

# Monetary Policy in a Zero-Interest-Rate Economy



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## Introduction

If short-term interest rates fall toward zero, it may be necessary for the Fed to re-think how it conducts monetary policy. In this document, we examine why conventional policy loses its effectiveness at very low interest rates, and review some of the alternative policy tools that are available. We're hopeful that this entire discussion will prove to be academic—that our economy's natural resilience, together with the easing the Fed has already undertaken, will be sufficient to get employment and output growing again. But it's nice to know that if additional stimulus is required, there are still arrows left in the quiver.

## The Recovery May Be Stalling Despite Low Interest Rates

As shown in **Figure 1**, short-term interest rates are as close to zero as they've been at any time since 1958. Any further rate reduction will make life difficult for banks and money-market funds, which will either have to start paying out less than a dollar for each dollar invested, or to begin charging explicit management fees.

As of August of last year, it certainly looked as though further interest-rate cuts would not be required. Important monthly indicators like industrial production and payroll employment were clearly on the upswing (**Figure 2**). Since August, however, the incipient recovery hasn't unfolded according to plan. Employment has been particularly weak, hitting new cyclical lows for three months running.<sup>1</sup> We're hopeful that positive trends will re-emerge now that the Iraq situation has been more-or-less resolved. But if we're wrong, or if another adverse shock hits the world economy, then new stimulus will be required.

Figure 1

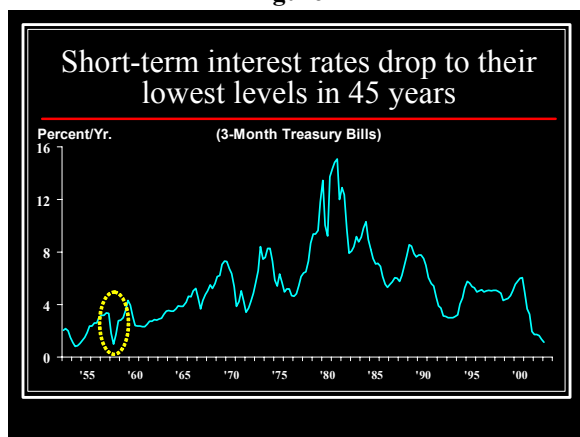
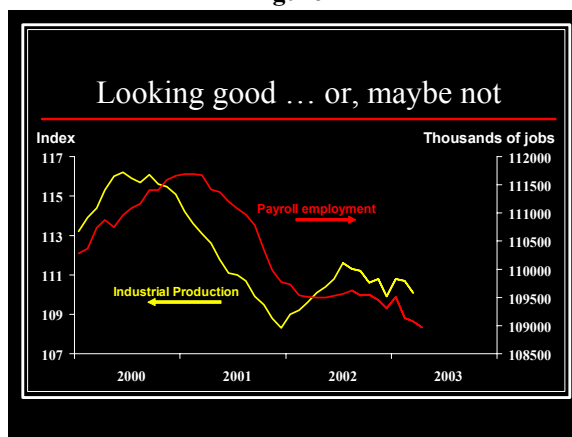


Figure 2



<sup>1</sup> The year-to-year change in private payrolls has been negative for 22 straight months—the longest uninterrupted stretch of job losses since 1944-46.

## **The Conventional Response to a Weak Economy: Open-Market Operations**

Usually, the Fed attacks weakness in the economy by conducting expansionary open market operations. In a typical open-market operation, the Fed purchases Treasury bills from bond traders in the New York securities market. The effect is to increase liquidity in the economy—cash and bank reserves rise while the number of Treasury bills held by the public falls—and to lower short-term interest rates. Lower interest rates encourage consumption and investment, and greater liquidity provides the means to finance the new expenditures.

Unfortunately, conventional open market operations lose their effectiveness as the yield on Treasury bills is driven to zero. At a zero interest rate, a Treasury bill is no different from vault cash or large-denomination currency. An open-market operation is like the Fed offering to exchange twenty \$1 bills for one \$20 bill: The increase in liquidity is negligible. Moreover, there is no way to achieve any further reduction in the interest rate. Why would anyone accept a *negative* return on Treasury bills when they have the option of holding cash, which offers a zero return? With no increase in liquidity and no reduction in the interest rate, there is no reason to expect an open-market operation to produce any increase in household or business spending.

