Discussion of "Monetary Policy Uncertainty and Monetary Policy Surprises"

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Does monetary policy uncertainty affect the transmission of monetary policy to financial markets? De Pooter, Favara, Modugno, and Wu investigate this question empirically and find that the answer is "yes": when monetary policy uncertainty is higher, as measured by interest rate options, then the effects of a given monetary policy announcement surprise (of 25bp, say) are reduced.

The sign of this effect is intuitive. From a Bayesian or Kalman filtering perspective, when there is more uncertainty about the Fed's monetary policy announcement *ex ante*, then a given 25bp surprise in that announcement is smaller in standard deviation terms. The optimal Bayesian or Kalman filtering response to the announcement is then less than if the *ex ante* uncertainty had been lower.

However, it's also easy to imagine that the results in the paper could have gone the other way. As can be seen in their Figure 1, monetary policy uncertainty reached historic lows in the middle of the U.S. zero lower bound period from 2009 to 2015. If U.S. monetary policy was less effective during this period, then that would tend to produce a *positive* relationship between monetary policy uncertainty and the effects of monetary policy announcement surprises. The fact that Michiel and his coauthors do *not* find this in the data is thus interesting and indirectly supports the findings in some other studies (e.g., Swanson and Williams, 2014; Wu and Xia, 2016; Skaperdas, 2017; Swanson, 2018; Debortoli, Gali, and Gambetti, 2019) that U.S. monetary policy remained about as effective as normal throughout the zero lower bound period.

This main result of the paper also has interesting implications for monetary policy transparency and communication. Assume first that greater central bank transparency reduces monetary policy uncertainty in the financial markets. According to the De Pooter et al. estimates, this lower uncertainty increases the ability of the central bank to move markets when the central bank needs to—that is, monetary policy announcement surprises by the central bank become more powerful. So greater central bank transparency makes monetary policy surprises more powerful on those occasions when the central bank does need to surprise the markets. This result should be reassuring to central banks around the world, who have generally increased transparency over the past twenty years.

Federal Funds Rate vs. Forward Guidance vs. Asset Purchases

The baseline results in De Pooter et al. (2020) define the "monetary policy surprise" to be the change in the 2-year Treasury yield in a narrow (60-minute) window of time around the FOMC announcement. This is a common measure of monetary policy surprises, but it assumes that changes in the federal funds rate and changes in forward guidance have the exact same effects on financial markets, all summarized by their effects on the 2-year Treasury yield. Empirical evidence in Gurkaynak, Sack, and Swanson (2005) and Swanson (2019) explicitly rejects this assumption.

As a robustness check, I thus repeat the analysis by Michiel and his coauthors, but separate out changes in the federal funds rate from changes in forward guidance and changes in asset purchases. Swanson (2019) separately estimates these three components of monetary policy for every FOMC announcement from January 1990 to June 2019. Then, like Michiel and coauthors, I interact each of these monetary policy announcement surprises with the level of monetary policy uncertainty from their paper, running the regression

$$\Delta y_t = \alpha + \beta_1 \, \Delta ffr_t + \beta_2 \, \Delta fg_t + \beta_3 \, \Delta LSAP_t + \gamma_1 \, \Delta ffr_t \times MPU_t + \gamma_2 \, \Delta fg_t \times MPU_t + \gamma_3 \, \Delta LSAP_t \times MPU_t + \varepsilon_t,$$

where *t* indexes FOMC announcements, Δ denotes the change in a 30-minute window around the FOMC announcement, *y* denotes either the 5-year or 10-year Treasury yield, *ffr* denotes the expected federal funds rate after the meeting, *fg* the Gurkaynak et al. (2005) measure of forward guidance over the next several quarters, *LSAP* the Swanson (2019) measure of the Fed's (large-scale) asset purchases after the meeting, and *MPU* the De Pooter et al. (2020) level of monetary policy uncertainty the calendar day before date *t,* as measured by interest rate options. My sample runs from July 1991 (when my intradaily Treasury yield data begin) through January 2018 (when the De Pooter et al. uncertainty measure ends).

The results of this regression are reported in Table 1. As in Swanson (2019), the *ffr*, *fg*, and *LSAP* variables are measured in standard deviations, so the coefficients in Table 1 are in units of basis point response in the Treasury yield per standard deviation change in the monetary policy instrument. Thus, a one-standard-deviation surprise increase in the federal funds rate (which is about 8.4bp, as reported in Swanson 2019) causes the 5-year Treasury yield to increase about 0.6bp and the 10-year yield to increase about 2.8bp (when there is no uncertainty). A one-standard deviation increase in forward guidance causes the 5-year yield to rise 6bp and the 10-year yield 3bp, and a one-standard-deviation increase in asset purchases causes the 5-year yield to fall about 2.3bp and the 10-year yield 6.3bp. Heteroskedasticity-consistent standard errors are reported beneath each estimated coefficient.

