ECONOMIC COMMENTARY

Financial Markets' Perceptions of the FOMC's Data-Dependent Monetary Policy

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Over the past ten years, the Federal Open Market Committee (FOMC) has repeatedly emphasized that future policy is data dependent. In this *Economic Commentary*, we investigate how financial markets expected future interest rates to change with the release of new data on inflation and labor market conditions. We find that the surprises in economic indicators have a stronger effect on the 2-year Treasury yield than on the expected federal funds rate to be set in the next FOMC meeting. This implies that markets understand that under the data-dependent approach, policy decisions do not heavily rely on the most recent data or short-run fluctuations, but, rather, rely more on the persistent trend of the economy. In addition, we observe that expected future interest rates have become more sensitive to surprises in inflation after 2022, suggesting that the FOMC's determination to reduce inflation has been well-understood by the markets.

Introduction

In the past decade, it has become common to characterize monetary policy as "data dependent." At the press conference following the December 2013 Federal Open Market Committee (FOMC) meeting, then-Chair Ben Bernanke used the term "data-dependent" for the first time in explaining the FOMC's plan to reduce the pace of asset purchases in future meetings.[1, 2] Since then, it has been common for FOMC participants to emphasize that future policy decisions are data dependent. For example, at the post-meeting press conference on July 26, 2023, Chair Jerome Powell said that "Looking ahead, we will continue to take a data-dependent approach in determining the extent of additional policy firming that may be appropriate."[3]

Some FOMC participants have provided explanations about what "data dependent" means in the context of policy decisionmaking. For instance, John Williams, president of the Federal Reserve Bank of New York, explained that he looks at what he notes is a "whole raft" of data, including GDP growth, inflation, and employment (Williams, 2019).[4] This *Economic Commentary* investigates the financial markets' perceptions of the FOMC's data-dependent approach by studying how markets expected interest rates to respond to economic indicators that directly relate to inflation and labor market conditions.[5]

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We divide the past 10 years into four phases comprising two episodes with interest rates constrained by the effective lower bound (ELB) and two episodes of policy normalization after ELB episodes in order to account for quite different circumstances faced by policymakers over this period. We find that except for the most recent phase of March 2022 to October 2023, financial markets' expectations of the near-term federal funds rate (FFR)[6] do not change significantly in response to surprises in data about inflation, the labor market, or economic activity. In contrast, the 2-year Treasury yield, an indicator of the expected future path of the FFR, changes significantly with surprises in inflation and the labor market in almost all phases. In addition, we find that the sensitivity of 2-year Treasury yields to unexpected changes in inflation has been much higher since 2022.

Our empirical results suggest that financial markets understand the FOMC's data-dependent approach to mean that the FOMC regularly adjusts the stance of policy in response to inflation and labor market surprises. Financial markets also seem to take "data dependent" as meaning that policy adjusts gradually to news about the trend of the economy and not suddenly in response to incoming data. In addition, the finding that financial markets have become more sensitive to inflation news since 2022 is consistent with a view that financial market participants believed the FOMC would take the steps necessary to combat inflation in the aftermath of the COVID-19 pandemic.

Data and Methodology

Interest rates and economic fundamentals affect each other. To capture the causal effect of a change in the economic indicators on the change in the expected policy rate, we need to isolate the unexpected (or "surprise") components of economic indicators. To this end, we obtain data on the surprise components of economic indicators from Thomson-Reuters Economic Consensus. Thomson-Reuters conducts surveys of professional forecasters regarding their expectations of the initial releases of various economic indicators. The surprise component of each data release is defined as the released value of the data minus the median expectation of the value prior to the release.[7] We consider the economic indicators that directly measure or potentially affect inflation and employment: core CPI inflation,[8] nonfarm payrolls, unemployment rates, and retail sales excluding autos.

We use contract prices of 30-day fed funds futures to infer expectations of policy rates at the upcoming FOMC meeting.[9] Economists typically use longer-maturity rates, such as the 1- or 2-year Treasury note yield, to infer the expected future path of policy rates (for examples, see Gürkaynak, Sack, and Swanson, 2005; and Swanson and Williams, 2014).[10] We follow the literature and use the 2-year Treasury yield as the measure of the expected future interest rate path.

Sample Periods

In the past 10 years, the FFR reached its ELB and lifted off from it twice as a result of the 2007–2009 global financial crisis and the 2020–2023 COVID-19 pandemic. We thus divide our sample into four phases. The cutoff dates of the four periods are the dates of scheduled FOMC meetings when there is a change from ELB to non-ELB or vice versa. We do not include unscheduled FOMC meetings in our analysis.

