Remember the lesson of Figure 1, on what happened when interest rates hit zero and stayed there. There was no spiral.

Modern theory and fact agree: Inflation and economy are *stable* with fixed rates.

That does not mean that fixed interest rates are a good thing. They are possible, but not

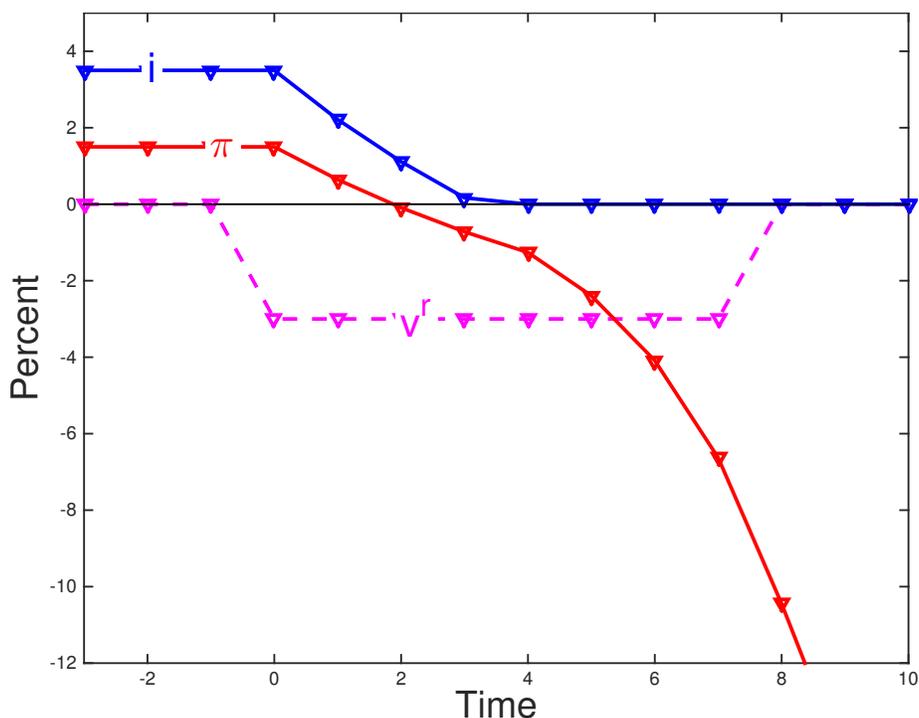


Figure 10: The spiral. Simulation of a old-Keynesian model in response to a negative natural rate shock.

necessarily desirable. Remember

$$\text{interest rate} = \text{real rate} + \text{expected inflation}$$

If interest rates are fixed, then as real rates vary – remember, real rates should be low in recessions and high in booms – inflation must vary, and in the opposite direction. Prices are a bit sticky and volatile inflation is not desirable. So even in the view that inflation is stable with fixed interest rates, it is still a good idea for the Fed to raise rates in boom times and lower them in recessions. The Taylor rule is alive and well. But the zero bound or slightly slow to move rates are not a spiral-tempting disaster.

7 Heresy 6: How does this thing work anyway?

- Conventional wisdom: Raising interest rates lowers inflation, & vice-versa.
- Heresy 6 (Implication of stability & modern theory). After a short run negative effect, persistently higher interest rates raise inflation.

