Interest Rates, Yield Curves, and the Monetary Regime

by Joseph G. Haubrich

Talk to just about any Federal Reserve economist, and they will tell you that at cocktail parties, school fundraisers, and whatnot, the question they always get asked is "where are interest rates going?" Now while the Fed economist may have little wisdom to impart, it is true that the Federal Reserve does target interest rates. The rate that the Fed targets, however, the federal funds rate, is of direct interest only to bankers and other investment professionals (who seem over-represented in certain Cub Scout packs, but that's another story). The rates people worry about are the ones that more directly affect them—mortgages, auto loans, credit cards.

Of course, the Federal Reserve does affect these interest rates, but the connection between the short-term rates targeted by the Fed and the longer-term rates most people worry about is complicated and involves some subtle factors. It's generally understood that when the Fed changes the federal funds rate, other rates in the economy also change. What's less appreciated is that the way interest rates change depends not just on what the Fed does today, or even next month or next year, but also on people's perceptions about the goals and credibility of the monetary authority. These goals and the accompanying expectations in turn depend on the institutional arrangements of monetary policy—some countries have laws mandating low inflation, others have a tradition of keeping inflation low, still others have nothing of the kind. This *Economic Commentary* looks at how such arrangements influence the impact of Federal Reserve actions on the broader financial markets. In a phrase, it looks at the impact of monetary regimes.

Regimes

Probably the best way to think of a monetary regime is as a set of institutional arrangements—how monetary policy is set up—along with the corresponding expectations of the public. Thus it's not just what is called the monetary standard, which comprises the laws, regulations, and bureaucracy governing the money supply, but also includes expectations—does the public believe the commitment to zero inflation, or not?

The concept of a monetary regime is quite broad. The situations encompassed range from systems where money consists of unbacked, rather flimsy pieces of paper to those where people knew the money supply would change only if someone sailed to a distant island and returned with disk hewn from solid rock (as was the case on the Isle of Yap). Usually though, monetary regimes tend to be a variation of two (somewhat idealized) types: commodity standards and fiat systems.

Commodity standards presuppose that money is freely convertible into a commodity—usually gold, but silver is also common. Under a gold standard, for example, the money supply is fixed by the supply of gold in the world. This provides a nominal anchor to the price level, effectively preventing long-term inflation since it ties money to gold.

The yield curve has a wealth of information about future interest rates and economic conditions. Users should exercise caution, though, as many of the relationships that hold between the behavior of the curve and what it fortells depend on the monetary regime in place at the time the curve is drawn.

Of course, some inflation is still possible in the short run because transport costs, shipping delays, and so on mean that money isn't immediately converted into gold, but barring major gold discoveries, the inflation will dissipate quickly.

A fiat regime has no backing for money. That is, the government or central bank will only exchange your paper money for other paper money, not gold or silver. (The word fiat comes from the Latin for "let it be done," indicating that the government just declares that the paper is money.)

A gold standard is not the only regime that will keep inflation low. A fiat regime, where money is not backed, can still be credible if there is a commitment to low inflation. This commitment might be informal, just a consensus of those in charge or the product of culture and tradition. The commitment to low inflation might be man-

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dated by law, as in Canada, Great Britain, and New Zealand. Just as in the gold standard case, sometimes inflation will occur, but the central bank acts to bring it down. And people expect that to happen.

Regimes are not always be credible. For example, when the price level and money supply are not tied down by law or by a gold standard, inflation can, and has, gotten out of control. Thus the economy, in addition to short-term inflation, may see inflation over the longer term. People realize that inflation has increased and is unlikely to decrease for quite some time. Neither the workings of a gold standard or the commitment of the central bank are in place to force inflation back down.

In some sense, then, a good measure of the credibility of a regime is the persistence of inflation. In both the gold standard and the credible fiat regime, a burst of inflation does not last, as either the standard or the central bank soon gets prices under control. With a noncredible fiat regime, however, things are different. Higher inflation may last for a long time. What was temporary inflation in a credible regime becomes persistent inflation in a less credible regime.

As the reader might have guessed, these regimes are not purely imaginary, though they may be starker than what is actually seen in practice. The United States was on some form of a gold standard from 1879 until 1933. For most of that period inflation remained low (see figure 1). The major exception was World War I and its aftermath, when inflation at times reached nearly 30 percent. This reflected massive gold imports from Europeans looking for a safe harbor for their assets. Shortly after the war, though, as the Europeans countries returned to the gold standard, prices fell, and it was deflation that hit double digits in the United States during the early 1920s.

After 1933, when Americans could no longer exchange their dollars for gold, (or even own gold) the United States still retained a tenuous link to the gold standard in that currency was required to have a partial gold backing. The government was required to hold a certain amount of gold for each Federal Reserve note issued to the public. This requirement was eliminated in 1968. After this time, foreign central banks could still exchange dollars for gold, but even this ended in August of 1971.

