Macroeconomic Surprises and the Demand for Information about Monetary Policy*

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This paper studies the *demand* for information about monetary policy, while the literature on central bank transparency and communication typically studies the *supply* of information by the central bank or the reception of the information provided. We use a new data set on the number of views of the Federal Reserve's website and show that exogenous news about the state of the economy as reflected in U.S. macroeconomic news surprises raise the demand for information about monetary policy. Surprises trigger an increase in the number of views of the policy-relevant sections of the website, but not the other sections. Hence, we show that market participants not only revise their policy expectations after a surprise, but also actively acquire new information.

JEL Codes: E52, E58, E32.

1. Introduction

Central banks communicate with financial markets and the general public. The past two decades have seen a remarkable shift towards a higher degree of transparency of central banks about their intentions, the decisionmaking process, and their internal forecasts (Blinder et al. 2008). More recently, central banks such as the Federal Reserve (Fed) or the European Central Bank (ECB) reached the zero lower bound on nominal short-term interest rates and had

*I am grateful to Boragan Aruoba, the editor of this journal, and two anonymous reviewers for very helpful comments on an earlier draft. I also thank David Finck, Lucas Hafemann, Matthias Neuenkirch, and seminar participants at Giessen and the Jahrestagung of the Verein für Socialpolitik for many helpful discussions and suggestions. Salah Hassanin provided excellent research assistance. Author contact: University of Giessen, Department of Economics, Licher Str. 66, D-35394 Gießen. E-mail: peter.tillmann@wirtschaft.uni-giessen.de.

to resort to unconventional tools to implement a further monetary easing. Among these new tools is forward guidance, i.e., enhanced communication with the public about monetary policy in the future. The adoption of forward guidance further increased the interest in central bank communication.

However, central bank communication is typically understood as the provision of information by the central bank to markets and the wider public. Hence, it is about the *supply* of information in order to reduce the information asymmetry between the central bank and the market. As of yet, the literature does not pay much attention to the *demand* for information. Papers study the response of asset prices to central bank announcements or the market reception of central bank communication (e.g., Gürkaynak, Sack, and Swanson 2005a, 2005b; Hansen and McMahon 2016; Cieslak and Schrimpf 2019; Hansen, McMahon, and Tong 2019; Neuhierl and Weber 2019; Swanson 2021). Much less is known about the demand side of central bank communication, that is, what type of information market participants strive for or at what time they want to update their information set about future monetary policy.

This paper studies the demand for information about the monetary policy of the Federal Reserve. We use a new data set that contains the daily number of views of the Federal Reserve Board's website between 2015 and 2019. The data, which have not yet been used to understand the interaction of market participants with the Fed, allow us to break down the demand for information into different aspects of central banking. This is possible because we know the views of each section of the Fed's website such as the "Monetary Policy" section, the "News & Events" section, or the "FOMC" subsection of the "Monetary Policy" section. We discuss the data set with all its limitations below.

As a matter of fact, the views of the Fed's website reflect a number of determinants. One of them is monetary policy itself. For example, views of the website explode around meetings of the Federal Open Market Committee (FOMC). Hence, website views are driven by the supply of and the demand for information. We believe that macroeconomic surprises are an exogenous source of variation of the demand for information and thus facilitate an identification of demand effects. It is not likely that the Fed adjusts its supply of information as a systematic response to particularly good or bad

macroeconomic news. Therefore, we concentrate on the response of website views to exogenous macroeconomic surprises. Financial markets pay a lot of attention to U.S. data releases such as new nonfarm payroll employment figures on "Payroll Fridays." The literature shows that financial markets immediately adjust their assessment of future monetary policy based on the surprise component of news announcements (e.g., Fleming and Remolona 1999; Balduzzi, Elton, and Green 2001; Andersen et al. 2003, 2007; Gürkaynak, Sack, and Swanson 2005b; Hördahl, Remolona, and Valente 2020).[1] These news surprises are exogenous with respect to the number of website views on the release day and allow us to study exogenous movements in website views triggered by the news release.

The only two papers using central bank website data thus far are Haldane, Macauley, and McMahon (2019) and Jung and Kühl (2021). Haldane, Macauley, and McMahon (2019) use data on website traffic associated with the release of the Inflation Report of the Bank of England. Their data show an increase in website visits following the introduction of a "layered" form of presentation that addresses experts and the wider public differently. Jung and Kühl (2021) employ website traffic on the ECB's website using Google Analytics to show how ECB communication affects the public's demand for information about monetary policy. A higher search volume has an affect on inflation expectations. They use monetary policy shocks in a two-hour window around Governing Council meetings to show that the demand for information increases in the size of the policy shock. The adoption of forward guidance by the ECB reduced the demand for information, while complex unconventional programs such as the Asset Purchase Program raised the demand for information. The crucial difference with respect to these two papers is that we study the adjustment of the demand for information following exogenous macroeconomic news surprises rather than news issues by the central bank itself. We want to know whether market participants do not just reassess the expected path of monetary

[1]Beechey and Wright (2009) show that real interest rates are responsive to macroeconomic surprises and explain a large part of the responses of nominal interest rates on announcement days. Gilbert et al. (2017) contrast the market response to news surprises with their intrinsic value, i.e., their ability to forecast future real economic activity.

policy in light of macroeconomic surprises, but also actively acquire information about the Fed.

Based on our new data set, we study the response of website views to exogenous macroeconomic surprises. To the extent news surprises prompt markets to recalibrate their expectations about monetary policy, market participants should also actively acquire new information, e.g., by searching the Fed's website for new information, re-reading the last FOMC statement, or checking the last set of FOMC projections. In order to identify whether the change in website views is indeed motivated by the demand for information about monetary policy rather than other businesses of the Fed, we separately study the views of each section of the Fed's website. A release after which the number of views of the "Monetary Policy" section increases but interest in the remaining sections remains unchanged is interpreted as a shift in attention towards monetary policy.

We regress the number of website views on macroeconomic news surprises and interpret the estimated effect as a reflection of the *demand* for information. It is unlikely that changes in the *supply* of information systematically coincide with macroeconomic news and thereby render the demand-side interpretation invalid. Thus, we believe that macroeconomic surprises are shocks to information demand. In order to rule out that our results are driven by the supply of information rather than the demand, i.e., to help identify the effect, we proceed as follows. First, we control for events that clearly change the supply of information. These includes meetings of the FOMC, releases of FOMC minutes, and speeches of the Chair or the Vice-Chair of the Federal Reserve. Second, we also distinguish between news during the blackout period before meetings of the FOMC and news in normal times. During the blackout period, members of the FOMC and senior staffers of the Federal Reserve adhere to a strict embargo and abstain from any provision of news and views about the state of the economy or the future course of monetary policy.[2]

[2]One could try to draw an analogy between this paper and the literature on the estimation of supply and demand curves utilizing exogenous variation in supply or demand in a two-stage least-squares (2SLS) regression model. This

We find that macroeconomic surprises prompt a higher demand for information about monetary policy. The views of the policy-relevant sections of the website increase significantly on days with macroeconomic news. The views of the other sections of the website, in contrast, remain insensitive to news. Hence, market participants not only adjust their expectations of future monetary policy—they also actively acquire new information. The results remain unchanged if we control for measures of policy uncertainty. We find that during the blackout period, when the supply of new information from the Fed is negligible, the sensitivity of website views to labor market surprises is even larger than during normal times.

We also study whether positive or negative news surprises have asymmetric effects on information demand as well as the role of forecast disagreement before the news release for the subsequent demand for Fed information. The marginal effect of the size of the surprise is smaller for negative surprises. Forecast disagreement weakens the demand for information about monetary policy. This finding is in line with Pericoli and Veronese (2016), who show that the market response to news falls in the dispersion of beliefs reflected in the Bloomberg survey.