## **The Zero-Interest-Rate Bound Can Lead to Serious Trouble if There is Deflation**

Policy-makers can find themselves in serious trouble if they come up against the zero interest-rate bound during a period of falling prices—that is, during a period of deflation. That’s because what ultimately matters to households and firms is the *real* cost of borrowing—what economists call the real interest rate. The real interest rate is the difference between the market, or “nominal,” interest rate and the rate of inflation. It is the prospect of a low *real* interest rate that makes current consumption and investment spending attractive. The trouble is, even a zero nominal interest rate can produce an expected real interest rate that is too high if people expect a negative inflation rate.

For example, if prices fall at a 3 percent annual rate, then a zero nominal interest rate puts the real cost of borrowing at a positive 3 percent. The prospect of a 3-percent real interest rate might be just fine in a healthy, growing economy. It will be excessive, however, in an economy where the growth outlook is poor, or where fragile finances have led households and firms to become cautious about spending and banks to become cautious about lending.

## Unpleasant Scenarios

The U.S. Great Depression is the textbook example of what can go wrong if policymakers are slow to respond to a deteriorating economy and falling inflation. As shown in **Figure 3**, the Federal Reserve cut the short-term nominal interest rate from 5 percent in 1929 to ½ percent in late 1932. However, inflation fell even faster. Consequently, the real interest rate—the difference between the nominal interest rate and the inflation rate—actually increased, rising from 3½ percent in the spring of 1929 to a peak of 15 percent in late 1931 and early 1932. Monetary policy was, effectively, becoming tighter and tighter in the early 1930s, rather than easier and easier.

As a result, industrial output fell by a whopping 50 percent relative to trend. Recovery didn't begin until 1933, when the Roosevelt administration suspended gold payments and allowed the dollar to depreciate. Inflation rose well above the nominal interest rate, turning the real interest rate sharply negative.

Japan in the 1990s provides a more recent example of the trouble that can be caused by the zero interest-rate bound. Like the Depression-era Federal Reserve, the Bank of Japan cut short-term nominal interest rates in response to a weak economy (**Figure 4**). By the second half of 1995, the 3-month government rate was essentially zero. Although the interest-rate decline was too slow to prevent inflation rate from turning into deflation, the real interest rate fell from 5 percent in late 1990, to 3 percent in 1993, to 1 percent or less in 1995, 1996 and 1997. Industrial output, which had nosedived in the early 90s, began to recover in 1996. But then the Asian economic crisis hit. Conventional monetary policy was powerless to respond, and Japan remains mired in depression to this day.

Figure 3

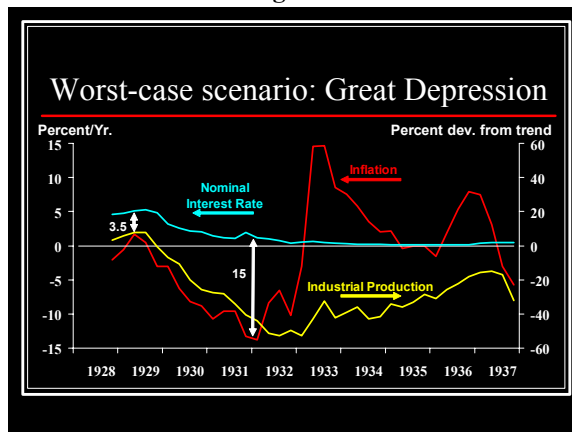
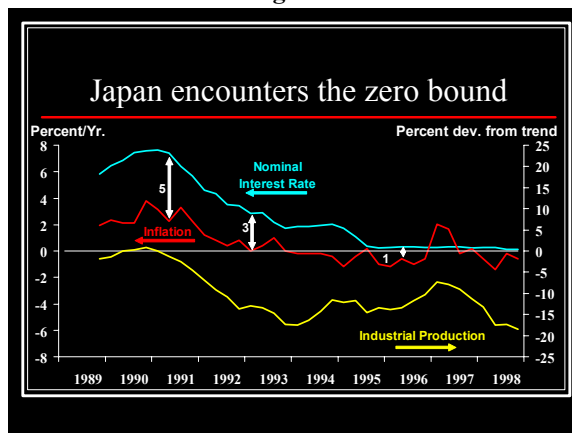


