The Fed Information Effect, Episode by Episode

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Abstract

The Fed information effect—whereby a policy tightening can signal Fed optimism and raise output and prices—appears at some FOMC meetings but not others. High-frequency studies classify individual meetings as information or policy surprises but cannot trace the macroeconomic dynamics of any single episode. Combining narrative sign restrictions with a systematic-monetary-policy SVAR, I recover episode-specific output and price responses for well-documented decisions from 1968 to 2025. The information channel is real but heterogeneous, largely muted, and increasingly rare, surviving only at genuine communication surprises. The results complement, rather than overturn, the response-to-news account of Bauer and Swanson.

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1 Introduction

Do central banks really have information superiority over public market participants? The answer to this question has long been debated in the literature. The belief that Federal Open Market Committee (FOMC) announcements may affect the perception of public market participants about monetary and non-monetary fundamentals underscores the belief that the Fed has an information advantage over the general public.

Romer and Romer (2000) formally introduce this as the Fed Information Channel of monetary policy. That is, when the Fed surprises the economy with some revision in monetary policy or a monetary policy announcement, that surprise may be due to revisions in the belief of the public about the present conditions of the larger macroeconomy (Nakamura and Steinsson, 2018)[1]. However, recent studies such as Bauer and Swanson (2021) and Bauer and Swanson (2022) argue that the empirical results of other studies that claim the existence of the Fed information channel[2] support the existence of a channel that is more general and encompassing. Formally, Bauer and Swanson (2021) introduces the Fed Response to News Channel of monetary policy whereby economic news that is available to all market participants (like unemployment data, stock market performance, various output indicators, etc.) released prior to an FOMC announcement or Fed chair speech will encourage both the Fed and the public to revise its monetary policy stance and forecast, respectively. The results of these studies firmly support that the Fed information effect plays a very muted role, if not an absent one, in all cases. Studies like Bu et al. (2021) and Jarociński and Karadi (2020) have tried to disentangle these two channels through various means, which have recently been criticized due to the nature of the approach.

[1]Pinchetti and Szczepaniak (2023) highlight this very clearly. The existence of such an effect emanates from the notion that Fed communication (like during speeches or FOMC announcements) influences the expectations of various economic agents in two ways. One of which is the communication of any unexpected monetary policy actions (monetary effect) and the other is the how the Fed analyzes or perceives the performance of the economy and policy justification (information effect)

[2]Studies that use high-frequency changes in various interest rates, such as Euro-dollar futures around a short and narrow period of time, usually thirty minutes prior and subsequent to a scheduled FOMC announcement as a candidate measure policy shocks pertaining to monetary policy. Newer studies such as Bauer and Swanson (2022) include Fed speeches

This debate is not, however, a binary choice between a world with an information channel and a world without one. The high-frequency literature already recognizes that some FOMC announcements look like information surprises and others like conventional policy surprises, and it classifies individual meetings accordingly, typically from the sign of the co-movement between interest rates and stock prices in a narrow window around the announcement (Jarociński and Karadi, 2020; Cieslak and Vissing-Jorgensen, 2021; Nakamura and Steinsson, 2018). The recognition that the information channel is present at some meetings and absent at others is thus well established. What that literature cannot easily deliver is the *macroeconomic* counterpart of this classification. Because a high-frequency surprise is measured only in a short asset-price window, one cannot trace the dynamic response of output and prices to any single episode, and the impulse responses that discipline the debate are of necessity averaged across many meetings.

My contribution is to recover those episode-specific dynamics. Using the narrative sign restrictions of Antolín-Díaz and Rubio-Ramírez (2018) within the systematic-monetary-policy SVAR of Arias et al. (2019), I condition the structural identification on individual, well-documented decisions and trace the full output and price responses that each implies. This complements, rather than overturns, the announcement-window classification: it asks which particular episodes actually produce the wrong-way movements in output or prices that are the footprint of an information channel, and how large and how persistent those movements are. Framing the question this way lets me characterize the residual that Bauer and Swanson (2021) and Bauer and Swanson (2022) leave open, namely the specific historical episodes on which an information component survives even if a Fed-response-to-news channel accounts for most of the average.

The tension I address is summarized in Figure 1. An unexpected tightening can work through the traditional channel, in which higher borrowing costs lower output and prices, or through an information channel, in which the hike itself signals that the Fed views the economy as stronger than the public believed, leading private agents to revise output and price forecasts upward. The empirical footprint of the information channel is therefore a "puzzle", output or prices that move the wrong way after a policy surprise. The reverse logic applies to easings. A surprise cut can signal Fed pessimism and depress private forecasts.

[Figure 1 about here.]

Which channel dominates is an empirical question that need not have the same answer at every point in time. Figure 2 plots the identified monetary-policy shock over 1966 to 2025 together with the FOMC episodes I study. The narrative approach lets me zero in, event by event, on the months where a well-documented decision plausibly carried an information component, from the Volcker disinflation through the forward-guidance and pandemic era.

[Figure 2 about here.]

I build on Arias et al. (2019), whose sign and zero restrictions address the methodological concerns raised by purely zero contemporaneous identification. My baseline uses the standard flat conjugate prior over the reduced-form parameters, so that inference is driven by the data and the narrative rather than by prior shrinkage; replacing it with the hierarchical prior of Giannone et al. (2015) leaves the conclusions qualitatively unchanged (a supplementary appendix is available on request). I then add narrative sign restrictions (Antolín-Díaz and Rubio-Ramírez, 2018) that discipline the structural shocks around a few well-documented historical events, combining the appeal of narrative methods for mitigating omitted-variable bias with the flexibility of sign restrictions.

I find evidence of a Fed information channel at several points in recent history, in line with Nakamura and Steinsson (2018), though the puzzles are typically small and often statistically insignificant. In December 1988, for example, the median price response turns positive only gradually and with zero inside the credible band, whereas February 1994 is more pronounced, with a positive price response that is close to significant at medium horizons. My reading is deliberately measured and consistent with Bauer and Swanson (2021) and Bauer and Swanson (2022): the Fed-response-to-news channel very likely dominates, and the information effect I recover is modest and episodic, surviving mainly at genuine communication surprises rather than at large, regime-defining shocks.

Section 2 goes through a brief review narrative identification using SVARs pertaining to the Fed information channel and the methodological difficulties associated with existing monetary policy shock instruments. Section 3 goes through the methodology, detailing the different kinds of sign and narrative restrictions that will be used. Section 4 and 5 go through the different events and results of why the Fed information channel exists. Section 6 concludes and gives further recommendations.

2 Brief Review of Related Literature

Traditional monetary SVARs such as Christiano et al. (1996) and DSGE models such as Smets and Wouters (2007) imply that a contractionary monetary policy shock lowers output in the short run and eventually eases inflation back toward its prior level. I refer to this as the traditional result: contractionary policy lowers output and prices.

A strand of literature spearheaded by Romer and Romer (2000) finds instead that contractionary shocks are sometimes associated with higher output and faster inflation, an association termed the Fed information effect. Romer and Romer (2004) construct a narrative monetary policy series from FOMC meetings, and Uhlig (2005) recovers similar puzzles using minimal sign restrictions rather than zero contemporaneous restrictions. Romer and Romer (2004) and Nakamura and Steinsson (2018) interpret this as an information component in policy: FOMC announcements shift private-sector views about non-monetary fundamentals because the Fed is perceived to hold superior or earlier information. A tightening can then signal that the Fed views the economy as stronger than the public believed, leading agents to revise their forecasts upward rather than downward.

Studies that investigate the existence of the information channel usually take the approach of using a monetary policy instrument (or a monetary policy surprise) corresponding to the monetary policy series or perhaps an information series that may represent shocks in a model. Prominent examples include the high-frequency surprises of Nakamura and Steinsson (2018), Gürkaynak et al. (2005), and Bu et al. (2021).

Narrative approaches to identifying monetary policy shocks are not new. There has been a strand of literature starting from Romer and Romer (1989) and going to Nakamura and Steinsson (2018) and Bu et al. (2021). Generating monetary policy surprises out of narrative information is generally a tedious process which involves combing through many FOMC announcements and/or speeches. The approach was coined as the narrative approach wherein qualitative sources such as newspapers and FOMC transcripts are used to gather systematic evidence. As stated in Romer and Romer (2023), the main purpose of this was to respond to the problem of potential omitted variables through the use of substantive narrative evidence which may be used to defend or motivate certain monetary policy decisions. These shocks are then utilized as the actual shock series corresponding to the monetary policy or information shock specified under a given model or as a monetary policy 'surprise' (i.e. instrument) used to alleviate endogeneity concerns. Several studies that used these shocks find that there is indeed an information component that exists in monetary policy.

As this counter to the conventional is certainly controversial, many other studies would question whether or not the information component of monetary policy actually exists. There have been two main counterarguments to this controversial result. One is more methodological, pertaining to the identification and exogeneity of the shock series' used in Romer and Romer (2004) and Nakamura and Steinsson (2018). The other counterargument is more theoretical along the grounds that the Fed and the general public have roughly the same information set.

Stock and Watson (2018) note that a valid instrument must be both exogenous and relevant. On exogeneity, Cieslak (2018) and Miranda-Agrippino and Ricco (2021) show that estimated policy surprises are partly predictable from economic and financial data predating the announcement, while Leeper (1997) argues that the narrative instruments of Romer and Romer (1989) respond endogenously to past macroeconomic conditions. On relevance, Ramey (2016) and Bauer and Swanson (2021) stress that the systematic component of policy has come to dominate, so the surprise may carry less information than once thought. Together these critiques call into question the high-frequency proxies used to identify monetary policy shocks.