Our results can be interpreted through the lens of recent attempts to introduce inattention or rational information acquisition into macroeconomics and finance (see Sims 2003; Veldkamp 2012). Under a limited capacity to process information, attention is a precious resource. In contrast to the rational expectations paradigm, inattentive market participants (Reis 2006) do not continuously update their information set, but remain inattentive. Hoopes, Reck, and Slemrod (2015) find a similar pattern for taxpayers' online search for information. If the tax deadline approaches, online searches for capital-gains-taxation surges. After the deadline, agents remain inattentive. The optimally chosen level of attention implies that market participants sporadically update their information set. Market participants' expected benefit of acquiring information is dependent on the magnitude of the expected errors that would be made in the absence of updating. A large (absolute) macroeconomic

analogy, however, is not perfect, as we observe the quantity of information, i.e., the number of viewers, but there is no price of information.

surprise may be a signal that information based on previous periods is now less accurate for the future, and so would increase this expected benefit of acquiring new information.[3]

2. The Data Set

To fix ideas, consider a stylized reaction function of the Fed. The short-term interest rate, R_t, is set as a function of the time-varying state of the economy, θ_t, $R_t = f_t(\theta_t)$. The reaction function $f_t(.)$ changes over time. Macroeconomic news surprises provide information about θ_t to market participants. However, in order to be able to gauge the consequences of the signals about θ_t for interest rates, agents have to acquire information on $f_t(.)$ from the Fed's website. The macroeconomic news alone without the information about the form of the reaction function remains a noisy signal about monetary policy.

We measure the quantity of information consumed about monetary policy by the number of views of the Federal Reserve Board's website (https://www.federalreserve.gov/) and its main sections. This is made possible by a new data set to be introduced below. Apart from Haldane, Macauley, and McMahon (2019) and Jung and Kühl (2021), website views have not yet been used to study the flow of information between central banks and the public.

We believe website visits offer several advantages over alternative measures of attention to the Fed such as newspaper articles or the search volume on Google.com: First, in contrast to newspaper reports, clicking on the Fed's website reflects an active research for information. The appearance of an article in a leading newspaper, in contrast, is not informative about how often the article is actually read. Second, using visits to the Fed's website allows to distinguish between sections of the website. Hence, we can narrow the acquisition of new information down to, say, information about monetary policy as opposed to information about the payments system. Third, in contrast to the Google Trends search volume, the number of website views is informative about the absolute level of the demand for information. Data from Google Trends, in contrast, is normalized

[3]I am grateful to an anonymous reviewer for clarifying discussions on this point.

Figure 1. The Website of the Board of Governors of the Federal Reserve System

Note: Navigation bar on the home page of the Board of Governors of the Federal Reserve System: https://www.federalreserve.gov/, accessed on February 7, 2020.

such that the observation with the highest search volume is assigned a value of 100. Below, we also estimate our main regression model for daily visits to Wikipedia pages about the Federal Reserve and for the daily search volume of Fed-related terms on Google.

As a matter of fact, the Fed's website is just one out of many sources of information about monetary policy. In particular, financial professionals use news-wire services of data providers such as Bloomberg to search for information. However, even for professional market participants, the Fed's website remains an important source of information. Hayo and Neuenkirch (2015) conduct a survey among 195 market participants showing that respondents rely on self-monitoring their home central bank, while they retrieve information through media reports regarding foreign central banks' actions.

Figure 1 shows a screenshot of the Fed's website as of February 2020. We use the number of views of the home page as well as all the main sections of the site, that is, "About the Fed," "News & Events," "Monetary Policy," "Supervision & Regulation," "Payment Systems," "Economic Research," "Data," and "Consumers & Communities." While the "Monetary Policy" section is clearly related to monetary policy, the other segments are not. This distinction allows us to identify whether an increase in the number of views is indeed

related to monetary policy. We also use data for the main subsection of the "Monetary Policy" section, i.e., the subsection "FOMC," that contains all the information about the Federal Open Market Committee including the meeting calender, minutes, transcripts, and projections. Figure 1 shows the navigation bar with the content of the "Monetary Policy" section unfolded in order to see the content of the "FOMC" subsection.[4]

We filed a Freedom of Information Act request to the Board of Governors of the Federal Reserve System and obtained data on the daily number of views of the aforementioned sections of the Fed's website for the time period October 2, 2015 to October 8, 2019.[5] The sample period mostly covers the period after the Fed returned to conventional monetary policy in December 2015. In October and November 2015, markets were already anticipating the "lift-off" from the zero lower bound in December 2015.

We obtained the number of views only. We could not obtain the number of distinctive users or the clicks per user. As we cannot distinguish between different types of viewers of the Fed website, we refer to the viewers as "market participants," knowing that this characterization is not free from assumptions. Since the Fed does not use persistent cookies or single-session cookies to track views, the number of unique views would be inaccurate.[6]

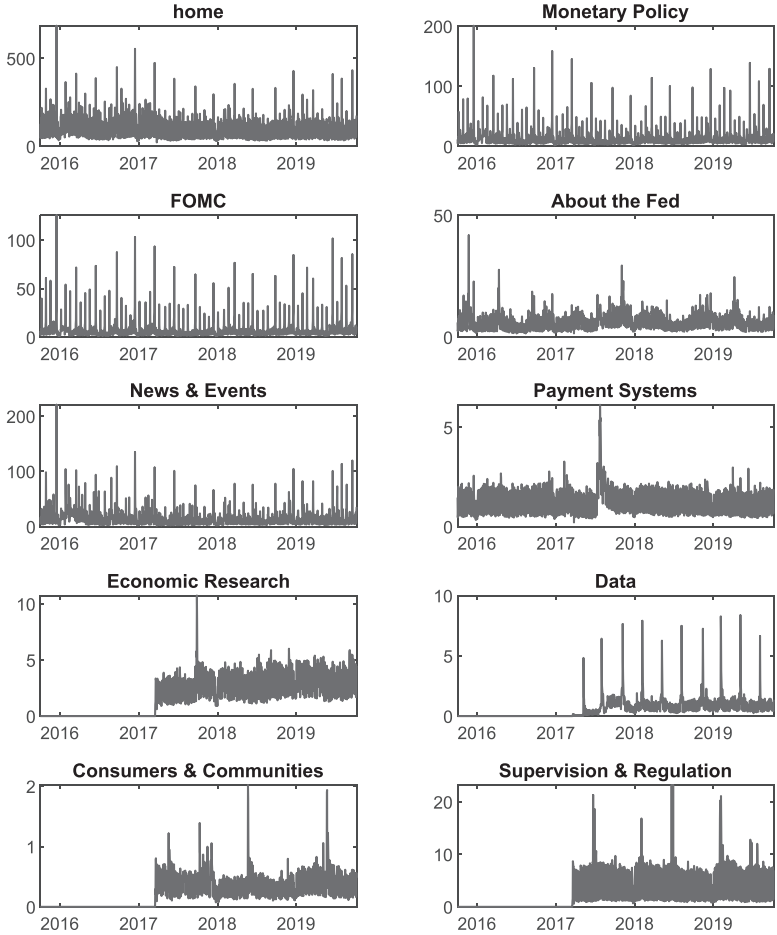
Figure 2 shows the daily number of views of each section of the Fed's website over the sample period. We see that the number of views as well as the volatility of views differ strongly across sections of the website. For the "Consumers & Communities" section, the number of views is the smallest and least volatile. The views of the "FOMC" and "Monetary Policy" sections, in contrast, are very volatile, with the number of clicks exploding on FOMC meeting

[4]The appendix uses snapshots of the Fed website from https://archive.org/web/ to document that the basic structure of the website did not change much over the sample period. The appendix also documents the provision of information on the website during the blackout period before meetings of the FOMC.

