



# When Will Banks Start Raising Deposit Rates: Here's What History Shows

Bill Nelson & Gonzalo Fernandez Dionis | April 25, 2022

As interest rates rise across the economy, bank depositors have not seen much increase in the rates they are being paid. This note examines why, looking at the economics of deposit pricing and how deposit rates have behaved during similar periods in the past. Analysts talk about the deposit “beta” – the amount the deposit rate goes up in response to a rise in market rates, but that concept is not especially useful when deposit and market rates are near zero. Judging by past behavior, market rates will have to rise up a bit before deposit rates start to respond. That said, history may not be a perfect guide for the behavior of deposit rates going forward because so many things have changed since the last time market rates rose substantially and durably above zero.

The FOMC targets the federal funds rate, the interest rate on unsecured overnight loans between banks. Researchers often analyze the relationship between deposit rates and the fed funds rate, in part because the Fed targets the rate and in part because overnight fed funds loans resemble deposits in some ways. Both instruments are very short term – fed funds are returned the next day, deposits, apart from time deposits, are available on demand. Both instruments are mostly loans to commercial banks. And both instruments are highly liquid.

However, deposits and fed funds loans are also different in important ways. Deposits are available to households and businesses in amounts of all sizes while fed funds loans are made by financial institutions and are typically very large. Deposits of less than \$250,000 are insured by the FDIC, and banks pay risk-based premiums for that insurance. Pricing of fed funds is one-dimensional – via the interest rate – while pricing of deposits has other dimensions including fees and minimum balance requirements. Perhaps most importantly, deposits come with payment services – the ability to transmit or receive funds, transfer balances between accounts, or withdraw cash, usually at no additional fee to the customer.

All of these differences are reasons why deposit rates should be expected to be below the fed funds rate. Payment services are valuable to depositors and expensive for banks to provide. Deposit insurance eliminates credit risk while fed funds loans are exposed to the risk that the bank will default. Small borrowings by the bank in the form of deposits are more costly for the banks than large borrowings in the form of fed funds.

Not surprisingly, therefore, historically deposit rates have been below the fed funds rate. The deposit rate we analyze, described below, has averaged about 1 1/3 percentage points below the fed funds rate during periods when the fed funds rate is away from the zero lower bound. Like the fed funds rate, deposit rates have not gone below zero. Consequently, when the fed funds rate is close to zero, deposit rates and the fed funds rate get squeezed together – that is, deposit rates are less than the fed funds rate by less than normal.