Results for the uncertainty interaction terms in Table 1, however, are more mixed. As in De Pooter et al. (2020), I estimate a negative sign for the interaction between the federal funds rate and uncertainty on the 10-year Treasury yield, but not the 5-year yield. Similarly, I estimate a negative sign for the interaction of forward guidance and uncertainty on the 5-year yield, but not the 10-year yield. I estimate a positive sign (i.e., a dampening effect) on the combined effect of uncertainty and asset purchases on the 10-year yield, but not the 5-year yield. Thus, the sign of the uncertainty effect that Michiel and his coauthors estimate varies across different measures of monetary policy surprises and across the 5- vs. 10-year Treasury yield.

Table 1: Treasury Yield Responses to Federal Funds Rate, Forward Guidance, and LSAPs

	5-year Treasury yield	10-year Treasury yield
Federal funds rate	0.63 (.571)	2.76*** (.467)
Forward guidance	6.04*** (.292)	3.04*** (.220)
Asset purchases	–2.33*** (.789)	–6.34*** (.529)
Fed funds rate × uncertainty	0.64*** (.218)	–0.65*** (.176)
Fwd guidance × uncertainty	–0.44*** (.125)	0.31*** (.092)
Asset purchases × uncertainty	–0.63** (.313)	0.60*** (.219)

Notes: heteroskedasticity-consistent standard errors in parentheses. *** denotes statistical significance at the 1% level.

These results suggest that monetary policy uncertainty has a more complicated relationship with the effects of FOMC announcement surprises than is suggested by De Pooter et al. (2020). Additional research along these lines seems warranted.

Of course, there are some differences between my specification in Table 1 and the one used by Michiel and his coauthors in Table 2 and Table A6 in their paper. For example, my sample includes unscheduled as well as scheduled FOMC announcements, while Michiel and coauthors exclude unscheduled announcements, and I use the 30-minute change in the 5- and 10-year Treasury yields around FOMC announcements, as in Gurkaynak et al. (2005), while Michiel and coauthors use the 2-day changes in those yields. Michiel and coauthors also include additional control variables on the right-hand side of their regressions, such as the level of uncertainty itself, the level of the 2-year Treasury yield, and the level of the VIX; I don't include these additional controls in my analysis since in theory they, like the constant term in the regression, should be statistically insignificant and numerically close to zero.

I have tried varying my specification along all of these lines, but my results are almost always the same as in Table 1, above, with one exception. Including or excluding unscheduled FOMC announcements does not affect my results; beginning the sample in 1991 or 1999 does not affect my results; including or excluding the additional control variables on the right-hand side does not affect my results. The one thing that does reconcile my results with Table A6 in De Pooter et al. (2020) is to use the *two-day change* in the 5-year and 10-year Treasury yields on the left-hand side of the regression, instead of the 30-minute change or the one-day change in those yields. Using the two-day change is crucial; nothing else matters. This is surprising, because for the baseline results in De Pooter et al. (2020), which use just the single measure of monetary policy surprises, the results are robust to using the two-day change vs. the 30-minute or one-day change as the left-hand side variable.

In theory, using the two-day change in yields vs. 30-minute or one-day change should not matter. In practice, some of the two-day changes in 5- and 10-year yields in late 2008 and 2009 were especially large and seem to be driving the difference in results. The fact that the results are not robust along this dimension is concerning and warrants further investigation before we take the results in Table A6 of De Pooter et al. (2020) at face value.

Comparison to Tillmann (2019)

Finally, a recent paper by Tillmann (2019) investigates some of the same issues as Michiel and his coauthors. Tillmann looks at the effects of monetary policy surprises on the yield curve, measured the same way as in De Pooter et al. (2020), and he also interacts those monetary policy surprises with a measure of monetary policy uncertainty. Like Michiel and coauthors, Tillmann estimates a negative coefficient on the interaction between monetary policy surprises and monetary policy uncertainty.

In contrast to Tillmann (2019), Michiel and coauthors use a market-based measure of monetary policy uncertainty from interest rate options, whereas Tillmann uses a newspaper-based measure from Husted et al. (2020). Michiel and coauthors look at the high-frequency, daily effect of monetary policy announcements on the yield curve, whereas Tillmann looks at an impulse response function over several months. And Michiel and coauthors analyze the net positions of primary dealers and futures traders, which provides a useful additional perspective on the relationship between monetary policy uncertainty and FOMC announcement effects.

Summary

De Pooter et al. (2020) find that lower monetary policy uncertainty increases the effects of monetary policy surprises. Taken at face value, this suggests that greater monetary policy transparency in turn makes monetary policy more powerful when central bankers need to surprise the markets. However, the effects of uncertainty on the financial market responses to FOMC announcements is somewhat sensitive to how monetary policy is measured, which asset price response is being considered, and whether that asset price response is measured over a one-day (or 30-minute) vs. two-day window. Overall, there is important additional work to be done in this area.

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