[5]For the "Economic Research," "Data," "Consumers & Communities," and the "Supervision & Regulation" subsections, the data start in 2017 due to a reorganization of these website sections.

[6]The Fed's website policies are explained here: https://www.federalreserve.gov/website-linking-policies.htm.

Figure 2. Number of Daily Views of the Federal Reserve Website



Note: The graphs show the number of daily views (in thousands) of each section of the Federal Reserve Board's website. The sample period covers October 2, 2015 to October 8, 2019.

days. On selected days, the number of views is 200 times higher than the average number of views of the "Consumers & Communities" section. The remarkable spikes in the traffic in the "Data" section occur on the days the Fed releases the Senior Loan Officer Opinion Survey on bank lending standards.

To account for the vast differences in average website views, we will base the empirical analysis below on the number of views in standard deviations from its section-specific mean. The regression model will also contain a number of dummy variables, i.e., for FOMC meetings, publication dates of FOMC minutes, and day-of-the-week dummies, which account for the strong daily patterns in the data.[7]

Importantly, the number of views of the policy-relevant sections fluctuates even in the inter-meeting period. We will study macroeconomic news announcements as one exogenous source of these fluctuations.

To understand the data series, we study the distribution of views of each website section and the correlation of views across website sections. Figure 3 shows histograms of views for each section. The histograms also document the skewness and the long tails of the distributions of views. Views of the policy-related sections of the website, i.e., the "Monetary Policy" section and the "FOMC" subsection, jump on days of important monetary policy decisions. This should not be a problem for our daily event study, as the days of macroeconomic news announcements do not coincide with FOMC meeting days.

Figure 4 shows the correlation of views across website sections as a heatmap. Daily views of the monetary policy section are strongly positively correlated with views of the FOMC subsection. We refer to these two sections as the policy-relevant sections of the website. The correlation between the policy-relevant sections and the "About the Fed" and the "News & Events" section is also positive, but smaller. The correlation coefficients in the figure suggest that views of the policy-related sections are only loosely correlated with views of the remaining sections.

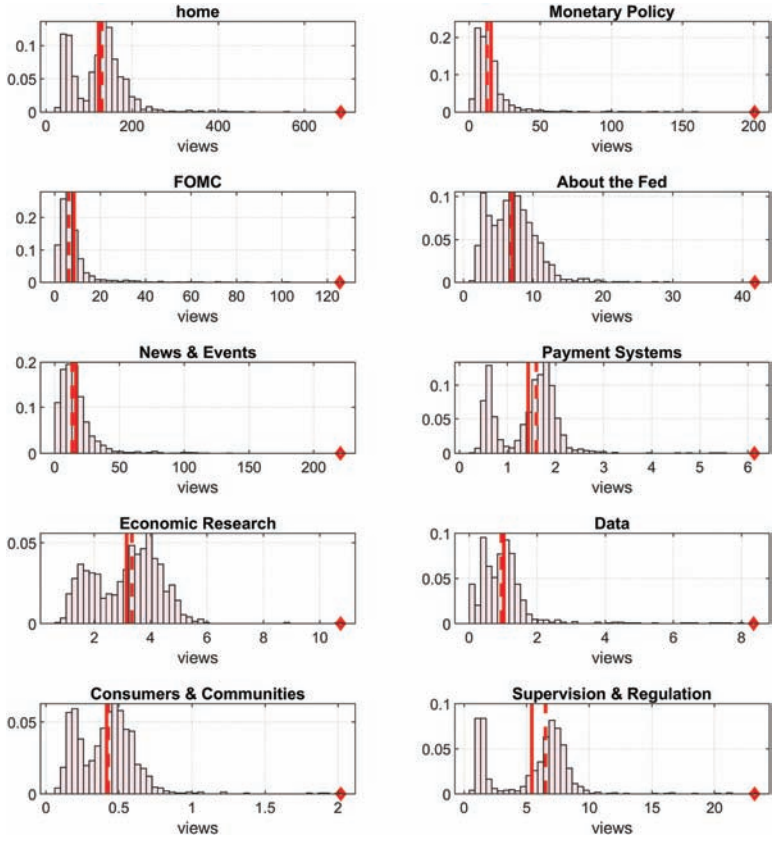
3. The Demand for Information After News Announcements

3.1 Macroeconomic News Surprises

The demand for information about the Federal Reserve and the number of clicks on the Federal Reserve's website are endogenous

[7]Similar daily patterns are also found in Jung and Kühl (2021) for the number of views of the ECB website.

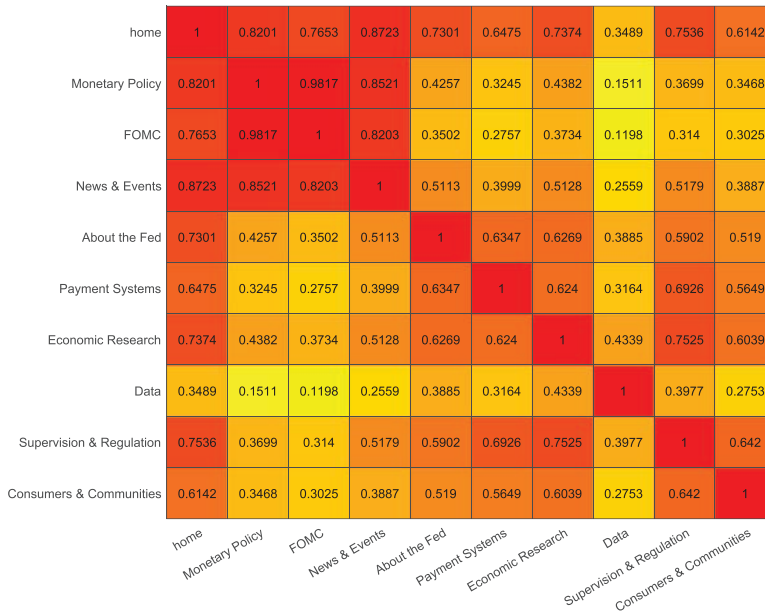
Figure 3. Distribution of Daily Views of Federal Reserve Website



Note: The graphs show histograms of the number of daily views (in thousands) of each section of the Federal Reserve Board's website. The solid (dashed) vertical line is the mean (median). The diamond marks the maximum number of views. The sample period covers October 2, 2015 to October 8, 2019.

variables. Hence, throughout the paper, we study only those changes in the demand for information about monetary policy which are triggered by exogenous news surprises about the U.S. economy. We focus on scheduled monthly releases of new macroeconomic figures, i.e., about the labor market or capacity utilization, which should prompt an adjustment of expectations about monetary policy. These news

Figure 4. Correlation of Views of Federal Reserve Website



Note: The graph shows the correlation of the daily number of views of different sections of the Federal Reserve's website. The darker the color, the higher is the correlation. The sample period covers March 20, 2017 to October 8, 2019, for which we have data on all website sections.

releases are the main source of public information about changes in the state of the U.S. business cycle.

Table 1 lists the indicators and their release schedule. Certainly, some of those indicators are more important than others. For example, news about non-farm payroll employment is by far the most closely watched monthly real economic indicator for the U.S. economy. The press devotes regular columns to the upcoming labor market report such as Bloomberg's "What to Expect From Tomorrow's Jobs Data" column or the *Wall Street Journal's* "5 Things to Watch in the [month] Jobs Report."