While the arguments made above were more methodological on the validity of the instrument, there is a more theoretical angle presented in Bauer and Swanson (2021). The belief is that the availability of widely available economic information or news will cause both the central bank to revise policy forecasts and adjust the monetary policy stance as well as cause market participants to revise their expectations. In Bauer and Swanson (2021), they deem this channel as the Fed response to news channel and argue that monetary policy shocks are driven by this response to news channel and that the information channel argued in Romer and Romer (2000) and Nakamura and Steinsson (2018) is non-existent or extremely muted at best.

3 Model Overview, Identification, and Priors

For the model specification, I closely follow Arias et al. (2019) while employing the narrative sign restrictions proposed Antolín-Díaz and Rubio-Ramírez (2018) along with a couple of modifications. I begin by detailing a typical structural vector autoregression (SVAR) in the form below as in Arias et al. (2019).

$$\mathbf{y}_t'\mathscr{A}_0 = \sum_{l=1}^{p} \mathbf{y}_{t-l}'\mathscr{A}_l + \mathbf{c} + \varepsilon_t' \quad \text{for } 1 \le t \le T \tag{1}$$

in which $\mathbf{y}_t$ is an $n \times 1$ vector containing the endogenous variables, $\mathscr{A}_l$ is of dimension $n \times n$ and contains the structural parameters for $0 \le s \le p$ where p is the specified lag length in which $\mathscr{A}_0$ is invertible, $\mathbf{c}$ is a $1 \times n$ vector of parameters which are constants. Moreover, ε_t is an $n \times 1$ vector comprising my structural shocks where, conditional on information in the past and a set of initial conditions $\mathbf{y}_0 ..., \mathbf{y}_{1-p}$, follows a Gaussian normal distribution with mean zero and a covariance matrix $\mathbf{I}_n$.

If I define $\mathscr{A}'_+ \equiv \begin{pmatrix} \mathscr{A}'_1 & \dots & \mathscr{A}'_p & \mathbf{c}' \end{pmatrix}$ where $\mathscr{A}_+$ is an $m \times n$ matrix in which $m = np + 1$ and $\mathbf{x}'_t = \begin{pmatrix} \mathbf{y}_{t-1} & \dots & \mathbf{y}'_{t-p} & 1 \end{pmatrix}$ for all $1 \leq t \leq T$, I have that

$$\mathbf{y}'_t \mathscr{A}_0 = \mathbf{x}'_t \mathscr{A}_+ + \varepsilon'_t \quad \text{for } 1 \leq t \leq T \tag{2}$$

It is well known that the structural representation above can be rewritten in reduced-form (VAR)[3] which is given as

$$\mathbf{y}'_t = \mathbf{x}'_t \mathscr{B} + \mathbf{u}'_t \quad \text{for } 1 \leq t \leq T \tag{3}$$

Clearly, the errors $\mathbf{u}_t$ which are from the reduced form representation are $\mathbf{u}'_t = \varepsilon'_t \mathscr{A}_0^{-1}$ where $\mathbb{E}[\mathbf{u}_t \mathbf{u}'_t] = \Sigma = (\mathscr{A}_0 \mathscr{A}'_0)^{-1}$ and $\mathscr{B} = \mathscr{A}_+ \mathscr{A}_0^{-1}$. From here, it is clear that $\mathscr{B}$ and Σ are parameters that can be obtained from the reduced form representation of the VAR and $\mathscr{A}_0$ and $\mathscr{A}_+$ are parameters from the structural representation of the VAR. For simplicity, let Θ collect the structural parameters $\mathscr{A}_0$ and $\mathscr{A}_+$. From here, for a given value of Θ, I define the structural shocks using equation 2 as

$$\varepsilon'_t(\Theta) = \mathbf{y}'_t \mathscr{A}_0 - \mathbf{x}'_t \mathscr{A}_t \quad \forall \quad 1 \leq t \leq T \tag{4}$$

By construction, equation 1 is not identified. Hence, there is a need to impose restrictions on Θ the I need to be able to recover the structural shocks. I follow the agnostic identification procedure in Arias et al. (2019) in which uses a procedure similar to Uhlig (2005) but focuses on the component of monetary policy that is deemed more systematic only. In addition to the restrictions in Arias et al. (2019), I add narrative restrictions allowing me to force the errors from the structural representation (and subsequently, the historical decomposition) to adhere and agree around well established narratives that I will highlight. The use of

[3] See Arias et al. (2018) for the derivation.

narrative sign restrictions as in Antolín-Díaz and Rubio-Ramírez (2018) differs from other identification schemes in that it does not fall prey to the critiques of Miranda-Agrippino and Ricco (2021) and Ramey (2016) on the exogeneity and relevance of using an instrument for monetary policy shocks and it does not suffer from Uhlig (2005)'s critique of using a simple Cholesky identification scheme or simple sign restrictions may force one to just look at the whole system instead of specific idiosyncrasies. Moreover, the use of just sign restrictions is susceptible to the fact that the set of admissible structural paramaters will be quite big and thus making it substantially difficult to generate consistent implications for key outputs of the VAR like impulse response functions, historical decompositions, and forecast error variance decompositions (Antolín-Díaz and Rubio-Ramírez, 2018).

The use of narrative sign restrictions (NSRs) will restrict the structural parameters such that these will agree with a widely agreed historical narrative. The key to its use[4] lies in the fact that structural shocks are continuous functions with respect to the structural parameters $\mathscr{A}_0$ and $\mathscr{A}_+$ contained in Θ. In essence, the implementation is similar to that of traditional sign restrictions as given in equation 5 where $\mathbf{S}_j$ is an $s_j \times r$ matrix where s_j is the number of sign restrictions used to identify a j-th structural shock. It may be the case that I have sign restrictions or opt to not have any in any implementation.

$$\mathbf{S}_j \mathbf{F}(\Theta) \mathbf{e}_{j,n} > \mathbf{0} \tag{5}$$

NSRs are implemented by using an appropriate form of $\mathbf{S}_j$ and $\mathbf{F}(\Theta)$. One of these will implement the class one of narrative sign restrictions which constrains the structural parameters in such a manner that the structural shocks follow a certain sign for a specified range of dates. Class two narrative sign restrictions would be to constrain the contribution of a certain structural shock to the change in a variable in such a way that that contribution is the most/least important than all other shocks for a certain range of dates. These classes may be used together, alone, or in conjunction with other sign or zero restrictions (as I will

[4]Implementation is based on Antolín-Díaz and Rubio-Ramírez (2018)

do in this paper).

Class one NSRs constrain mainly the sign of a response for a pre-specified period. In trying to identify some j-th structural shock, I need to impose some restriction in such a way that the sign of the j-th structural shock at a particular episode s_j, which occurs during the dates $t_1, ..., t_{s_j}$, is, say, positive[5]. This is done by imposing sign restrictions with an agreeable definition of $\mathbf{F}(\Theta)$ as $\mathbf{F}(\Theta) = \Theta$. Moreover, an appropriate definition of $\mathbf{S}_j$ as an $s_j \times (n + m)$ matrix consisting of 0s, 1s, and -1s that can select entries over the structural parameterization.

$$\mathbf{e}'_{j,n}\varepsilon_{t_\nu} > 0 \text{ for } 1 \leq \nu \leq s_j \tag{6}$$

Class two NSRs restrict the historical decomposition. Following Antolín-Díaz and Rubio-Ramírez (2018), I use two types. Type A requires the j-th shock to be the most (or least) important driver of the unexpected change in the i-th variable over a date range, that is, its absolute contribution exceeds that of any other structural shock. Type B is stronger, requiring the j-th shock's absolute contribution to exceed the sum of all other shocks' contributions.

Class 2, Type A NSRs follow the form below. Suppose I have a model with m variables in which there are T number of periods. Suppose that between period $t_1..., t_{s_j}$ until $t_1 + h_1..., t_{s_j} + h_{s_j}$, the $j-$th structural shock was considered the most important contributor[6] to the unexpected change in the $i_1..., i_{s_j}$ variables. Note that I operationalize this in absolute value as

$$\begin{multline} |H_{m,j,t_\nu,t_\nu+h_\nu}(\Theta), \varepsilon_{t_\nu}(\Theta)..., \varepsilon_{t_\nu+h_\nu}(\Theta))| \\ - \max_{j \neq j'} |H_{m,j',t_\nu,t_\nu+h_\nu}(\Theta), \varepsilon_{t_\nu}(\Theta)..., \varepsilon_{t_\nu+h_\nu}(\Theta))| > 0 \tag{7} \end{multline}$$

[5] I present this as the case I will typically be exploring, an unexpected increase in the cost of borrowing (for which the FFR is often used)

[6] The analogous definition for the least important contributor simply reverses the inequality.

The holds for the period covering $1 \leq \nu \leq s_j$ and can be utilized in conjunction with other narrative restrictions of the same or different class as well as zero or sign restrictions. Turning to Class 2, Type B NSRs, one can see that these are a mere generalization of equation 7. Suppose I consider the case that the j-th structural shock is the overwhelming driving of the unexpected change in the $i_1 ..., i_{s_j}$ variables that lasts for periods $t_1 ..., t_{s_j}$ until $t_1 + h_1 ..., t_{s_j} + h_{s_j}$. I operationalize this as

$$|H_{m,j,t_\nu,t_\nu+h_\nu}(\Theta), \varepsilon_{t_\nu}(\Theta)..., \varepsilon_{t_\nu+h_\nu}(\Theta))| \\ - \sum_{j \neq j'} |H_{m,j',t_\nu,t_\nu+h_\nu}(\Theta), \varepsilon_{t_\nu}(\Theta)..., \varepsilon_{t_\nu+h_\nu}(\Theta))| > 0 \quad (8)$$

Apart from using narrative sign restrictions, I follow Arias et al. (2019), who uses the Bayesian approach of Arias et al. (2018) and the variable specification of Uhlig (2005). My baseline adopts the standard flat conjugate (normal–inverse–Wishart) prior over the reduced-form parameters, conditioning on the initial observations. This is the natural benchmark for a set-identified sign-restriction SVAR: because the width of the credible bands is governed by the identified set rather than by reduced-form estimation uncertainty, an uninformative prior lets the data and the narrative restrictions, rather than prior shrinkage, drive inference. As a robustness check I re-estimate the model under the hierarchical prior of Giannone et al. (2015), in which a shrinkage hyperparameter is selected automatically by maximizing the marginal likelihood; this leaves the qualitative conclusions unchanged (a supplementary appendix is available on request).