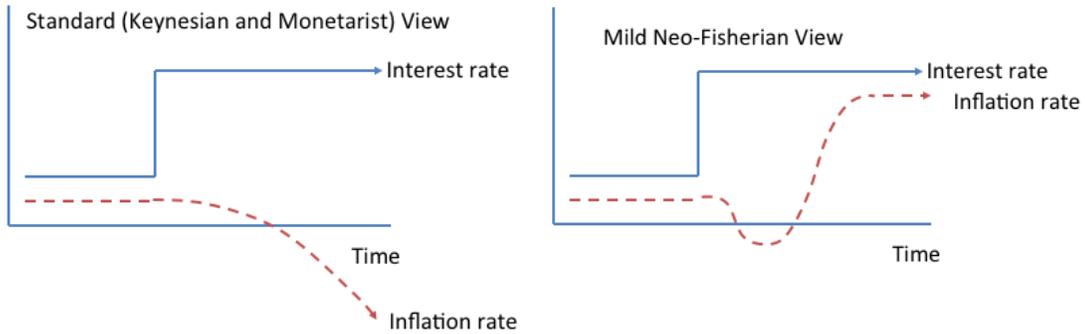


Figure 11: The effect of interest rates on inflation. Which is it?

- Are we past bump, at the point that persistently low rates have led to low inflation?

If inflation is stable around fixed interest rates, then if you raise rates and leave them there, inflation must eventually *rise* to meet the interest rates.

It's not as nutty as it seems. Most of our experience is the short run relationship, which is negative.

However, this possibility – this consequence of stability – suggests that after 8 years near zero, we have gotten over any negative response of inflation to rates, and low interest rates are attracting low inflation. And that if the Fed raises rates, it will eventually cause the inflation that it will, in the event, pride itself for foreseeing.

Consistent with this view, consider Japan and Europe (Figure 12). Both of them have lower – negative – interest rates than we do. And inflation is drifting down in both places. Which is the chicken, and which is the egg?

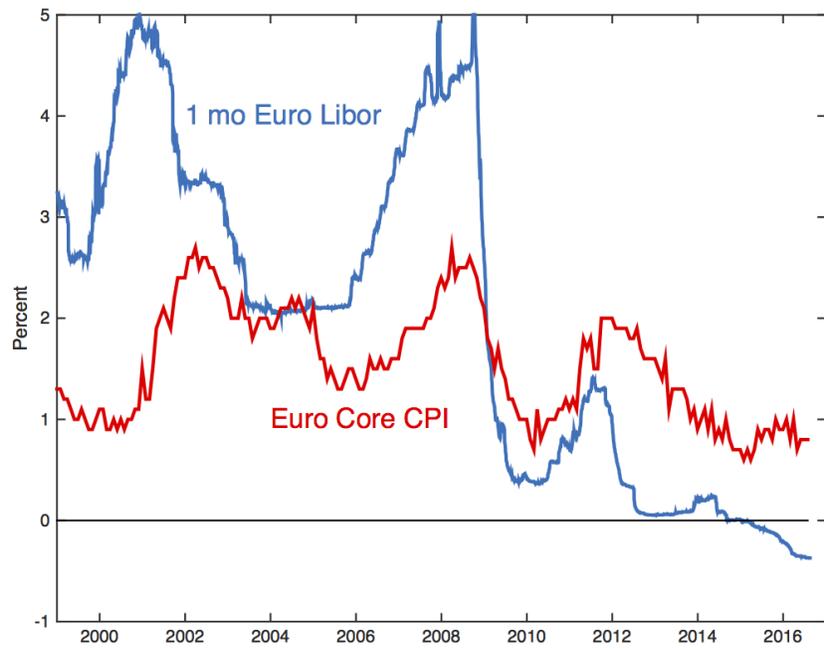
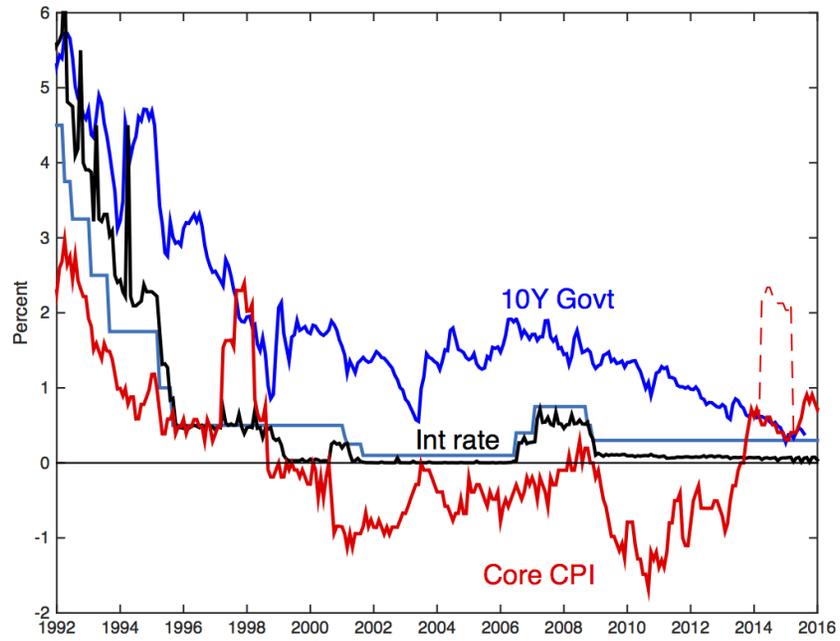