Many of our results will be based on non-farm payroll releases. However, we include a broad set of indicators in order to highlight the importance of non-farm payroll data. Besides non-farm payroll numbers, our indicators include the ISM (Institute for Supply

Table 1. Releases of U.S. Macroeconomic Indicators

Indicator	Release Schedule
(1) Non-farm Payroll Employment	On First Friday of the Month by the Bureau of Labor Statistics
(2) ISM Manufacturing Survey	On First Business Day of the Month by the Institute for Supply Management
(3) Industrial Production	Around the 15th of Each Month by the Federal Reserve Board Together with (4)
(4) Capacity Utilization	Around the 15th of Each Month by the Federal Reserve Board Together with (3)
(5) Personal Income	Last Business Day of the Month by the Bureau of Economic Analysis
(6) Retail Sales	Around the 15th of Each Month by the U.S. Census Bureau

Note: The table lists the set of macroeconomic indicators, whose surprise components we focus on in the empirical analysis. We maintain the releases of industrial production and capacity utilization in our data set, although these indicators are provided by the Fed itself, in order to investigate whether their release triggers interest in the policy-related sections of the Fed's website.

Management) manufacturing survey, industrial production, capacity utilization, retails sales, and personal income. In light of the short sample period, we do not use the first releases of gross domestic product (GDP) and other macroeconomic aggregates, which are available on a quarterly frequency only.

While most indicators are published by U.S. statistical agencies, some (industrial production and capacity utilization) are released by the Federal Reserve Board itself. We keep these indicators in the sample in order to assess whether the Fed's own data releases raise interest in the monetary policy sections of its website.

Financial markets should be driven by the unexpected part of the data release only. To isolate the surprise component of the news, we follow the large literature and contrast the release of indicator j at day t, I_t^j, where j is one of the indicators listed in

Table 1, with the median consensus forecast, F_t^j. Hence, the surprise component is

$$Surp_t^j = \frac{I_t^j - F_t^j}{\sigma_{F,j}}. \tag{1}$$

The difference between realization and consensus expectation should be the macroeconomic surprise. It is normalized by the standard deviation of the time series of forecasts. The constant used to normalize the difference should have no effect on the results. A positive $Surp_t^j$ reflects an unexpected improvement in macroeconomic conditions, while $Surp_t^j < 0$ is a surprise deterioration of economic activity.

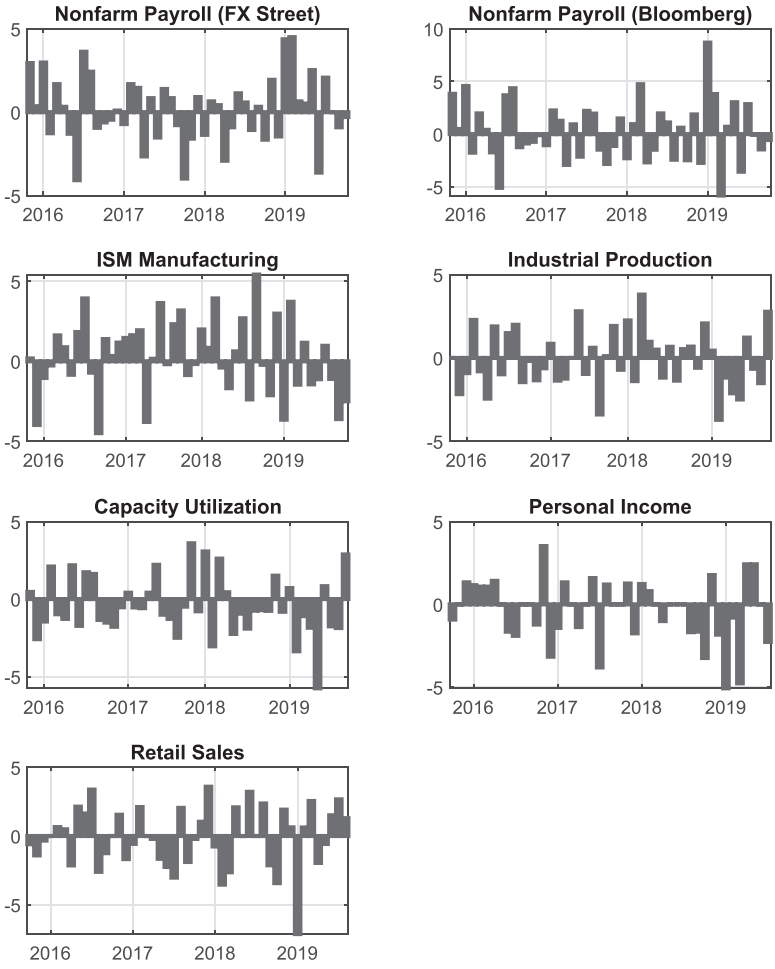
For each of the macroeconomic indicators, we use the surprise component available on Bloomberg, which is based on the Bloomberg survey of market participants. Since the non-farm payroll release is much more important than the other indicators, we use surprises based on the survey from FXStreet.com as an alternative data source. Below, we will study the difference between both surprise components for the non-farm payroll releases in detail and elaborate on the role of forecast dispersion for the response to news.

The survey forecasts, both the Bloomberg survey and the one conducted by FXStreet.com, collect forecasts from market participants in the days before the release. For each indicator, we have 48 news surprises throughout our sample period. The surprise components on announcement dates m are shown in Figure 5. In the online appendix (available at https://sites.google.com/view/petertillmann/startseite), we show the market response in a narrow window of 30 minutes after the release of non-farm payroll news, the most important macroeconomic indicator. The evidence clearly underlines the notion that markets adjust the expected interest path in light of labor market news.

3.2 The Regression Model

We now turn to one of our two main research questions: to what extent do exogenous news surprises change the demand for information about monetary policy? To address this question, we regress the number of website views, which we introduced before, on the macroeconomic surprises. On macroeconomic announcement days,

Figure 5. Macroeconomic News Surprises



Note: The graphs show the surprises elements of different macroeconomic news announcements on announcement days. The first surprise series is taken from FX Street; the remaining surprise series are drawn from Bloomberg. The surprises are defined as the difference between the news release and the median of the consensus forecast divided by the standard deviation of forecasts. The sample period covers October 2, 2015 to October 8, 2019.

a change in the attention of market participants with respect to monetary policy should be reflected in an increase in the number of views of policy-related sections of the website.

Let V_t^i be the logarithmic number (multiplied by 100) of views of the Fed's website section i on day t. We run a model separately for each website segment i, in which we regress the website views on the absolute news surprises of type j and a set of control variables, e.g.,

$$V_t^i = \beta_0 + \beta_1 |Surp_t^j| + \beta_2 T_t^{after} + \beta_3 V_{t-1}^i + \Gamma' X_t + \varepsilon_t, \qquad (2)$$

where β_0 is a constant and X_t is a vector of control variables to be explained below. In the baseline model, we include the three most important news surprise jointly. Nevertheless, we also report results for possible combinations of news surprises. We use the absolute news surprise, as positive and negative surprises would equally well trigger interest in monetary policy.