I follow the identification scheme of Arias et al. (2019) which heavily draws from Leeper et al. (1996) and Leeper and Zha (2003) which suggests that monetary policy shock identification will imply the specification of the component of monetary policy that is generally considered more systematic in nature, which specifically asserts how monetary policy will react to the broader macroeconomic state. I construct a VAR system containing six variables ordered as GDP, GDP deflator, commodity price index, total reserves, total nonborrowed reserves, and the policy rate in the spirit of Uhlig (2005)[7]. Before using NSRs, I impose two additional restrictions in keeping with Arias et al. (2019).

The first restriction is that the policy rate reacts at the same time to changes in GDP, the GDP deflator, and commodity prices. These are implemented by zero restrictions. In most monetary SVARs and in keeping with Uhlig (2005)'s criticism, the policy rate responds with some lag on changes in output and prices[8]. Moreover, the policy rate is restricted from reacting contemporaneously to changes in reserves. The policy rate was then viewed as an alternative instrument during most of the mid-1990s and other studies such as Christiano et al. (1996) also specified this same restriction.

The second restriction is to impose that changes in output and prices are consistent with standard monetary policy type rules through sign restrictions. For easier notation, I label a particular structural shock in the model as the monetary shock in which this shock is the same one that appears in the monetary policy equation which I also order first. Therefore, the first equation of the SVAR is given as

$$\mathbf{y}_t'\mathbf{a}_{0,1} = \sum_{l=1}^{\nu} \mathbf{y}_{t-l}'\mathbf{a}_{l,1} + \varepsilon_{1t} \quad \text{for } 1 \leq t \leq T \tag{9}$$

Rewriting this equation to clearly show my identification strategy, I get

$$ffr_t = \rho_y y_t + \rho_p p_t + \rho_{pc} pc_t + \rho_{tr} tr_t + \rho_{nbr} nbr_t + \sigma\varepsilon_{1,t} \tag{10}$$

I let $\rho_y = -a_{0,61}^{-1}a_{0,11}$, $\rho_p = -a_{0,61}^{-1}a_{0,21}$, $\rho_{pc} = -a_{0,61}^{-1}a_{0,31}$, $\rho_{tr} = -a_{0,61}^{-1}a_{0,41}$, $\rho_{nbr} = -a_{0,61}^{-1}a_{0,51}$, and $\sigma = a_{0,61}^{-1}$.

In essence, I am following Uhlig (2005)'s identification strategy wherein I do not impose the controversial zero restriction on output but instead impose sign restrictions on how monetary policy may affect the GDP deflator, non-borrowed reserves, and the FFR. In

[7]Note that, moving forward, I call GDP and output as well as GDP deflator and 'prices' interchangeably
[8]It has typically been allowed to react contemporaneously with commodity prices

particular, I argue that the identified shock does not elicit an increase in prices nor in non-borrowed reserves, and that it does not decrease the FFR. This specification was partly criticized by Arias et al. (2019) suggesting that eliminating the price and liquidity puzzle through the imposition of the aforementioned sign restrictions is a reasonable idea but is likely not enough to identify monetary policy shocks. While Uhlig (2005)'s identification and restriction scheme is more a direct assault on the zero-contemporaneous restriction, Arias et al. (2019) is more centered on the component of monetary policy that is more systematic in nature. This is because monetary policy is formed in adherence to the prevailing economic conditions. I detail Arias et al. (2019)'s restrictions in greater detail below

Sign Restriction 1. The FFR responds positively to output and price hikes. In here, sign restrictions are imposed to coincide with the systematic response of monetary policy to changes in the macroeconomy (i.e. changes in prices and output). Like Arias et al. (2019),the response of the FFR to changes in commodity prices is said to be unrestricted. This restriction implies that $\rho_y > 0$ and $\rho_p > 0$ in equation (5).

Zero Restriction 1. The FFR is unaffected by changes in reserves. This restriction is based on widely agreed upon literature in that the federal funds rate, whether directly or indirectly, was the main instrument used by the Fed to implement policy. This restriction implies that $\rho_{tr} = 0$ and $\rho_{nbr} = 0$.

Then, in addition to these two restrictions, I implement the use of narrative sign restrictions as outlined in Antolín-Díaz and Rubio-Ramírez (2018). These restrictions on the trajectory of the response are largely based on narrative information that had been collected throughout time in order for me to constrain the structural parameters in a manner by which the historical narrative agreed upon is followed. These historical narratives are largely based on other sources of literature and news and are well established. In essence, I use the narrative identification scheme without the burden of needing to come up with a shock that would otherwise fall into typical criticisms because of the lack of exogeneity or relevance.

Bearing in mind that historical decompositions and structural shocks are continuous functions of Θ[9], it is easy to construct any continuous function of the structural parameters, say $\mathbf{F}(\Theta)$ which goes from $\mathscr{A}_0$ and $\mathscr{A}_+$ to the of $r \times n$ matrix space. In this approach, I consider two types of NSRs. The first type concerns restricting the structural parameters in a manner by which the sign of the structural shocks for certain date/s agrees with my well established narrative. The second type concerns restricting the structural parameters such that the relative contribution of a shock in the structural representation to an observed but change in a particular variable is more important that any other shock for certain date/s in absolute value terms.

An updated dataset relative to that used in Arias et al. (2019) is employed. The monthly dataset spans from January 1965 to December 2025, so that it includes the great moderation as well as the more recent Global Financial Crisis, the zero-lower-bound (ZLB) and forward-guidance era, and the COVID-19 period. I use six variables, namely GDP in real terms, prices through the GDP deflator, a commodity price index (CPRI), total reserves, total non-borrowed reserves, and the policy rate. The first two variables are interpolated to a monthly frequency using the industrial production index and the consumer price index, respectively[10]. The pre-2008 commodity index (CRBSPOT, the BLS Commodity Price Index) was obtained from Refinitiv Datastream. From 2008 onward it is extended with the IMF all-commodity price index. The reserve series and the effective federal funds rate are from FRED. During the ZLB episodes (2009 to 2015 and 2020 to 2021) the effective funds rate is replaced by the Wu and Xia (2016) shadow federal funds rate, which restores identifying variation in the policy stance when the actual rate is pinned near zero. I caution that, because of the large expansion of the Federal Reserve's balance sheet, the two reserve series are dominated by quantitative easing after 2008 and their responses in that period should be interpreted with care. That same balance-sheet expansion induces a pronounced structural break in the reserve series that destabilizes the narrative reweighting for some earlier episodes. I therefore

[9] See Antolín-Díaz and Rubio-Ramírez (2018) for details.

[10] Arias et al. (2019) uses the interpolation methodology of Bernanke and Mihov (1998). My post-2007 extension benchmarks quarterly real GDP and the GDP deflator to the monthly industrial-production and CPI indicators.

adopt a two-sample strategy. The pre-forward-guidance episodes of Sections 4.1 to 4.3 are estimated on the 1965 to 2007 sample, whereas the forward-guidance-era episodes of Section 4.4 are estimated on the full 1965 to 2025 sample with the shadow rate, which is precisely the period for which the extension is needed. I employ 12 lags, include no deterministic term, and stationarize any non-stationary series.

4 Results

Before turning to individual episodes, Figure 3 shows the baseline systematic-monetary-policy shock estimated on the full sample without any narrative restriction. A contractionary shock lowers real output and the price level while raising the funds rate on impact, the textbook response, and the benchmark against which I look for puzzles. The narrative restrictions below ask whether, around specific well-documented FOMC decisions, this benchmark is overturned.

[Figure 3 about here.]

Each figure that follows should be read as the macroeconomic counterpart of an announcement-window classification. The high-frequency literature can establish that a given FOMC decision comoved with asset prices in the manner of an information surprise, but it stops at the announcement window and cannot say what that decision did to output and prices over the following months and years. The narrative-restricted SVAR supplies exactly that missing object, the episode-specific impulse response. Two features of this design are worth emphasizing. First, because identification comes from a documented historical narrative rather than from intraday asset prices, it reaches episodes that predate the availability of high-frequency data altogether, including the tightenings of the 1960s, 1970s, and 1980s that the scatter-plot classification cannot evaluate. Second, and for the same reason, it remains available at the zero lower bound, when the funds-rate window is uninformative and the high-frequency surprise is hardest to read. What follows is therefore not a re-classification of meetings but a reading of the dynamic macroeconomic footprint of individual decisions.

The results can be broken down into two main types which are seen in Table 1. First, there are certain events that constitute just a price puzzle. That is, a surprise increase in the FFR would yield an increase in inflation. Secondly, there are certain events that constitute just an output puzzle, which is when a surprise increase in the FFR yields an increase in output. I go through some of the dates I find these in, highlight narrative information supporting the imposition of the NSRs, and go through the underlying results.

[Table 1 about here.]