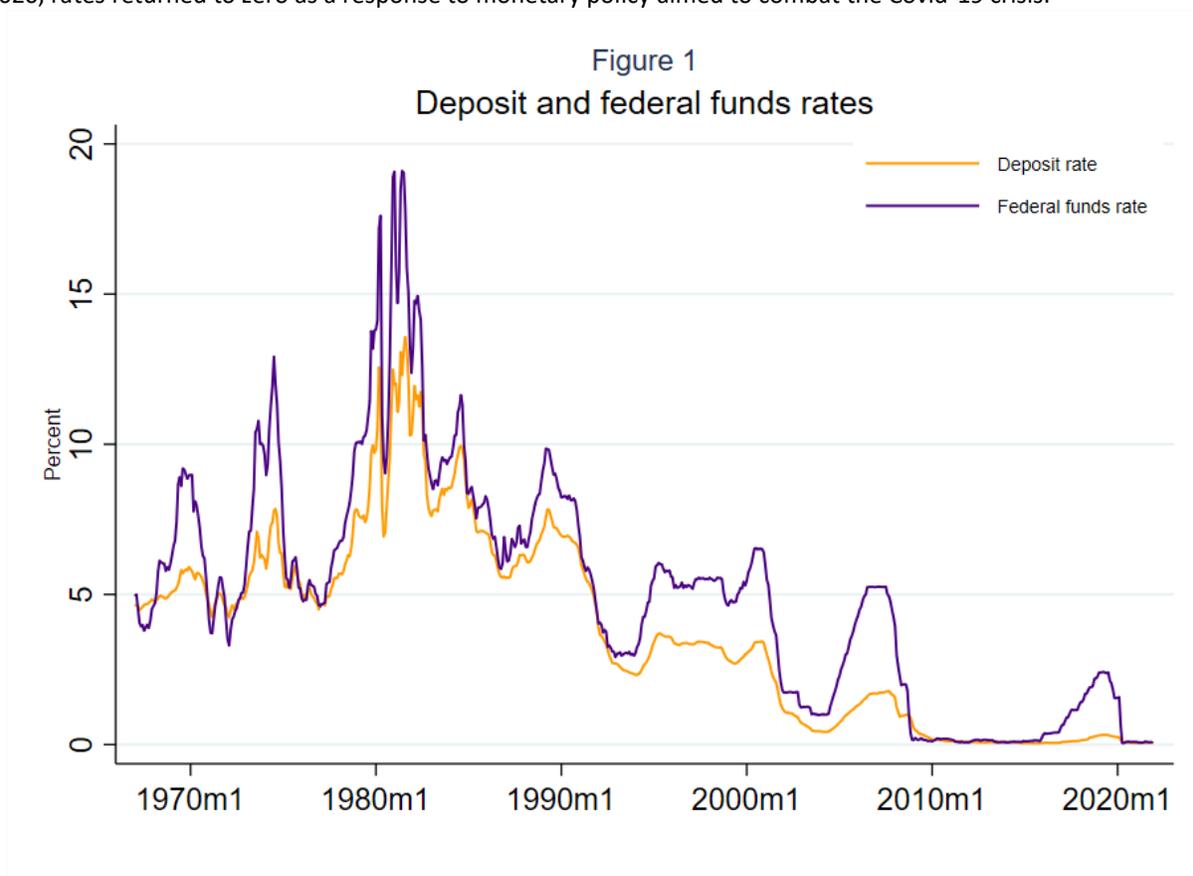
In this note, we examine how deposit rates have behaved in relation to the fed funds rate, using an empirical specification that accounts for the effect of the zero lower bound on the rates. We use the estimates to project deposit rates in the event that the FOMC continues to increase the fed funds rate. Deposit rates are initially unresponsive to the rise in rates as the normal spread between the funds rate and deposit rates is reestablished. Over time, the responsiveness of deposits to changes in the fed funds rate picks up.

## Data and Empirical Analysis

Our sample includes monthly data on the deposit rate and the federal funds rate from January 1967 to December 2021. The federal funds rate is the month-average of the effective federal funds rate (the daily rate weighted by transactions) from the Federal Reserve Economic Data website.<sup>1</sup>

We calculate the interest rate on deposits using data from the Centre for Financial Stability<sup>2</sup> on the rate of return on the M2 monetary aggregate. M2 consists of currency, demand deposits, savings deposits, other checkable deposits, money-market deposit accounts, small-denomination time deposits, and retail money market funds.<sup>3</sup> We adjust the rate upward to account for the components of M2 that do not bear interest (currency and travelers checks) or did not bear interest for much of the sample (demand deposits).

In Exhibit 1 we plot both rates across our sample period. The deposit rate tracks the fed funds rate but at a slight discount. Our sample includes substantial variation. From 2008 to early 2017, the funds rate was effectively trading around the zero-lower bound. The 2018 hiking cycle produced a muted response from the deposit rate. In March 2020, rates returned to zero as a response to monetary policy aimed to combat the Covid-19 crisis.



<sup>1</sup> <https://fred.stlouisfed.org/series/FEDFUNDS>

<sup>2</sup> [https://centerforfinancialstability.org/amfm\\_data.php#methods](https://centerforfinancialstability.org/amfm_data.php#methods)

<sup>3</sup> The definition of M2 is available in the Federal Reserve's H6 statistical release: <https://www.federalreserve.gov/releases/h6/current/default.htm>

## Empirical Analysis

The objective of the analysis is to predict and explain the evolution of the deposit rate over coming months as the FOMC increases its target range for the federal funds rate. For this purpose, we use a model that captures the realized deposit rate alongside a shadow or equilibrium rate that represents the rate that would normally prevail if the deposit rate were to go below zero.

