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Inflation and the Fed rate decisions between 1954 and 2024. Should we expect recession?

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Abstract

A strict linear proportionality between the CPI inflation and the actual interest rate defined by the Board of Governors of the Federal Reserve System is studied. During the last 70 years, the cumulative CPI is just the cumulative interest rate times 1.37. There are periods when the Fed interest rate deviates from the long term inflation trend driven by the CPI. In this paper, we use the observational dataset provided by the Economic Resources & Data of the Federal Reserve Bank of St. Louis. The difference between the cumulative curves of the CPI and the Fed rate divided by 1.37 is periodic. The recessions observed after 1955 are well synchronized with the kinks and turns in the difference curve. The most recent recession as related to the peak in the difference was expected in 2020, but was likely mixed with the COVID-19 induced recession. The current Fed rate is not high enough to return the difference to the zero line in before 2030-2040.

Observations

The CPI and the Federal Funds effective rate data between 1954 and 2024 are available from the Economic Resources & Data of the Federal Reserve Bank of St. Louis [1]. In Figure 1, we depict the effective rate, **R,** and the monthly estimate of the consumer price inflation, **CPI**, for the previous 12 months (not seasonally adjusted). One can see that **R** lags behind the CPI since 1980, i.e., inflation grows at its own rate and **R** has to follow up. The idea of interest rate is that a higher **R** should suppress price inflation when it is high due to the effect of expensive money. During the low inflation or deflationary periods with slow economy, low (in some countries negative) **R** has to channel cheap money into the economic growth. The reaction of inflation is also expected not immediately but with some time lag.

Therefore, the idea of the Fed rate influence on the consumer price inflation is based on some cumulative effect of the change in money price for the economy. It would be instructive to look into the cumulative curves of both the CPI and the Fed rate in an attempt to confirm the influence of the latter on the former parameter. The cumulative influence of the interest rate should produce a desired effect in the long run and inflation should go in the direction towards the values acceptable for the FRS. Figure 2 displays the cumulative curves of the monthly estimates of **R** and **CPI**. At first glance, both curves are very similar and evolve in sync but at different rates, i.e., with different slopes.

We have estimated the best coefficient to fit both curves as 1.37 (interestingly, this is similar to the fine structure constant α=137 in physics). Figure 3 displays the resulting curves. We have added vertical lines to present the recession periods as reported by the National Bureau of Economic Research (NBER) Business Cycle Dating Committee [2]. This is an intriguing plot. In the long run, the **R** curve fluctuates around the **CPI** one and returns to it. (We consider CPI as an independent endogenous economic variable.)

Finally, Figure 4 presents the difference between the cumulative curves. Most recently, this difference peaks in March 2023 and then slightly falls. This peak was expected and is a genuine reaction of the Fed to the dramatic surge in inflation during and after the pandemic. The money pumping into the economy was extraordinary, and money devaluation was a natural reaction. The peak in the difference in March 2023 was 3 quarters after the technical recession: two subsequent quarters with negative growth rates in Q1 and Q2 2022. If to consider the Fed

behavior as based on rules and precedents, one can expect that the positive deviation between the inflation and the Fed rate curves has to be closed within the next 20 years. The Fed rate has to be higher than CPI inflation times 1.37.