The variable T_t^{after} is the number of days that have elapsed since the last FOMC statement. Ehrmann and Sondermann (2012) show that the relative information content of news increases if the distance to important news of the past becomes larger. Therefore, we expect that the number of views increases the more time has elapsed since the previous policy meeting.[8]

We are primarily interested in the coefficient estimate for β_1. A positive coefficient would imply that a macroeconomic surprise raises the interest in Section i of the Fed's website. The vector X_t contains control variables that should reflect other determinants of market participants' interest in the Fed website. We include a dummy that is one on FOMC meeting days and zero otherwise. This variable captures the strong increase in the public's interest on meeting days. Since the interest in the Fed increases before the meeting and remains high even on the days after the announcement, we also include two leads and lags of the meeting dummy. The publication of the FOMC meeting's minutes three weeks after the FOMC statement should also raise the interest in the Fed. Hence, we construct a dummy that is one on those days that coincide with the publication of FOMC minutes and zero otherwise. These control variables, e.g.,

[8]A non-linear function of the number of days after the FOMC announcement is also possible. For example, interest could remain high after the announcement, decrease thereafter, and increase as the new FOMC meeting approaches. We experimented with different specifications, which, however, leave the main findings unchanged.

the dummies for FOMC meetings and the publication dates of minutes, also control for the supply of information in the policy-relevant sections of the website. Apart from small editorial changes, the Fed does not regularly supply other pieces of information in the "Monetary Policy" section. Hence, after controlling for these two events, we can be confident that fluctuations in website views are driven by the demand rather than supply of information.

Finally, we include a set of day-of-the-week dummies to control for the daily patterns of website views. This should capture the smaller number of views on Fridays and the weekend relative to other days of the week, weekly releases of data, and other factors.

4. Empirical Evidence

We discuss most of the results for a model that includes three separate series of the three most important news surprises, i.e., non-farm payroll news, news about the ISM manufacturing survey, and news about industrial production. We also report alternative specifications for non-farm payroll surprises, which are the most important news release. The appendix provides additional results.

4.1 Baseline Results

Table 2 presents the coefficient estimates for all sections of the website. As our baseline result, we find that labor market surprises raise the number of views of the policy-relevant sections of the Fed's website, i.e., the "Monetary Policy" section and the "FOMC" subsection. The effect is positive and highly significant. Put differently, either a negative or a positive news surprise raises the demand for information about monetary policy. A non-farm payroll surprise 1 percentage point in size raises the number of views of the "FOMC" section by more than 5 percent. News about industrial production also enter with highly significant coefficients, while news surprises about the ISM are significant for the "FOMC" subsection only.

Views of other sections of the website, which do not primarily contain information about monetary policy, remain unaffected by

Table 2. Response of Website Views to the Most Important News Surprises

Website Section	Absolute Surprise			Days after FOMC	Lagged Views, Dummies for Meeting, Minutes, and Day of the Week	# Obs.	R^2
	Non-farm	ISM	IP				
Home	2.026 (0.643***)	2.608 (1.106**)	4.525 (1.186***)	0.065 (0.032**)	Yes	1,464	0.91
Monetary Policy	4.204 (1.001***)	1.882 (1.353)	4.367 (1.772**)	0.236 (0.038***)	Yes	1,464	0.91
FOMC	5.136 (1.158***)	2.413 (1.451*)	5.340 (1.813***)	0.344 (0.039***)	Yes	1,464	0.03
About the Fed	2.180 (1.158*)	0.012 (1.379)	0.501 (1.236)	0.020 (0.043)	Yes	1,464	0.86
News & Events	3.017 (1.504**)	1.413 (1.825)	2.181 (2.261)	0.014 (0.065)	Yes	1,464	0.83
Payment Systems	1.079 (0.910)	2.026 (1.138*)	0.210 (0.082)	0.084 (0.039**)	Yes	1,464	0.87
Research Economic	1.197 (0.766)	2.056 (1.116*)	–0.514 (1.105)	0.030 (0.041)	Yes	933	0.90
Supervision & Regulation	1.806 (1.011*)	4.202 (1.909**)	0.213 (0.957)	0.060 (0.057)	Yes	932	0.92
Consumers & Communities	–0.088 (1.508)	1.904 (1.982)	–2.100 (1.246*)	0.037 (0.061)	Yes	932	0.79
Data	0.502 (0.950)	1.285 (1.716)	–2.120 (1.196*)	–0.028 (0.109)	Yes	932	0.89

Note: The dependent variable is the daily (log, multiplied by 100) number of views of the specific section of the Federal Reserve's website. The series of macroeconomic surprises are drawn from Bloomberg. "Days after FOMC" counts the number of days elapsed since the last FOMC statement. The regression also includes a constant. The sample period covers October 2, 2015 to October 8, 2019. Robust standard errors are in parentheses. A significance level of 1 percent, 5 percent, and 10 percent is denoted by ***, **, and *, respectively.

the surprise or even respond negatively. The only exception is the front page, for which the three alternative news surprises also raise the number of views. This is not surprising, as the front page serves as a starting point for navigating the Fed website.

We also find that the number of views of the policy-relevant sections increases in the number of days elapsed since the last FOMC statement. As the next FOMC meeting approaches, market participants' demand for information increases. With each day elapsing after the last meeting, the number of views of the "FOMC" site increases by 0.3 percent. All dummy variables enter the equation with highly significant coefficients. To save space, we do not report these coefficients here.

Macroeconomic surprises drive the demand for policy-relevant information. In the subsequent analysis, we therefore concentrate on the "Monetary Policy" and "FOMC" sections of the website and ignore the other sections in order to save space. In the appendix, we assess the properties of the most important news series and run a placebo experiment: we shift the non-farm payroll surprises one day or one week, respectively, into the past or the future and estimate the model again. We find a significant increase in views only for the original payroll surprises, not the placebo dates. This corroborates the notion that the non-farm payroll news systematically contain information that triggers the search for information by market participants.

4.2 The Blackout Period

As discussed in the introduction, website views reflect changes in both the supply of and the demand for information. However, macroeconomic news surprises should be a source of exogenous variation in the demand for information while leaving the supply unchanged. In this subsection, we take an additional identifying step and study the blackout period only. We can rule out changes to the supply side of information during the blackout period in advance of the FOMC meeting. Members of the FOMC and senior staff members of the Federal Reserve Board adhere to a strict blackout period starting on the Saturday 10 days before each FOMC meeting. During this period, they refrain from any public comment on monetary

policy.[9] Hence, we can be certain that there is no change in the supply of monetary policy information during this period.[10] In the appendix to this paper, we show archived screen shots of the Fed website during the blackout period before the September 2018 FOMC meeting in order to document that there is indeed no important new information available on the website before the meeting.

We split the news surprises between surprises during and outside the blackout period. This provides us with a clear identification of the demand-driven increase in website traffic. An important caveat, however, remains: the news surprises are not equally distributed between blackout and non-blackout periods. Of the 48 non-farm payroll releases, 3 fall into the blackout period and 45 occurred before the blackout. For the ISM (industrial production) news, 10 (12) fall into the blackout period and 37 (36) fall in the non-blackout period.

Table 3 shows the results. The surprise components of labor market news and the ISM survey remain a highly significant driver of website views during normal times. During the blackout period, i.e., in the absence of changes to the supply of information, non-farm payroll news have an even larger impact on website views. The coefficient doubles during the blackout period for both the "Monetary Policy" and the "FOMC" section. A 1 percentage point surprise about the state of the labor market raises the number of views of the "Monetary Policy" section by 11 percent. During the blackout, labor market news also significantly affect views of the "News & Events" section. News about industrial production also become more important during the blackout. Note that this effect does not hinge on the fact that the FOMC meeting is approaching, as we still include the number of days elapsed after the previous meeting to account for that.

The fact that the effect of news on website visits becomes stronger is in line with the view that prices are more responsive to

[9]The rules on external communications for Federal Reserve staff during the blackout period are documented here: https://www.federalreserve.gov/monetarypolicy/files/FOMC_ExtCommunicationStaff.pdf.

[10]Ehrmann and Fratzscher (2009) and van Dijk, Lumsdaine, and van der Wel (2016) study the behavior of financial markets in the run-up to FOMC meetings and show that prices respond more strongly to central bank communication and macroeconomic announcements, respectively, during the Fed's blackout period.