Figure 12: Japan and Europe.

8 Heresy 7: The Phillips curve

Conventional wisdom, largely reflected in Federal Reserve statements, has a clear view of where inflation comes from.

- Inflation comes from “tight markets,” principally tight labor markets.

As I write in Fall 2017, conventional wisdom says that the low unemployment rate, and other measures such as many unfilled job openings presage wage inflation, which will be passed through to price inflation. This view motivates the hawkish case for raising interest rates, even though current inflation remains below the Fed’s 2% target, and accounts for the fact that the Fed has raised rates at all.

The conventional view of monetary policy acts through this causal channel. Lower interest rates will stimulate aggregate demand, which will stimulate output, which will cause companies to hire more people, which will tighten labor markets, which will lead to higher wages, which will lead to higher prices.

Sometimes, the correlation between inflation and unemployment is read the other way. (We economists seem to specialize in reading correlations as causal relationships, and forgetting that there are two curves that may shift in any set of observations.) In the recession, if only the Fed could raise inflation, the story went, it could thereby reduce unemployment. Bring on the helicopters full of money.

In any case, even the Phillips curve correlation has vanished, if it ever was there.

The top panel of Figure 13 shows the time series of inflation and unemployment through the last two recessions. You can see inflation blip down and unemployment rise in the bottom of a recession. Even that correlation vanishes though in the subsequent expansion and most of all in the last one. Inflation quickly bounces back to a bit below 2%, while unemployment remains high. There is just no relation all between the level of labor market “slack” and the rate of inflation.

The bottom panel of Figure 13 shows the data since 2008 as a scatterplot, with inflation on the left and unemployment on the bottom. Your eye may wish to draw a negatively sloped line. But really the evidence there is on the right hand side – inflation dipped down and came back up while unemployment stayed high. The traditional scatterplot is a bit misleading because the points are not randomly chosen, but follow each other as you can see in the first plot.

The plot really shows that there is essentially no relationship between inflation and unemployment – the line is flat. Furthermore, there is a lot of vertical scatter – the line isn’t really a line.

(A clever Fed economist once parried, yes, the line is nearly flat! That’s great news. It