4.1 Price Puzzle

The price-puzzle episodes span 1968 to 1997, and the earliest of them lie well before intraday asset-price data exist, so the narrative lens used here is the only way to bring them into the debate at all. In the dates December 1988, February 1994, and March 1997, I find that the expected results seen in Arias et al. (2019) change once the additional narrative restrictions are added. In Figure 4, I zero in on the imposition of narrative sign restrictions for December 1988 and can see that there exists considerable mass in which the posterior median response of inflation is positive and remains positive for a prolonged horizon. The details of the restrictions are given below

Narrative Sign Restriction 1. For the observation December of 1988, the shock pertaining to monetary policy/information is positive.

Narrative Sign Restriction 2. For December of 1988, the shock pertaining to monetary policy/information was the main contributor to the surprise movement in the federal funds rate. Ergo, the contribution of the shock to the unexpected movement in the FFR is larger than the sum of the contributions of all other shocks, in absolute value terms.

Narrative Sign Restriction 3. For January and February of 1989, the shock pertaining to monetary policy/information is also positive, reflecting the documented continuation of the tightening into early 1989.

[Figure 4 about here.]

To defend the imposition of the narrative sign restrictions in December 1988, I follow the argument of Romer and Romer (2023)[11]. Based on the narrative account, there was an inherent willingness to reduce inflation and accept a short contraction in output in the December 1988 meeting. It counts as a contractionary monetary policy shock because policymakers, despite considerable normal levels of growth and unemployment, undertook substantive policy actions and rejected the view that the current level of inflation was acceptable, thereby taking drastic measure to try and bring it down. Moreover, in the narrative account, it is clear that the policymakers were aware and fully accepted the consequences on output and employment. In my results, I find that output responds positively in the first few periods but declines rapidly and stays so for quite some time, consistent with what is expected from a contractionary monetary policy. On the other hand, there is an immediate decline in the level of prices, but the response drifts back toward zero over the horizon and remains persistently above the baseline, at odds with the traditional contractionary response. It is also noticeable that the path of the response differs greatly from Arias et al. (2019) despite imposing the same sign and zero restrictions but adding three additional narrative sign restrictions[12]. Moreover, Antolín-Díaz and Rubio-Ramírez (2018) cite Romer and Romer (2004) point out that there had been noticeable increases in the interest rates towards the latter part of 1988. The tightening was not a one-off. The December 1988 firming was implemented in two stages and was followed by further tightening into early 1989, including an increase in the discount rate to 7 percent on February 24, 1989 (Federal Reserve Bank of New York, 1990). Requiring the monetary policy shock to remain positive through January and February 1989 reinforces the contractionary reading of the episode, and in the results it produces a more persistently positive federal funds rate response. A thorough scan of the narrative account highlights a

[11] In Examples of the Narrative Analysis of Monetary Shocks found in pages 1400-1401

[12] In all impulse-response figures the Arias et al. (2019) baseline response is the blue line and the narrative-restricted response is the red line.

policy shift pointed more towards reducing inflation over time[13].

I present another price puzzle that occurred in February 1994. In doing so, I impose the following NSRs

Narrative Sign Restriction 3. For the observation February of 1994, the shock pertaining to monetary policy/information is positive.

Narrative Sign Restriction 4. For February of 1994, the shock pertaining to monetary policy/information was the main contributor to the surprise movement in the federal funds rate. Ergo, the contribution of the shock to the unexpected movement in the FFR is larger than the sum of the contributions of all other shocks, in absolute value terms.

[Figure 5 about here.]

The response of prices in February 1994 are somewhat inline with that of December 1988. There is an immediate impact on prices and commodity prices but it is statistically near zero, suggesting that if ever there was a price puzzle, it was fairly muted. Interesting to note that in the first three quarters, output growth is positive, albeit close to zero, suggesting the presence of a short-term output puzzle. To defend the imposition,Antolín-Díaz and Rubio-Ramírez (2018) argues that the Fed started tightening consecutively over the next year, raising the federal funds rate by about 300 bps, which caught market participants off guard. Moreover, the velocity of the increase in the FFR was itself a surprise. The Romer and Romer (2004) series indicates that the monetary policy tightening between the months of February and November was substantially more aggressive than the baseline path the Fed had outlined earlier. This is more closely related to a true information shock than that of the monetary policy shock since according to the Greenbook forecasts, the Fed had access to confidential employment data that would have been released after the meeting had been conducted which would not have been publicly available prior to the preparation of the Greenbook forecasts. On paper, this seems like the best candidate for a true 'Fed information' shock but the results suggest a more muted response.

[13] This logic and account is obtained from the Greenbook series highlighting that the forecasts for inflation failed to degrade in the latter part of 1988 and that the forecasts were revised slightly upward.

The earliest price-puzzle episode is December 1968, one of the anti-inflationary monetary shocks that Romer and Romer (1989) and Romer and Romer (2023) identify from the narrative record, when the Federal Reserve firmed policy against rising inflation late in the Martin era. Figure 6 shows a mild price puzzle. Relative to the baseline (blue), the narrative-restricted response of the GDP deflator (red) is higher and turns slightly positive, though zero remains inside the credible band. The episode is well identified and extends the pattern back to the 1960s, well before the era of explicit central-bank communication.

[Figure 6 about here.]

I uncover two further tightening episodes that display a clear price puzzle under the narrative restriction. August 1978 and March 1997. For both I impose that the monetary-policy shock is positive and that it is the most important contributor to the surprise movement in the federal funds rate around the meeting (Class 2, Type A).

August 1978 is one of the Romer and Romer (1989) narrative tightening dates, when the Miller-era Federal Reserve raised the discount rate against accelerating inflation. Figure 7 shows that, relative to the baseline (blue), the narrative-restricted response of the GDP deflator (red) turns positive and commodity prices rise, while output falls, a pronounced price puzzle. The episode is comparatively well identified, with a few hundred draws satisfying the restrictions.

[Figure 7 about here.]

March 1997 corresponds to the lone tightening of 1997, when Chairman Greenspan raised the funds rate 25 basis points pre-emptively amid concerns about an overheating labor market and "irrational exuberance," tightening against inflation that had not yet materialized in the data. This is a natural information-effect candidate. A pre-emptive hike signals the Fed's private read that the economy is stronger than the public believes. Figure 8 confirms a price puzzle, the narrative-restricted deflator and commodity-price responses (red) lie above the baseline (blue) and are positive.

[Figure 8 about here.]

The March 20, 2001 FOMC meeting exemplifies the Federal Reserve information effect during the early forward guidance period. The Fed cut rates 50 basis points to 5.0% precisely as the economy entered recession, with March 2001 marking the official business cycle peak (National Bureau of Economic Research, 2001). This occurred during what Lunsford (2020) identifies as the "economic-outlook only" communication period (February 2000-June 2003), when FOMC statements provided forward guidance about economic risks but avoided direct policy inclinations. The economic context creates ideal conditions for information effects. The dot-com collapse had already reduced NASDAQ by 44%, business investment fell $190 billion in 2001, and employment peaked exactly in March 2001 (Congressional Research Service, 2001). The Fed was responding to recession-in-progress rather than preventing future weakness. Lunsford (2020) shows that during this period, a surprise decrease in the orthogonal path of the federal funds rate caused immediate decreases in stock prices and GDP growth forecasts, with the March 2001 observation noted as particularly influential in the analysis. This creates the ideal narrative restriction. Easier monetary policy signaled Fed pessimism about economic conditions rather than providing stimulus.

Narrative Sign Restriction 5. For the observation March of 2001, the shock pertaining to monetary policy/information is negative.

Narrative Sign Restriction 6. For March of 2001, the shock pertaining to monetary policy/information was the most important contributor to the surprise movement in the federal funds rate. That is, the absolute contribution of the shock to the unexpected movement in the FFR exceeds that of any other structural shock.

[Figure 9 about here.]

From the results, there is a protracted decline in the GDP deflator and the commodity price index following the shock, even though the policy action is an easing. Under the textbook channel an easing would raise prices. The observed decline is the price-side signature of the information effect, whereby the surprise cut signals Fed pessimism about the economic outlook. I note, however, that March 2001 is weakly identified (only a small number of draws satisfy the restrictions). The same qualitative pattern appears far more sharply in the well-identified January 2001 episode discussed below.

The clearest easing evidence comes from January 2001. On January 3, 2001 the FOMC cut the funds rate 50 basis points in a surprise inter-meeting move, outside the regular calendar and accompanied by language pointing to a rapidly weakening outlook. This is arguably the sharpest "the Fed knows something" signal in my sample, and it is very well identified, over six hundred draws satisfy the restrictions, compared with a handful for March 2001. Figure 10 plots the response to the easing. Output rises modestly, as a textbook stimulus would predict, but the GDP deflator turns negative and commodity prices fall well below the baseline. A decline in prices following an easing is the price-side signature of the information channel. The surprise cut signals Fed pessimism, and private forecasts of prices are revised downward.

[Figure 10 about here.]

A weaker version of the same pattern appears in November 2002. On November 6 of that year the FOMC cut the funds rate 50 basis points, a larger move than markets had anticipated, against the backdrop of a deflation scare that dominated policy discussion that autumn. Two weeks later Governor Bernanke delivered his well-known warning that the Federal Reserve should act preemptively to keep deflation from taking hold (Bernanke, 2002), which makes the cut a natural candidate for a signal about the committee's private read of the outlook rather than a simple stimulus. Figure 11 shows that output rises while the deflator response stays close to zero, so any information content is present but muted. Taken together, the easing episodes suggest that the information channel operates primarily on the price side, since easings that surprise the public toward pessimism depress price expectations, but that its strength varies considerably across episodes.

[Figure 11 about here.]