- **Phase 1: December 2013–October 2015**
  The FOMC meeting in December 2013 is the first FOMC meeting after 2008 in which the Fed Chair used the term "data dependent" to describe policy decisionmaking. Although the normalization of monetary policy had begun, the FFR was still kept at its ELB through the October 2015 FOMC meeting. One important reason for not raising the policy rate sooner was that inflation had been running below 2 percent.

- **Phase 2: December 2015–January 2020**
  The FOMC lifted the FFR from zero at the December 2015 meeting and then continued raising rates until the target range for the rate reached 2.25 percent to 2.50 percent in December 2018. In subsequent months, the FOMC gradually cut the policy rate, citing uncertainties about the global economy and muted inflation pressure.

- **Phase 3: March 2020–January 2022**[11]
  COVID-19 began to spread rapidly in the United States in early 2020 and was declared a global pandemic by the World Health Organization in March 2020;[12] the pandemic quickly triggered a sharp economic downturn that began that same month. Amid the COVID-19 economic crisis, the FOMC swiftly cut the FFR to effectively zero. The pandemic-induced recession was short-lived and was followed by a surge in inflation. The FOMC kept the FFR at the ELB through the beginning of 2022, initially expecting that the inflation pressure would be transitory.[13]

- **Phase 4: March 2022–October 2023**
  When high inflation turned out to be more persistent than expected, FOMC policy pivoted. At the March 2022 FOMC meeting, the FOMC raised the FFR for the first time since the onset of the COVID-19 economic crisis. This rise was then followed by additional rate hikes at nine subsequent meetings, most recently at the July 2023 meeting.

Empirical Results

For all four sample periods, we regress the daily changes in our constructed expected near-term FFR and in 2-year Treasury yields on the surprise components of the economic indicators, including core CPI inflation, nonfarm payrolls, unemployment rates, and retail sales excluding autos.

- The expected near-term policy rate

Table 1 shows the regression results for the changes in the expected near-term FFR. Looking first at the results in the ELB periods, column (1) and column (3) show the estimated coefficients in Phase 1 and Phase 3, respectively. In these two phases, the expected near-term FFR does not significantly change with any news about the economy, thus implying that, with policy already at the ELB, financial markets had confidence in the FOMC's commitment to keeping the policy rate at zero through at least the upcoming FOMC meeting.

Column (2) reports the regression results for the non-ELB period before the COVID-19 economic crisis. Although the FFR was unconstrained during this time, financial markets still appeared not to expect the interest rate at the upcoming FOMC meeting to significantly respond to any surprises in the indicators we observe. Column (4) reports the results in the non-ELB period after 2022. Different from the estimated coefficients in column (2), column (4) shows that the markets expected the near-term FFR to be sensitive to the most recent changes in inflation and labor market conditions. Specifically, the estimated coefficient on core CPI surprises is 0.377, much larger than the estimated coefficient in all other phases, and it is statistically significant at the 1 percent level. This situation implies that markets expected upside inflation surprises would result in bigger positive changes in the expected near-term FFR after 2022 than in all three previous periods.

Table 1: Dependent Variable: Daily Change in the Expected Near-Term FFR

	Dec 2013 – Oct 2015	Dec 2015 – Jan 2020	Mar 2020 – Jan 2022	Mar 2022 – Oct 2023
Core CPI	0.055	0.060	-0.000	0.377***
	(0.034)	(0.045)	(0.026)	(0.080)
Nonfarm payroll	0.012	0.095	0.000	0.121*
	(0.052)	(0.058)	(0.01)	(0.071)
Unemployment rate	-0.018	0.041	-0.003	-0.113*
	(0.022)	(0.033)	(0.003)	(0.645)
Retail sales excl. auto	0.001	-0.001	-0.001	-0.012
	(0.008)	(0.009)	(0.002)	(0.014)
Constant	-0.002	0.001	-0.004	0.002
	(0.001)	(0.002)	(0.003)	(0.005)
Observations	111	255	102	88
R-squared	0.031	0.024	0.013	0.261

Standard errors in parentheses. Number of nonfarm payrolls are in thousands. ***$p<0.01$, **$p<0.05$, * $p<0.1$

- The yield on 2-year Treasuries

Table 2 reports regression results for the changes in the 2-year Treasury yield. In the ELB periods of Phase 1 and Phase 3, our findings suggest that the 2-year Treasury yield changed significantly with surprises in inflation and labor market conditions. This result is consistent with that identified in Swanson and Williams (2014), who find that monetary policy was still effective in the ELB period between 2008 and 2010 because of the FOMC's impact on 1- and 2-year Treasury yields through forward guidance communications and large-scale asset purchases.