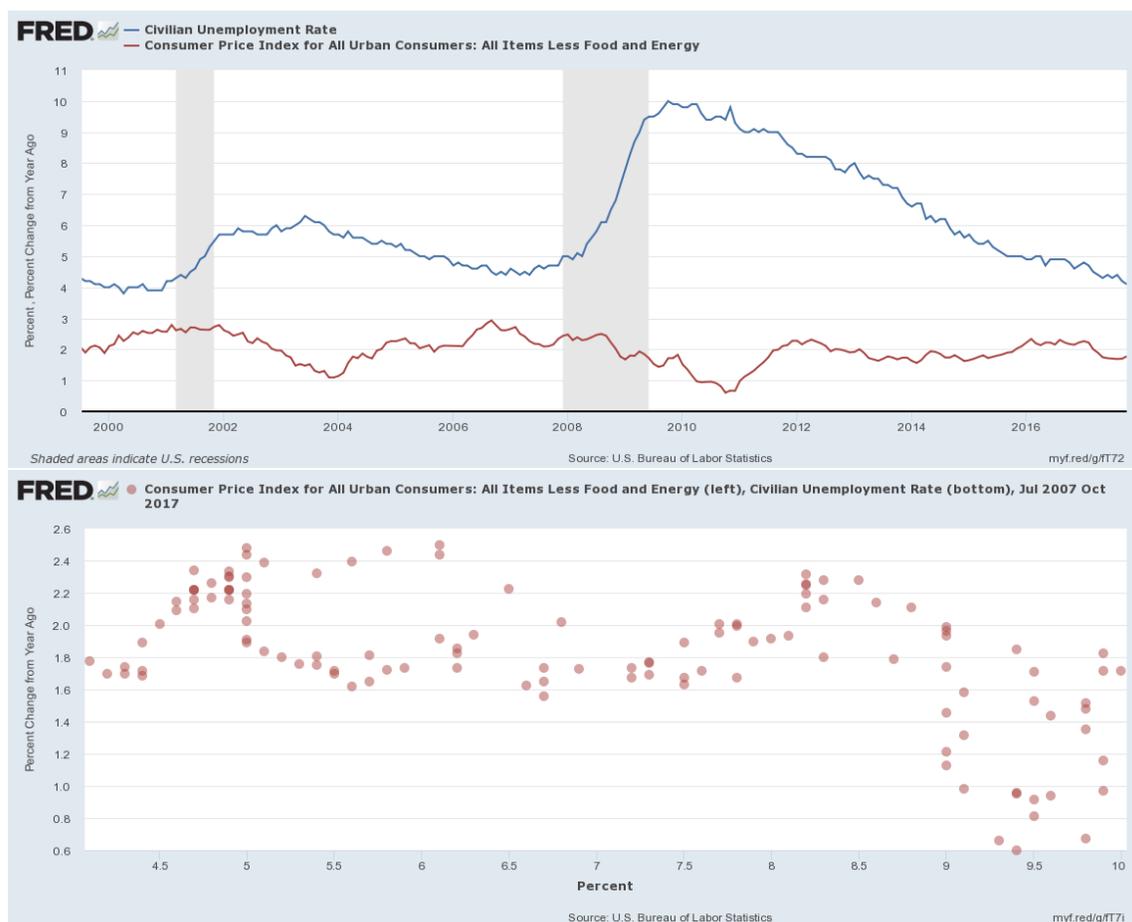


Figure 13: Inflation (core) and unemployment.

means if we could only get inflation up half a percent we would instantly cure unemployment. The vertical scatter emphasizes that the line is really just mush, not an exploitable flat line.)

Well, once again, so much for the real world, how does it work in theory? Nothing seems more obvious than the proposition that if labor markets are tight, if there are more jobs than people who want to work, that employers will offer higher wages, right?

No, as a matter of fact. If employers want to attract more workers, they must offer higher wages *relative* to prices. Saying “I’ll pay you in pennies” doesn’t do any good. Both prices and wages rising at the same time does nothing to attract workers. If wages are “sticky” then the only way to have wages rise is for product prices to fall – we should expect tight labor markets to result in *less* inflation in goods prices!

Likewise, perhaps inflation comes from tight product markets, and what could be more natural than the idea that if there is more demand than supply that companies should raise prices. But that also only works for relative prices.

This is one of the first, most important, and most forgotten lessons of macroeconomics. What works for an individual market does not work for the economy as a whole. The overall price level is a different object than (relative) prices or wages. (And, similarly, trying to raise everyone's income by raising everyone's relative income, handing out protections to each industry and to labor, is equally doomed. No, we cannot pull ourselves up by our bootstraps.)