4.2 Output Puzzle

Contractionary monetary policy may also induce an increase in output. By the logic of Pinchetti and Szczepaniak (2023), this is the channel most closely associated with the "Fed information effect." In practice it is the weaker of the two signatures in my sample. The clearest instance is the mild output puzzle attached to the December 2018 tightening in the forward-guidance era, discussed in Section 4.4. A further candidate, the hawkish-surprise cut of June 2003, does produce a small output puzzle under the baseline specification, but it is fragile: the effect is modest relative to its credible band, is concentrated at long horizons, and its sign is sensitive to the prior. I therefore treat June 2003 as a fragile case and do not emphasize it. The more durable evidence for an information channel in the pre-crisis sample is the price-side evidence of Section 4.1 and the easing episodes below.

4.3 Episodes without an Information Component

Not every salient FOMC decision carries an information component, and it is instructive to see where the narrative restriction leaves the baseline essentially unchanged. Three well-identified tightening episodes, October 1979, November 1994, and June 1999, produce textbook responses. Output and prices both fall, and the narrative-restricted responses (red) track the baseline (blue) closely, with no puzzle. October 1979 is the Volcker "Saturday Night Special," the regime-defining shift to reserve targeting that Meltzer (2009) documents as an unusually public and well-understood commitment to disinflation. It is the most sharply identified event in my sample (roughly a thousand admissible draws) precisely because it was such a large, unambiguous monetary shock rather than a subtle communication surprise. The same pattern holds for the other large, well-documented disinflation shocks. April 1974 and May 1981, both Romer and Romer (1989) anti-inflationary shock dates, likewise produce textbook responses in which output and prices fall, with no price puzzle, even though both are very sharply identified. These were sweeping, unambiguous tightenings rather than communication surprises, and it is precisely at such regime-defining shocks that the information channel is absent. November 1994 is especially telling when set against February 1994. The initial surprise tightening in February displays a price puzzle, but the later, by-then-anticipated 75 basis point hike in November does not. This accords with the reading of the 1994 cycle as a deliberate and increasingly well-telegraphed preemptive strike against inflation, an episode that Goodfriend (2007) treats as a milestone in the move toward transparent, expectations-based policy. The information content resided in the initial surprise, not in the continuation of a cycle the public had already priced.

The point is reinforced by two episodes the identification scheme cannot pin down at all. The June 2004 "measured pace" hike, among the most heavily pre-announced moves in Federal Reserve history, and the September 1998 LTCM easing both collapse to a single admissible draw. Once policy is fully telegraphed, or the funds-rate surprise is dominated by non-monetary (here, global financial) disturbances, there is essentially no monetary-policy surprise for the narrative restriction to isolate. This is consistent with Ramey (2016): as monetary policy has become more systematic and transparent, identifiably exogenous, information-bearing surprises have become rarer.

4.4 The Forward-Guidance and Zero-Lower-Bound Era

The episodes above all predate the financial crisis. A natural question is whether the information component survives into the forward-guidance and zero-lower-bound (ZLB) era, when the federal funds rate was pinned near zero and communication became the Fed's primary instrument. This is also the setting in which an announcement-window measure of the policy surprise is least informative, since the funds rate itself barely moves, so the ability of the narrative approach to identify a stance from the documented record rather than from the rate window is especially valuable here. To examine this I use the extended 1965 to 2025 sample, replacing the funds rate with the Wu and Xia (2016) shadow rate during the ZLB so that the policy stance retains identifying variation. I stress that the reserve responses are not interpretable in this period. The discussion focuses on output and prices.

The central finding is that the information effect does not vanish after forward guidance, but it becomes concentrated in genuine surprises. The clearest case is the May 2013 "taper tantrum," when Chairman Bernanke's unexpected suggestion that the Fed might slow asset purchases sharply tightened the perceived policy stance. Figure 12 shows a modest price puzzle. Relative to the baseline (blue), the narrative-restricted response of the GDP deflator (red) is higher and turns mildly positive, and commodity prices rise. The taper tantrum is exactly the kind of communication surprise in which an information component is expected to appear.

[Figure 12 about here.]

The contrast with the December 2015 liftoff is instructive. That first post-crisis hike was telegraphed for the better part of a year, so it carried little news. Figure 13 shows a textbook response. Output and prices both fall, and the narrative-restricted responses if anything lie below the baseline. There is no puzzle. Just as November 1994 differed from February 1994, the information content lies in the surprise, not in a move the public has already priced.

[Figure 13 about here.]

The easing side tells the same story. The March 2020 emergency cuts, an abrupt, inter-meeting move to zero as the pandemic unfolded, are shown in Figure 14. Output rises, as a textbook stimulus would predict, but the GDP deflator and commodity prices fall. The surprise cut signalled Fed alarm about the outlook and depressed private price forecasts, the same price-side information signature found in January 2001. The August 2011 introduction of calendar-based forward guidance produces a weaker version of this pattern. At that meeting the FOMC first tied the expected path of the funds rate to an explicit horizon, stating that economic conditions were likely to warrant exceptionally low rates at least through mid-2013. This is precisely the kind of Odyssean commitment that Campbell et al. (2012) show can shift expected output and inflation, and that Bernanke (2020) later described as one of the two principal new tools of policy at the effective lower bound. Because such guidance is designed to reveal the committee's own assessment of how long weakness will persist, it is a natural setting for an information effect, and the muted decline in prices I find is consistent with that reading.

The contested December 2018 hike shows a mild output puzzle. The Federal Reserve raised rates into falling equity markets and a widening set of downside risks, and the sharp reversal toward easier policy in early 2019 fits the pattern of policy sensitivity to financial conditions documented by Cieslak and Vissing-Jorgensen (2021). Finally, the March 2022 liftoff into surging inflation displays a price puzzle. This is consistent with a hike that signalled the Fed's private read that inflation was more persistent than the public believed, although it is the least sharply identified of these episodes and should be read with caution.

[Figure 14 about here.]

Taken together, these episodes qualify the view that the information effect disappears once the Fed adopts explicit forward guidance. The effect is certainly muted and rarer than in the earlier decades, but it re-emerges precisely when the Fed genuinely surprises the public, the 2013 taper tantrum and the 2020 pandemic cuts, and is absent when the move is fully anticipated, as at the 2015 liftoff.

5 Historical Decomposition

Beyond the impulse responses, it is useful to ask how the narrative restriction reallocates the observed historical movements of the data across structural shocks. Figure 15 reports the historical decomposition of the monetary-policy shock around the December 1988 price-puzzle episode.

[Figure 15 about here.]

Figure 15 presents the historical decomposition of the monetary-policy shock around the December 1988 episode. In each panel the black line is the observed deviation of the variable from its deterministic baseline, so it summarizes the combined effect of all structural shocks. The blue and red lines isolate the contribution of the monetary-policy shock alone, under the baseline and narrative identifications respectively. The comparison makes the effect of the narrative restriction transparent. Under the baseline (blue), the monetary-policy shock accounts for only a small share of the observed movements in the federal funds rate and prices over 1988 to 1989. Under the narrative restriction (red), a larger share of the run-up in the funds rate and of the increase in commodity prices is attributed to the identified monetary-policy/information shock, while for real output the two identifications remain close. In other words, imposing the narrative around this well-documented tightening loads more of the observed price dynamics onto the monetary-policy shock, precisely the reallocation that underlies the price puzzle in the corresponding impulse responses.

6 Conclusion

The existence of the Fed information effect seems plausible according to my new identification scheme. While the points echoed by Bauer and Swanson (2021) on the Fed response to news channel are likely true as well, it does not detract from the fact that there are episodes throughout recent history that are in support of the so called channel of monetary policy reliant of Fed information superiority.

Tightening episodes such as August 1978, December 1988, February 1994, and March 1997 display a price puzzle under the narrative restriction, and the earlier of these are accompanied by a slight short-run output puzzle, suggesting a revision in expectations brought about by short-term and unexpected information conveyed by the Fed's actions. This reinforces points made by Romer and Romer (2004) and Nakamura and Steinsson (2018) that the Fed retains some information advantage even in more modern times, albeit a decreasing one. A revealing contrast is the 1994 cycle. The initial surprise tightening of February 1994 carries an information component, whereas the later, well-anticipated 75 basis point hike of November 1994 produces a textbook response with no puzzle. Likewise, the regime-defining but widely understood October 1979 Volcker shock, the well-telegraphed June 1999 tightening, and the heavily pre-announced June 2004 "measured pace" hike show little or no information content, indeed, the latter cannot be identified at all. This pattern lends credence to Ramey (2016)'s argument that identifiably exogenous, information-bearing surprises have become harder to find as monetary policy has grown more systematic and transparent.

A candidate output puzzle appears in June 2003, featuring an increase in GDP of around fifteen basis points that builds over the forecast horizon, though this episode is fragile and sensitive to the prior, so I treat it as a robustness exercise rather than a headline result. On the easing side, the surprise inter-meeting cut of January 2001, and more weakly March 2001 and November 2002, produces the mirror-image signature. Output rises as a textbook stimulus would predict, but prices fall, consistent with an easing that signals Fed pessimism and depresses private price forecasts. The January 2001 episode, being a genuine surprise, is far more sharply identified than the calendar-scheduled March 2001 meeting.

Extending the analysis into the zero-lower-bound and forward-guidance era, using the Wu and Xia (2016) shadow rate to recover identifying variation when the funds rate is pinned near zero, qualifies the common view that the information effect disappears once the Fed relies on explicit forward guidance. The effect is certainly muted and rarer, but it re-emerges precisely at genuine communication surprises. The May 2013 taper tantrum displays a mild price puzzle and the March 2020 pandemic cuts display the price-side easing signature, whereas the fully anticipated December 2015 liftoff produces a textbook response with no puzzle. The recurring theme, across six decades, is that the information content resides in the surprise rather than in the policy action itself.