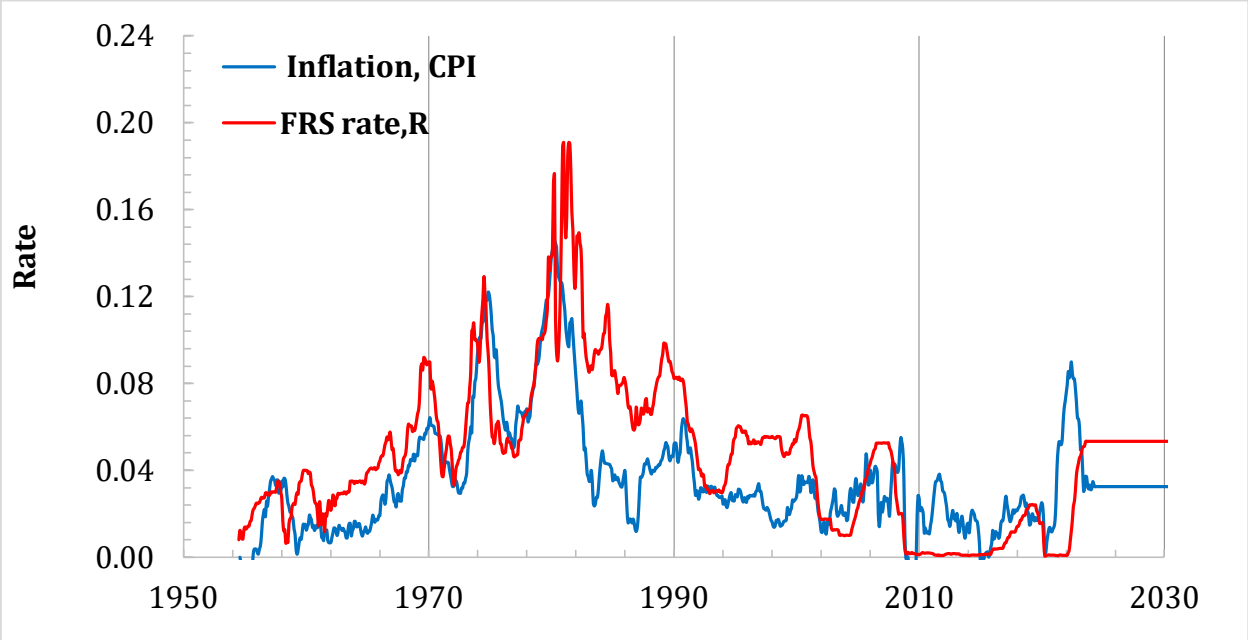

Figure 1. The monthly estimates of the Federal Funds effective rate, R, the rate of consumer price inflation, CPI, between July 1954 and August 2024.

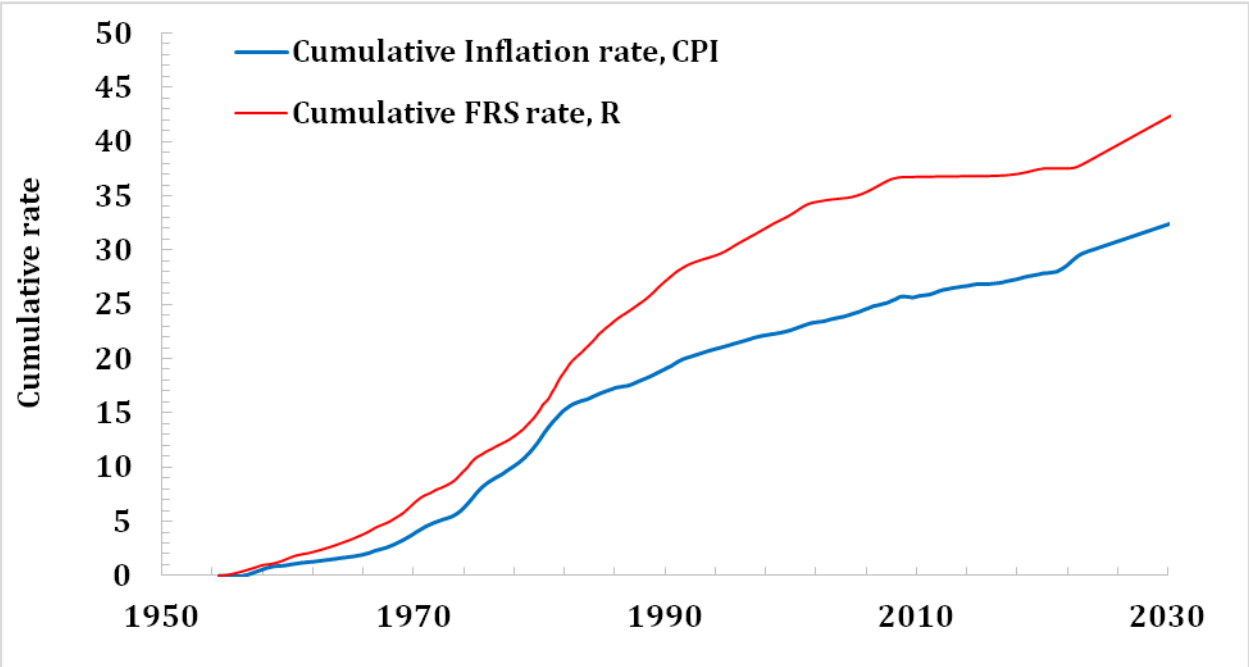

Figure 2. Cumulative values of the two curves in Figure 1.

