Discussion Paper

What moves markets?

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Non-technical summary

Research Question

A key question in the macro-finance literature concerns the drivers of asset prices. Are asset prices mainly driven by news, or by changes in sentiment and other factors unrelated to economic fundamentals? In most asset pricing models, news play a dominant role. But in empirical investigations, the explanatory power of news is often quite low.

Contribution

We study the explanatory power of news by building a large, time-stamped event database covering a wealth of news related to the macroeconomy, including macroeconomic data releases, central bank announcements, bond auctions, election results, sovereign rating downgrades, and natural catastrophes. We combine this event database with high-frequency stock price and bond yield changes, both for the US and the euro area, going back to 2002.

Results

We find that roughly half of all stock and bond price movements in the US and euro area occur in tight windows around clearly identifiable news and in this sense can be explained by those news. On the positive side, this share is much higher than most previous studies found. However, our results still ascribe a large role to return variation that cannot be linked to news about economic fundamentals.

Nichttechnische Zusammenfassung

Fragestellung

Eine zentrale Frage in der makro- und finanzökonomischen Literatur betrifft die Einflussfaktoren von Finanzmarktpreisen. Werden Finanzmarktpreise hauptsächlich durch unerwartete Nachrichten beeinflusst oder durch Stimmungsänderungen und andere Faktoren, die nichts mit den wirtschaftlichen Fundamentaldaten zu tun haben? In den meisten Modellen spielen Nachrichten eine dominierende Rolle. In empirischen Studien ist die Erklärungskraft von Nachrichten jedoch oft recht gering.

Beitrag

Wir untersuchen die Erklärungskraft von Nachrichten für Finanzmarktpreise, indem wir eine umfangreiche, mit Zeitstempeln versehene Ereignisdatenbank aufbauen, die makroökonomisch relevante Nachrichten wie Datenveröffentlichungen, Ankündigungen von Zentralbanken, Anleiheauktionen, Wahlergebnisse, Rating-Herabstufungen und Naturkatastrophen umfasst. Wir kombinieren diese Ereignisdatenbank mit hochfrequenten Veränderungen von Aktienkursen und Anleiherenditen, sowohl für die USA als auch für den Euroraum, die bis ins Jahr 2002 zurückreichen.

Ergebnisse

Unsere Ergebnisse zeigen, dass etwa die Hälfte aller Aktien- und Renditebewegungen in den USA und im Euroraum in engen Zeitfenstern um eindeutig identifizierbare Nachrichten auftreten und in diesem Sinne durch diese Nachrichten erklärt werden können. Einerseits scheint dieser Anteil hoch, da die meisten früheren Studien eine geringere Erklärungskraft von Nachrichten finden. Andererseits legen unsere Ergebnisse nahe, dass ein Großteil der Finanzmarktbewegungen nicht auf makroökonomisch relevante Nachrichten zurückgeführt werden kann.

WHAT MOVES MARKETS?

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Abstract

What share of asset price movements is driven by news? We build a large, time-stamped event database covering scheduled macro news as well as unscheduled events. We find that news account for about 50% of all bond and stock price movements in the United States and euro area since 2002, suggesting that a much larger share of return variation can be traced back to observable news than previously thought. Moreover, we provide stylized facts about the *type* of news that matter most for asset prices, the persistence of news effects, and spillover effects between the US and euro area.

Keywords: Macro news; Asset prices; High-Frequency Identification; Event Database

JEL classification: E43; E44; G12; G14

1. Introduction

A key question in macro-finance is to what extent asset prices are driven by macroeconomic fundamentals, as opposed to other factors, such as changes in sentiment or flows. Answering this question is hard since asset prices and macro variables are endogenous, move simultaneously, and are both driven by other – potentially unobservable – factors. In recent years, event studies employing high-frequency asset price reactions around key news events have been one of the most fruitful lines of research in this area. The idea is that within these short time windows, causality runs from news to asset prices and not the other way around. This type of setup has been widely used to study the impact of, e.g., monetary policy news, macroeconomic data releases, uncertainty shocks, and oil shocks.[1]

In this vast event study literature, each paper usually focuses on one type of news or a small subset of news items. Our goal in this paper is to quantify the total explanatory power of macro news for asset returns. We thus combine and extend existing work to build a massive intraday event database that covers a much larger set of news items. Our database comprises both regular, scheduled news (such as macro data releases and central bank announcements) as well as unscheduled, ad hoc events (such as elections, natural catastrophes, terrorist attacks, etc.). Overall, the database covers almost 100,000 scheduled news releases and more than 1,000 unscheduled events over a period of more than 18 years. We use this database in tandem with high-frequency asset price changes at the 15-minute frequency going back to 2002. The asset price data we study comprise sovereign yields with a two, five and ten year maturity, as well as stock prices, both for the US and the euro area. We entertain the standard assumption in this literature that asset price changes observed in a tight window around an event (-15 to $+30$ minutes in our case) can be attributed to the occurrence of the news.

Based on these data, we document the following stylized facts about news and asset prices. First, unscheduled news – such as geopolitical events or news about Covid-19 – account for about 10-15% of all asset price variation, even though they only make up about 2% of all event windows in our sample. Thus, unscheduled news, which are often neglected in empirical research due to data availability, represent a significant source of asset price variation.

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[1]Regarding monetary policy, see e.g. Kuttner (2001); Cochrane and Piazzesi (2002); Bernanke and Kuttner (2005); Gürkaynak, Sack, and Swanson (2005); Nakamura and Steinsson (2018); Cieslak and Schrimpf (2019); Leombroni, Vedolin, Venter, and Whelan (2021); Kroencke, Schmeling, and Schrimpf (2021); Swanson (2021). Regarding macro data releases, see e.g. Andersen, Bollerslev, Diebold, and Vega (2003); Altavilla, Giannone, and Modugno (2017); Gürkaynak, Kısacıkoğlu, and Wright (2020). Regarding uncertainty shocks, see e.g. Piffer and Podstawski (2018). Regarding oil shocks, see e.g. Känzig (2021).

Second, we show that out of the wealth of scheduled news releases that continuously hit the market, only a small subset of news systematically affects returns. In particular, we run OLS regressions of absolute returns on announcement dummies for each scheduled macro news series and identify news that significantly increase the volatility of an asset's return. From the over 400 news series in our event database, we only keep between 55-85 "important" series, depending on the asset under study. In other words, while about 20% of all our intraday windows contain (at least) one news release, only 8% of all windows contain an important release. Yet, those news capture a hefty share of market fluctuations and dramatically raise the share of "explained" return variation to up to 50%.

Third, the importance of scheduled macro news for asset returns is very unevenly distributed, even within the above-mentioned subset of important news. Taking 10-year US bond yields as an example, ad hoc events account for 11% of total variance, and the *top ten* scheduled macro news items already raise this share to above 30%. Adding the next 20 most important scheduled macro news releases only increases this number to about 40%, and adding all 38 remaining important releases finally leads to a share of explained variance slightly above 50%.

Overall, the share of return variation that we link to observable news is much higher than documented in the earlier literature, which typically attributes less than one tenth of the unconditional R^2 to macro news (discussed further below). That a large share of asset price movements can be traced back to observable news seems interesting in itself but it also speaks to the recent literature on non-fundamental drivers of returns by providing a benchmark for the amount of return variation that is unrelated to macro news.[2]

Fourth, we investigate the longer-horizon response of asset prices to news to better understand the type of information in macro news that is transmitted to asset markets. More specifically, while all our results discussed above are based on the change in asset prices in tight intraday windows around news events, we also run regressions in which we allow for longer-term effects of up to one quarter as in Altavilla et al. (2017). Interestingly, we find that the long-run response to news events is generally very similar to the short-run response discussed above. This suggests that the news events we study indeed present relevant news about macro fundamentals which permanently move asset prices. Our results are incompatible with an alternative story under which news only move asset price in a transitory way, which would be typical for, e.g., short-lived liquidity effects.

Fifth, we provide a decomposition of asset price movements into different *types* of news to further understand the sources of asset price movements. To do so, we classify scheduled macro news into four different categories: news about growth, inflation, fiscal policy, and

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[2]See, e.g., Gabaix and Koijen (2021) on the importance of flows in inelastic markets for driving return variation or Edmans, Fernandez-Perez, Garel, and Indriawan (2021) on sentiment and global stock and bond returns.

monetary policy. We find that news about growth are most important, accounting for about 35% of the *explained* return variation across bonds and stocks for both the US and the euro area. The second most important type of news is monetary news (mostly central bank announcements), which account for about 20% of the explained return variation. News about inflation have been the least important type of news during our sample period. These results seem relevant, since they can be used to determine which type of news announcements to control for in empirical work. For example, Bauer and Swanson (2020) argue that one should control for important macro news announcement when interpreting the information content of high-frequency monetary policy shocks.[3] In terms of asset classes, we find that stock returns respond stronger to unscheduled news than bond yields.

Similarly, we differentiate between domestic and foreign news, both from a US and euro area perspective, and study their relative importance. Perhaps not surprisingly, US macro news account for the majority of return variation across bonds and stocks in both the US and the euro area. To give an example, the ECB Press Conference, as the most important European scheduled news event, only ranks sixth in the global list whereas US news, such as the employment report, occupy the first five ranks. Nonetheless, we find that foreign news account for a sizeable share of US stock return variation, which is in stark contrast to US bonds, for which domestic news clearly dominate. These results seem relevant in light of a large literature (e.g. Albagli, Ceballos, Claro, and Romero, 2019) that tests for spillovers in international financial markets.

We also provide a number of additional results and robustness checks. As a sanity check of our main finding that up to 50% of all asset price movements are attributable to news, we run a simple falsification exercise to show that that our event database explains much more return variation than would be expected by pure chance alone. We also show that our standard event window length (-15 to $+30$ minutes) is sufficiently long for news to be incorporated into prices. Longer event windows obviously raise the share of explained market movements, but the increase merely corresponds to the mechanical effect of covering a larger share of observations.

We check that our results are not solely driven by overnight returns (see, e.g. Boyarchenko, Larsen, and Whelan, 2020, on the importance of overnight returns) since ad hoc events (such as election results) and some scheduled news tend to happen outside of European or US trading hours. We run a simple robustness check and exclude all overnight windows from the sample. We still find that the remaining news items capture

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[3]Similarly, Savor and Wilson (2014) show that macro news matter for the performance of the capital asset pricing model whereas Cieslak and Pang (2021) propose an identification scheme to extract structural shocks from asset prices and use them to interpret the information contained in macro news. In all such cases, it seems important to know which news matter for which type of asset class.

around 40% of total return variation.

We study the importance of news across the return distribution to better understand the nature of the link between news and returns. Our results consistently show, across assets and across jurisdictions, that news explain a higher percentage of market movements in the tails of asset returns compared to the middle part of the distribution. For example, we find that for the 5-year US yield, all of the 0.01% largest declines and roughly 95% of the 0.01% largest increases occur around news.

Finally, we report results for one particular application of our database. Specifically, we revisit the predictability of monetary policy surprises by means of macro news. A recent literature has extensively studied asset price changes in narrow windows around central bank announcements to identify monetary policy "surprises" (e.g., Nakamura and Steinsson, 2018). However, one branch of this literature has documented that these surprises are partially predictable by publicly available information. We thus deploy our database and test whether high-frequency monetary policy surprises are systematically related to (prior) macro news releases. Corroborating earlier evidence, e.g., Miranda-Agrippino and Ricco (2021); Bauer and Swanson (2020); Neuhierl and Weber (2021), we find some evidence for predictability of monetary suprises.

Related literature. A large literature has studied the response of asset prices to news and provides a useful benchmark for our main finding that about 50% of total return variation can be attributed to observable news events. To put our numbers into perspective with the previous literature, note that the lowest R^2 we obtain with our database is roughly 40% for US stock prices. In contrast, Ogneva and Xia (2021) find that only about 5% of the daily variation in the S&P 500 index future occurs in 45-minute windows around selected domestic macro announcements (and another 5% around individual large firms' earnings announcements). Brogaard, Nguyen, Putnins, and Wu (2022) find, based on VAR decompositions at the individual stock level, that 8% of the aggregate return variance is from market-wide information (while 31% is from noise, 37% from public firm-specific information, and 24% from private firm-specific information). Regarding bonds, the literature typically finds that observable macro surprises only explain a small share of yield changes, even when conditioning on narrow windows around scheduled news releases. For example, Altavilla et al. (2017) find that macro surprises explain around 30% of the bond yield changes in 30 minute windows around releases. This conditional R^2 translates to an unconditional R^2 of just 3%, since only few observations in their intraday dataset contain a release.

Gürkaynak et al. (2020) argue that virtually *all* yield curve movements around macro releases are due to news. They argue that the low R^2 typically found in event studies is due to a measurement problem, as the econometrician's measure of "news" is incomplete and

only captures headline figures, usually as deviations from survey expectations. Most news releases contain information beyond headline figures, though, and once these unobserved news are accounted for (via a latent factor), virtually all of the immediate market response is explained by news. But again, this is true only for the intraday event windows they study. The overall share of explained market movements would be much lower, since there are only about 14 event windows per month in Gürkaynak et al. (2020)'s sample period and each window is only 20 minutes long. In any case, Gürkaynak et al. (2020)'s findings support our approach of fully attributing market movements to the respective news events around which they occur.