All in all, I find evidence of a Fed information channel that is real but modest. This finding is consistent with, rather than a refutation of, Bauer and Swanson (2021) and Bauer and Swanson (2022). Their central point, that a Fed-response-to-news channel accounts for most of what earlier studies attributed to an information effect, is very likely correct, and my results agree that the information channel is muted and is not the dominant force in most regimes. What the narrative approach adds is a characterization of the residual. The information effect does not vanish, but it is confined to a particular kind of event, namely genuine communication surprises such as the price-puzzle tightenings of December 1968, August 1978, December 1988, February 1994, and March 1997, and the pessimism-signal easings of January and March 2001. It is absent from the large, regime-defining disinflation shocks of April 1974, October 1979, and May 1981, which produce textbook responses despite being very sharply identified, and from moves the public has already priced, such as the November 1994 continuation, June 1999, and the June 2004 measured-pace hike. The effect is also becoming rarer as monetary policy grows more systematic and transparent, as Ramey (2016) anticipates. I do not claim the channel is large or pervasive. I claim only that it survives on a well-defined subset of episodes, and that on those episodes it moves prices or output the wrong way relative to the textbook response. That is enough to matter for how the Fed weighs the signaling content of its communication, even in a world where the response-to-news channel dominates.

Declaration of Generative AI and AI-Assisted Technologies in the Manuscript Preparation Process

During the preparation of this work, the author used Claude Code in order to improve the language and readability of the manuscript. After using this tool, the author reviewed and edited the content as needed and takes full responsibility for the content of the published article.

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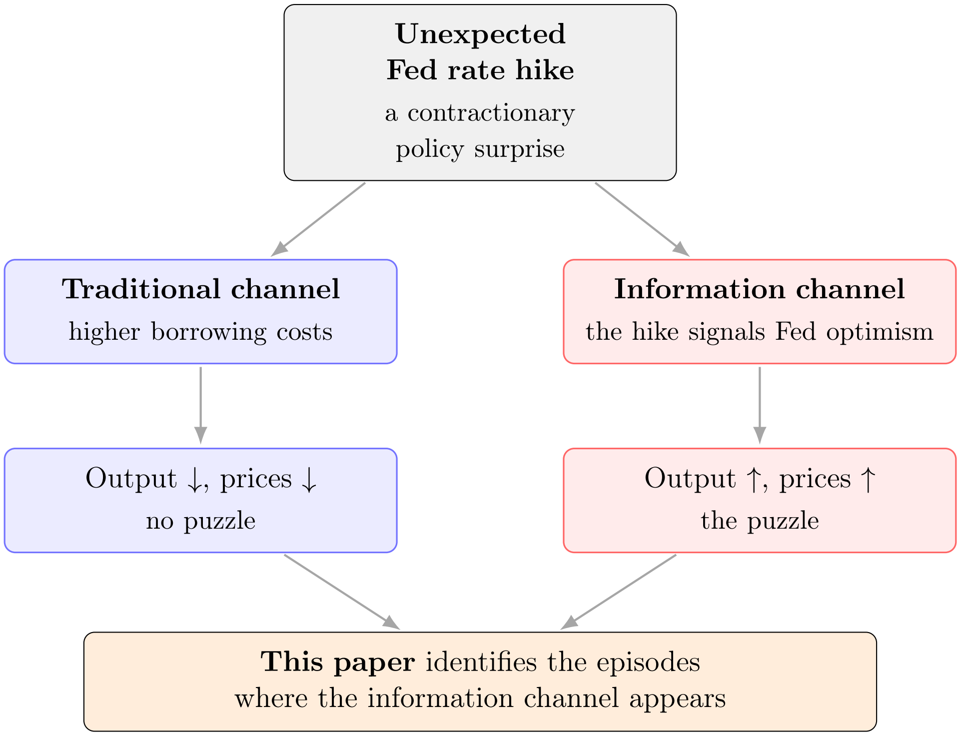

Figure 1: Two channels of a contractionary monetary-policy surprise.

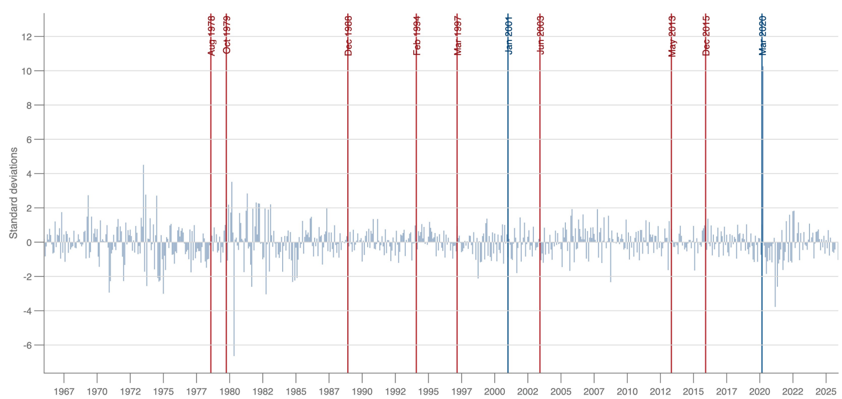

Figure 2: The identified monetary-policy shock and the studied FOMC episodes, 1966 to 2025. The series is the pointwise posterior median of the structural monetary-policy shock under the baseline identification, standardized. Red lines mark tightening episodes and blue lines mark easings that I examine.

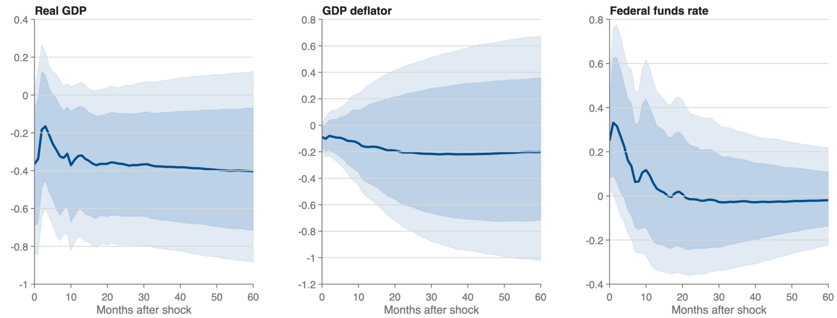

Figure 3: The systematic monetary-policy shock in the baseline model (no narrative restriction). Posterior median responses to a contractionary shock with 68% and 90% credible bands, Arias et al. (2019) identification, 1965 to 2007.

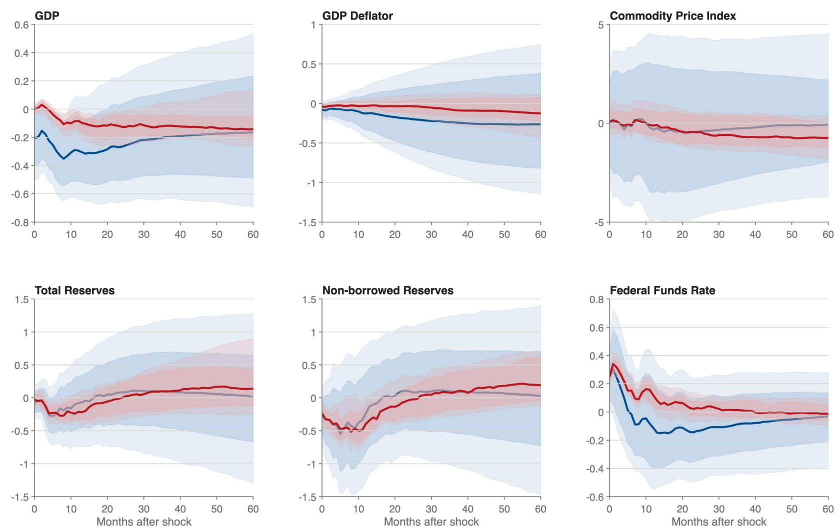

Figure 4: Impulse Response Functions with Narrative Restrictions (December 1988)

Note. Blue line and shaded bands correspond to the Arias et al. (2019) baseline (systematic monetary-policy identification). Red line and bands correspond to the narrative-restricted specification. Solid lines are posterior medians and shaded regions are 68% and 90% pointwise credible bands. The federal-funds-rate impact response is normalized to +25 basis points.

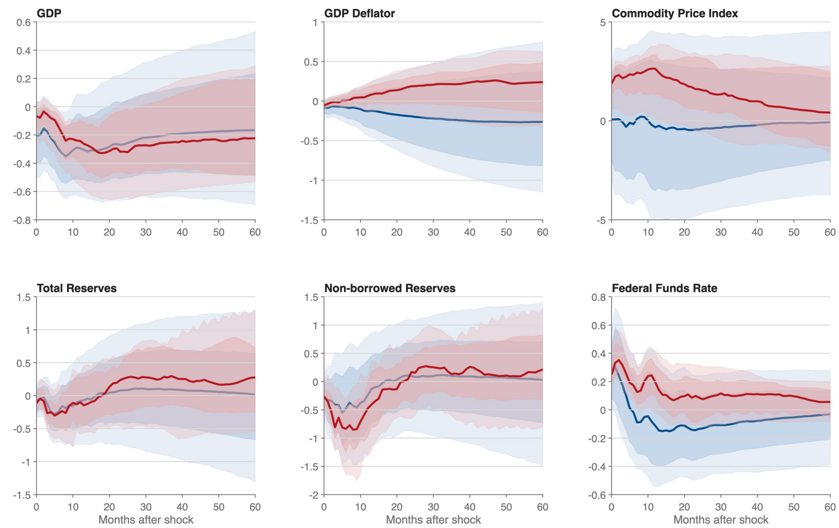

Figure 5: Impulse Response Functions with Narrative Restrictions (February 1994)

Note. Blue line and shaded bands correspond to the Arias et al. (2019) baseline. Red line and bands correspond to the narrative-restricted specification. Solid lines are posterior medians and shaded regions are 68% and 90% pointwise credible bands. The federal-funds-rate impact response is normalized to +25 basis points.