At least since 1972, the United States has been on a fiat regime. This has at times looked like both the credible and the noncredible fiat regime described above. For most of the 1970s, inflation was high and it persisted at high levels for most of the decade. Since the middle 1980s, however, inflation has been lower, and its increases only temporary.

■ Riding the Yield Curve

The different types of monetary regimes embody different patterns of action by the central bank and different expectations of the public. These patterns strongly color how interest rates will move. Understanding the influence of these patterns means taking a closer look at different interest rates.

As mentioned above, there are many types of interest rates in the financial marketplace: Think of mortgages, savings bonds, auto loans, and junk bonds. There are interest rates on safe investments (savings bonds) and risky investments (junk bonds), short-term rates and long-term rates, rates backed by hard collateral (auto loans) and those backed by promises to pay. For our purposes, though, the most important patterns arise when we concentrate on different maturities: short versus long rates. And to avoid differences in risk and so forth, it makes sense to further focus on just U.S. Treasury debt, which is considered default free. Plotting these rates against their maturity produces the yield curve. Understanding how the yield curve moves and reacts to different economic events provides a glimpse into the relationships between long- and short-term interest rates. For example, short-term interest rates might be quite low, but that does not guarantee low long-term rates: a steeply sloped yield curve will have long rates much higher than short rates.

What does this talk of interest rates have to do with regimes? The monetary regime has a lot to do with the shape and movement of the yield curve, and thus with how closely short and long-term rates move together (or don't).

The first step in this process is recalling how inflation affects interest rates. When prices rise, dollars in the future buy less than dollars today, so getting 10 percent interest does not buy you 10 percent more stuff. The "real" return or real yield is less than the 10 percent because of the value inflation takes away. Smart investors know this, and take account of expected inflation when making financial transactions. As a result (the famous Fisher equation) the nominal interest rate on a bond or money market account can be thought of as being composed of a real rate and an expected inflation rate. A 10 percent interest rate with no inflation gives you the same real return as a 15 percent interest rate when inflation runs at 5 percent.

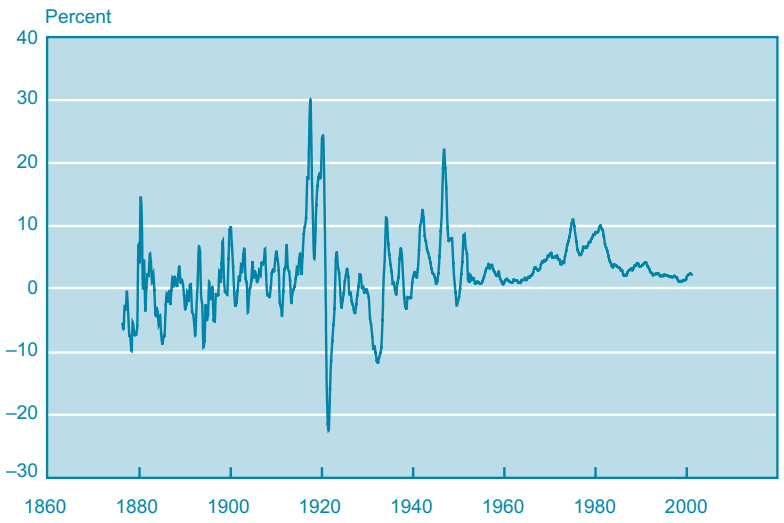
This is where regimes, their credibility, and the persistence of inflation come in. Under a credible regime, such as a gold standard, inflation may be high at times, but it is only temporary. Thus, shorter-term rates—three months, one year, and so forth, should build in that inflation premium, and increase. Over the long haul, however, inflation will revert to low levels, so there shouldn't be much of an inflation premium on 10-, 20-, or 30-year bonds.

This means that under a credible regime, inflation shocks end up flattening the yield curve temporarily. (Conversely, a shot of deflation will make the curve steeper.)

Things are different under a less credible regime, where inflation is more persistent. Inflation hangs around longer, so that high inflation today means high inflation tomorrow as well. The inflation premium not only gets built in to short rates, but to longer rates as well. Unlike the credible case, where inflation moved up only short-term interest rates, in the noncredible case, inflation moves up long and short rates. This shifts the entire yield curve up. The curve does not, however, get appreciably steeper or flatter, as rates move up with inflation.

That last point deserves a bit more explanation. Whether the curve gets steeper or flatter depends on how persistent inflation is. In one extreme case, where higher inflation today causes people to expect that higher rate forever, the slope does not change. If inflation is less persistent, the long rates won't rise as much as short rates, and the curve will move up and flatten, though not as much as in the credible

FIGURE 1 INFLATION IN THE UNITED STATES



SOURCES: Balke and Gordon (1986); and the U.S. Department of Commerce, Bureau of Economic Analysis.

case. It's even possible that people see a small rise in inflation today and think this presages even more inflation, so the curve gets steeper.

