

Economics Group

Special Commentary

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Fed Funds Surprises & Equity Markets: Part 3

Executive Summary

In the financial markets today, monetary policy is certainly an important factor. However, there is uncertainty as to how markets will respond to increases in the federal funds rate, which many believe will occur later this year. In this report, we provide estimates of the sensitivity of broad-based equity indices to surprises in Fed policy, as measured by the deviations in federal funds rate announcements from expectations. We look specifically at how equity indices respond to the surprise component of a fed funds rate announcement.¹ Bernanke & Kuttner (2003) provide a framework for analyzing the response of equity markets to surprises in the federal funds target rate.² We confirm their results and include additional data to analyze how the relationship changed during the financial crisis.

Our main findings suggest that equities move in the opposite direction to surprises in the fed funds target rate immediately following the event. This result was statistically significant for the period before the financial crisis, but as expected, the relationship broke down during the crisis. The myriad of extraordinary factors affecting financial markets during the financial crisis (fiscal intervention and unconventional monetary policy to name a few) likely caused the relationship between equities and surprises in the federal funds rate to break down. We suspect the precrisis relationship will return during this tightening cycle and that positive surprises in the fed funds rate will be associated, on average, with a decline in equities immediately following the release. This has implications for monetary policy and the economy in the coming tightening cycle.

Our main findings suggest that equities respond negatively to shocks in the fed funds target rate immediately following the event.

Should Equity Returns Be Affected by the Fed Funds Rate?

The theoretical link between equities and the fed funds rate is not as direct as that of Treasury securities or foreign exchange, which we investigated in previous reports. An equity's fundamental value is the discounted value of expected future cash flows. While there are numerous methods for estimating both future cash flows and the appropriate discount rate, here we will address qualitatively how each component would be affected by a surprise in the funds rate from a macroeconomic perspective.

Intuitively, there is a rather clear relationship between the discount rate and the fed funds rate.³ Part 2 of this series provided evidence that Treasury yields at the short end of the curve increase following positive fed funds surprises, on average.⁴ Longer-dated Treasuries, however, were not significantly affected by fed funds surprises. The seemingly clear relationship between Treasury debt at different maturities and the federal funds rate does not necessarily hold as a result of the term premium's offsetting effect on longer-term interest rates. In addition, the expected cash flows from an equity investment are not discounted at a constant risk free rate because the cash

¹ Earlier reports studied the sensitivity of the dollar and Treasury securities to shocks in the funds rate.

² Bernanke, B. S., & Kuttner, K. N. (2003). "What Explains the Stock Market's Reaction to Federal Reserve Policy?" *Federal Reserve Bank of New York Staff Reports No. 174*.

³ There are many different ways of discounting expected future cash flows from an equity security and a detailed explanation is beyond the purview of this study. That said, the discount rate can be thought of as the risk-free rate plus a risk premium, to account for the fact that cash flow from equities are uncertain.

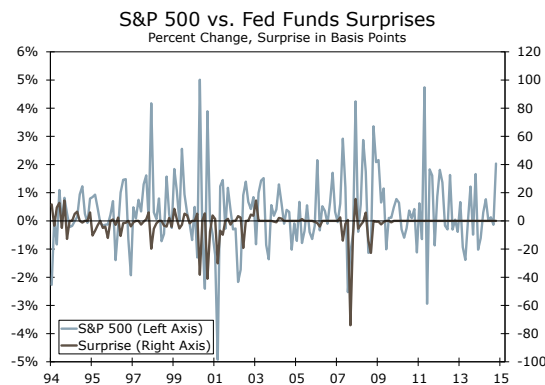
⁴ Silvia et al. (2015). "Fed Funds Surprises & Treasury Yields: Part 2." *Wells Fargo Economics Group*



flows are uncertain and the risk premium imbedded in the discount rate could plausibly be affected by fed funds rate surprises. Therefore, the effect on the discount rate of a fed funds rate surprise is ambiguous.

Shocks to the fed funds rate also may impact expected cash flows. Corporate profits, a driver of equity earnings, are one of the more cyclical components to GDP.⁵ Because of their cyclical nature, expectations regarding corporate profits, and therefore cash flows from equities, may be altered by surprises in the fed funds rate. A positive surprise in the fed funds rate likely leads to decreased expectations of future cash flows in the aggregate. The positive surprise, ceteris paribus, indicates tighter-than-expected monetary policy, which would have a negative effect on economic growth and, therefore, corporate profits. In addition, changes in the foreign exchange value of the dollar could alter expected corporate profits following a fed funds surprise. A positive surprise in the fed funds rate may lead to dollar appreciation, which would decrease the value of foreign earnings and make exports relatively less competitive. This, although, is unlikely to play a large role, as the first report in this series concluded that the trade weighted dollar was insignificantly affected, at least initially, by shocks to the fed funds rate.

Figure 1



Source: Bloomberg, LP and Wells Fargo Securities, LLC

Our hypothesis is that equities will be negatively impacted by a surprise in the fed funds rate.