The remainder of the paper unfolds as follows. The next Section describes our high-frequency asset price data and our news database. Section 3 provides our main results, Section 4 provides additional results and robustness checks, and Section 5 concludes. We provide details on the asset price data, the construction of the news database, as well as tables and figures with additional results in an Appendix to this paper.

2. Asset Prices and News

Section 2.1 provides details on our high-frequency asset price data. The remaining sections describe the type of news we include in our database. Since we do not try to measure the "surprise component" of news, as is commonly done in the literature (e.g., as deviations of actual headline figures from survey expectations), we are able to include a much wider set of potentially relevant news series for which no survey expectations exist.[4] If not mentioned otherwise, we use a 45-minute window for all events, i.e. from 15 minutes prior to 30 minutes after the news release.[5]

2.1. High-Frequency Asset Prices

We construct a dataset of continuous asset price changes at the 15-minute frequency. Our sample ranges from March 2002 to September 2020. It includes stock prices and sovereign bond yields with 2-, 5-, and 10-year maturity, both for the US and the euro area. In the latter case, sovereign bond yields refer to Germany.

All stock price and bond yield series are based on futures contracts and cover up to 14 hours of trading per day, from 2 a.m. to 4 p.m. US Eastern Time. Hence, in addition

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[4]This is in line with Gürkaynak et al. (2020), who argue that news announcements contain much more relevant information beyond the few headline numbers that surveys ask about.

[5]To be precise, we include the 15-minute window in which the release occurs, plus the preceding and subsequent window. If a release occurs at the full quarter of an hour, as is almost always the case, this corresponds to a $[-15, +30]$ minute window. For overnight events, the event window covers the first 30 minutes of trading on the next trading day.

to one overnight window (from the previous day's close to 2:15 a.m.) we have up to 55 intraday windows (from 2:15 a.m. to 2:30 a.m., .., 3:45 p.m. to 4:00 p.m.) per trading day. If not stated otherwise, henceforth all times refer to US Eastern Time. In total, we have over 200,000 observations per asset.

Besides their longer trading hours, a key advantage of futures over cash securities is their high liquidity, thanks to their standardized nature and low trading costs. A potential drawback of using futures is that price changes do not perfectly match price changes in the underlying cash securities, e.g., due to the cost of carry. Since our focus is on high-frequency price movements in short event windows, however, these differences should be negligible and we do not attempt to correct for the carry of the different futures contracts. To transform price changes of bond futures into yield changes, lastly, we divide price changes by the modified duration of the underlying cheapest-to-deliver bond. Appendix A provides further details on our high-frequency asset price database.

2.2. Macroeconomic Data Releases

To start with a broad set of macroeconomic news, we include all available releases for 22 countries from Bloomberg Economic Calendar. The 22 countries are the US, the euro area aggregate, its first 12 member countries, six other European countries (the UK, Switzerland, Sweden, Denmark, Norway, and Poland) and China and Japan. The only restriction we impose is that a series has at least 50 releases during our sample.

Since we rely only on the timing of releases, we merge releases that always or almost always coincide. The US Employment report, for example, is one type of news in our setting, even though it contains a wide range of economic information. Bloomberg e.g. provides data on 14 different headline figures. We treat different transformations of a release as one type of news.[6] We also add a handful of other releases manually, namely the ECB Bank Lending Survey, the ECB Survey of Professional Forecasters and "Weekly Petroleum Status Reports" by the US Energy Information Administration (EIA), see Crego (2020).

In total, we study 382 types of macro data series (comprising over 1,000 different underlying series or transformations) with over 70,000 distinct releases (comprising almost 150,000 distinct data points). Table IA.2 in the Appendix provides details.

2.3. Bond Auctions

For the US and the four largest euro area countries, we include bond auction results. We follow the US convention and differentiate between bills (debt instrument with less than

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[6]The same data is often released with different reference periods, e.g., as year-over-year or quarter-over-quarter changes, or with different adjustments, e.g., as seasonally or working-day adjusted values.

one year maturity), bonds (up to ten years maturity) and notes (more than ten years maturity). For France, Italy and Spain, the data is from Bloomberg. For Germany, the data is from the website of the German debt management agency. For the US, the data is from the Treasury website.

Besides auction results, the US Treasury website also contains the exact times at which each debt auction was publicly announced. Hence, for the US, we also include auction announcements as news. For Germany, we include the debt agency's yearly "issuance preview", which contains the projected issuance dates and volumes for the forthcoming year. In total, we include over 10,000 auction-related news events. Table IA.3 in the Appendix provides details on these data.

2.4. Monetary Policy Announcements

Extending the database by Cieslak and Schrimpf (2019), we study announcements of eight major central banks, namely the Federal Reserve (Fed), European Central Bank (ECB), Bank of England (BoE), Bank of Japan (BoJ), Swiss National Bank (SNB), Swedish Riksbank, Bank of Canada (BoC), and Reserve Bank of Australia (RBA).

We distinguish various types of announcements, including press releases and press conferences by the main governing body of each central bank, speeches by the central banks' chair or president, ad hoc press releases and minutes of policy meetings. For the Fed, speeches include testimonies by the Federal Reserve Chair before Congress, and we further add Beige Book releases, Discount Rate Minutes and public statements by FOMC participants other than the Fed Chair. For the ECB, speeches include hearings by the ECB President at the European Parliament, and we further add releases of the Economic Bulletin and statements by Governing Council members other than the ECB president. We also include (i) the results of open market operations, namely: main refinancing operations (MRO), regular and targeted longer-term refinancing operations ((T)LTRO), and other refinancing operations such as US Dollar and Swiss Franc operations; (ii) voluntary repayment amounts in the (T)LTRO operations; (iii) news about the ECB's balance sheet: ECB weekly financial statements, the purchase volumes of the Securities Markets Programme (SMP) and the Asset Purchase Programmes (APP). For the BoE, we add releases of the Inflation Report. For the BoJ, we add the Monthly Outlook Reports and Summary of Opinions releases. For the SNB, lastly, we include the annual General Meeting of SNB Shareholders and Quarterly Bulletin releases. Table IA.4 in the Appendix shows the types of announcements whereas Table IA.5 lists the number of events per news type. In total, we include over 7,000 central bank news events.

In contrast to macro data releases and bond auction events, central bank announcements are not necessarily scheduled in advance. Since we aim for a clean separation into

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scheduled and unscheduled news, we manually classify each central bank announcement. For unscheduled policy meetings and ad hoc press releases, this classification is straightforward. Speeches are more tricky. We classify most of them as unscheduled events, except e.g. regular testimonies by the Federal Reserve Chair before Congress or hearings by the ECB President at the European Parliament.

For most central bank news, we use the usual 45 minute window. The only exception are press conferences and speeches, for which windows end 15 minutes after the conference or speech ended. If we have no exact timestamp for the end of a press conference or speech, we use a 75-minute window, i.e. from 15 minutes prior to 60 minutes after the start of the event.

2.5. Ad Hoc (unscheduled) Events

The above-mentioned recurring news are of course not the only news that move markets. Many of the largest asset price movements during our sample period are triggered by unexpected events like the Brexit referendum or the Lehman Brothers bankruptcy. Disregarding these "ad hoc" events would severely understate the role of news in explaining market movements.

Hence, we build a database of ad hoc events, extending previous literature whenever possible. Rigobon and Sack (2005) and Wolfers and Zitzewitz (2009), for example, identify several key events related to the Iraq War. Guillen (2009) and Ait-Sahalia, Andritzky, Jobst, Nowak, and Tamirisa (2012) chronicle the most important events of the global financial crisis. Bahaj (2020) constructs an event database for the European sovereign debt crisis. Känzig (2021) studies "oil supply news" related to OPEC meetings. Bianchi, Kind, and Kung (2019), lastly, identify announcements by Donald Trump, e.g., in the form of tweets, regarding trade conflicts and US monetary policy.

Our database incorporates all these events and further adds various other types of news, e.g., terrorist attacks, natural disasters or election outcomes. Whenever necessary, we obtain intraday timestamps for events from Factiva or Bloomberg. In total, we collect over 1,000 clearly identifiable news events. Table IA.6 in the Appendix gives an overview.

For ad hoc events, we usually use a 75-minute event window from 15 minutes prior to 60 minutes after the start of the event. In many cases, such as political speeches, we can and do use exact timestamps for the end of an event.

3.   Which News Move Markets?

This Section reports the main results of our empirical analysis using the news database described above. We first map the largest market moves during our sample period to news

events in our database in Section 3.1 and show that most large market moves can indeed be attributed to observable news events. Section 3.2 reports results for regressions that aim to identify the most important scheduled news events in our database. Section 3.3 presents our main result, namely the share of market movements that can be attributed to news. Section 3.4 shows that these news-driven movements are quite persistent, which suggests that the news we study indeed contain price-relevant macro information. Section 3.5-3.6 decompose the explained R^2 into types of economic news as well as into domestic and foreign news. Section 3.7, lastly, discusses our main findings.

3.1. Large Market Movements and News

To get a sense of our database and the link between news events and asset price movements, we start with a list of the thirty largest market movements during our sample period and see whether we can tie these price jumps to observable news in the spirit of Cutler, Poterba, and Summers (1989). Table 1 reports the results from this exercise.

As is evident from Table 1, most large asset price jumps can be clearly attributed to an observable news event as indicated by a corresponding entry in the "Event" column of that table. The results also show that no news category clearly dominates as there are scheduled news (e.g. US employment reports) as well as unscheduled news on this list. However, it is noteworthy that the largest price jumps occurred on unscheduled news, which are often neglected in the literature. Finally, some price jumps do not occur on identifiable macro news and seem to have other causes. We will get back to these "no-news" price jumps further below.

Table 1: Largest Market Jumps

Date	Time	y_{2y}^{US}	y_{5y}^{US}	y_{10y}^{US}	y_s^{US}	y_{2y}^{EA}	y_{5y}^{EA}	y_{10y}^{EA}	y_s^{EA}	unsch.	Event
24.06.2016	ON	-24	-28	-26	-4	-13	-18	-27	-12	1	Brexit referendum
15.09.2008	ON	-34	-30	-20	-3	-21	-18	-13	-3	1	Lehman Brothers bankruptcy
09.03.2020	ON	-21	-20	-18	-4	-16	-17	-18	-8	1	Covid-19 spreads, quarantine imposed on Northern Italy; oil price war escalates between Russia and Saudi Arabia
26.06.2002	ON	-34	-27	-19	-5	-11	-11	-9	-6	1	Worldcom accounting scandal
22.01.2008	ON	-19	-15	-10	-5	-19	-15	-10	-11	0	
16.03.2020	ON	-9	-20	-21	-5	-7	-8	-9	-9	1	Covid-19 spreads, quarantine imposed in Spain
10.05.2010	ON	12	13	12	3	17	15	13	6	1	ECB's Securities Markets Programme announcement
18.03.2009	14:30	-10	-28	-37	2	-7	-12	-14	1	0	FOMC Statement, QE1 announcement
08.09.2008	ON	18	22	17	3	13	13	8	2	1	Fannie Mae and Freddie Mac taken over by the US government

Table 1: Largest Market Jumps (continued)

Date	Time	y_{2y}^{US}	y_{5y}^{US}	y_{10y}^{US}	y_s^{US}	y_{2y}^{EA}	y_{5y}^{EA}	y_{10y}^{EA}	y_s^{EA}	unsch.	Event
22.01.2003	ON	-11	-14	-12	-3	-9	-13	-12	-6	0	
29.06.2015	ON	-10	-14	-13	-1	-5	-14	-22	-5	1	Greek debt crisis, capital controls announced
29.01.2004	ON	20	22	16	-1	11	12	9	-1	0	FOMC statement omits promise to hold rates steady for a "considerable period"
15.03.2011	ON	-9	-12	-11	-2	-11	-15	-12	-3	1	Fukushima nuclear disaster, explosion at reactor 3
27.10.2008	ON	-12	-10	-8	-5	-7	-8	-5	-5	0	
12.12.2008	ON	-9	-11	-11	-4	-7	-10	-9	-3	1	USD14bn auto bail-out deal fails in US Senate
10.03.2020	ON	9	16	14	1	9	11	13	2	1	Covid-19, negotiations about emergency relief package in US advance
26.06.2003	ON	17	15	11	-2	10	11	9	-1	0	Fed cuts policy rate by 25bp
06.05.2010	14:45	-9	-9	-10	-4	-5	-7	-7	-6	1	Greek parliament approves EU/IMF bailout package amid major riots
25.03.2008	ON	13	19	14	2	9	7	6	2	1	JPMorgan takes over Bear Stearns
07.04.2003	ON	10	12	8	2	10	9	7	5	1	Iraq War, US troops enter Bagdad
02.04.2004	08:45	18	19	17	1	9	-8	6	1	0	US Employment Report
05.03.2004	08:45	-15	-19	-14	-0	-13	-9	-5	-1	0	US Employment Report
07.05.2004	08:45	23	20	13	-0	7	7	7	-0	0	US Employment Report
17.10.2002	ON	10	14	9	3	8	7	4	5	0	
03.10.2003	08:45	12	14	10	1	11	11	8	1	0	US Employment Report
07.10.2002	ON	-9	-18	-12	-3	-7	-6	-6	-2	1	Iraq War, US Pres. Bush: "use of force may become unavoidable"
24.03.2003	ON	-12	-11	-8	-1	-7	-7	-6	-5	1	Iraq War, coalition forces face apparent setbacks over preceding weekend
15.08.2002	ON	2	8	7	4	9	11	7	4	0	
24.04.2017	ON	7	9	8	1	10	11	11	3	1	Macron beats Le Pen in first round of French presidential election
10.06.2008	ON	17	12	8	-1	12	11	6	-1	1	Fed speech by Bernanke: "upside risks to inflation"

Dates and Times refer to US Eastern Time. Bond yield changes ($y_{2y}, .., y_{10y}$) are in basis points, stock price changes (y_s) are in percent. For overnight events (Time=ON), market movements refer to the previous trading days' close till the stated day's opening price. Unscheduled events, i.e. either unscheduled monetary policy announcements or ad hoc events (Section 2.5) are marked as $unsch. = 1$. The ordering is based on average normalized market movements.