■ Digging in the Data

Now all this matters precisely because many people are anxious to extract any information they can from the yield curve. So the first set of people who can benefit from understanding the relation between regimes and the yield curve are those financial analysts, market watchers, and homeowners looking to refinance who are concerned with the relationship between long and short rates.

The lesson for them is that the regime matters a lot when thinking about the connection between long rates and short rates. Seeing short rates rise today doesn't always tell you much about long rates, and this is particularly true in times of low and stable inflation. For example, over the past decade and a half, 10-year interest rates have shown both large increases and decreases in response to changes in the federal funds rate, the overnight rate targeted by the Fed's Federal Open Market Committee.

Another set of people who should heed the message about regimes are those who use the yield curve to help forecast the future. This probably includes many of those responsible for monetary policy. Because financial markets are by their very nature forward looking, they embody the expectations of a great many people, and thus contain a lot of information about the future. Many people in fact use the slope of the yield curve—the difference between long and short rates—to forecast economic growth. The idea is that an inverted yield curve can signal an upcoming recession. More generally, a flat (or inverted) yield curve presages slow growth, with a steep curve predicting faster economic growth. The reasons for this are not entirely clear, but in part, this may reflect monetary policy: A steep yield curve means the central bank is keeping short-term rates below average, indicating expansionary policy. How reliable this yield curve signal is varies over time, however, and the reliability depends a lot on which monetary regime we're in.

Recall that under a credible nominal regime, with a gold standard or inflation target, inflation, being temporary, will increase short rates but leave long rates unchanged. Bursts of inflation then add noise to the signal the yield curve is giving—some purely nominal shifts are added to the movements forecasting the real economy. Under a credible regime, then, the yield curve should have some trouble forecasting the real economy.

With a regime that is not credible, the situation is different. Since inflation is more persistent, it tends to hang around for a while, and this drives up long-term rates along with short-term rates. That is, yields shift up together all along the curve, keeping the slope roughly constant. That means persistent inflation does little to change the slope of the yield curve, keeping its predictive properties intact. So under a noncredible regime the yield curve does better in forecasting the real economy.

The differences in credibility perhaps underlie the somewhat murky performance of the yield curve in predicting the most recent recessions. In the early 1980s, when the credibility of the Federal Reserve was not as strong, the yield curve gave clear signals of recessions. The recession starting in January 1980 was heralded by an inverted yield curve a year earlier, in January of 1979, and short rates exceeded long rates by almost a full point by September of 1979. Similarly, the recession of July 1981 was preceded by an inverted yield curve, where short rates exceeded long rates by over two and half percent in December 1980.

In contrast, when the Federal Reserve had attained greater credibility, predictions from the yield curve were not so clear. Prior to the 1990 recession, for example, the yield curve did not invert, though it did flatten considerably. Prior to the most recent recession starting in March 2001, the curve did invert, but short rates exceeded long rates by barely half a percentage point, and that was in December of 2000, giving little lead time.

■ Clouds and Silver Linings

The points made about regimes, inflation, and yield curves have neglected some very important issues. There are large advantages to having a regime with stable low inflation. Firms and workers can set contracts without worrying about inflation eating away the gains. The tax code won't automatically bump people into higher tax brackets even if real incomes don't rise. The post office won't have to keep raising the cost of stamps.

But these advantages come with some costs, and one of these costs is a yield curve that is more difficult to interpret. Such a cost hardly justifies a return to double-digit inflation, but it should serve as a cautionary reminder that some signals and indicators will prove murkier in some regimes than others.

■ Notes

1. This *Commentary* is based on work with Michael D Bordo of Rutgers University. A more detailed discussion of the ideas can be found in the paper, "The Yield Curve, Recession, and the Credibility of the Monetary Regime: Long-run Evidence, 1875–1997." Federal Reserve Bank of Cleveland, Working Paper, no. 04-02, and NBER Working Paper no. 10431, April 2004.

2. The specific examples of spreads and growth use monthly data for the spread between 10-year and 3-month Treasury securities. Other maturities and more frequent data (daily, weekly) would be a bit different, (that is, one could find a small, brief inversion prior to the 1990 recession) but the basic message would be the same.

3. The data for a portion of the inflation series used in figure 1 come from Nathan S. Balke and Robert J. Gordon. 1996. "Historical Data," in appendix B of *The American Business Cycle: Continuity and Change,* NBER Studies in Business Cycles, vol. 25, edited by Robert J. Gordon, University of Chicago Press, Chicago.

Recommended Reading

The concept of a monetary regime is explored in more depth in:

Michael D. Bordo and Anna J. Schwartz. 1999. "Monetary Policy Regimes and Economic Performance: The Historical Record," in *Handbook of Monetary Economics*, vol. 1, edited by John B. Taylor and Michael Woodford, Elsevier Science B.V.

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