In sum, while the sensitivity of the change in equity prices to fed funds surprises is somewhat ambiguous, our hypothesis is that equities will be negatively impacted by a surprise in the fed funds rate. This is because market interest rates (and therefore the discount rate) should increase, at least on the short end of the curve, and aggregate expected cash flows are likely to suffer following a fed funds shock. This is confirmed when looking at the correlation coefficient between the daily percent change in the S&P 500 index and fed funds surprises, which was -0.17 over our sample.⁶

Relationship Between Equities and Surprises Has Broken Down

In a similar manner to Parts 1 & 2 of this series, we estimated an ordinary least squares regression.⁷ The dependent variable in our analysis was the daily percent change of the S&P 500 index and the independent variable was the fed funds surprise, outlined in Part 1 of this series. Sample statistics for our dataset are found in Table 1.

⁵ Silvia, John E. (2014). "Corporate Profits and Its Link in the Macro Economy." *Wells Fargo Economics Group*.

⁶ The negative correlation coefficient indicates that, on average, a positive surprise in the federal funds rate is generally associated with a fall in the S&P 500.

⁷ The previous reports in this series are available on request.

Table 1

Summary Statistics (1994-2008)		
	S&P 500	Surprise
Count	127	127
Nonzero Surprises	84	84
Mean	0.33	(2.23)
St. Dev.	1.39	10.31

Surprise in Bps, S&P 500 in Percentage Points

Source: Bloomberg, LP and Wells Fargo Securities, LLC

For the entire sample, we found that, similar to Bernanke & Kuttner (2003), a positive surprise in the fed funds target rate was associated with a decline in the S&P 500 immediately following the event. For the full sample, we found that, on average, a positive surprise of one percent is associated with a 1.14 percent decline in the S&P 500, although this result was not statistically significant (Table 2). The pre-crisis relationship was stronger and statistically significant, with a one percent positive surprise in the fed funds rate associated with a decline of 4.83 percent in the S&P 500.

During the crisis, the sensitivity of equities to surprises in the fed funds rate was positive, although statistically insignificant. The rapid rate cuts during the crisis likely were a major reason for the differing results. As we have discussed in previous reports, the rate cuts also contained large signals to financial markets regarding the health of the U.S. economy and the severity of the crisis. In other words, the unexpected negative surprises by the Fed may have signaled even more weakness in the economy than was thought by financial markets. In addition, issues with liquidity and credit constraints may have contributed to the relationship's breakdown during the crisis. It is unclear whether the relationship will revert back to historical norms, as many things have changed in the financial markets. That said, we believe that the crisis did play a large role in the breakdown of the relationship between fed funds surprises and changes in equity prices. We believe the relationship should at least partially revert back to the historical norm now that the large signaling effects that monetary policy contains regarding the economy has subsided to some extent.

A positive surprise in the fed funds target rate was associated with a decline in the S&P 500 immediately following the event.

Table 2

Sensitivity of Equities to Fed Funds Surprises			
	Intercept	Surprise Coefficient (a)	Interaction Term Coefficient
Full Sample	0.44**	-1.14	N/A
Pre-Crisis	0.24	-4.83***	N/A
Crisis	1.32**	3.97	N/A
Asymmetries	0.42*	-1.21	0.44

(a) Sensitivity to 100 bps surprise

* Significant at 0.1

** Significant at 0.05

*** Significant at 0.01

Source: Wells Fargo Securities, LLC

In addition, to see if there was an asymmetric response to fed funds surprises, we created an interaction term and ran another regression including this interaction term as a dependent variable.⁸ Similar to previous studies, we found that equity markets are slightly less sensitive to positive fed funds surprises, although the difference was not statistically significant.

Sensitivity of Financial Markets and the Economy

In this series of reports, we have investigated the sensitivity of foreign exchange, Treasury securities and equity indices to surprises in the fed funds target rate. Generally speaking, we have found that Treasury and foreign exchange markets are not as sensitive as we would have expected to surprises in the funds rate, but equities did appear to react significantly to the surprises. While this is somewhat surprising, it does have some implications for decision makers.

⁸ See previous reports in series for more detailed methodology, available on request.

Our analysis suggests that yields on longer-term Treasury securities may be less sensitive to shocks in the fed funds rate than many analysts have come to expect. This should comfort policymakers to some extent, but also be a cause for concern. While it suggests we should not see a repeat of the taper tantrum scenario when the Fed begins to raise rates (assuming no unusual adjustment to the expected fed funds rate out into the future), it also means that the Fed may be less able to increase long-term yields with its traditional policy tool. That said, the Fed could always sell assets from its balance sheet if it needed to rapidly tighten policy as another channel for policy implementation.

With respect to equities, we suspect that the more traditional historical relationship between equities and fed funds surprises will prevail, although there is uncertainty as to the validity of this expectation. The extraordinary factors surrounding the rapid fed funds rate cuts during the crisis likely contained more signaling regarding the health of the overall economy than traditional changes to the funds rate. We suspect that these signals will not be as strong when the Fed begins raising rates. This would suggest that positive fed funds surprises may have a negative effect on the equity market due to lower expected cash flows and a modestly higher discount rate. Wealth effects were one mechanism through which monetary stimulus has affected the real economy, and positive surprises in the funds rate may have negative wealth effects. That said, we suspect that other determinants of consumer spending will dominate and lead to continued improvement in consumer spending. In addition, it appears as if the Fed is trying mitigate surprises when it moves by emphasizing its intent on a measured pace of rate increases and focus on the data.

Recall this series of essays only studied surprises in the fed funds target rate and the immediate financial market response. Therefore, the conclusions we drew from the study do not include the many other factors affecting financial markets. That said, our analysis still helps to reinforce our forecast for the coming tightening cycle.

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