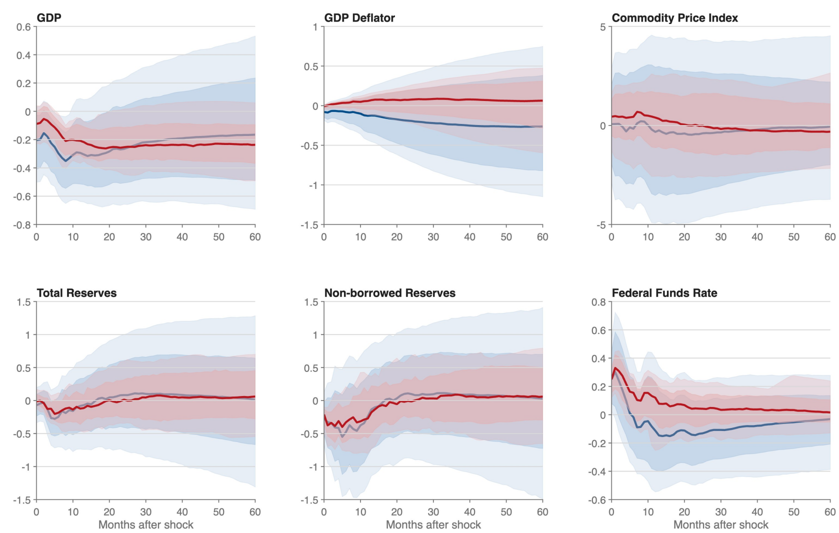

Figure 6: Impulse Response Functions with Narrative Restrictions (December 1968)

Note: Blue line and shaded bands correspond to the Arias et al. (2019) baseline; red line and bands correspond to the narrative-restricted specification. Solid lines are posterior medians and shaded regions are 68% and 90% pointwise credible bands. The federal-funds-rate impact response is normalized to +25 basis points.

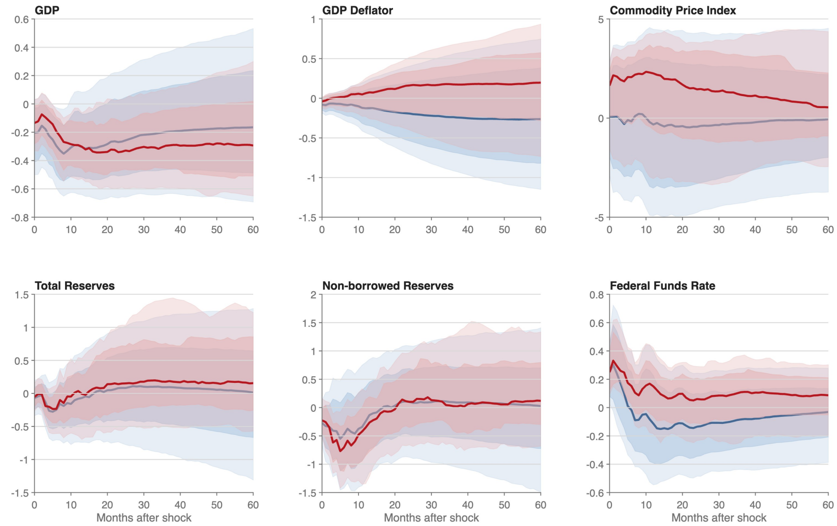

Figure 7: Impulse Response Functions with Narrative Restrictions (August 1978)

Note. Blue line and shaded bands correspond to the Arias et al. (2019) baseline. Red line and bands correspond to the narrative-restricted specification. Solid lines are posterior medians and shaded regions are 68% and 90% pointwise credible bands. The federal-funds-rate impact response is normalized to +25 basis points.

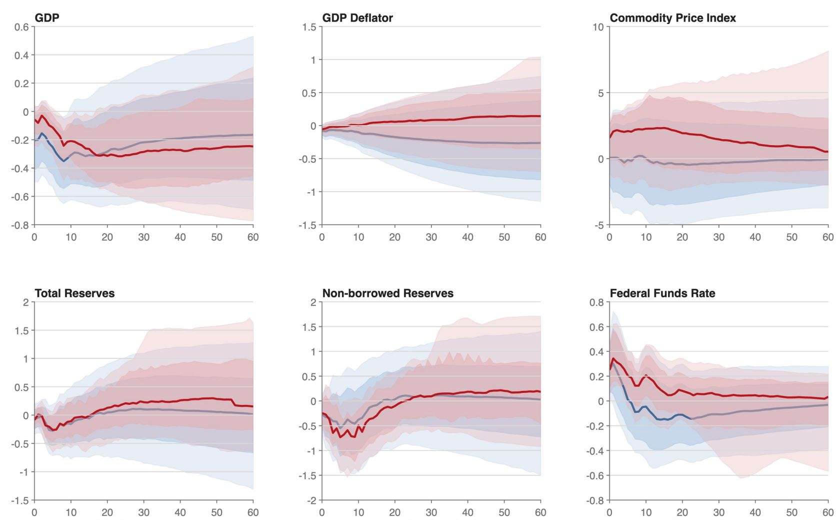

Figure 8: Impulse Response Functions with Narrative Restrictions (March 1997)

Note. Blue line and shaded bands correspond to the Arias et al. (2019) baseline. Red line and bands correspond to the narrative-restricted specification. Solid lines are posterior medians and shaded regions are 68% and 90% pointwise credible bands. The federal-funds-rate impact response is normalized to +25 basis points.

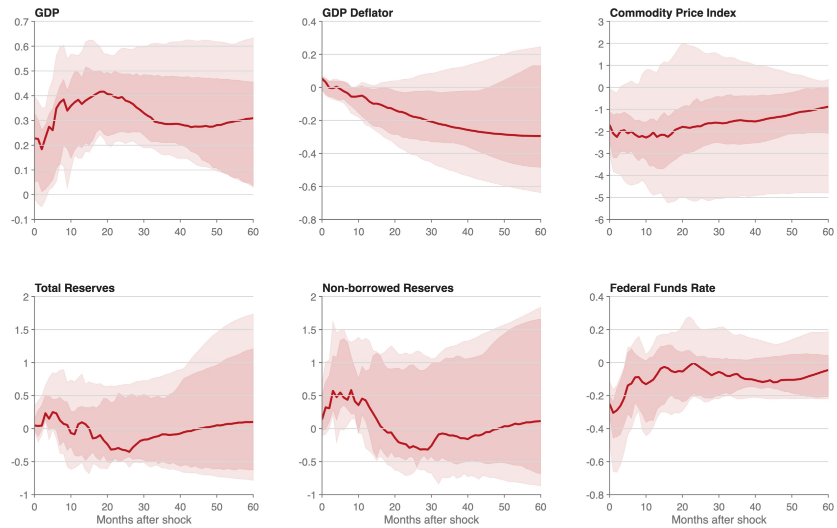

Figure 9: Impulse Response Functions with Narrative Restrictions (March 2001)

Note. Red line and shaded bands correspond to the narrative-restricted specification (posterior median with 68% and 90% pointwise credible bands). Because this is an easing episode, responses are normalized to the actual policy easing (−25 basis points on the federal funds rate at impact).

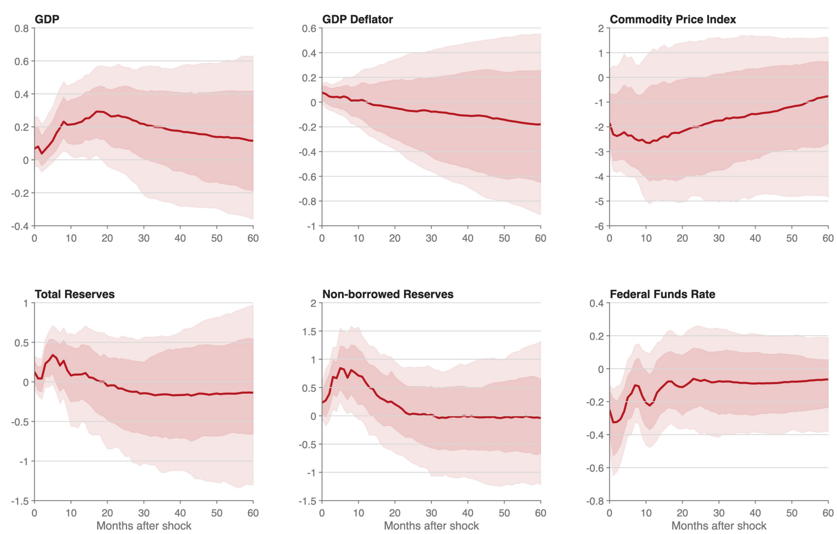

Figure 10: Impulse Response Functions with Narrative Restrictions (January 2001)

Note. Red line and shaded bands correspond to the narrative-restricted specification (posterior median with 68% and 90% pointwise credible bands). Responses are normalized to the actual policy easing (−25 basis points on the federal funds rate at impact).