Table 3. Response of Website Views to News Surprises: The Role of the Blackout Period

	Website Section	
	Monetary Policy	**FOMC**
Absolute Surprise Outside Blackout		
Non-Farm	4.050	4.955
	(1.015***)	(1.166***)
ISM	3.559	3.969
	(1.287***)	(1.446***)
IP	1.806	3.203
	(2.286)	(2.448)
Absolute Surprise During Blackout		
Non-Farm	11.234	13.906
	(3.942***)	(3.974***)
ISM	–8.832	–7.525
	(2.979***)	(2.202***)
IP	8.570	8.861
	(2.549***)	(2.145***)
Days after FOMC	Yes	Yes
Dummies	Yes	Yes
Lagged Views	Yes	Yes
# Obs.	1,464	1,464
R^2	0.91	0.93

Note: The dependent variable is the daily (log, multiplied by 100) number of views of the specific section of the Federal Reserve's website. The series of macroeconomic surprises are drawn from Bloomberg. We separate surprises during the blackout period before the FOMC meeting from surprises during normal times. The regression also includes a constant and all the control variables explained in the text. The sample period covers October 2, 2015 to October 8, 2019. Robust standard errors are in parentheses. A significance level of 1 percent, 5 percent, and 10 percent is denoted by ***, **, and *, respectively.

news during the blackout (Ehrmann and Fratzscher 2009).[11] If markets are more volatile, the incentives of market participants to pay attention are higher. Hence, the stronger effect of news during the

[11]I am grateful to an anonymous reviewer for this interpretation.

blackout period is consistent with the interpretation of the results in terms of the demand for information rather than the supply of information.

While these results corroborate our baseline finding, the effect of news about the ISM survey remains puzzling. During the blackout, views respond negatively to the surprise component of the survey.

4.3 Alternative Triggers of Attention

The regression model discussed before studies the response of website views to absolute news surprises. We now look at the responses to announcement dummies. We replace $|Surp_t^j|$ in the regression model by a dummy that is one on the announcement day and zero otherwise. Thus, the results are independent from the magnitude of the surprise. The first column in Table 4 reports the results. We find that views of the "Monetary Policy" section and the "FOMC" subsection strongly increase on days with non-farm payroll announcements and releases of industrial production.

Besides macroeconomic news surprises, the number of website views could also respond to other factors that trigger an increase in attention to the Fed. In the following, we study the impact of speeches of senior Fed policymakers, uncertainty about economic policy or monetary policy, respectively, tweets from President Trump, and dissent on the FOMC.

We construct a dummy variable that takes the value of one on a day when the Fed Chair or Vice-Chair gives a speech and is zero otherwise. This variable is included as an additional control variable in our regression equation. Table 4 reports the estimated coefficients. The key result remains unchanged: labor market news prompt an increase in the demand for information about monetary policy. Views of the "Monetary Policy" and "FOMC" sections strongly increase. Furthermore, views remain weakly sensitive to news about the ISM survey and industrial production. Speeches of the Chair and the Vice-Chair strongly raise the attention in the "Monetary Policy" and "FOMC" sections of the website. Hence, the number of website views is very responsive to changes in the supply of policy-relevant information.[12]

[12]Likewise, the Chair's testimony to Congress should raise the public's interest in the Fed and, as a result, the clicks on its website. Hence, we construct a

Fluctuations in uncertainty are another potential explanation for changes in website views. An increase in uncertainty, both about economic policy in general and monetary policy in particular, could trigger an increase in the demand for information. To rule out that our results are driven by uncertainty, we augment the regression equation with the level of two alternative uncertainty indices.[13] The first index is the Baker, Bloom, and Davis (2016) newspaper-based Economic Policy Uncertainty (EPU) index. While the EPU index reflects a general notion of policy uncertainty, our second index of monetary policy uncertainty (MPU) summarizes the uncertainty about the path of short-term interest rates over the coming 180 days. The uncertainty measure is calculated from Eurodollar futures following Swanson (2006). The results are also shown in Table 4. Monetary policy uncertainty drives views of the policy-related website sections, while general economic policy uncertainty remains insignificant for all parts of the website. Most importantly, the surprise component of non-farm payroll releases and industrial production remain significant drivers of the demand for information about Fed policy.

It could be argued that the attention to the Fed triggered by news releases is due to President (or then-candidate) Trump's public pressure on the Fed. The President mostly used his Twitter account to comment on the Fed's reluctance to ease monetary conditions and to attack Chair Powell personally.[14] A tweet from the President on announcement days rather than the announcement itself could be the true driver of attention to the Fed. Therefore, we search the Trump Twitter Archive for tweets on the state of the labor market or the Federal Reserve.[15] Specifically, we collect a variable that counts the daily number of tweets containing the word "Fed" and another variable with the daily number of tweets containing the word "jobs"

dummy that is one for days that coincide with the Chair's testimony and zero otherwise. This dummy, however, remains always insignificant and is excluded from the regression.

[13]We use uncertainty in $t-1$ to avoid that reverse causality, i.e., a change in uncertainty due to new information about monetary policy in t.

[14]See Tillmann (2020) for evidence on the effect of Trump's pressure on interest rate expectations incorporated into long-term yields.

[15]See http://www.thetrumparchive.com/.

Table 4. Response of Website Views to News Surprises: Alternative Drivers of Information Demand

	Website Section											
	Monetary Policy						FOMC					
Announcement Dummies												
Non-farm	14.830 (3.220***)						17.636 (3.487***)					
ISM	2.895 (3.155)						4.913 (3.117)					
IP	6.864 (3.208**)						8.584 (3.184***)					
Absolute Surprise												
Non-farm		4.107 (1.050***)	4.258 (1.004***)	4.173 (0.956***)	4.203 (1.020***)	4.208 (1.001***)		5.043 (1.200***)	5.168 (1.147***)	5.074 (1.090***)	5.227 (1.179***)	5.287 (1.152***)
ISM		1.861 (1.367)	2.019 (1.351)	1.804 (1.310)	1.795 (1.334)	1.857 (1.351)		2.400 (1.457*)	2.511 (1.449*)	2.231 (1.369)	2.253 (1.411)	2.367 (1.448)
IP		4.544 (1.758***)	4.368 (1.786**)	4.399 (1.759**)	4.448 (1.768**)	4.431 (1.741**)		5.503 (1.806***)	5.344 (1.820***)	5.389 (1.776***)	5.499 (1.815***)	5.443 (1.790***)
Fed Speeches		7.126 (2.179***)						6.648 (2.187***)				
EPU			−0.028 (0.014**)						−0.017 (0.015)			
MPU				13.050 (3.656***)						23.659 (3.987***)		

(*continued*)

Table 4. (Continued)

	Website Section											
	Monetary Policy						FOMC					
Trump #Tweets												
On Jobs					0.420						0.169	
					(0.902)						(0.979)	
On Fed					3.145						6.059	
					(0.916***)						(1.078***)	
FOMC Dissent						1.279						2.075
						(0.579***)						(0.626***)
Days after FOMC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lagged Views	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	1,464	1,464	1,459	1,459	1,464	1,464	1,464	1,464	1,459	1,459	1,464	1,464
R^2	0.91	0.91	0.91	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.93	0.93

Note: The dependent variable is the daily (log, multiplied by 100) number of views of the specific section of the Federal Reserve's website. The series of macroeconomic surprises are drawn from Bloomberg. We include the following variables: (i) the daily number of speeches given by the Fed Chair and the Vice-Chair, (ii) the Economic Policy Uncertainty (EPU) index of Baker, Bloom, and Davis (2016), (iii) an indicator of monetary policy uncertainty (MPU) constructed from Eurodollar futures following Swanson (2006), (iv) the number of tweets sent by President Trump that include reference to the labor market and the Fed, respectively, and (v) a measure of dissent in the last FOMC meeting. "Days after FOMC" counts the number of days elapsed since the last FOMC statement. The regression also includes a constant. The sample period covers October 2, 2015 to October 8, 2019. Robust standard errors are in parentheses. A significance level of 1 percent, 5 percent, and 10 percent is denoted by ***, **, and *, respectively.

or "labor market." We then run a specification of the regression equation in which we include these two additional variables.