Table 2: Dependent Variable: Daily Change in the 2-year Treasury Yield

	Dec 2013 – Oct 2015	Dec 2015 – Jan 2020	Mar 2020 – Jan 2022	Mar 2022 – Oct 2023
Core CPI	0.040	0.147**	0.043**	0.831***
	(0.087)	(0.057)	(0.019)	(0.200)
Nonfarm payroll	0.646***	0.301***	-0.000	0.324*
	(0.133)	(0.074)	(0.001)	(0.178)
Unemployment rate	0.044	0.092**	-0.004*	-0.239
	(0.056)	(0.042)	(0.002)	(0.162)
Retail sales excl. auto	0.056***	0.004	-0.001	-0.011
	(0.020)	(0.012)	(0.001)	(0.034)
Constant	0.006*	0.005**	0.001	0.009
	(0.004)	(0.002)	(0.002)	(0.013)
Observations	111	255	102	88
R-squared	0.229	0.101	0.080	0.215

Standard errors in parentheses. Number of nonfarm payrolls are in thousands. ***$p<0.01$, **$p<0.05$, * $p<0.1$

Figure 1: 2-Year Treasury Yields and Unemployment Rates
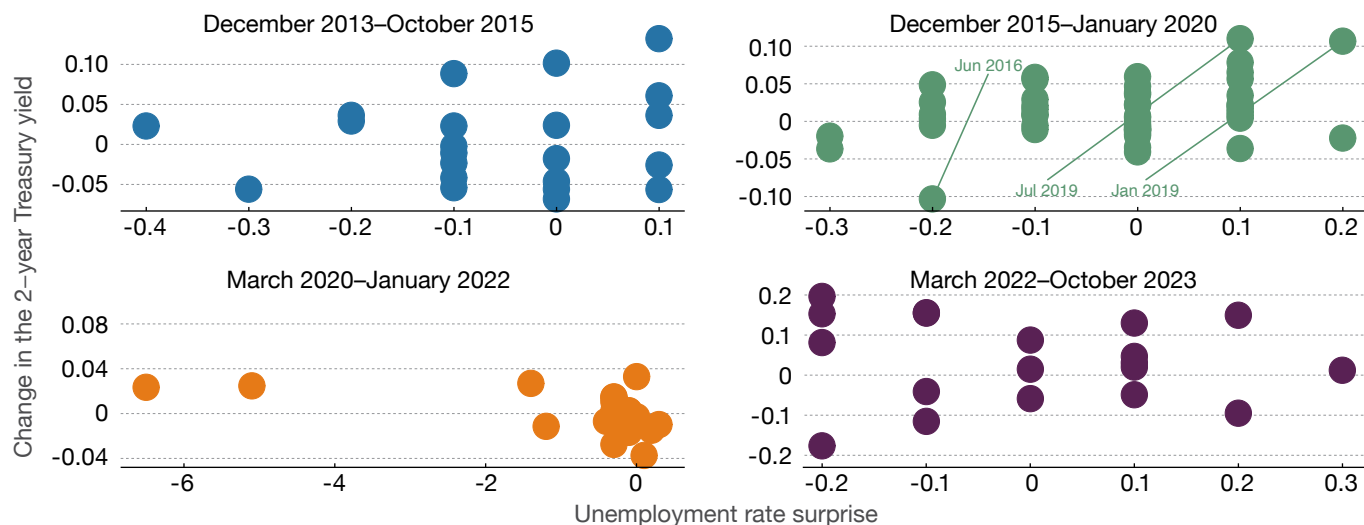
Sources: Thomson Reuters, Bureau of Labor Statistics, Chicago Board of Trade, Haver Analytics, authors' calculations

Notes: The horizontal axis shows the surprise components of unemployment rates. The vertical axis shows the change in the 2-year Treasury yield on the days of the data release. Numbers are in percentage points.

Estimated coefficients reported in columns (2) and (4) show that when the current interest rate is not bounded at the ELB, financial markets also believed future interest rates would respond to current economic news. Specifically, the 2-year Treasury yield increased with positive surprises in core CPI inflation and nonfarm payrolls. Note that the estimated coefficient in the core CPI surprise in column (4) is close to one, much higher than those in all three previous phases, including in the earlier non-ELB Phase 2. This indicates that, in Phase 4, financial markets believed that the FOMC would make bigger changes in interest rates in response to inflation surprises than in the three previous periods. In column (2)'s results for Phase 2, the estimated sign of unemployment is positive and significant, contrary to economic intuition. To check whether this implies a different policy response to unemployment in Phase 2 compared to policy responses in other phases, we plot the change in 2-year Treasury yield against the surprise components in unemployment rates in Figure 1. We find that the significantly positive relationship between the 2-year Treasury yield and unemployment surprises is likely driven by the outliers of June 2016, January 2019, and July 2019. Apart from these observations, there does not seem to be a significant positive relationship between unemployment rate surprises and 2-year Treasury yields.[14]