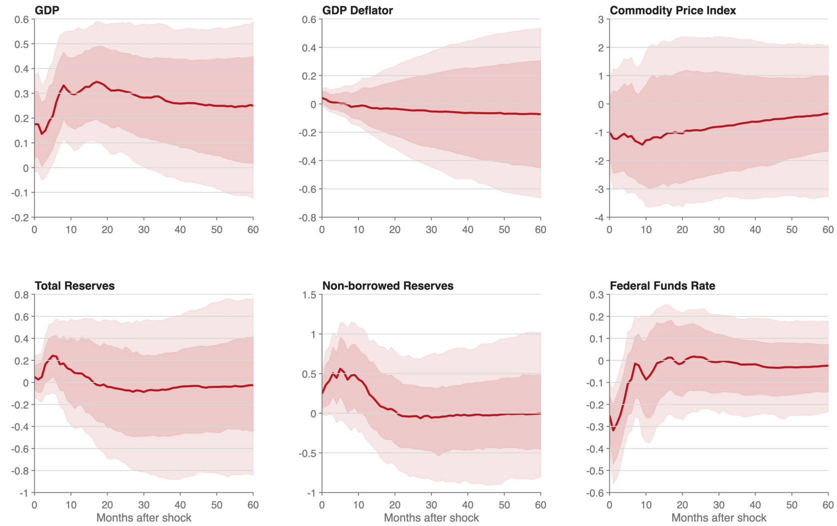

Figure 11: Impulse Response Functions with Narrative Restrictions (November 2002)

Note. Red line and shaded bands correspond to the narrative-restricted specification (posterior median with 68% and 90% pointwise credible bands). Responses are normalized to the actual policy easing (−25 basis points on the federal funds rate at impact).

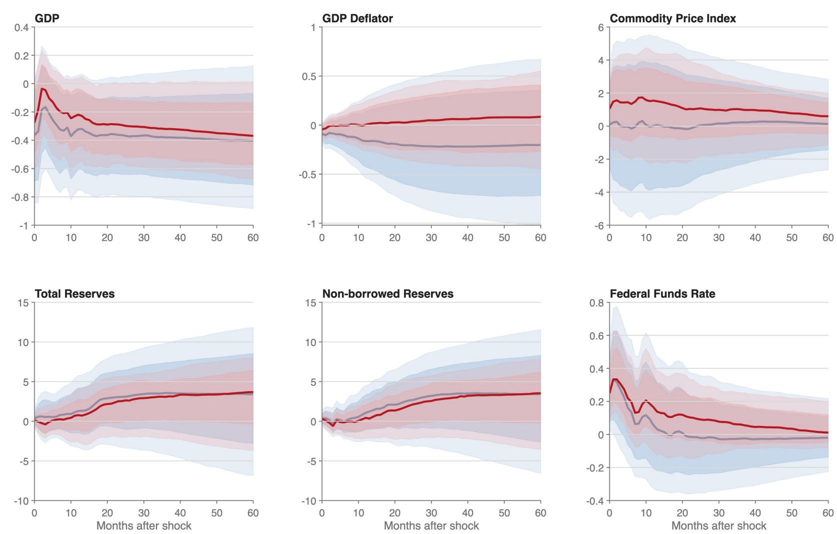

Figure 12: Impulse Response Functions with Narrative Restrictions (May 2013, "taper tantrum")

Note. Blue line and shaded bands correspond to the Arias et al. (2019) baseline. Red line and bands correspond to the narrative-restricted specification. Solid lines are posterior medians and shaded regions are 68% and 90% pointwise credible bands. Estimated on the extended 1965 to 2025 sample with the shadow rate.

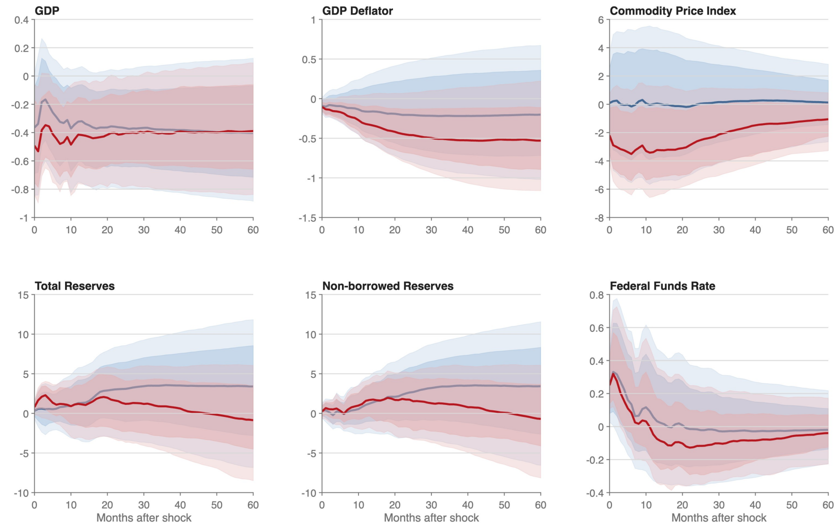

Figure 13: Impulse Response Functions with Narrative Restrictions (December 2015, liftoff)

Note. Blue line and shaded bands correspond to the Arias et al. (2019) baseline. Red line and bands correspond to the narrative-restricted specification. Solid lines are posterior medians and shaded regions are 68% and 90% pointwise credible bands. Estimated on the extended 1965 to 2025 sample with the shadow rate.

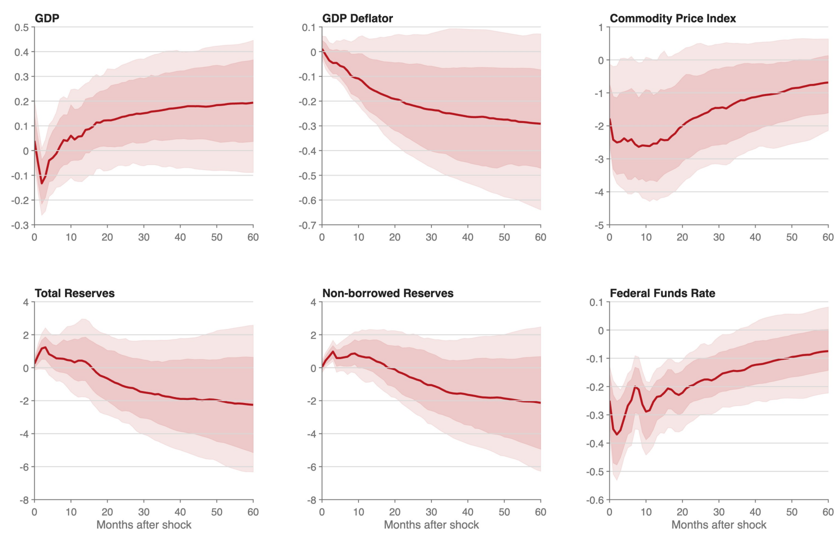

Figure 14: Impulse Response Functions with Narrative Restrictions (March 2020, COVID-19 emergency easing)

Note. Red line and shaded bands correspond to the narrative-restricted specification (posterior median with 68% and 90% pointwise credible bands). Responses are normalized to the actual policy easing. Estimated on the extended 1965 to 2025 sample with the shadow rate.

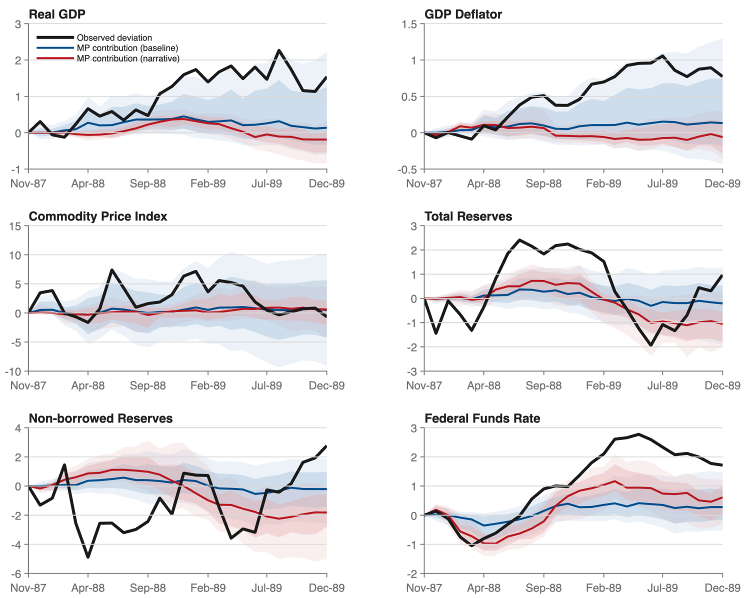

Figure 15: Historical Decomposition of the Monetary-Policy Shock around a Price-Puzzle Date (December 1988)

Note. The black line is the observed deviation of each variable from its deterministic baseline (equivalently, the sum of all structural-shock contributions). The blue line and shaded band give the contribution of the monetary-policy shock under the Arias et al. (2019) baseline identification. The red line and band give the contribution of the monetary-policy shock under the narrative-restricted identification. Shaded regions are 68% and 90% pointwise credible bands. The window is centered on December 1988.

Pattern under the narrative restriction	FOMC episodes
Price puzzle (tightening $\Rightarrow$ prices rise)	December 1968, August 1978, December 1988, February 1994, March 1997
Output puzzle (tightening $\Rightarrow$ output rises)	June 2003§
Easing signals pessimism (easing $\Rightarrow$ prices fall)	January 2001, March 2001‡, November 2002†
No puzzle (textbook response)	April 1974, October 1979, May 1981, November 1994, June 1999

Table 1: Summary of episodes examined for a Fed information component. † denotes a muted (near-zero) response, ‡ denotes weak identification (few draws satisfy the restrictions), and § denotes a fragile result that is sensitive to the prior specification and treated with caution. The heavily telegraphed June 2004 ("measured pace") and September 1998 (LTCM) episodes could not be identified at all, and May 2000 is only weakly identified.