

Disentangling the Information and Forward Guidance Effect of Monetary Policy Announcements on the Economy¹

(Extended Abstract)

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Central bank announcements may comprise different information components. For example, an announcement of monetary easing may either be perceived as an expansive stimulus or, contrary, as a systematic response by the central bank to unfavorable economic news the public is unaware of. This paper presents a novel strategy to decompose the information content of central bank announcements that explicitly accounts for such an information effect regarding economic prospects. Based on a formally derived prediction of the standard New Keynesian model, the identifying assumption reads that the information effect should be correlated with movements in five-year, five-year breakeven inflation rates on announcement days, while forward guidance regarding future interest rates should not be correlated. Disentangling distinct dimensions of monetary policy, the effects of monetary policy announcements on the term structure and on the macroeconomy are investigated. The results provide new insights about the transmission mechanism of monetary policy measures and highlight the effectiveness of forward guidance.

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The leverage of monetary policy on the economy is not limited to having control over the path of the short-term interest rate. For decades, central bankers and researchers alike have shown that monetary policy affects the real economy mainly through its impact on market participants' expectations (see Woodford, 2001; Blinder et al., 2008, and references cited therein). The importance of central bank communication and transparency has increased, particularly as a result of the exceptionally low interest rates in recent years. However, central bank announcements and interventions, e.g. changes to the short-term interest rate or forward guidance, may transmit information to the public beyond the policy itself. While there is a large literature on how surprise interest rate changes affect the real economy, the transmission of other dimensions of central bank announcements such as providing new information about the state of the economy is less clear-cut. The aim of this paper is to provide a theoretically grounded approach to empirically disentangle the information revealed by FOMC announcements into a standard monetary policy shock, forward guidance regarding future interest rates and an information effect about the economic state.

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There exists a wide-range of approaches to investigate the implications of monetary policy announcements. The high-frequency identification (HFI) employed in this paper quantifies these effects by means of financial market data. In particular, changes in interest rate futures around monetary policy meetings are causally linked to the information content of the actions and statements made by the central bank. In their seminal paper, Gürkaynak et al. (2005) demonstrate how to decompose such monetary policy surprises into changes related to the current risk-free interest rate and information about the future path of the policy rate. However, Campbell et al. (2012) and Nakamura and Steinsson (2018) challenge this identification strategy by showing that monetary policy announcements do not only convey information about the current and future path of the short-term interest rate but may also reflect information about the present state of the economy. Consider, for example, a surprising announcement by the central bank to deviate from the interest rate path expected by market participants in the near future. Market participants may perceive this either as an expansive stimulus to strengthen the economy or, contrary, as a systematic response by the central bank to unfavorable economic news the public is unaware of. Assuming standard economic transmission channels, those two readings of the hypothetical central bank announcement imply quite opposing effects onto real economic variables.

In this paper, I present a novel decomposition of the information content of FOMC announcements that is explicitly taking into account the effect of information about the state of the economy. Specifically, I identify monetary policy surprises along three dimensions: changes in the federal funds rate, forward guidance, and an information effect about the economic prospects. Using a standard New Keynesian model to rationalize the identification strategy, I argue that the latter information effect of central bank communication can be separated from surprises about the monetary policy path by using the change in long-term forward inflation rates as an instrument. Standard theory implies that the expected path of inflation is determined by market participants' expectations about the current and future stance of monetary policy and by their assessment of economic fundamentals. However, as forward guidance is limited to a certain horizon in order to be credible, and given that the time for price adjustments is finite, the impact of monetary policy measures on the path of inflation expectations has to be limited, too. Reverse, this implies that changes in inflation forward rates fairly beyond this horizon could only be driven by news regarding the economic fundamentals. This kind of restriction allows me to analyze the effects of changes in the current and future path of short-term interest rates without taking a stance on how the exact transmission mechanism of information about the economic prospects revealed by central banks is working.

To assess the effect of monetary policy announcements on market participants' expectations, I employ the HFI approach of Gürkaynak et al. (2005) and its extension by Swanson (2017). I extract three principal components from a broad range of asset prices for the sample period July 1991 to September 2017 and rotate them in a way so that they have a clear structural interpretation. Based on the intuition provided above, I assume that high-frequency variations in five-year, five-year forward breakeven inflation rates implied by the TIPS market are solely driven by information related to economic prospects. In reference to the literature, I call this component the information effect of monetary policy communication.

The residual asset price responses are partitioned into a component representing unexpected changes in the current monetary policy rate, i.e. the federal funds rate, and a second component which represents surprise changes in the future path of monetary policy. I call the latter effect forward guidance. In general, the presumption that monetary policy announcements systematically affect the yield curve through at least three factors is supported by the findings of Swanson (2017).

The particular approach I take to rotate the latent factors obtained from the principal components analysis (PCA) is inspired by the external instrument identification literature recently summarized by Stock and Watson (2018). In spirit, the problem of finding a suitable rotation matrix equals the identification of the impact matrix in a structural vector autoregression (SVAR) analysis. The latent factors obtained from the PCA can be considered a weighted average of the underlying structural shocks. The key idea is that the rotation matrix can be partially identified given that only one resulting factor is correlated with the external instrument. In terms of the identification problem of this paper, I use the changes in long-term inflation rate forwards on monetary policy announcement days as the proxy variable for the information effect.

From a theoretical point of view, the information effect relies on the notion that central banks' assessment about the economic prospects are, at least perceived, superior to those of the public. Irrespective if this information asymmetry is rationalized by the FOMC's superior ability in processing and interpreting publicly available information (Romer and Romer, 2000), or by an opinion leader position attributed to central banks (Nakamura and Steinsson, 2018), proxies of FOMC's private information are perfect to test the proposed identification strategy. Using a Romer and Romer (2000) style regression, I provide evidence that the information effect measure is the single component that reflects the difference between Greenbook forecasts produced for the FOMC decisions and public forecasts obtained from survey data.