Now (of course) there are economic theories of the Phillips curve, and good ones. To get the overall level of prices and wages to correlate with labor or product market slack, you need some second-order effect, some "friction." The easiest one to understand is Bob Lucas' classic theory. In this context, employers can fool people into working harder for a little while by posting higher wages. If the people don't know that prices are going up too, they will think the real wage (relative to price) is higher, and not realize they are just being paid in devalued currency. Once they figure it out, of course, the boost to employment vanishes. (Also, this is a theory of causality from unexpected inflation to higher employment, not the other way around.)

The point here is not that there is no theory of the (apparently vanished) Phillips cure. The point here is that the simple commonsense idea that tight markets cause inflation is wrong. If you want a theory, you need to go past obvious supply and demand and add some friction to pricing or to information processing, and then you need to think the Fed understands and can exploit this friction to guide us to better outcomes than we get to on our own.

Maybe that's not how the economy is wired. Maybe labor market "tightness" and "slack" is not the root of inflation.

9 Heresy 8: Inflation Dangers

- Conventional Wisdom: The danger of inflation comes if the Fed does not raise rates quickly enough. Then we have a positive spiral.
- Heresy 8: The inflation danger comes from *fiscal* policy. A Greek unwind. As past low-rates and pegs evaporated due to fiscal problems. And then Fed will be powerless to stop it.

If inflation is indeed stable, then small mistakes in monetary policy will not lead to spiraling inflation.

Federal Debt Held By the Public

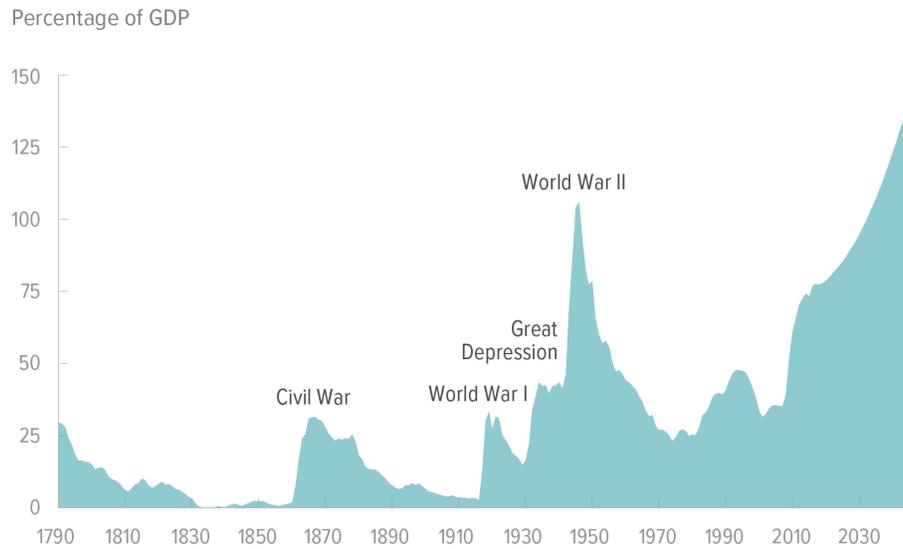


Figure 14: US debt. Source: CBO long-term budget outlook.

Inflation, like all crises, usually comes from unexpected sources. Our fiscal situation leads to a chance of inflation. If interest rates rise to 5%, our government will have to pay \$ 1 trillion per year of additional debt service. It can't. This event could pile on top of a new financial crisis and recession occasioning a few more trillion dollars of borrowing, on top of unreformed taxes and entitlement spending. People seeing that crisis coming will unload government debt, try to buy real things, and drive inflation. If that happens, there is nothing the Fed can do about it.

This possibility is not a forecast. It's a risk, and a small risk, like living above an earthquake fault that breaks every few hundred years. That doesn't mean you should rush out of the house right now. But that doesn't mean we're safe either. Bond markets still trust the US to sort out our fiscal mess. But if they ever lose that faith, we get inflation – stagflation – that will seem to the Fed, and to conventional wisdom, to have come from nowhere.