Figure 4

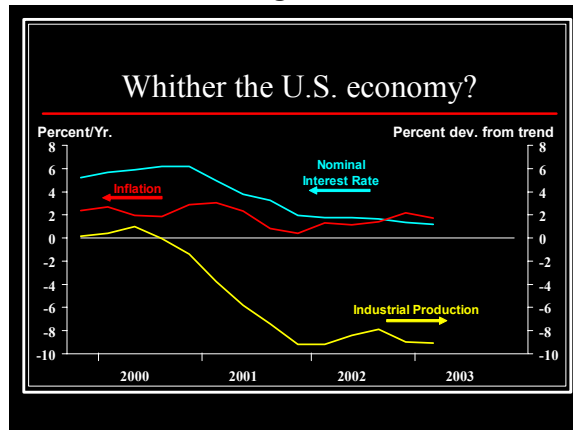


## Whither the U.S. Economy?

It took the Bank of Japan six years to get short-term interest rates (briefly) down below the rate of inflation. As shown in **Figure 5**, the Fed has closed the interest-rate–inflation gap in less than half the time. This relatively quick action has prevented inflation from becoming outright deflation and avoided any significant damage to U.S. financial institutions.

As we saw earlier, however, recent declines in industrial output have raised concerns that the U.S. economy may be stalling out. With the nominal interest rate so close to zero that conventional open-market operations are of doubtful effectiveness, what policy options are available to the Fed, should further stimulus be required?

Figure 5



## Strategies for overcoming the zero bound

A number of strategies have been proposed for pulling the economy out of a zero-interest-rate trap, ranging from the radical to the mundane and from the practically difficult to the eminently practicable. In this part of the presentation we examine several such strategies. We first consider the boldest, though also the most difficult to implement—eliminating the zero bound altogether. Turning towards more workable strategies, we examine modifications to standard policy that avoid some of the problems alluded to in the first part of the presentation. Among these more workable approaches are strategies that require the coordination of Fed policy with that of other actors—either foreign central banks or domestic fiscal policy-makers—and strategies that the Fed can follow unilaterally.

### Bold, but impractical—eliminating the bound altogether

The most daring suggestion for escaping the zero-interest-rate trap is one that eliminates the zero lower bound altogether. How can this be done? As noted in the first part of the presentation, the zero bound on interest rates exists because money pays a sure nominal interest rate of zero. No one would be willing to hold any asset that pays a *negative* nominal interest rate, as long as zero-interest money is available as a store of value.

The strategy for eliminating the zero bound, therefore, is to make money pay a negative nominal interest rate, by imposing some type of ‘carry tax’ on currency and deposits.

It's easy to envision such a system with regard to deposits at the Federal Reserve or transactions deposits at banks; for the most part, the technology to implement such a system is already in place. A tax or fee on Reserve deposits of 1% per month, for example, would mean that those deposits, in effect, pay a nominal interest rate of roughly minus 12%.

The technological difficulty lies mainly in imposing such a tax on currency. In the 1930s, Irving Fisher of Yale University, one of the greatest American economists, proposed such a system, in which currency had to be periodically 'stamped', for a fee, in order to retain its status as legal tender. The stamp fee could be calibrated to generate any negative nominal interest rate that the central bank desired.



While the technology available for implementing such a system is more sophisticated today than in Fisher's time, enforcement still seems a mammoth problem, involving physical modifications to currency and some means of tracking the length of time each piece spends in circulation.