In order to shed light on the transmission mechanism of monetary policy, I estimate the impact of the identified shock measures on the term structure of interest rates. My findings show that different monetary policy actions have quite distinct effects on risk premia: while a surprise cut in the short-term interest rate increases the nominal term premium moderately, expansionary forward guidance leads to a persistent decrease in the term premium. This is in line with the suggestions by Woodford (2012) and Filardo and Hoffmann (2014), implying that forward guidance reduces uncertainty about the future path of the policy rate and, thus, reduces the risk compensation required by investors. Moreover, the information effect does not alter the expected average path of future short-term rates, but strongly impacts the term premium. This supports the interpretation that the shock measure conveys significant information about the economic prospects beyond the future path of monetary policy and induces market participants to update their expectations.

In a final step, these distinct components of monetary policy announcements are used as instruments to identify structural shocks using a proxy SVAR model and instrumental variables local projection (LP-IV). Both methodologies have in common that shocks are identified by exploiting the information content of appropriate instruments.³ Particularly, I assume that the three identified factors are at least correlated with the structural shocks of interest.⁴ Consequently, they can be used to partially identify the SVAR model and to trace out the dynamic effects of these shocks on the macroeconomy (Stock and Watson, 2012; Mertens and Ravn, 2013; Gertler and Karadi, 2015).

Using US data for the period July 1990 to August 2016 I am able to provide new evidence for the effectiveness of surprise changes in the federal funds rate and forward guidance. In particular, my results imply that forward guidance has a considerable impact on output with a peak about two years after the announcement. While the sample period ends in August 2016, my analysis covers both the period of the Great Moderation and the zero lower bound period. Consequently, I extend the work of Gertler and Karadi (2015) whose sample ends in 2012 and, more importantly, by explicitly taking into account an information effect. The latter allows me to analyze the effects of changes in the current and future path of short-term interest rates in isolation of anticipated changes in the economic prospects.

In general, the paper is related to several strands of the literature in monetary economics. First and foremost it contributes to the growing empirical literature on the Fed information effect (Romer and Romer, 2000; Barakchian and Crowe, 2013; Miranda-Agrippino, 2016; Melosi, 2017). Using survey data, Campbell et al. (2012) and Nakamura and Steinsson (2018) show that monetary tightening surprise shocks lead to a decrease in the expected unemployment rate and an increase in expected output growth, respectively. Campbell et al. (2012) explain their results by introducing the distinction between Delphic and Odyssean forward guidance. While the former indicates a public statement by the monetary authorities about their expectation regarding the prospects of the economy and potential responses by the central bank, it does not bind monetary policy in any way. Contrary, Odyssean forward guidance binds future monetary policy to an announced path that may potentially be time-inconsistent as time passes by (see also Campbell et al., 2016).

Most closely related to this paper are Andrade and Ferroni (2016) and Jarociński and Karadi (2018). Both papers use SVARs identified with sign restrictions to separately assess the impact of Delphic and Odyssean forward guidance shocks to the economy. Jarociński and Karadi (2018) assume that information about the future policy path and about the economic fundamentals have contrary effects on stock prices. Similar to this paper, Andrade and Ferroni (2016) use high-frequency inflation expectation data to differentiate between forward guidance and an information effect. However, they use five-year inflation expectations for

³ See Ramey (2016) and Stock and Watson (2018) for a recent review of LP-IV as well as proxy SVARs.

⁴ As central banks may conduct their monetary policy not only during scheduled meetings, for example speeches or newspaper interviews of major central bankers may also affect participants' expectations about future actions, the identified factors do not represent the structural shocks themselves.

the Euro area derived from inflation linked swaps. Two aspects critically differentiate my paper from these papers. First, the identification strategy of Jarociński and Karadi (2018) is not differentiating between a standard monetary policy shock and forward guidance regarding the future short-term rate. In contrast, Andrade and Ferroni (2016) identify (Odyssean) forward guidance by assuming that one-year-ahead interest rates and five-year-ahead inflation expectations move in opposite direction. However, as explained by Jarociński and Karadi (2018), this could also be the result of news about supply shocks revealed by the central bank. Second, both papers use only one or two factors extracted from the term structure of interest rates. Consequently, they dismiss potential curvature information which may be important for adequately accounting for the zero lower bound period.⁵

Given the methodology employed, the paper also contributes to the literature which uses proxy SVARs to analyze the dynamic effects of monetary policy. Gertler and Karadi (2015) exploit the information of a single instrument, i.e. changes in the four-quarter-ahead fed funds futures, to identify shocks to the one year Treasury yield. More recent approaches, e.g. Lakdawala (2016) and Kim (2017), try to decompose the effects of conventional monetary policy working through variations in short-term interest rates and forward guidance by allowing for two shocks instrumented by two proxy variables. In contrast to the results presented in this paper, both papers find rather counterintuitive responses of output and prices to forward guidance shocks which they explain by the presence of a potential information effect of central bank announcements.

A number of recent papers shows that an import transmission channel of monetary policy works through altering term premia and risk premia of bonds (Hanson and Stein, 2015; Abrahams et al., 2016; Crump et al., 2016; Kliem and Meyer-Gohde, 2017). This paper contributes to this literature by providing evidence for the considerable and quite distinct effects of different monetary policy actions on the term structure.

⁵ Actually, in their baseline model, Jarociński and Karadi (2018) use the three-months-ahead federal funds futures rate as their single measure of policy surprises.

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