3.2. Important Scheduled News

The key event study assumption – that the entire asset price change can be attributed to the respective news event around which it occurs – is standard in the literature on monetary policy news and major macro news. But the assumption is less convincing for

news that are less closely followed by market participants. Hence, to avoid overstating the importance of news, we want to impose the assumption only on the subset of news that *systematically* moves markets.

We identify these important news by running the following dummy regression for each asset, using heteroskedasticity-robust standard errors:[7]

$$|\Delta y_t| = \alpha + \sum_{i}^{N_i} \beta_i \cdot D_{it} + \lambda \cdot FE + \gamma \cdot vol + \epsilon_t \tag{1}$$

where Δy_t are yield changes or stock returns and D_{it} are dummy variables that equal one if a given news series i is released around that window, with $N_i = 434$.[8] FE includes several calendar-based fixed-effects and vol includes various lagged volatility measures.[9] In particular, vol is specified as follows

$$vol = \gamma^{15m}\sigma^{15m} + \gamma^{1h}\sigma^{1h} + \gamma^{2h}\sigma^{2h} + \gamma^d\sigma^d + \gamma^w\sigma^w + \gamma^m\sigma^m + \gamma^q\sigma^q \tag{2}$$

where σ denotes "realized power" measures, i.e. cumulated past absolute returns over different horizons, namely 15 minutes, one hour, two hours and a day, week, month and quarter.[10] Note that at this stage we want to find out which of the regular scheduled news from Sections 2.2-2.4 move markets. Hence, we drop any periods with unscheduled news from the regression.

Figure 1 lists the 25 most important scheduled releases, measured by their mean t-statistic across all eight assets. Table IA.8 in the Appendix contains results for all 423 news types. Unsurprisingly, the US employment report is by far the most important news release and US news clearly dominate overall, with 20 out of the 25 most important scheduled releases concerning the US. Out of those US releases, most are macroeconomic data releases but three releases relate to monetary policy: FOMC press releases, FOMC minutes, and speeches by the Fed Chair. This is in line with Brusa, Savor, and Wilson

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[7]We have also experimented with more recent regularization methods, namely LASSO and elastic nets, to identify relevant news. Compared to both of these methods, our OLS dummy regression classifies far fewer news items as relevant. To be conservative, we thus prefer to work with the OLS dummy regressions.

[8]The 434 series consist of 382 macro news (see Table IA.2), 16 bond auction news (see Table IA.3), and 36 central bank news (eight types of central bank news are dropped because all their releases are classified as unscheduled, see Table IA.5).

[9]Figure IA.4 in the Appendix shows the importance of the included fixed-effects and lagged volatility measures and Figure IA.5 shows that they reproduce the volatility pattern throughout the day quite well.

[10]E.g. $\sigma^{15m} = |\Delta y_{t-1}|$ for intraday returns and $\sigma^d = \sum_{k=1}^{55} |\Delta y_{t-k}|$ if we have 55 windows within the last 24 hours. Ghysels, Santa-Clara, and Valkanov (2006) find that realized power measures are the best predictor of future volatility. Instead of including calendar-based fixed-effects and lagged volatility measures directly in the regression, one could also employ them in a two-step weighted least squares approach, as e.g. Andersen et al. (2003) and Andersen, Bollerslev, Diebold, and Vega (2007) do to study net (rather than absolute) returns.

(2020), who focus on monetary policy news and show that news from the Federal Reserve are more important than news coming out of other countries' central banks. Three other releases in Figure 1 concern Treasury auctions. This is in line with Gorodnichenko and Ray (2017), who study auction results to identify "debt demand shocks" and Phillot (2021) who studies auction announcements to identify "debt supply shocks".

Across assets, the total number of "important" releases varies from 55 (for the 2-year US yield) to 85 (for EA stock prices), see Table 2. Interestingly, the number of relevant releases is always higher for European assets than for their US counterparts. Overall, 158 out of the 434 releases have a significant impact on at least one asset.

	2-year yield	5-year yield	10-year yield	stock prices
US	55	70	68	74
EA	83	83	81	85

Table 2: Number of important scheduled releases per asset, defined as the number of coefficients β_i from Equation (1) that are significant at the 10% level.

3.3. Share of Explained Market Movements

Having identified the relevant scheduled news, what fraction of total market movements can we reasonably attribute to news? Figure 2 gives the answer. For each asset price, we compute

$$\Omega(k) = \frac{\sum_{i=1}^{k} (D_{it} \cdot y_t)^2}{y_t^2} \tag{3}$$

where k is the rank of each news release for a given asset (for most assets, $k = 1$ is the US employment report). Hence, $\Omega(k)$ refers to the share of total variance "explained" by the top k most important releases. As explained above, we set event windows from 15 minutes before an event to 30 minutes after the event so that $\Omega(k)$ only picks up the share of explained variance in a tight window around the news event and guards our results against falsely attributing price changes to other events on the same day. However, even with this tight event window, the assumption that all of the price movement can be attributed to the news event, is less convincing for less important types of scheduled news. Hence we only include news whose release has a significant impact on an asset's price as per the results of the regression in (1) above.[11]

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[11]For unscheduled news, i.e. either unscheduled monetary policy announcements or ad hoc events from Section 2.5, we cannot rely on the approach in regression in (1) to filter out "important" unscheduled news and thus include all events. Figure IA.2 in the Appendix shows the variance shares of different types of unscheduled events.

Figure 1: Most Important Scheduled News. Each symbol-color combination refers to a t-statistic of β_i from a separate regression, one for each of the eight assets we study, see Equation (1). Each row label refers to a different news release. Monetary policy announcements are in bold font. See Figure IA.3 for the next 50 most important scheduled news.

Figure 2 reports results for the share of explained variance of stock returns and yield changes in the US and euro area. The figure shows that unscheduled events alone account for roughly 11-16% of total variance. Adding the 20 most important scheduled releases raises this share to around 25-38%, and including all relevant scheduled releases accounts for roughly 50% of all market movements. In our view, this is a reasonable estimate of the share of financial market movements that is driven by news. For comparison, the thin lines without symbols in the bottom part of Figure 2 report the share of intraday observations associated with news events relative to all observations in the sample. This simple benchmark serves to check how much variance is "explained" simply by picking lots of news events in our sample period. These numbers range from about 3% to slightly above 20% and indicate that the results in Figure 2 are not purely mechanical. Rather, they highlight, that the importance of news is very unevenly distributed across news items with the most important news accounting for the lion's share of the explained return variation across assets.

For completeness, the last entry in Figure 2 ("+ all other" news) also shows results when we include *all* 434 news types from our database, even if their release has no significant impact on asset prices as per regression (1). In this setting, the share of explained variance rises to about 60-70%, which can be regarded as an upper bound on the importance of macro news.

Table 3 provides a summary of the results in Figure 2. The table contains the R^2 values when using only ad hoc (unscheduled) events, including important scheduled news, and including all other scheduled news.

	y_{2y}^{US}	y_{5y}^{US}	y_{10y}^{US}	y_s^{US}	y_{2y}^{EA}	y_{5y}^{EA}	y_{10y}^{EA}	y_s^{EA}
Ad Hoc Events	12.1	11.6	11.1	15.4	14.2	12.7	12.4	16.5
	(3.4)	(3.4)	(3.4)	(3.4)	(3.4)	(3.4)	(3.4)	(3.4)
+ Important Scheduled News	47.7	53.1	50.5	41.1	51.0	50.5	46.9	47.0
	(20.3)	(24.2)	(24.1)	(22.2)	(24.5)	(24.6)	(23.8)	(22.4)
+ All Other News	67.5	69.8	69.1	60.4	71.2	72.2	71.6	70.1
	(50.3)	(50.3)	(50.3)	(50.3)	(50.3)	(50.3)	(50.3)	(50.3)

Table 3: Variance shares around selected event windows. Values in parentheses refer to the percent of observations covered. See Figure 2 for details.

3.4. Persistence of News Effects

An important question is whether the market movements we attribute to news are persistent or transitory. Persistent movements would indicate that the news contain relevant macro information, which permanently moves asset prices. Short-lived movements could indicate that market participants initially overreact to news, or that prices move due to
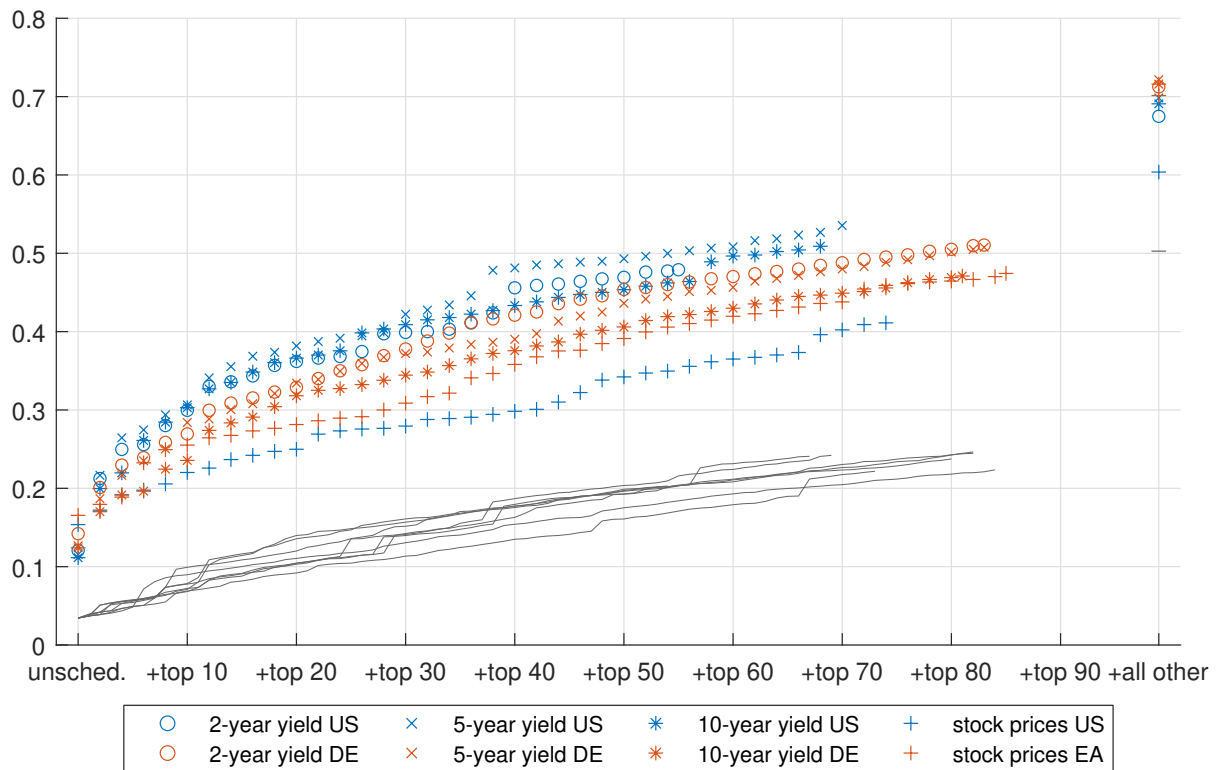
Figure 2: "Explained" variance shares. Each symbol refers to the cumulative variance of an asset around selected windows, divided by the total variance of the asset, see Equation (3). The first entry on the x-axis refers to all windows around unscheduled news, i.e. either unscheduled monetary policy announcements or ad hoc events (Section 2.5). The next entries on the x-axis add the k most important scheduled news types for each asset, determined by the t-statistic from regression (1). Only releases with significant effects are included, hence the number of news types differs across assets. The last entry on the x-axis adds all the remaining scheduled news. For reference, the solid black lines show the percent share of observations covered by event windows.

transitory liquidity effects.