Given the technological hurdles involved in its implementation, a carry tax on money may not be feasible as a response to any events that might transpire in the next year, though it certainly merits study as a possible response to events that might transpire in the next decade. This is particularly the case if achieving and maintaining price stability makes bumping up against the zero interest rate bound a more frequent event.

## More workable modifications to standard policy

If the bound can't be easily sidestepped—at least in the immediate future—what options does the Fed have? As implied in the first part of the presentation, one key is to conduct monetary policy in a way that doesn't simply give the private sector “change for a twenty”—that is, monetary policy must take actions which expand the *sum* of zero-interest money and its zero-yielding substitutes, not simply swap one for the other. This can be done through purchases of assets that are not perfect substitutes for money. We will consider three possible candidates:

1. Foreign exchange
2. Real goods and services
3. Other domestic securities—such as longer-term Treasuries.

Strategies which target the first two candidates, as we'll see, can only succeed if the Fed coordinates its policy actions with those of other actors—namely, foreign central banks or domestic fiscal policy-makers. A strategy targeting the third is something the Fed can do today, unilaterally, within the constraints imposed by the Federal Reserve Act.

## The foreign exchange escape route

Foreign exchange intervention has been suggested by more than one prominent economist as a surefire strategy for getting out of a zero-interest rate trap.

How would such a strategy work? In this approach, the Fed would pursue a targeted, substantial depreciation of the U.S. dollar, by purchasing foreign currency using newly minted dollars. The dollar depreciation would increase current demand by stimulating net exports—that is, by increasing sales of U.S. goods abroad and reducing purchases of foreign goods in the U.S. If the Fed committed to maintain the depreciated dollar for some length of time, inflationary expectations could also increase. Higher expected inflation, in turn, would result in a lower prospective *real* interest rate, even if nominal rates do not change.

The big problem with this strategy is that, in a roundabout way, it amounts to conducting a *monetary contraction* in our trading partners' economies. In buying up another country's currency—and assuming the Fed simply holds, rather than spends, that foreign currency—the Fed would, in effect, be reducing the foreign economy's supply of money and, likely, raising interest rates there as well. If the foreign central bank was attempting to pursue a neutral or expansionary policy, the Fed's action might generate some consternation or even a policy response. If the Fed purchased Euros, for example, the European Central Bank might respond by simply printing more of them, thus neutralizing the Fed's action.

To be successful, this strategy requires cooperation, or at least acquiescence, on the part of our trading partners. Given growth prospects elsewhere around the globe, such acquiescence, while not impossible, seems unlikely.

## The goods & services solution

Why not have the Fed just conduct an open market purchase of real goods and services? Even more so than exchange rate intervention, this strategy would represent a direct stimulus to aggregate demand.

As posed, though, the strategy has a major drawback: it violates the Federal Reserve Act. The Fed isn't authorized to purchase goods and services, apart from those needed for the operation of the Federal Reserve System.

The strategy *can* be implemented, however, by coordination with fiscal policy-makers. The Federal government, for example, could purchase goods and services and finance the purchases with new debt, which the Fed in turn would buy—in technical terminology, the Fed would 'monetize' the resulting debt.

By coordinating with fiscal policy, the Fed could even implement what is essentially the classic textbook policy of dropping freshly printed money from a helicopter. In this case, the Fed would monetize government debt that had been issued to finance a tax cut.



The scale of operations entailed by this approach would be large—to monetize government spending equal to 1% of GDP, for example, could mean increasing the monetary base (the sum of currency and bank reserves) by as much as 15-20%. Though trite to say, it is nonetheless true that extreme times could require extreme measures.

## The simplest strategy: buying other domestic securities

We finally turn to the simplest strategy: buying other domestic securities. Even if the short riskless rate is equal to zero, other interest rates on other securities will generally be positive, and those securities could be targets for open market operations. This is a course of action that the Fed can follow today, without coordinating its action with other policy-makers, or running afoul of the Federal Reserve Act.

The Federal Reserve Act does impose restrictions on what type of domestic securities the Fed may or may not buy through open market operations. These are detailed in **Figure 6**.