The deposit rate estimate uses an error-correction model framework composed of two simultaneous equations intended to capture both the long-run relationship between the federal funds rate and the deposit rate as well as the short-run dynamics of the deposit rate as the funds rate changes. The change in the deposit rate is caused by two factors; the short-run dynamics, which are driven by the change in federal funds rate, and the error correction term – the tendency of the deposit rate to return over time to its equilibrium level.

There is no economic reason why the cost to a bank of providing payments services and the value of those services to depositors, as well as the interest rate spread owing to the other differences between deposits and fed funds loans, should change with the level of interest rates, so in the model the equilibrium deposit rate just differs from the fed funds rate by a constant spread.

The model captures the effect of the zero lower bound on deposit rates in two ways. First, if the unrestricted model prescribes a negative deposit rate, we set the model's prescription to zero. Second, if the equilibrium deposit rate is below zero, we calculate the predicted deposit rate as the change from the lagged equilibrium rate rather than from the lagged deposit rate. The second adjustment prevents the short-run dynamics from swamping the effect of the significant gap between the deposit rate and the equilibrium deposit rate when interest rates rise up from the zero lower bound.

Under this framework we illustrate how the deposit rate would generally not react to changes in the fed funds rate while the long-term spread between both rates remains compressed, represented by a negative equilibrium deposit rate. As the fed funds rate returns to more normal levels, so would the spread between both rates, allowing for a more reactive deposit rate.<sup>4</sup>

### REGRESSION RESULTS

We fit the model using nonlinear least squares. Table 1 presents the results. The constant term indicates that, on average, when the fed funds rate is away from the zero lower bound, the deposit rate was 1.4 percentage points below the funds rate. The constant term is also the estimated spread between the funds rate and the equilibrium deposit rate. When the deposit rate is away from the zero lower bound, the deposit rate increases in each month by just under half of the change in the funds rate in that month. Lastly, the deposit rate tends toward its equilibrium rate at a pace of 2 percent each month.

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<sup>4</sup> Future research could improve on this analysis by using better deposit rate data and including a tobit correction to better capture the behavior of the error terms around the zero-lower bound.

**Table 1: Error-correction model for the deposit rate**

Independent variables	(2)
Equilibrium spread between the deposit rate and the fed funds rate	-1.34*** 0.36
Change in fed funds rate	0.46*** 0.02
Gap between the deposit rate and the equilibrium deposit rate	-0.02*** 0.01

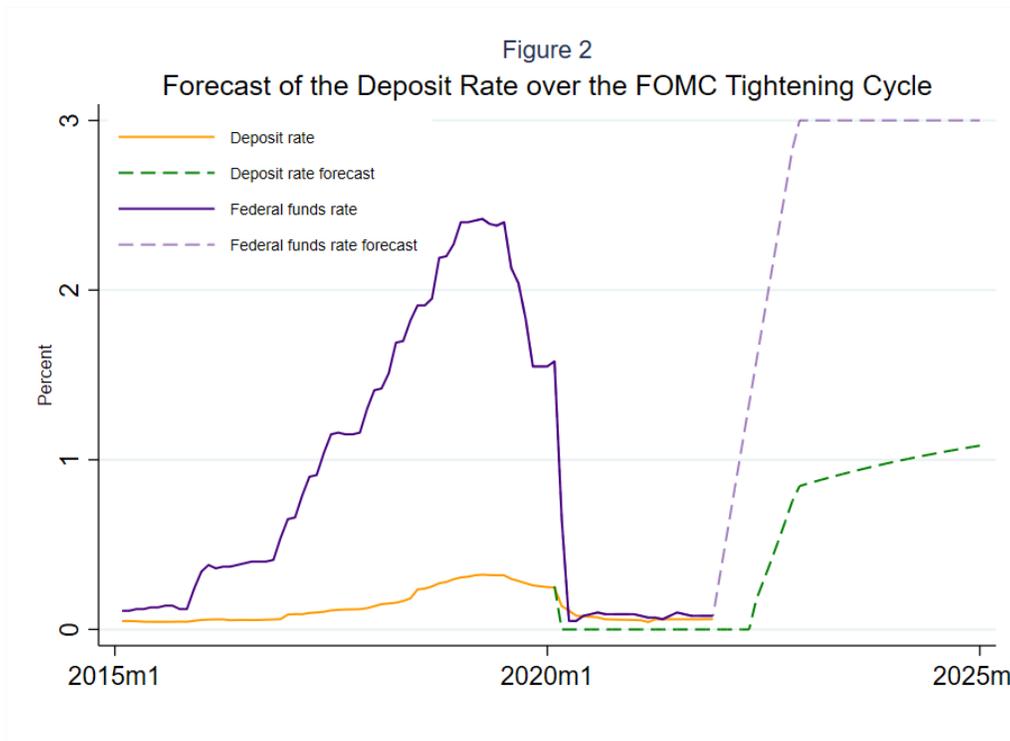
\*\*\* Significant at the 1 percent level.