We check the persistence of news effects by running the same type of regressions as Altavilla et al. (2017), namely:

$$\sum_{j=0}^{H_k} \Delta y_{t-j} = \alpha + \sum_{j=0}^{H_k} \Delta y_{t-j}^* + \epsilon_t \tag{4}$$

where Δy_t^* are the "explained" asset price changes, i.e. all changes around unscheduled news or around "important" scheduled releases. We estimate this regression for different horizons H_k, ranging from our 15-minute frequency up to quarterly frequency.[12]

There are three possible results. First, the explanatory power of news could stay constant across horizons, reflecting persistent effects of news. Second, the explanatory power could fall, reflecting transitory effects of news. This would be the case if prices *mean-revert* after news, i.e. the immediate market reactions lose predictive power at longer horizons. Third and lastly, the explanatory power of news could rise at longer horizons, as e.g. found by Altavilla et al. (2017).[13] One way for this to be true in our case would be if prices *drift* after news, e.g., because market participants need more time to digest information than our tight event windows allow for. In this case, the immediate market reaction would be predictive of further price movements.

Figure 3 shows the results. Moving from the intradaily to daily frequency raises R^2 values slightly. That means the immediate market reaction to news does not reverse on average, but instead is followed by further movements in the same direction in the next 24 hours. Extending the horizons further, i.e. moving to weekly, monthly and quarterly frequency, decreases R^2 values slightly. At those horizons, prices exhibit some mean-reversion after news events.

Overall, the results point to a rather permanent shift in asset prices in response to news. This suggests that asset prices do indeed move due to the release of new information about macro fundamentals and not simply due to short-term liquidity effects.

3.5.   Economic Type of News

Our approach can also be used to shed light on the economic drivers underlying the observed market movements. To do so, we classify each news type as belonging to one or

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[12]The intradaily frequency corresponds to $H = 0$. For longer horizons, H corresponds to the number of intraday windows within the specified time frame (e.g. $H = 56$ for the daily frequency if we have 56 windows within the last 24 hours).

[13]Altavilla et al. (2017) measure surprises in the usual way, i.e. as the difference between actual values and prior median survey expectations. They find that surprises explain around 3% of bond yield changes at the 30 minute frequency, 10% at the daily frequency and about 30% at the quarterly frequency. They reconcile this finding by arguing that news-driven yield changes have a higher persistence compared to other market movements.
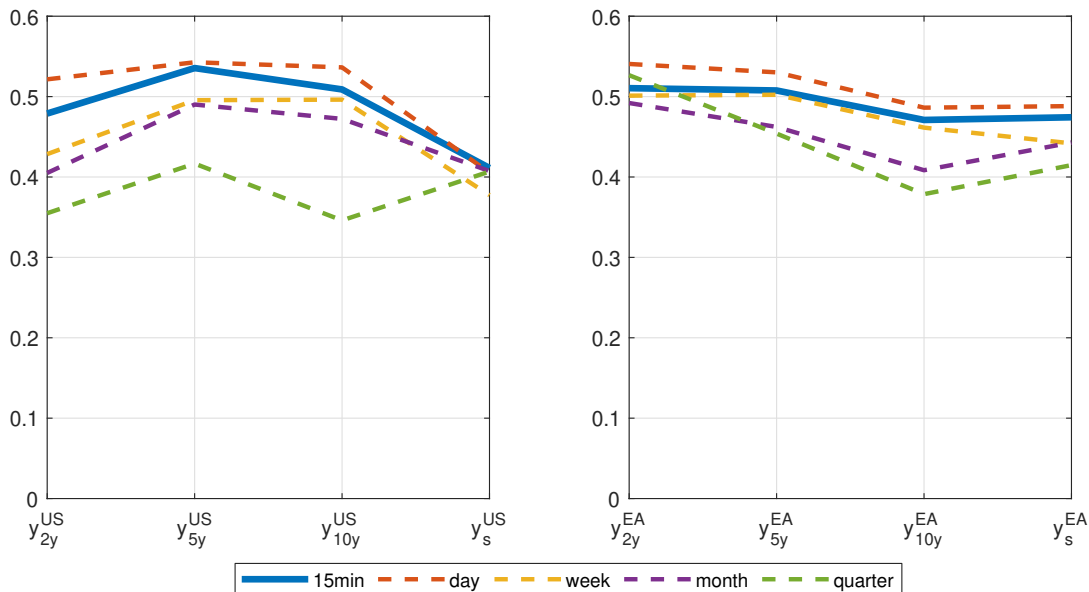
Figure 3: R^2 values from Equation (4) for different horizons H_k. Values for the 15min horizon correspond to our baseline results.

multiple economic categories, namely growth (expectations), inflation, fiscal (comprising mostly bond auction news), and money (comprising mostly central bank announcements), see Table IA.7 for an overview.

We then simply allocate the market movement around a given release to its economic category. For example, asset price changes around a Fed press release are attributed to the "money" category. If multiple news occurred simultaneously, we use the t-statistics from regression (1) as weights, assigning zero weight to releases not significant at the 10% level. If a news type belongs to multiple economic categories, we allocate the movement equally to each category. If any of the ad hoc events from Section 2.5 took place, we assign the entire market movement in this event window to the "ad hoc" category.

Figure 4 shows the resulting decomposition of the "explained R^2" for each asset. We see that news about (expected) growth account for most market movements, followed by news about monetary policy. News about inflation matter least. Ad hoc events, which are often neglected in empirical research that studies the importance of news for asset prices, are an important driver of returns and especially so for equities.

3.6. Domestic vs. Foreign News

Figure 5 looks at *scheduled* news and decomposes market movements into domestic and foreign news.[14] As one might expect, domestic news are more important for bond yields than for stock prices, and more important for US asset prices than euro area asset prices.

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[14]We focus on scheduled news here because the ad hoc news from Section 2.5 are not categorized into "country of origin".
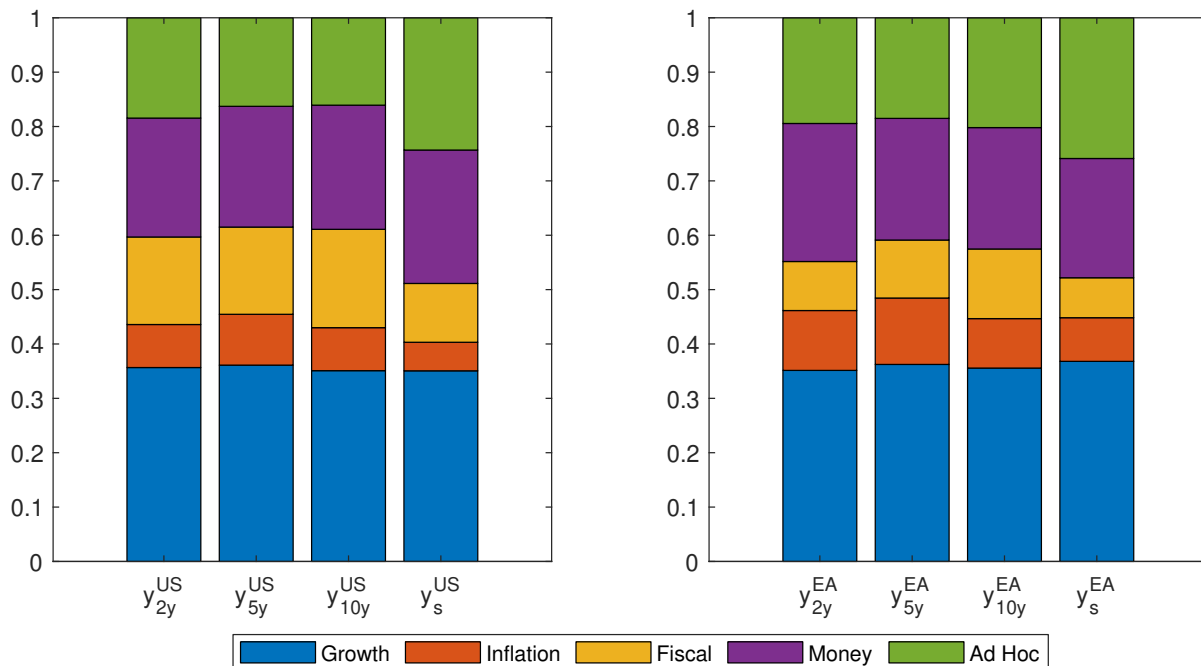
Figure 4: Decomposition of "explained" market movements into economic categories.

For US bond yields, roughly 20% of the variation stems from foreign news, which is remarkably close to the estimate by Kim and Ochoa (2020) based on a quite different methodology. From a European perspective, foreign news are much more important and account for up to 60% of bond yield variation.

For stock prices, these figures are considerably higher. Approximately 40% of the explained market movements are due to foreign news for US stock prices and 70% for EA stock prices. Overall, these results imply a strong dominance of US news for bond yields but a relatively less important role of US news for stocks.

3.7. Discussion of Main Results

We end this Section with a discussion of how to interpret our main findings. In particular, we discuss whether our results are more likely to over- or underestimate the explanatory power of news.

Our approach assigns asset price changes in a narrow event window entirely to the respective news released in that window. But since asset prices most likely would have moved to some extent anyways ("background noise"), our approach, while standard in the event study literature, will overestimate the explanatory power of news to some extent. More generally, we might in some cases erroneously identify a "news" event based on the subsequent market reaction (post hoc ergo propter hoc fallacy).[15] To guard against

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[15]For example, Baker, Bloom, Davis, and Sammon (2021) find that next-day newspaper reports identify
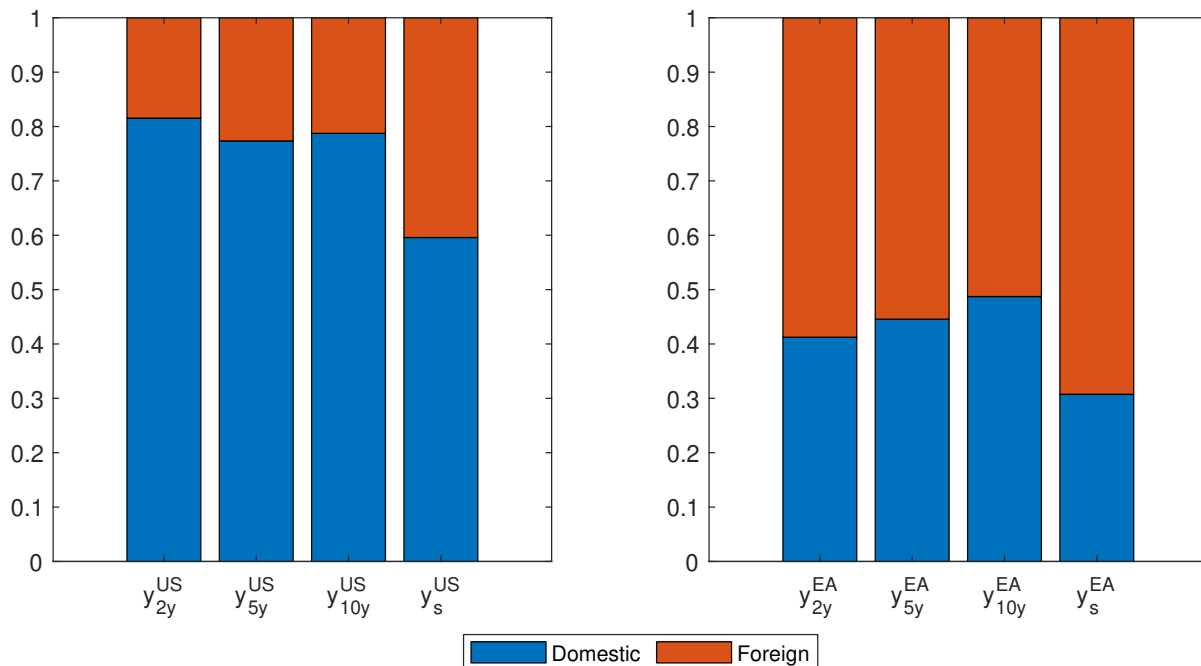
Figure 5: Decomposition of "explained" market movements into domestic and foreign news. For the Euro area, domestic news include all country-level news of member states. Movements around the ad hoc events from Section 2.5 are omitted.

this effect, we try to be conservative and to only include clearly relevant events in our database. However, some discretion in choosing which news to include is inevitable and the best we can do is be transparent about these choices. Hence, we will make the news database available to other researchers in the future. In any case, this issue is mostly relevant for unscheduled news, which account for roughly 11-16% of asset price variation in our data set (see Table 3). Hence, dropping some potentially controversial events from our database would only moderately affect our results.

On the other hand, we might underestimate the explanatory power of news for a couple of reasons. First, despite our vast event database, we are still missing potentially important news. For example, we omit private information about macro news, e.g. in the form of early releases (Bernile, Hu, and Tang, 2016; Michaelides, Milidonis, Nishiotis, and Papakyriakou, 2015; Hendershott, Livdan, and Schürhoff, 2015) or via unofficial communication of central bank officials with the private sector (Cieslak, Morse, and Vissing-Jorgensen, 2019). More generally, our event database omits events for which the timing is unclear and might not fully capture the effect of news that diffuses only gradually to the public (Hong, Lim, and Stein, 2000).

Second, we condition on news that is significant in a regression sense to come up with a list of "important news" (Section 3.2). For example, scheduled ECB president

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proximate causes for all but 12% of US stock market jumps (daily absolute price changes ≥2.5%) in the post-war period.

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speeches, which are insignificantly related to asset prices according to Table IA.8 are not counted in our main result that "news capture 50% of all return variation."[16] However, some of these speeches clearly affected asset prices. Likewise, in the interest of simplicity and robustness, we also do not allow for time-variation in "importance" in the dummy regressions (1). Some news, e.g., Italian and Spanish bond auction results, may well have had a significant market impact during the European sovereign debt crisis but are not included in the list of "important news" since they do not enter the regression significantly for the full sample period.