The broader picture in Figure 4 is even more interesting to discuss in details. Firstly, the difference is very close to periodic behavior. The previous peak was near 1980, i.e., ~45 years ago. The previous trough was observed in the beginning of 2000s. The amplitudes of the peaks and troughs are similar: from 1.8 in 1980 to 2.0 for the most recent. The amplitude of the latter could be an artifact of the longer zero-Fed-rate policy during the very slow recovery after the 2008 recession and the COVID-19 pandemic.

When looking into the recession periods observed since 1955 and comparing them with the kinks and turns in the CPI-Fed rate difference in Figure 4 one may have an impression that the former are most often coincide with the latter. The only important exclusion is that the 2023 peak was not marked any recession. The 2020 recession is exogenous and fully related to the COVID-19 pandemic. Or not? Can it be that the peak in 2023 is not linked to a new recession, but the 2020 recession was forced by the expected 2020 CPI-Fed rate peak smashed by the Fed actions forced by COVID-19?

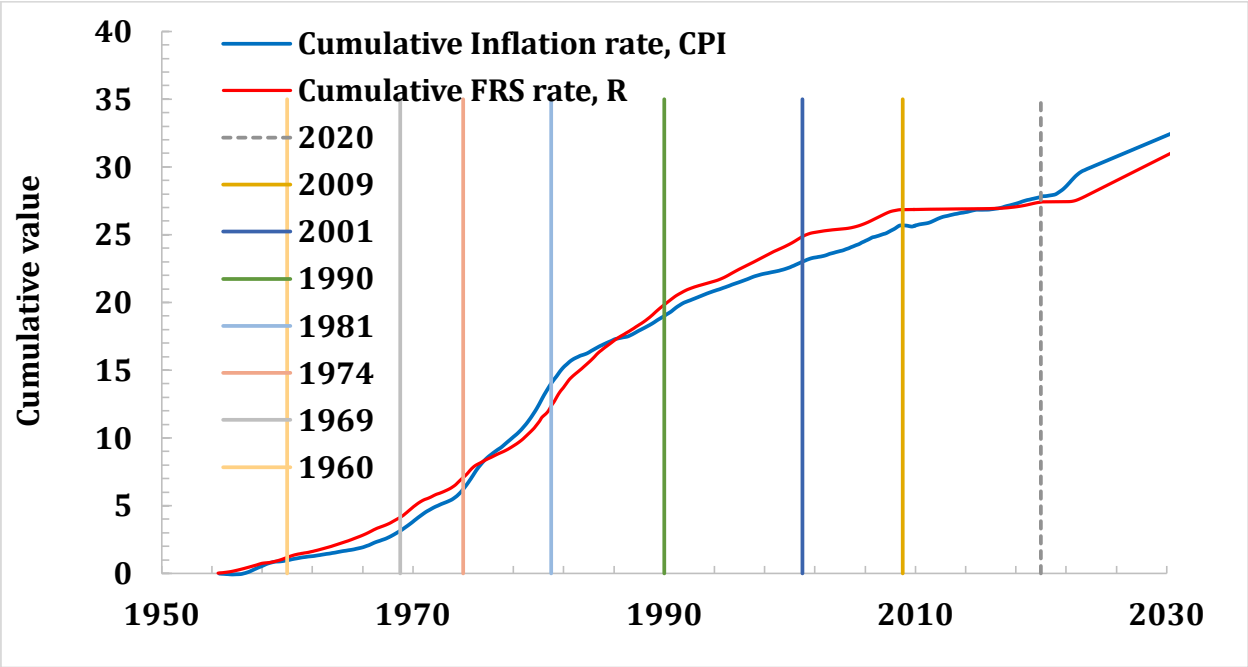

Figure 3. Same as in Figure 2, but **R** is divided by 1.37. Vertical lines present the recession periods as reported by the National Bureau of Economic Research (NBER) Business Cycle Dating Committee.