Table 4 presents the results of the extended model. Tweets on the Fed are a significant driver of website views for the "FOMC" subsection only. Tweets on the labor market itself do not enter the regressions with a significant coefficient. Importantly, the main results remain unchanged: macroeconomic news surprises still shift attention to the policy section of the website, but not the remaining sections.

Decisions in the FOMC are frequently accompanied by dissenting votes. The literature shows that dissent contains information that is relevant for financial markets (Madeira and Madeira 2019). A possible source of dissent could be disagreement among voting FOMC members in the assessment of the macroeconomic situation. Thus, dissent could raise the market's interest in the upcoming release of macroeconomic indicators. Macroeconomic surprises, in turn, could motivate market participants to search online for the number and the name of dissenters in the previous meeting. Therefore, we aim at controlling for dissenting votes in the previous FOMC meeting. We draw on the data provided by Thornton and Wheelock (2014) and include the number of dissenting votes in our benchmark regression equation. All baseline findings remain unchanged. Dissent in the previous meeting strongly increases attention on release days.

4.4 The Response to Individual News Surprises

Thus far we have shown results for a selection of news surprises only. We now report the results for two alternative models in which we include all news surprises jointly. This allows us to compare the relevance of different surprises for market participants' information demand.

Table 5 shows the coefficients for two alternative specifications In the first, we include the Bloomberg non-farm payroll surprise, the ISM survey, capacity utilization, personal income, and sales surprises, while the second specification includes the FX Street non-farm payroll surprise, the ISM survey, industrial production, personal income, and sales surprises. Note that news about capacity utilization and industrial production are released on the same day.

Table 5. Response of Website Views to Individual News Surprises

	Website Section							
	Monetary Policy				**FOMC**			
Absolute Surprise								
Non-farm	4.083		0.944		4.984		1.716	
(Bloomberg)	(1.001***)		(1.043)		(1.154***)		(1.344)	
Non-farm		5.344		0.757		6.376		1.378
(FX Street)		(1.685***)		(1.776)		(1.879***)		(2.437)
ISM	1.956	1.841			2.566	2.431		
	(1.346)	(1.378)			(1.439*)	(1.482)		
IP		4.417		–2.120		5.163		–0.329
		(1.758**)		(2.505)		(1.842***)		(2.312)
Capacity	3.891		–3.724		4.645		–1.629	
Utilization	(2.010*)		(3.055)		(1.946**)		(2.696)	
Personal Income	–1.461	–1.462	–1.825	–1.834	–2.608	–2.625	–2.816	–2.821
	(1.411)	(1.410)	(1.221)	(1.219)	(1.285**)	(1.283**)	(1.137**)	(1.136**)
Sales	–0.659	–0.664	–0.000	0.120	0.077	0.079	0.928	1.062
	(1.158)	(1.169)	(1.509)	(1.527)	(0.908)	(0.922)	(1.305)	(1.302)

(*continued*)

Table 5. (Continued)

	Website Section							
	Monetary Policy				**FOMC**			
Absolute Release								
Non-farm			2.487	2.636			2.579	2.881
			(0.781***)	(0.748***)			(0.900***)	(0.922***)
IP				2.501				2.108
				(0.914)				(0.801***)
Capacity			3.131				2.573	
Utilization			(1.061***)				(0.931***)	
Personal Income			0.483	0.480			0.419	0.416
			(0.566)	(0.566)			(0.603)	(0.603)
Sales			–0.470	–0.456			–0.554	–0.555
			(0.381)	(0.400)			(0.429)	(0.435)
Days after FOMC	0.237	0.236	0.229	0.231	0.345	0.344	0.340	0.341
	(0.038***)	(0.038***)	(0.038***)	(0.038***)	(0.039***)	(0.039***)	(0.039***)	(0.039***)
Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lagged Views	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	1,464	1,464	1,464	1,464	1,464	1,464	1,464	1,464
R^2	0.91	0.91	0.91	0.91	0.93	0.93	0.93	0.93

Note: The dependent variable is the daily (log, multiplied by 100) number of views of the specific section of the Federal Reserve's website. The series of macroeconomic surprises are drawn from Bloomberg and FX Street, respectively. The regression also includes a constant. The sample period covers October 2, 2015 to October 8, 2019. Robust standard errors are in parentheses. A significance level of 1 percent, 5 percent, and 10 percent is denoted by ***, **, and *, respectively.

News surprises on non-farm employment (for both the Bloomberg and the FX Street survey), industrial production, and capacity utilization shift attention to the monetary-policy-related sites of the Federal Reserve. This underlines the notion that macro surprises trigger an increase in the demand for information about monetary policy.

Table 5 also reports the estimated coefficients from a model that includes the absolute news release besides the absolute news surprise. While the former is, for example, the absolute growth rate of non-farm employment released, the latter is the unexpected component of employment growth. We find that the news surprises no longer enter significantly once the absolute releases are included.

The results suggest that market participants respond to the release, not the surprise component, when updating their information set. It seems that the factors that trigger an adjustment of market prices, i.e., news surprises, are not necessarily identical to the factors that prompt observers to revise their information. This remains an interesting issue for future research.

To summarize, this subsection shows that news surprises trigger market participants' demand for information about monetary policy. Fed observers actively start acquiring information about policy and do not just reassess their existing information set.

4.5 Alternative Indicators of Information Demand

The number of website views is an attractive indicator of the demand for information about the Federal Reserve. Nevertheless, we want to confirm the effect of macroeconomic surprises on information demand based on alternative indicators. The first alternative is the daily views of the Wikipedia entries on "FOMC" and "Federal funds rate." The access statistics can be obtained directly from the Wikipedia sites. The second indicator is the daily search volume on Google for "FOMC" or "Federal funds rate."

Table 6 shows that views of both Wikipedia sites respond significantly to news about the labor market. The public seems to collect information about the policymaking process when surprised by the performance of the labor market. News about industrial production raise interest in the "FOMC" Wikipedia page, while news about the

Table 6. Response of Alternative Attention Indicators to News Surprises

Indicator	Announcement Dummy			Days after FOMC	Dummies for Meeting, Minutes, and Day of the Week	# Obs.	R^2
	Non-farm	ISM	IP				
Wikipedia Views	6.823	–0.637	4.968	0.092	Yes	1,464	0.83
"FOMC"	(3.368**)	(2.527)	(2.836*)	(0.049*)			
Wikipedia Views	16.889	–2.334	2.691	0.094	Yes	1,464	0.89
"Fed Funds Rate"	(3.018***)	(2.562)	(2.914)	(0.033***)			
Google Searches	2.735	–11.225	–2.228	0.674	Yes	1,339	0.74
"FOMC"	(6.949)	(10.639)	(6.511)	(0.148***)			
Google Searches	1.126	–9.022	6.391	0.220	Yes	1,311	0.57
"Federal Funds Rate"	(8.442)	(7.132)	(8.371)	(0.121*)			

Note: The dependent variable is the daily (log, multiplied by 100) number of views of the Wikipedia entries or the search volume on Google. The regression includes a constant and all the variables and dummy variables introduced in the main text. "Days After FOMC" counts the number of days elapsed since the last FOMC statement. The sample period covers October 2, 2015 to October 8, 2019. Robust standard errors are in parentheses. A significance level of 1 percent, 5 percent, and 10 percent is denoted by ***, **, and *, respectively.