Third, we do not include a vast array of corporate news, such as earnings releases, which would surely increase the R^2 for stock returns further. We do not include this type of information since our goal is to focus solely on macro information that matters for the aggregate economy and not on idiosyncratic news about certain companies or industries. In this sense, we ignore the possibility that earnings announcements by large firms can affect aggregate market prices, as e.g. Gabaix (2011) and Ogneva and Xia (2021) argue.[17]

In sum, our estimate of the share of return variation that can be attributed to observable news appears quite conservative. However, our approach is silent about the mechanism by which these news are impounded into prices. While it might be the case that a news event shifts fundamentals and asset prices directly, a large literature has studied other mechanisms that rely on trading around news events to move prices (e.g., Evans and Lyons, 2008), such that news are only indirectly responsible for asset price changes. Our results thus do not invalidate the broader literature that emphasizes discount rate variation (e.g. in response to maro news) in driving asset returns (see, e.g., Cochrane, 2011, 2017, for surveys) or a more recent literature that points to flows as drivers of asset price variation (e.g. Gabaix, Gopikrishnan, Plerou, and Stanley, 2006; Gabaix and Koijen, 2021).[18]

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[16]This is likely because many speeches are unrelated to monetary policy and because of the relatively long event windows for speeches (usually -15 to $+60$ minutes).

[17]In fact, the positive market jump on 17 October 2002 for example, the fourth largest unexplained market movement in our sample (see Table 1), might have been caused by higher-than-expected IBM earnings. See e.g. the contemporaneous WSJ article "U.S. Stocks: IBM Surges on Upbeat Results" at https://www.wsj.com/articles/SB1034860486280987228.

[18]For example, Gabaix et al. (2006) hypothesize that trades by large institutional investors cause market jumps, even in the absence of important fundamental news. A case in point is the market turmoil on January 21, 2008. This episode is widely attributed to the unwinding of large stock positions by Societe Generale, which its "rogue trader" Jerome Kerviel had built up over the previous months. The incident was made public only three days later, so the market turmoil seems to have been caused by flows – rather than news. In fact, our approach identifies this episode as the largest unexplained market movement in the sample, see Table 1.

4. Additional Results and Robustness

This Section provides additional results and robustness checks. Section 4.1 conducts a falsification exercise to check the plausibility of our main findings. Section 4.2 provides evidence that our choice of the event window length is appropriate whereas Section 4.3 provides robustness on news occurring in overnight windows. Section 4.4 studies the importance of news across the return distributions and Section 4.5, lastly, applies our database to the predictability of monetary policy shocks.

4.1. Falsification Exercise

Our results show that up to 50% of all market movements occur around unscheduled news and "important" scheduled news and in this sense can be "explained" by news. As a sanity check of this result, we perform the following falsification exercise.

For each calendar week in our sample, we randomly draw as many "pseudo event windows" as there are actual event windows in that week. We repeat this 1,000 times and compute the "explained" variance share of the artificial event windows each time. Figure 6 shows the results. The pseudo event windows account for only 20-30% of the variance across assets and bootstrap draws, i.e. much less than our actual event windows explain.[19] This occurs somewhat mechanically, since we select "important news" based on the fact that they increase an assets' volatility. Nonetheless, this exercise shows how much more return variation our database explains than would be expected by chance.

4.2. R^2 with Longer Event Windows

Section 3.4 has shown that moving from the intradaily to daily frequency raises R^2 values slightly, which could indicate that our event windows are too tight. Recall that as our benchmark choice, we assume that most news are entirely reflected in prices within 30 minutes after the release or reporting of a news or event, see Section 2. Figure 7 shows how the share of explained variance (R^2) changes when using longer windows. In particular, starting from our benchmark choice ("+0 minutes"), we extend the windows by an additional 15, 30, 45 and 60 minutes.

The results in Figure 7 are intuitive as the share of explained market movements is higher the longer the event window. Extending each event window by a full hour, for example, would raise the share of explained market movement to 60-70%. However, using longer windows, the R^2 values actually increase less than the percent of observations

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[19]Recall that if we would draw pseudo event windows entirely randomly, the explained variance share would converge to the percent of observations covered. That the explained variance is slightly larger is due to the fact that our database contains more events during volatile trading weeks.
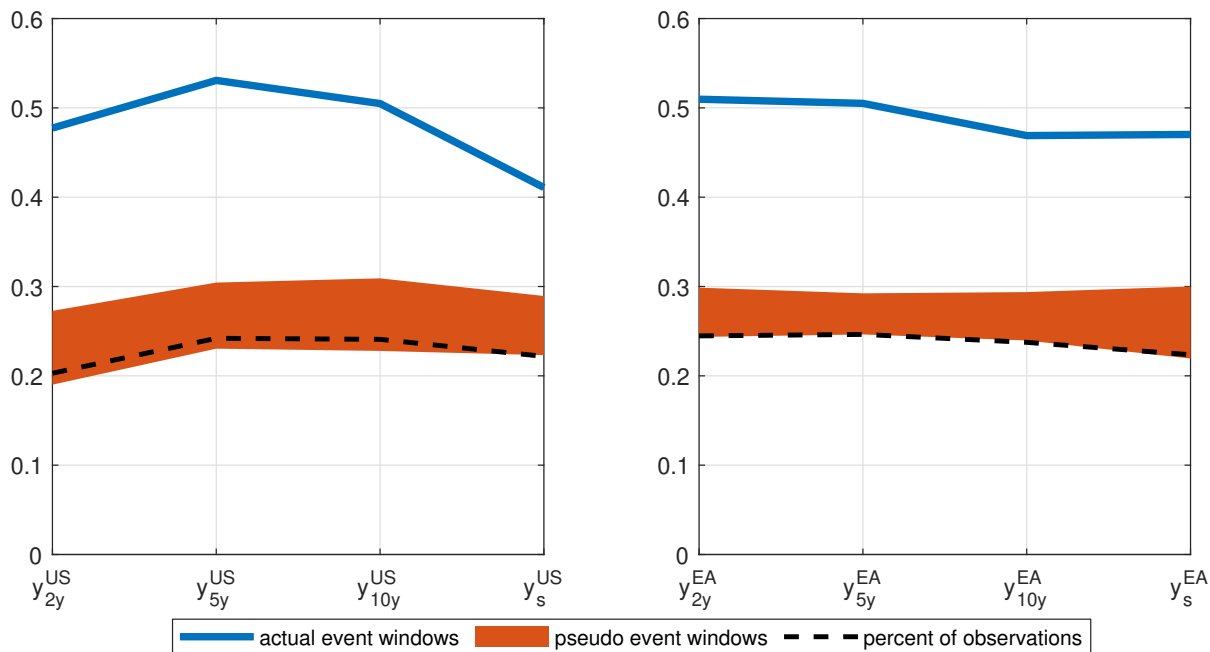
Figure 6: Variance shares in actual event windows vs. randomly drawn "pseudo event windows". The blue line shows the variance shares around ad hoc events and important scheduled news, see Table 3. The shaded area show the min-max range of the explained variance shares from 1000 bootstrap draws, using the same number of pseudo event windows as there are actual event windows for each week in our sample. For reference, the dashed black line shows the percent of observations covered, which is identical in both cases.
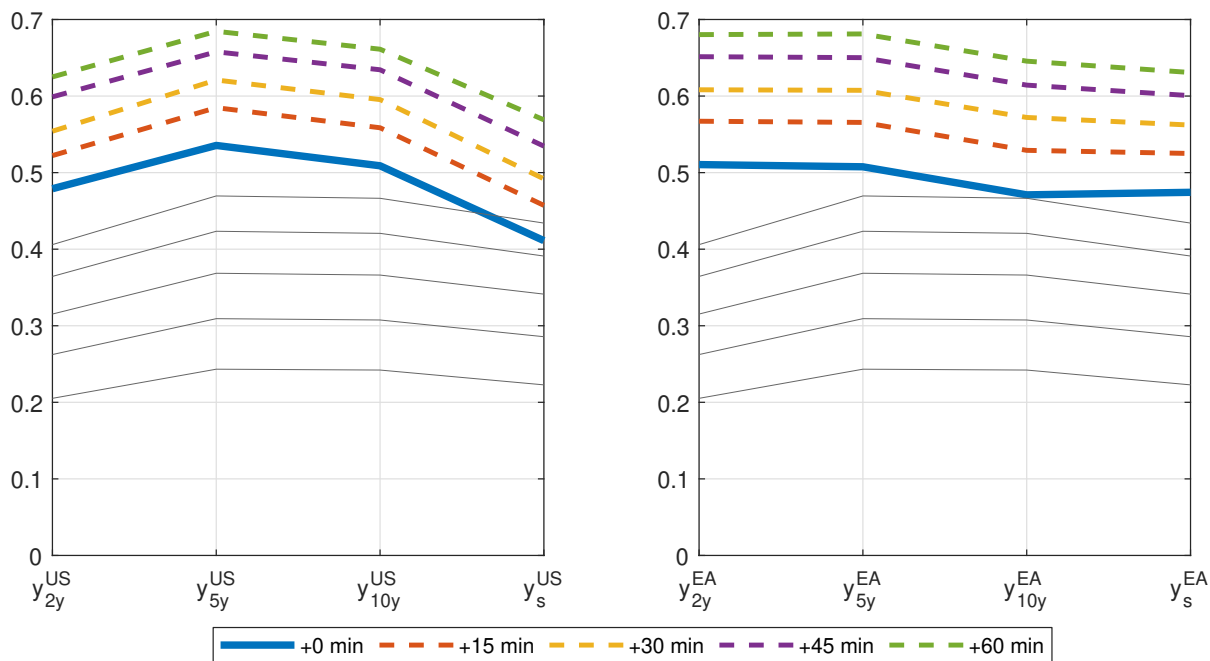
Figure 7: R^2 values using longer event windows. For reference, the solid black lines show the percent of observations covered.

covered (indicated by thin, dark lines in Figure 7). Hence, we conclude that using longer windows does not seem appropriate and that the R^2 values documented in Section 3.3 seem reasonably robust to altering the event window length.

4.3. Overnight vs. Intraday Windows

Figure 8 compares the share of explained variance in overnight and intraday windows (see, e.g., Boyarchenko et al., 2020, for the importance of overnight returns). Within overnight windows, we explain a much larger share of variance than during intraday windows. This is mostly because of ad hoc events which disproportionately occur during non-trading hours (e.g., the Brexit referendum results, the Lehman Brothers insolvency, etc., see Table 1). However, only a small fraction of observations are overnight windows. Hence, excluding those windows leads to a rather moderate drop in the overall share of explained market movements, see Table 4.
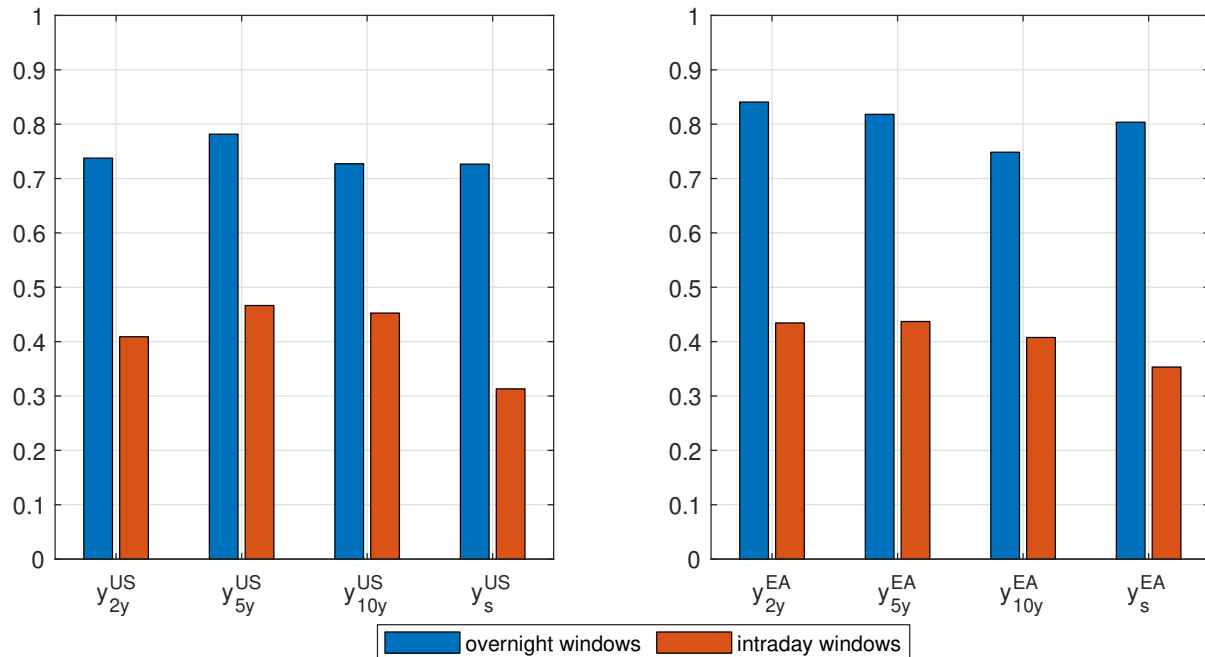
Figure 8: Share of "explained" variance in overnight and intraday windows.