Interpretations

Our results have two important implications. First, when new information is published that is different from expectations, for the most part financial markets do not expect the policy rate to respond immediately, but, rather, to change gradually over the next two years. This suggests that under the data-dependent approach, the FOMC puts more weight on the longer-term trend in the economy and less on short-term fluctuations. As

explained by James Bullard, the former president of the Federal Reserve Bank of St. Louis, policymakers often need to balance "not wanting to react too much to day-to-day observations on the economy" and "wanting to react sufficiently to changes in the underlying macroeconomic conditions" (Bullard, 2016).[15]

Second, our results show that financial markets perceive that the relative importance of inflation versus labor market surprises may change over time. More specifically, financial markets have expected policy rates to be more sensitive to inflation surprises after US monetary policy pivoted in the beginning of 2022. This finding suggests that central bank communication can shape financial market expectations. The FOMC successfully convinced financial markets that it would respond to inflation surprises in its efforts to bring inflation down amid the elevated readings of inflation in the post-COVID-19 era.

Conclusion

In this *Economic Commentary*, we study financial markets' perceptions of the FOMC's data-dependent policy. We examine how the expected near-term FFR and the 2-year Treasury yield change when released economic data differ from markets' expectations. We find that the surprises in the released data of inflation and labor market conditions have a stronger effect on the 2-year Treasury yield than on the expected near-term FFR. This result implies that markets expect the FOMC to respond more to the trend in the economy rather than to day-to-day fluctuations. We also find that the expected FFR path has become more sensitive to surprises in inflation since 2022, suggesting that the FOMC's focus on reducing inflation that had surged following 2020 has been well-understood by financial market participants.

Endnotes

1. In the preceding couple of years, the FOMC had made use of calendar-based forward guidance. For example, following the August 2011 meeting, the committee announced the federal funds rate was expected to be kept at "exceptionally low levels" "at least through mid-2013." See the FOMC statement at https://www.federalreserve.gov/newsevents/pressreleases/monetary20110809a.htm.

2. The December 2013 transcript is available at https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20131218.pdf.

3. The transcript is available at https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20230726.pdf.

4. Find the full speech at https://www.newyorkfed.org/newsevents/speeches/2019/wil190118.

5. There is a large body of literature that estimates monetary policy rules by studying the relationship of the FFR to past or expected future indicators of inflation and real economic activities (for example, Clarida, Gali, and Gertler, 2000). More recently, there has been a growing interest in studying what financial markets expect the FOMC to do, as the FOMC has become more transparent and begun providing forward guidance (see, for example, Hamilton, Pruitt, and Borger, 2011).

6. In this *Economic Commentary*, the "near-term FFR" is the FFR set at the next FOMC meeting.

7. One important feature of the data is that there is only a gap of a few days between the survey and the data release. So, the surprise component captures the new information only about the corresponding economic indicator.

8. We obtained very similar results with headline rather than core CPI inflation.

9. Following Kuttner (2001) and Gürkaynak (2005), we construct daily changes in the expected near-term policy rate while taking into account the day of an FOMC meeting in a given month.

10. The underlying assumption is the expectations theory, which implies that long-term rates are weighted averages of the current and expected future short-term interest rates.

11. We excluded data releases after February 26, 2020, and before May 8, 2020. During this time, there was a rapid decline in the expected policy rate and high uncertainty in markets.

12. See "WHO Director-General's Opening Remarks at the Media Briefing on COVID-19 – 11 March 2020" at https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020.

13. For instance, at the June 2021 FOMC post-meeting press conference, Chair Powell said that "as these transitory supply effects abate, inflation is expected to drop back toward our longer-run goal" (Board of Governors of the Federal Reserve System, 2021).

14. Since the Bureau of Labor Statistics releases the unemployment rate and total nonfarm payroll employment on the same day, it is possible that these outliers captured the positive correlation between the changes in the 2-year Treasury yield and the surprises in nonfarm payroll employment. We have checked that in all four phases we study, there is little correlation between the surprise in the unemployment rate and the surprise in nonfarm payroll, but in these three days, the surprise components of the two indicators have the opposite signs.

15. Full article available at https://www.stlouisfed.org/publications/regional-economist/january-2016/what-does-data-dependence-mean.

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