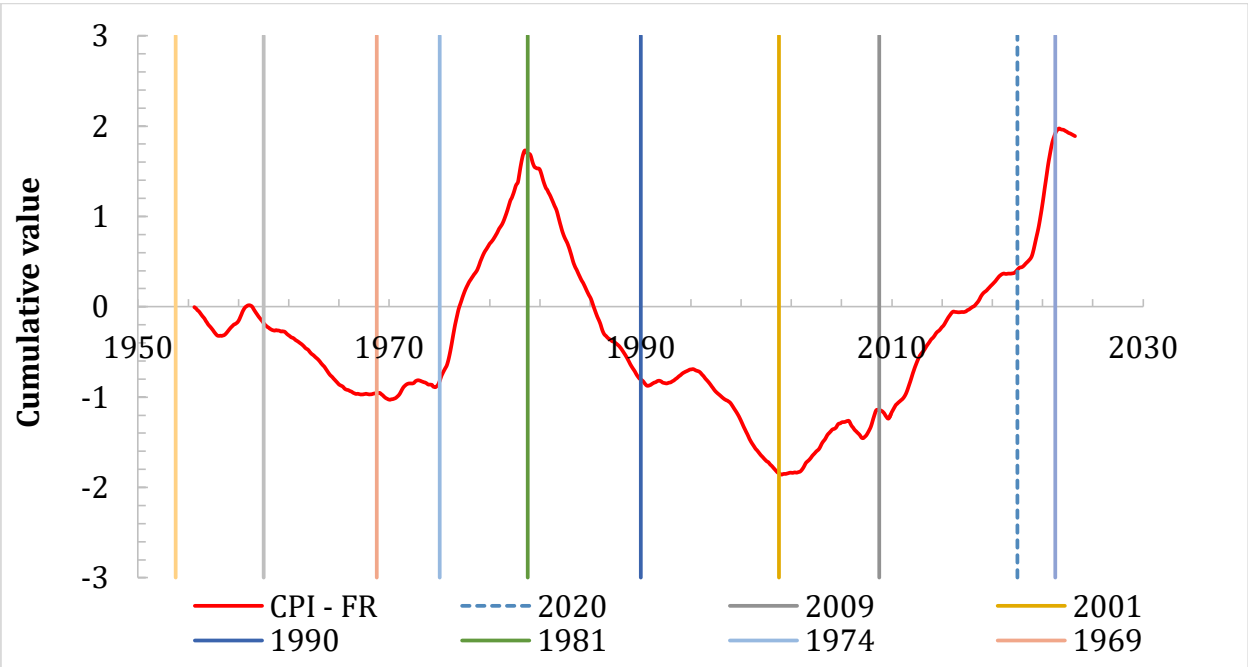

Figure 4. The difference between the **CPI** and **R** curves in Figure 3.

The 2023 peak was artificially high, but it has to be followed by a fast fall in the difference. With high inflation in 2022-2023 the Fed rate has to be high as well. It seems this rate was not high enough to suppress inflation in sense the lower and earlier peak in the difference and further drop according to the slope observed in the 1980s. With the Fed decision to quickly reduce the interest rate in the next 4 to 6 quarters, one can expect that the difference will not be falling at all. The effect of high difference during extended periods is not clear, but the difference has to come back to the zero line at some point in the next 10 to 15 years. One needs to follow these phenomena.

References

1. Economic Resources & Data of the Federal Reserve Bank of St. Louis (Consumer Price Index for All Urban Consumers: All Items in U.S. City Average (CPIAUCSL) | FRED | St. Louis Fed (stlouisfed.org)). Retrieved on September 15, 2024.

2. The National Bureau of Economic Research (NBER) Business Cycle Dating Committee. Business Cycle Dating | NBER. Retrieved on September 15, 2024.