4.4. Large vs. Small Market Movements

Figure 9 shows that we explain a higher percentage of market movements in the tails of asset price changes than around the middle part of the distribution. Recall that about 20-25% of of our sample period are covered by an event window of an "important news event" – see the numbers in parentheses in Table 3. But for very large (positive and negative) market movements, this share is much higher. For the 5-year US yield, for

	y_{2y}^{US}	y_{5y}^{US}	y_{10y}^{US}	y_s^{US}	y_{2y}^{EA}	y_{5y}^{EA}	y_{10y}^{EA}	y_s^{EA}
Base Case	47.9	53.6	50.9	41.1	51.0	50.8	47.1	47.4
	(20.5)	(24.3)	(24.2)	(22.3)	(24.5)	(24.9)	(23.9)	(22.6)
Excl. Overnight Windows	40.9	46.6	45.3	31.3	43.4	43.7	40.8	35.3
	(19.8)	(23.4)	(23.3)	(21.3)	(23.5)	(23.8)	(23.0)	(21.6)

Table 4: Explained variance share without overnight windows. The "base case" refers to the variance share around unscheduled and important scheduled news, see Table 3. Values in brackets refer to the percent of observations covered.

instance, 100% of the .01% largest declines and roughly 95% of the .01% largest increases can be attributed to news whereas the same number is only about to 20% at the median of returns. This finding further supports the important role of macro news for returns documented above. Moreover, for US stocks, we observe a strong asymmetry. In the tails, we can explain a larger share of price increases than declines. This is in line with Baker et al. (2021) who find, based on next-day newspaper reports, that news about fiscal and monetary policy triggers a greater share of upward than downward jumps. However, this asymmetry is much less pronounced for European stocks.
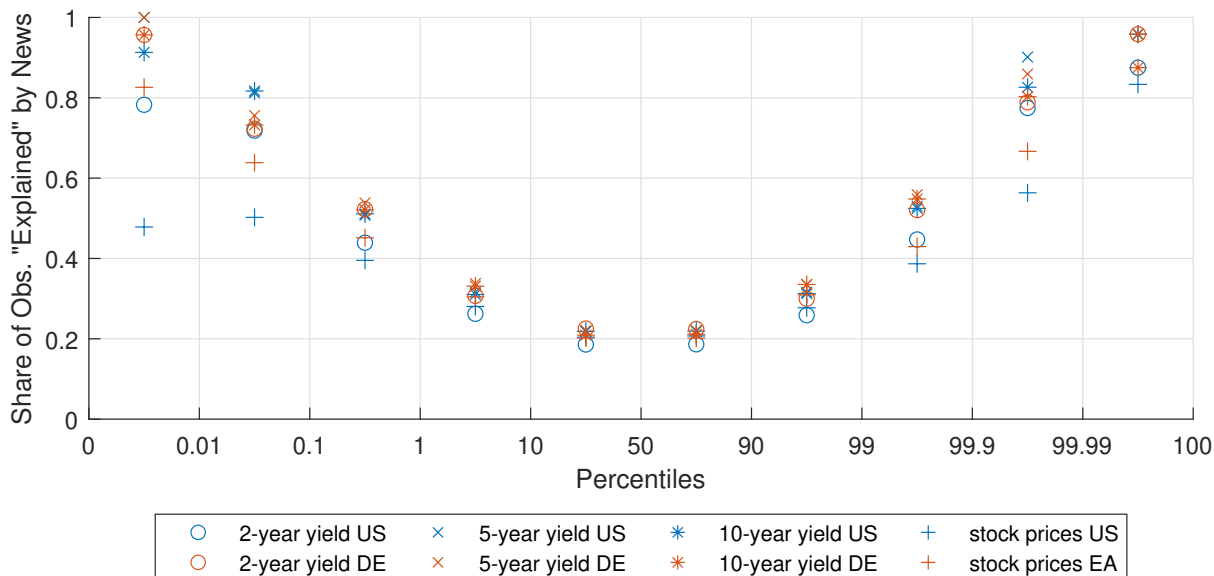
Figure 9: Share of market movements "explained" by news at different percentiles of the distribution.

4.5. Application: Predictability of Monetary Policy Surprises

A growing literature has documented that monetary policy "surprises", measured as high-frequency changes of asset prices around central bank announcements (e.g., Nakamura and Steinsson, 2018), are, in fact, partly predictable by public information. Miranda-Agrippino and Ricco (2021) for example show that principal components, extracted from

a large set of macro-financial variables, predict subsequent FOMC "surprises". Bauer and Swanson (2020) show that it is important to control for macro news released prior to an FOMC meeting when interpreting the economic meaning of monetary policy shocks.

Based on our extensive data set, we can extend this type of analysis and test whether monetary policy surprises are related to a broader set of past macro news and how news from one economic region (US or euro area) might spill over to another region. Our focus here is not to provide a large-scale out-of-sample predictability analysis but to simply test what type of news are significantly related to subsequent monetary policy shocks.

We do so by regressing monetary policy surprises, denoted mp_t and measured as the change in domestic 2-year yields in narrow windows around press releases and press conferences on central bank announcement days t, on cumulative 2-year yield changes in narrow windows around other news between day t and $t-1$ (i.e. the day of the previous press release or press conference). Note that we are not interested in the sign of the coefficients in such a regression per se but only in whether some events significantly predict future monetary surprises.[20] We thus run these regressions and focus on F-tests, i.e. tests for joint significance of slope coefficients of a certain news category. Overall, we look at five types of news categories: Domestic macro news, foreign macro news, domestic central bank news events, and ad hoc (unscheduled) events.

Table 5 reports results for running separate regressions for news events of different categories, where each column represents one regression of monetary policy shocks on a set of news. The last columns report results for a regression of monetary policy shocks on all "important" news (Section 3.2) in an elastic net framework to regularize the set of potential regressors.

Our results qualitatively confirm prior evidence in Miranda-Agrippino and Ricco (2021) or Neuhierl and Weber (2021) in that both FOMC and ECB announcement "surprises" are partly predictable by past market reactions to news. Interestingly, both FOMC and ECB surprises are significantly predictable by 2-year yield changes around foreign central bank news. FOMC surprises are also predictable by foreign macro news, whereas ECB surprises are predictable by domestic macro and ad hoc (unscheduled) news events. The associated (adjusted) R^2s seem quite sizeable and range from 9% (ECB surprises and domestic macro news) to 14% (FOMC surprises and foreign central bank news). When regressing monetary policy shocks jointly on all news events in an elastic net framework, these adj. $R^2 s$ are 18% for FOMC surprises and 34% for ECB surprises. We leave a more

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[20]The reason is that it is a priori unclear what sign to expect. Suppose that, between two FOMC meetings, there is good news about the economy and that yields increase around these events. If markets underreact to these news (relative to the Fed reaction function), we would expect a positive slope coefficient in a regression of monetary policy surprises on yield changes around these news events. If markets overreact, we would expect a negative slope coefficient. A detailed analysis of these patterns is clearly interesting but beyond the scope of this paper.

Table 5: Predictive Regressions by News Category

(a) FOMC Surprises

	Domestic macro	Foreign macro	Domestic CB	Foreign CBs	Ad Hoc	Elastic Net
F	0.91	2.01**	1.53	1.81**	0.43	9.03***
Adj. R^2	-0.01	0.06	0.02	0.14	-0.03	0.18

(b) ECB Surprises

	Domestic macro	Foreign macro	Domestic CB	Foreign CBs	Ad Hoc	Elastic Net
F	2.87***	1.23	2.67***	1.82***	2.65***	7.40***
Adj. R^2	0.09	0.01	0.09	0.11	0.06	0.34

Each column in each panel refers to a separate regression. The dependent variable in each case is mp_t, i.e. the change in 2-year yields in narrow windows around press releases and press conferences of the FOMC (panel a) or ECB (panel b). The regressors are 2-year yields changes around selected news. The first column uses yield changes around the ten most important (according to regression 1) domestic macro news as regressors. The second column uses changes around the ten most important foreign macro news. The third column uses changes around other domestic central bank announcements (such as speeches and minutes). The fourth column uses changes around foreign central bank announcements and the fifth column uses changes around the ad hoc events mentioned in Section 2.5. The last column uses the "elastic net" method with 10-fold cross validation to select relevant regressors from the set of all important news (according to regression 1).

in-depth study of these patterns for future research.

5. Conclusion

Using a large time-stamped event database together with continuous high-frequency asset price changes, we find that roughly half of all stock price and government bond yield movements in the US and euro area occur around clearly identifiable news events and, in this sense, can be "explained" by those news.

We thus find a much larger role for observable macro news in driving asset prices compared to the earlier literature. An optimistic interpretation of this finding is that asset prices do not seem disconnected from news about fundamentals at all and that the textbook model of asset prices as information aggregators is alive and well. However, a more pessimistic view is that a large share of return variation still cannot be linked to observable macro news, even when using a vast event database like ours. In any case, our time-stamped news database and the stylized facts documented in this paper should prove helpful for future research. First, our database allows researchers to precisely identify periods with and without (macro) news, which should be helpful for testing theories about how information is impounded into prices. Second, our results provide a benchmark for models with non-fundamental drivers of asset prices. Our estimates suggest that such models would have to match about half of the total stock or bond return variation by means of other mechanisms, e.g. noise trading or flows.

More generally, we hope that our database, which will be made publicly available, can help future research to separate between asset price movements emanating from macro news versus other drivers and to test theories about the transmission of news into asset prices and macro aggregates.

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Appendix to accompany

WHAT MOVES MARKETS?

This Appendix provides additional information on the high-frequency asset price data used in the empirical analysis (Appendix A), the construction of the news database underlying the main part of our paper (Appendix B), and it contains additional tables and figures that complement the empirical analysis (Appendix C).

A. High-frequency Asset Prices

This Section describes the high-frequency asset price data used in our empirical analysis.
Sources.   Intraday futures prices are from ThomsonReuters TickHistory (TRTH) for the US and from Eurex for the euro area. To convert bond price changes into yield changes, we divide by minus the modified duration of the underlying cheapest-to-deliver bond, obtained from Bloomberg for each bond future at each point in time.

Rollovers.   We use the nearest-to-maturity contracts for all futures, since these contracts are typically the most liquid. On the day of expiration t, we roll over to the next contract. For the overnight return from $t-1$ to t, we use the last price of the new contract on day $t-1$ and its first price on day t.

Filtering.   Unlike the prices from Eurex, prices from TRTH do not necessarily reflect actual trades. The data contains indicative quotes which might be stale.[21]   To filter out stale prices, we drop periods when a futures' price stays constant for one hour or longer. Since we use the maximum common sample for all eight futures, we effectively drop periods when any future's price is deemed stale.

Window Lengths.   All asset price movements either refer to 15-minute intraday windows or to overnight windows. Table IA.1 gives an overview. Of the overnight windows, most are exactly 10 hours and 15 minutes long, from 4 p.m. to 2:15 a.m. US Eastern Time, see Figure IA.1, which shows the intraday time of the first and last observation for each day in our sample. Due to our above-mentioned filtering scheme and non-trading days (weekends and public holidays), some overnight windows are considerably longer. The longest window in our sample e.g. is 137 hours (almost six days) long, from the close on December 23, 2003, to the opening on December 29. Some other long windows are due to missing data for US futures.[22]

Table IA.1: Length of Windows

15min	10:15h	$\leq$ 24h	$\leq$ 48h	$\leq$ 72h	$\leq$ 96h	$>$ 96h
232303	2544	1112	21	883	56	36

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[21]In particular, we use the *last* price from TRTH and fill missing values with the *mid* price (mean of bid and ask quotes), if the number of ask or bid quotes is above the 30th sample percentile and the difference between the *mid* price and interpolated *last* price is not in the top quartile.

[22]We were able to fill some of these missing values using data from https://www.tickdatamarket.com, but neither of the two datasets e.g. contained prices of 2-year and 5-year futures on January 21, 2003.