Some of the securities in the “allowed” column may be less-than-familiar. “Debt guaranteed by the U.S. government” refers to the debt of government-backed enterprises such as Ginnie Mae. A “bill of exchange” is essentially a draft order which specifies a future date on which the order is to be executed. “Bankers acceptances” are bills of exchange in which the bank on which the draft order is made guarantees payment.

For all practical purposes, the legal constraints limit open market operations to U.S. government debt or the debt guaranteed by the U.S. government. The markets for bills of exchange and bankers’ acceptances are simply too small to be of any use.

What if the assets in the “not allowed” column *were* “allowed”, though? This point is not moot, since aggressive use of the discount window—under certain emergency provisions in the Federal Reserve Act—can allow the Fed to sidestep, to some extent, the restrictions which apply to open market operations.

**Figure 6**

Federal Reserve Act restricts feasible instruments	
■ Allowed:	■ Not allowed:
■ Government debt	■ Corporate bonds
■ Debt guaranteed by U.S. government	■ Commercial paper
■ Bills of exchange	■ Equities
■ Bankers' acceptances	■ Mortgages



Even if the legal constraints were not present, however, it's not necessarily desirable to have the Fed acting in markets for corporate debt or mortgages. Whatever benefits there might be from such actions would have to be weighed against the cost of putting the Fed in the business of allocating private sector credit—a task for which the Fed has no particular expertise, and which would likely subject the Fed to unwelcome political pressures.

In what follows, we concentrate on purchases of government debt, though one should bear in mind that while more is possible, it is not necessarily desirable.

How, then, would this strategy work? Following this avenue, the Fed could purchase any government debt with positive yields—for example, longer-term Treasuries. In broad terms, reducing the supply of these securities forces the private sector to re-balance its portfolio. The yields on the securities whose supply has shrunk must fall, in order to make people content with holding less of them. The prices of these assets, which move in the opposite direction from yields, must rise.

For consumers, the lower yields reduce saving and spur consumption. For businesses, the lower yields can mean a lower cost of funds, while the rise in the assets' prices can improve businesses' balance sheets or give them more valuable collateral with which to secure financing.

This strategy, while indeed the simplest to implement, is not without problems:

First of all: No one, we believe, has a good *quantitative* sense of the mechanics of this strategy—that is, what size operations are needed to secure a given stimulus? While the Fed has managed longer-term yields at various times in the 1940s, '50 and '60s, the last time such a strategy was implemented was nearly 40 years ago.

Second, if the short riskless rate is zero, but other rates are positive, those rates must be positive for reasons—to compensate the holders of those assets for some form of illiquidity or risk. Under this strategy, the Fed takes those risks onto its balance sheet.

This leads us to a third point: the Fed is almost guaranteed to take a capital loss on its portfolio. If the strategy works, the economy picks up, interest rates go up, bond prices go down, and the value of the Fed's holdings of longer-term Treasuries falls.

Finally, narrowing the yield spread between assets of long and short maturity can stress institutions, such as banks, that profit from that spread. On the other hand, it must be noted, a wave of deflation-induced loan defaults would no doubt also be stressful for banks.

## **In conclusion...**

We've seen that open-market purchases of Treasury bills—the Fed's standard method for stimulating the economy over the past 40 years—become ineffective as short-term interest rates approach zero.

With Treasury bill rates so near zero, the Fed will need to be open to alternatives to standard policy and stand ready to vigorously pursue them if the economy remains weak.

In the event it must act alone, the Fed's best policy option is probably open-market purchases of longer-term government bonds. Efforts to influence longer-term Treasuries are not unprecedented: they were fairly common in the 1940s and early 1950s. But that's not to say that reorienting Fed policy would be problem-free: there are good reasons why the Fed usually aims its efforts on the short end of the yield curve.

If standard policy options are exhausted, the Fed's quiver is by no means empty. But the arrows that remain are less familiar and, perhaps, not quite as straight as the ones that have already been fired.

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