ISM survey enter with insignificant coefficients. Searches on Google, however, do not increase significantly after a news surprise.

4.6 The Asymmetric Response of Information Demand

In the specifications discussed before, we used the absolute news surprise, as positive and negative surprises should equally raise the demand for information about monetary policy. We now distinguish between positive and negative surprises in order to assess whether the effect is symmetric.

The announcement literature contains several examples of negative surprises, i.e., a surprising contraction of the economy, having a stronger effect on asset prices compared with a surprise expansion of the economy of identical absolute magnitude (Andersen et al. 2003, 2007; Hautsch and Hess 2007). Though the focus of the analysis is on the demand for information triggered by macro surprises, not the adjustment of market prices, we aim to find out whether the demand for policy-relevant information is also characterized by an asymmetry. Do negative news spark a higher demand for Fed information than positive news?

We construct a dummy variable that is one for negative surprises, i.e., $D_t^{neg} = 1$, and zero otherwise. The interaction of this dummy with the news surprise thus allows negative surprises to have an effect on website views that is different from positive surprises.

The modified regression reads as follows:

$$V_t^i = \beta_0 + \beta_1 |Surp_t^j| + \beta_2 T_t^{after} + \beta_3 V_{t-1}^i + \beta_4 D_t^{neg} + \beta_5 D_t^{neg} \times |Surp_t^j| + \Gamma' X_t + \varepsilon_t. \quad (3)$$

We are particularly interested in the coefficient β_5. The estimated coefficients are reported in Table 7. We restrict ourselves to non-farm payroll (Bloomberg) surprises. For the "Monetary Policy" section and the "FOMC" subsection, news surprises remain a highly significant determinant of website views. The demand for policy information, however, is asymmetric: the news surprise enters both regression equations with a positive sign. Hence, larger absolute surprises increase website views. The negativity dummy enters with a positive coefficient. Hence, negative news raise website views independent from the magnitude of the surprise. The interaction term with the

Table 7. Response of Website Views to Non-farm Payroll Surprises: Asymmetries and Dispersion

	Website Section			
	Monetary Policy		FOMC	
Absolute Surprise	6.515	5.243	7.211	5.809
	(1.554***)	(1.213***)	(1.543***)	(1.359***)
Dummy Negative		14.281		17.020
		(4.911***)		(5.534***)
Interaction Term		–7.425		–7.328
		(2.042***)		(2.619***)
Dispersion	–17.358		–15.809	
	(5.931***)		(6.874**)	
Days after FOMC	Yes	Yes	Yes	Yes
Dummies	Yes	Yes	Yes	Yes
Lagged Views	Yes	Yes	Yes	Yes
# Obs.	1,464	1,464	1,464	1,464
R^2	0.91	0.91	0.93	0.93

Note: The dependent variable is the daily (log, multiplied by 100) number of views of the specific section of the Federal Reserve's website. The series of macroeconomic surprises are drawn from Bloomberg. We include the following variables: (i) the dispersion measured by the absolute difference between the Bloomberg and the FX Street surprises, (ii) a dummy that is one if the surprise is negative and zero if it is positive, and (iii) an interaction term between the negativity dummy and the absolute surprise. "Days after FOMC" counts the number of days elapsed since the last FOMC statement. The regression also includes a constant. The sample period covers October 2, 2015 to October 8, 2019. Robust standard errors are in parentheses. A significance level of 1 percent, 5 percent, and 10 percent is denoted by ***, **, and *, respectively.

negativity dummy is negative. Thus, the marginal effect of the size of the surprise is smaller for negative surprises.

This result has to be interpreted against the backdrop of the interest rate cycle over much of the sample period. After the lift-off from the zero lower bound in December 2015, the Fed raised the target federal funds rate in several steps, before it implemented the first rate cut in July 2019. Hence, through most of the sample period,

markets reflected on a faster or slower tightening of monetary conditions, but not on an easing of policy. According to our results, markets believed that favorable labor market news required gathering additional information about monetary policy, possibly because they make a further tightening more likely. Negative news, in contrast, might have been interpreted as an indicator of the Fed leaving monetary conditions unchanged.

4.7 The Role of Forecast Dispersion

Unfortunately, we do not have access to the survey responses underlying the construction of the two alternative labor market surprise series used in this paper, so we cannot use the underlying cross-sectional dispersion of forecasts. However, we can use the difference between both surprises as a proxy for the dispersion of forecasts. Remember that both surprise series are constructed as the difference between realization and median forecast. The difference between both surprises, hence, should be proportional to the difference in median forecasts in two alternative surveys of market participants, as both surprise measures share the same realized value. There is, however, one important limitation to keep in mind: the two surveys may have been conducted at slightly different days in a given month. As a result, the difference between the two alternative surprise series also reflects different information sets. Hence, the dispersion measure is indicative only.

In this spirit, we construct the simple measure of forecast dispersion as the absolute difference of news surprises,

$$dis_t^{nonfarm} = |\widehat{Surp}_t^{nonfarm,Bloomberg} - \widehat{Surp}_t^{nonfarm,FXStreet}|, \quad (4)$$

where the hat over the variables denotes that we divide both surprise series by their standard deviation to make sure that both surprises are equally volatile. Note that this measure reflects forecast dispersion before the release of the labor market figures. The appendix shows that periods with a wider dispersion of forecasts are also periods with large surprises. This supports the notation that forecast dispersion is a useful but noisy measure of uncertainty.

We include $dis_t^{nonfarm}$ as an additional variable in our empirical model. A positive coefficient on forecast dispersion would indicate

that markets' need for information increases if the release has been preceded by more heterogeneous views on the state of the economy. We find that forecast dispersion reduces the demand for Federal Reserve information on announcement days; see Table 7 for the set of coefficients. The positive impact of the absolute news surprise on the number of views remains significant. This result is puzzling: to the extent a more dispersed range of forecasts of non-farm payroll employment ahead of the official data release reflects uncertainty about the state of the economy, we should expect a higher demand for Fed information. One potential explanation is that a wider dispersion of forecasts reflects uncertainty of the Fed itself about the economy, thus calling for a less activist policy response to the labor market news and, as a consequence, a smaller demand for information by the public.

5. Conclusions

In this paper, we used the number of views of the Federal Reserve Board's website to quantify the demand for information about U.S. monetary policy. This allows us to shed light on the demand for information around macroeconomic news surprises, which are widely regarded as the main source of public information about the state of the business cycle. The literature has firmly established that interest rates are very sensitive to news surprises, as investors recalibrate their expectations of future policy in light of the new information.

We add to this literature by showing that market participants not only update their beliefs about monetary policy, but also actively search for new information. The number of website views of the policy-relevant sections of the Fed's website increases after macroeconomic surprises. Our findings are in line with the literature on the allocation of attention of market participants and offer new insights into the demand for central bank information.

The paper also offers lessons for the design of central bank communication. We stress the role of the website as an important source of information on days of scheduled macroeconomic data releases. This implies that information provided on these specific dates should be relatively more effective than on other days. On these days, central banks such as the Federal Reserve could provide information they believe is particularly important to steer market expectations.

A visit to the current home page of the Fed is not very informative. The front page does not include information on the current level of the federal funds rate target, the date of the next FOMC meeting, the current inflation rate, the inflation target, or the definition of the Fed's mandate. Making this information quickly and easily accessible, without the need to click through the site, would enhance the role of the website as a main tool of communication with the public.[16] A better understanding of the demand for information about monetary policy should contribute to the design of a more effective central bank communication.

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