Figure IA.1: Covered Trading Hours
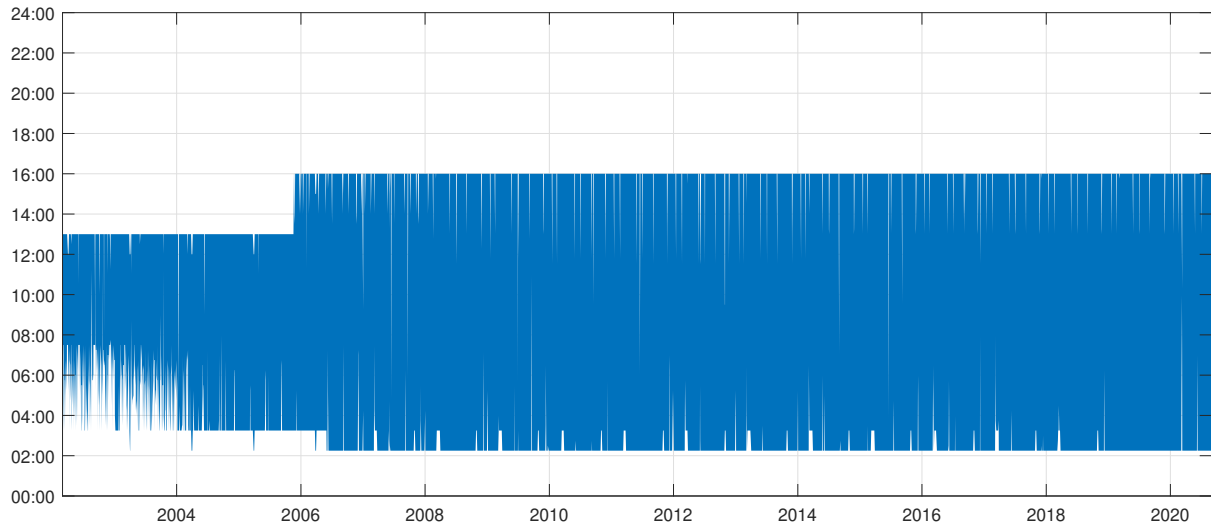
The colored area spans the time from the first to the last observation for each day in our sample. The intraday times on the y-axis refer to US Eastern Time. The coverage is largely determined by the trading hours of European futures, which ran from 3 a.m. to 1 p.m. till late 2005, from 3 a.m. to 4 p.m. till mid-2006, and from 2 a.m. to 4 p.m. afterwards. We do not exploit the fact that Eurex trading hours have been extended further since then.

B. News Database

This Section provides details on the construction of our news database. Section B.1 provides a list of all Bloomberg news items as well as details about sample coverage and timing. Section B.2 describes additional sources of news data and provides a classification of different news items into economic categories (i.e. "growth", "inflation", "fiscal", "money", "ad hoc").

B.1. News items and overview

Table IA.2: Overview Macro News

Description	Nid	Nt	Nr	Day	Time	First	Last
AT Bank Manufacturing PMI	1	88	88	Thu	04:00	28.03.2014	27.08.2020
AT CPI	6	229	457	Wed	04:00	16.10.2002	19.08.2020
AT GDP	2	76	147	Fri	03:00	13.02.2007	28.08.2020
AT Industrial Production	2	231	443	Fri	03:00	02.05.2002	25.08.2020
AT PPI	2	231	460	Fri	03:00	20.06.2002	28.08.2020
AT Wholesale Price Index	6	225	445	Fri	03:30	07.10.2002	07.08.2020
BE Budget Balance	1	211	211	Fri	10:15	07.06.2002	12.08.2020
BE Business Confidence	1	232	232	Fri	09:00	22.03.2002	25.08.2020
BE CPI	2	221	440	Thu	05:30	28.03.2002	28.05.2020
BE Consumer Confidence	1	233	233	Fri	09:00	20.03.2002	21.08.2020
BE GDP	3	151	293	Wed	09:00	17.04.2002	31.08.2020
BE Trade Balance	1	197	198	Mon	09:00	13.03.2002	15.01.2020
BE Unemployment Rate	1	221	221	Fri	05:00	07.06.2002	30.07.2020
CH CPI	5	237	744	Thu	03:15	03.04.2002	03.08.2020
CH Consumer Confidence	2	69	69	Thu	ON	06.05.2002	05.08.2019
CH Credit Suisse Survey	2	174	174	Wed	05:00	18.01.2007	26.08.2020
CH Foreign Currency Reserves	1	129	129	Fri	03:00	06.10.2010	07.08.2020
CH GDP	2	69	137	Thu	ON	28.05.2004	27.08.2020
CH Industrial Output	3	78	141	Thu	03:15	26.03.2002	20.08.2020
CH KOF Leading Indicator	2	231	231	Fri	05:30	27.03.2002	28.08.2020
CH Money Supply M3	1	157	157	Mon	03:00	20.06.2008	21.08.2020
CH PMI Manufacturing	1	234	234	Mon	03:30	01.03.2002	03.08.2020
CH Producer, Import Prices	2	233	464	Thu	03:15	15.03.2002	14.08.2020
CH Real Estate Index Family Homes	1	52	52	Mon	03:00	21.04.2008	17.07.2020
CH Retail Sales	3	234	265	Mon	03:15	15.03.2002	31.08.2020
CH Sight Deposits	2	311	622	Mon	04:00	27.07.2015	31.08.2020
CH Trade Balance	1	190	190	Thu	ON	21.03.2002	21.12.2017
CH Trade Data	3	154	351	Thu	ON	20.07.2006	20.08.2020
CH UBS Consumption Indicator	1	152	152	Tue	ON	28.06.2005	31.01.2018
CH Unemployment Rate	2	236	449	Fri	ON	08.03.2002	10.08.2020
CN Actual FDI & CN Contract FDI Cumulative	2	94	132	Mon	ON	12.06.2002	15.01.2010
CN CPI	1	233	233	Mon	ON	13.03.2002	10.08.2020
CN Economic Indices	3	114	155	Tue	ON	26.09.2005	06.05.2016
CN FDI	2	127	127	Thu	ON	22.02.2005	13.08.2020
CN Foreign Reserves	1	124	124	Mon	ON	16.10.2003	07.08.2020
CN GDP and Other Macro Aggregates	11	341	1195	Thu	ON	14.03.2002	14.08.2020
CN HSBC Composite PMI & CN HSBC Services PMI	2	132	220	Wed	ON	04.08.2010	05.08.2020
CN HSBC Manufacturing PMI	1	234	234	Mon	ON	01.11.2006	03.08.2020
CN Industrial Profits	2	142	144	Mon	ON	22.09.2005	27.08.2020
CN Manpower Survey	1	58	58	Tue	ON	11.12.2006	09.06.2020
CN Monetetary Aggregates	8	256	948	Fri	ON	28.03.2002	11.08.2020
CN PMI	3	246	366	Mon	ON	01.08.2005	31.08.2020
CN PPI & CN Purchasing Price Index	2	227	288	Thu	ON	22.07.2002	10.08.2020
CN Swift Global Payments CNY	1	67	67	Thu	ON	04.01.2016	20.08.2020
CN Trade Data	3	240	672	Mon	ON	12.03.2002	07.08.2020
CN Trade Data (CNY)	3	79	218	Mon	ON	09.02.2015	07.08.2020
CN Wholesale Price Index	1	51	51	Thu	ON	14.07.2005	22.10.2009
DE CPI	5	225	1098	Thu	08:00	26.02.2003	31.08.2020
DE CPI Baden Wuerttemberg	4	228	455	Thu	05:00	22.03.2002	31.08.2020
DE CPI Bavaria	4	230	460	Fri	04:00	22.03.2002	31.08.2020
DE CPI Brandenburg	4	229	457	Thu	04:00	25.03.2002	31.07.2020
DE CPI Hesse	4	231	462	Fri	04:00	22.03.2002	31.08.2020
DE CPI North Rhine Westphalia	4	230	459	Thu	04:30	25.03.2002	31.08.2020

Table IA.2: Overview Macro News (continued)

Description	Nid	Nt	Nr	Day	Time	First	Last
DE CPI Saxony	4	230	459	Thu	03:00	22.03.2002	31.08.2020
DE Expenditure Data	12	303	1357	Fri	ON	12.03.2002	25.08.2020
DE Factory Orders	2	273	535	Thu	06:00	06.03.2002	06.08.2020
DE GDP	4	78	200	Thu	ON	16.01.2003	30.07.2020
DE GfK Consumer Confidence	1	180	180	Thu	ON	27.07.2006	28.08.2020
DE IFO Survey	5	233	695	Tue	04:00	26.03.2002	25.08.2020
DE Import Price Index	2	243	464	Fri	ON	04.03.2002	28.08.2020
DE Industrial Production	2	268	530	Fri	06:00	28.03.2002	07.08.2020
DE Markit Construction PMI	1	87	87	Thu	03:30	04.04.2014	06.08.2020
DE PPI	2	232	464	Fri	ON	25.03.2002	20.08.2020
DE Retail Sales	2	232	463	Fri	ON	15.03.2002	31.07.2020
DE Unemployment Change & DE Unemployment Rate	2	260	466	Thu	03:45	06.03.2002	30.07.2020
DE Wholesale Price Index	6	232	464	Fri	ON	15.03.2002	13.08.2020
DK CPI & DK CPI EU Harmonized	4	234	932	Mon	03:30	11.03.2002	10.08.2020
DK Change in Currency Reserves & DK Foreign Reserves	2	226	377	Tue	10:00	04.03.2002	04.08.2020
DK Consumer Confidence	1	229	229	Thu	03:30	22.03.2002	21.08.2020
DK Danish PMI Survey	1	191	191	Mon	05:00	03.10.2005	03.08.2020
DK GDP	4	159	298	Fri	03:00	27.03.2002	31.08.2020
DK Industrial Production and Orders	5	207	311	Fri	03:30	05.03.2004	07.08.2020
DK New Car Registration	2	55	55	Fri	03:30	13.12.2002	25.09.2007
DK PPI	2	87	174	Mon	03:00	15.04.2014	17.08.2020
DK Retail Sales	2	216	431	Mon	03:00	28.08.2002	26.08.2020
DK Trade & Current Account Balance	4	232	530	Mon	03:30	13.03.2002	10.08.2020
DK Unemployment Rate	2	229	347	Thu	03:30	07.03.2002	31.08.2020
DK Wholesale Price Index	4	142	282	Mon	03:30	15.03.2002	15.01.2014
EA Bank Lending Survey	1	70	70	Tue	04:00	15.05.2003	14.07.2020
EA CPI	3	252	303	Wed	05:00	18.03.2002	19.08.2020
EA CPI Core & EA CPI Estimate	2	231	306	Fri	05:00	02.04.2002	31.07.2020
EA Car Registrations	4	213	285	Tue	ON	13.03.2002	16.07.2020
EA Construction Output	2	182	364	Wed	05:00	14.03.2005	20.08.2020
EA Consumer Confidence	1	137	137	Thu	10:00	18.02.2010	21.08.2020
EA Country-level Services PMI (DE, FR, IT)	15	740	2323	Thu	03:45	03.05.2004	21.08.2020
EA Current Account	1	196	196	Fri	04:00	26.03.2002	20.07.2018
EA EC Surveys	4	229	848	Thu	05:00	04.03.2002	28.08.2020
EA Employment	2	70	140	Fri	05:00	14.12.2006	14.08.2020
EA GDP	4	96	206	Thu	05:00	12.03.2002	31.07.2020
EA GDP Components	3	94	275	Wed	05:00	07.09.2004	09.06.2020
EA Industrial New Orders	2	99	198	Wed	05:00	26.01.2004	22.03.2012
EA Industrial Production	4	233	518	Wed	05:00	04.04.2002	12.08.2020
EA Labour Costs	2	101	127	Wed	05:00	22.03.2002	16.06.2020
EA M3 & EA M3 Money Supply	2	232	394	Thu	04:00	28.03.2002	27.08.2020
EA PMI (EA, GR)	7	591	1180	Wed	04:00	03.05.2004	21.08.2020
EA PPI	4	233	520	Tue	05:00	04.03.2002	04.08.2020
EA Retail PMI (incl. country-level releases)	4	52	208	Thu	04:00	04.04.2014	05.07.2018
EA Retail Sales & EA Retail Trade	4	233	519	Wed	05:00	01.03.2002	05.08.2020
EA Sentix Investor Confidence	1	168	168	Mon	04:30	06.08.2007	10.08.2020
EA Survey of Professional Forecasters	1	23	23	Fri	04:00	23.01.2015	17.07.2020
EA Trade Balance	3	232	450	Fri	05:00	22.03.2002	14.08.2020
EA Unemployment Rate	2	234	262	Tue	05:00	05.03.2002	30.07.2020
EA ZEW Survey	3	233	655	Tue	05:00	19.03.2002	11.08.2020
ES Budget Balance	1	77	77	Tue	07:00	29.11.2011	23.12.2019
ES CPI & ES CPI Core & ES CPI EU Harmonised	6	441	1600	Fri	03:00	13.03.2002	31.08.2020
ES Consumer Confidence	1	51	51	Tue	04:00	03.04.2007	04.07.2011
ES Current Account Balance	1	204	204	Fri	04:00	15.03.2002	31.08.2020
ES GDP	2	65	130	Fri	03:00	12.11.2004	31.07.2020
ES Hotel Occupancy & ES Hotel Price Index	2	59	90	Fri	ON	23.01.2002	23.10.2007
ES House Mortgage Approvals & ES Total Mortgage Lending	2	158	315	Wed	03:00	28.05.2008	28.08.2020
ES House transactions	1	160	160	Tue	03:00	28.04.2008	07.08.2020
ES Housing Permits	2	59	118	Thu	02:45	27.06.2008	31.10.2013
ES INE House Price Index	2	50	100	Thu	03:00	31.03.2009	09.06.2020
ES Industrial Output & ES Industrial Production	4	234	536	Fri	03:00	05.03.2002	07.08.2020
ES Labour Costs	1	74	74	Fri	03:00	22.03.2002	16.06.2020
ES Markit Composite PMI & ES Markit Services PMI	2	88	176	Wed	03:15	03.04.2014	05.08.2020
ES Markit Manufacturing PMI	1	89	89	Mon	03:15	01.04.2014	03.08.2020
ES PPI	2	221	441	Fri	03:00	25.02.2003	25.08.2020
ES Retail Sales	5	234	464	Thu	03:00	12.03.2002	28.08.2020
ES Trade Balance	1	173	173	Wed	04:00	18.04.2002	21.08.2020
ES Unemployment Net	1	216	216	Tue	03:00	06.03.2002	04.08.2020
ES Unemployment Rate	2	103	103	Fri	03:00	06.03.2002	28.07.2020
FI Business and Consumer Confidence	1	146	146	Mon	ON	27.05.2009	27.08.2020
FI CPI	2	232	463	Fri	ON	14.03.2002	14.08.2020
FI Consumer Confidence	2	232	232	Mon	ON	02.04.2002	27.08.2020
FI Current Account Balance	1	228	228	Fri	ON	15.03.2002	13.08.2020