Note that the concept of a deposit beta is ill-suited to describe the relationship between the deposit rate and the funds rate captured by the model. In particular, setting aside the zero-lower-bond effects, by construction 100 percent of an increase or decrease in the federal funds rate is eventually reflected in the deposit rate, but only half of the change in the funds rate would be reflected in the deposit rate immediately, the other half would show up over time as the deposit rate adjusts to its new equilibrium.

**FORECASTING THE PATH OF THE DEPOSIT RATE.**

The FOMC is expected to increase its target range for the fed funds rate significantly over coming months. We assume the Fed tightens the funds rate 25 basis points a month (essentially one 25 bp hike and one 50 bp hike each quarter) until the funds rate reaches 3.0 percent where it stays.

The projection is shown in figure 2. Initially, as the funds rate rises, the deposit rate remains at zero because the equilibrium deposit rate is still negative. Once the funds rate rises to 1.33 percent, the deposit rate rises about 35 basis points a quarter. Because the funds rate is rising faster than the deposit rate, the equilibrium deposit rate rises up above the deposit rate. When the funds rate stops increasing at 3 percent, the deposit rate continues to rise gradually, catching up to the equilibrium deposit rate. The deposit beta, the percentage change in the deposit rate divided by the percentage change in the funds rate, starts at zero during the period when the deposit rate remains at zero, then rises to 50 percent when the deposit rate and the funds rate are both rising, and then rises again to infinity when only the deposit rate is increasing.



## Conclusion

As the FOMC raises the fed funds rate, deposit rates will follow. The initial response may be sluggish, by historical standards, however, until the normal spread between deposit rates and the fed funds rate is reestablished. Our results suggest deposit rates will start rising when the funds rate exceeds 1.33 percent. Increases above that level pass through to deposit rates, but about half of the pass through occurs only gradually.

These estimates are determined almost entirely by the relationship between deposit rates and the fed funds rate for the 50 years before the Global Financial Crisis. However, there are many reasons to think that the future will not be like the past. Moreover, each of the differences have different implications making the net effect hard to predict. Since the last time that the funds rate was durably well above the zero lower bound, new liquidity regulations have made deposits, which are a stable source of funding, more valuable to banks. The rise of internet banking has made it easy for every depositor to shop around the country for the best deposit rate. At the same time, automatic payments and deposits may have made deposit relationships stickier. Regarding the near-term outlook for rates, banks are currently flush with deposits reflecting the inflows that have occurred over the past two years when deposit rates were relatively attractive (compared to alternatives).

The behavior of deposit rates over the upcoming year will provide important information on the net effect of all these developments on the responsiveness of deposit rates to changes in market rates and the average level of deposit rates relative to market rates. But the picture will not begin to become clear until the tightening cycle is further along.

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