Description	Nid	Nt	Nr	Day	Time	First	Last
FI Exports (EUR) & FI Imports (EUR) & FI Trade Balance	3	399	445	Fri	ON	04.04.2002	31.08.2020
FI GDP	5	303	382	Fri	ON	27.03.2002	28.08.2020
FI House Price Index & FI House Prices	3	102	193	Fri	ON	29.10.2010	27.08.2020
FI Industrial Production	3	235	460	Fri	ON	28.03.2002	10.08.2020
FI PPI	4	234	463	Mon	ON	18.03.2002	24.08.2020
FI Retail Sales & FI Retail Sales Volume	3	371	371	Fri	ON	14.12.2005	26.08.2020
FI Unemployment Rate	1	232	232	Tue	ON	19.03.2002	25.08.2020
FR Banque de France business sentiment survey	1	176	176	Mon	02:30	16.10.2006	10.08.2020
FR Budget Balance	1	232	232	Fri	02:45	06.03.2002	04.08.2020
FR Business Survey Overall Demand	1	53	53	Tue	02:45	29.04.2008	23.07.2020
FR CPI and Wages	6	334	1491	Fri	02:45	12.03.2002	28.08.2020
FR Consumer Confidence	2	221	221	Tue	02:45	02.04.2002	26.08.2020
FR Consumer Spending	2	219	437	Fri	02:45	20.03.2002	28.08.2020
FR Current Account Balance	2	232	232	Fri	02:45	22.03.2002	07.08.2020
FR GDP	2	85	161	Fri	ON	24.05.2002	31.07.2020
FR Housing Permits & FR Housing Starts	2	84	167	Tue	ON	26.03.2002	28.05.2009
FR Industrial Production & FR Manufacturing Production	4	235	930	Fri	02:45	14.03.2002	07.08.2020
FR Jobseekers Net Change & FR Total Jobseekers	3	123	231	Wed	12:00	28.11.2008	27.07.2020
FR Manufacturing and Business Confidence	4	222	714	Thu	02:45	27.03.2002	27.08.2020
FR Non-Farm Payrolls & FR Wages	2	145	194	Fri	02:45	17.05.2002	20.03.2020
FR PPI	2	221	442	Fri	02:45	02.04.2002	28.08.2020
FR Trade Balance	1	232	232	Fri	02:45	15.03.2002	07.08.2020
FR Unemployment Data	4	119	277	Thu	ON	02.04.2002	13.08.2020
GR CPI & GR CPI EU Harmonized	2	243	457	Fri	05:00	08.03.2002	07.08.2020
GR Current Account Balance	1	218	218	Fri	ON	13.11.2002	19.08.2020
GR GDP	3	117	187	Fri	05:00	13.03.2002	04.06.2020
GR Industrial Production	1	218	218	Fri	05:00	10.01.2003	07.08.2020
GR Retail Sales	1	227	227	Fri	05:00	10.06.2002	31.08.2020
GR Unemployment Rate	3	229	230	Thu	05:00	11.03.2002	06.08.2020
IE CPI & IE CPI EU Harmonized	4	231	882	Thu	06:00	13.05.2002	13.08.2020
IE Consumer Confidence	1	147	147	Tue	07:00	02.06.2009	24.08.2020
IE Current Account Balance & IE GDP	3	90	223	Thu	06:00	30.04.2002	20.07.2020
IE Industrial Production	3	231	461	Fri	06:00	22.03.2002	06.08.2020
IE Investec Composite PMI & IE Investec Services PMI	2	88	176	Wed	ON	03.04.2014	06.08.2020
IE Investec Manufacturing PMI	1	89	89	Mon	ON	01.04.2014	04.08.2020
IE Live Register Change & IE Live Register Level	2	231	462	Fri	06:00	01.03.2002	07.08.2020
IE New Private Car Licences & IE New Vehicle Licences	2	212	291	Fri	06:00	18.12.2003	10.08.2020
IE PPI	2	231	462	Thu	06:00	18.04.2002	21.08.2020
IE Property Prices	4	118	236	Wed	06:00	22.06.2011	18.08.2020
IE Retail Sales Volume	2	232	464	Fri	06:00	28.03.2002	28.08.2020
IE Trade Balance	1	228	228	Fri	06:00	25.07.2002	14.08.2020
IE Ulster Bank Construction PMI	1	88	88	Mon	ON	14.04.2014	10.08.2020
IE Unemployment Rate	1	233	233	Wed	06:00	01.03.2002	05.08.2020
IT Budget Balance	2	214	340	Mon	13:00	04.03.2002	01.07.2020
IT Business Confidence & IT Economic Sentiment	2	232	336	Thu	04:00	26.03.2002	28.08.2020
IT CPI	4	367	1191	Fri	05:00	15.03.2002	31.08.2020
IT CPI FOI Index Ex Tobacco	1	99	99	Fri	04:00	12.04.2013	12.08.2020
IT Consumer Confidence	2	231	266	Tue	04:00	20.03.2002	28.08.2020
IT Current Account Balance	1	226	226	Fri	05:00	18.03.2002	19.08.2020
IT Deficit to GDP	2	75	75	Fri	04:00	01.03.2005	26.06.2020
IT GDP	3	84	152	Fri	04:00	08.08.2003	31.07.2020
IT General Government Debt	1	115	115	Fri	04:30	15.12.2011	14.08.2020
IT Hourly Wages	4	183	363	Fri	04:00	02.04.2002	29.07.2020
IT Industrial Orders & IT Industrial Sales	4	206	815	Fri	04:00	22.04.2003	27.08.2020
IT Industrial Production	3	233	699	Fri	04:00	14.03.2002	06.08.2020
IT Large Company Empl.	1	68	68	Fri	04:00	09.05.2003	30.12.2009
IT New Car Registrations	1	233	233	Mon	12:00	05.03.2002	03.08.2020
IT PPI	2	229	457	Fri	04:00	28.03.2002	28.08.2020
IT Retail Sales	2	218	436	Fri	04:00	24.04.2003	31.07.2020
IT Retailers' Confid. General & IT Services Survey	2	85	158	Wed	03:30	30.10.2002	29.12.2009
IT Trade Balance EU & IT Trade Balance Total	2	231	448	Fri	04:00	25.03.2002	07.08.2020
IT Trade Balance Non-Eu (Euros)	1	95	95	Thu	04:00	25.03.2002	27.01.2010
IT Unemployment Rate	1	139	139	Fri	04:00	08.01.2010	30.07.2020
IT Unemployment Rate Quarterly	1	68	68	Fri	04:00	28.09.2004	12.06.2020
JP All Industry Activity Index	1	211	211	Fri	ON	23.01.2003	27.08.2020
JP BSI Large All Industry & JP BSI Large Manufacturing	2	70	140	Thu	ON	04.03.2004	11.06.2020
JP Bank Lending and Monetary Aggregates	5	233	604	Mon	ON	08.03.2002	11.08.2020
JP Bankruptcies	1	233	233	Mon	ON	14.03.2002	11.08.2020
JP CPI	12	289	1539	Fri	ON	02.04.2002	28.08.2020
JP Cabinet Office Indices	4	465	927	Fri	ON	07.03.2002	26.08.2020
JP Capacity Utilization & JP Industrial Production	4	465	1157	Fri	ON	15.03.2002	31.08.2020
JP Capital Spending and Company Earnings	4	73	206	Mon	ON	04.09.2003	27.07.2020
JP Consumer Confidence	3	207	282	Tue	ON	12.05.2004	31.08.2020

Description	Nid	Nt	Nr	Day	Time	First	Last
JP Convenience Store Sales	1	208	208	Mon	ON	20.02.2004	20.08.2020
JP Current Account	5	233	768	Mon	ON	14.03.2002	11.08.2020
JP Earnings Data	3	214	345	Tue	ON	01.10.2003	07.08.2020
JP Eco Watchters Survey	4	218	436	Mon	ON	09.06.2003	11.08.2020
JP Export Price Index & JP Import Price Index & JP PPI	6	233	590	Wed	ON	08.03.2002	13.08.2020
JP Foreign Investment	4	700	2750	Thu	ON	10.01.2007	27.08.2020
JP GDP and Components	9	156	678	Mon	ON	08.03.2002	17.08.2020
JP Household Spending & JP Overall Household Spending	3	233	262	Fri	ON	08.03.2002	07.08.2020
JP Household Spending and Employment Data	4	235	532	Fri	ON	02.04.2002	31.07.2020
JP Housing Loans	1	51	51	Thu	02:15	19.05.2008	13.08.2020
JP Housing Starts and Construction	3	235	669	Fri	ON	02.04.2002	31.08.2020
JP Loans, Discounts Corp	1	157	157	Mon	ON	14.05.2008	31.08.2020
JP M2 and M3	2	158	316	Tue	ON	09.06.2008	12.08.2020
JP Machine Orders	2	233	448	Thu	ON	11.03.2002	19.08.2020
JP Machine Tool Orders	1	457	457	Thu	ON	11.03.2002	27.08.2020
JP Manpower Survey	1	58	58	Tue	ON	11.12.2006	09.06.2020
JP Markit Services PMI & JP Markit/JMMA Composite PMI	2	116	230	Wed	ON	06.01.2014	21.08.2020
JP Markit/JMMA Manufacturing PMI	1	263	263	Fri	ON	30.11.2006	21.08.2020
JP Monetary Base	2	227	324	Tue	ON	02.10.2002	04.08.2020
JP Nationwide Dept Sales	1	232	232	Fri	ON	25.03.2002	21.08.2020
JP Official Reserve Assets	1	212	212	Fri	ON	07.02.2003	07.08.2020
JP PPI Services	1	232	232	Tue	ON	26.03.2002	26.08.2020
JP Retail Sales	3	230	666	Fri	ON	28.03.2002	31.08.2020
JP Small Business Confidence	1	186	186	Tue	ON	26.03.2002	27.09.2017
JP Supermarket Sales	1	189	189	Mon	ON	26.09.2005	21.08.2020
JP Tankan Surveys, Capital Spending and Company Profits	9	80	497	Mon	ON	02.04.2002	01.07.2020
JP Tertiary Industry Index	1	233	233	Fri	ON	20.03.2002	14.08.2020
JP Tokyo Avg Office Vacancies	1	132	132	Thu	ON	05.08.2010	06.08.2020
JP Tokyo Condominium Sales	1	232	232	Thu	ON	14.03.2002	20.08.2020
JP Tokyo Dept Store Sales	1	233	233	Fri	ON	15.03.2002	21.08.2020
JP Trade Balance	4	232	757	Wed	ON	20.03.2002	19.08.2020
JP Vehicle Production	1	219	219	Fri	ON	27.03.2002	31.08.2020
JP Vehicle Sales	1	234	234	Mon	ON	02.04.2002	03.08.2020
NL CPI & NL CPI EU Harmonized	8	256	806	Thu	03:30	08.03.2002	06.08.2020
NL Consumer Confidence	3	231	296	Tue	03:30	25.03.2002	20.08.2020
NL Consumer Spending	1	226	226	Fri	03:30	04.04.2002	20.08.2020
NL GDP	2	146	287	Thu	03:30	15.05.2003	14.08.2020
NL House Price Index	2	112	220	Fri	ON	21.02.2012	21.08.2020
NL Industrial Sales & NL Manufacturing Production	3	231	613	Fri	03:30	11.03.2002	07.08.2020
NL Producer Confidence	1	231	231	Tue	03:30	25.03.2002	28.08.2020
NL Retail Sales	2	230	230	Thu	03:30	13.03.2002	31.08.2020
NL Trade Balance	1	227	227	Fri	03:30	13.06.2002	14.08.2020
NL Unemployment Rate	4	230	250	Thu	03:30	19.03.2002	20.08.2020
NO CPI & NO CPI Underlying & NO PPI including Oil	6	236	1385	Fri	04:00	11.03.2002	10.08.2020
NO Consumer Confidence	1	51	51	Tue	ON	02.12.2008	13.08.2020
NO Credit Indicator Growth	1	222	222	Mon	04:00	03.09.2002	31.08.2020
NO Deposit Rates & NO Norwegian Overnight Rate	2	143	171	Wed	08:00	22.01.2003	20.08.2020
NO GDP & NO GDP Mainland	4	100	221	Tue	04:00	14.06.2002	25.08.2020
NO Ind Prod Manufacturing & NO Industrial Production	6	231	872	Fri	04:00	08.03.2002	07.08.2020
NO Manufacturing PMI	1	163	163	Mon	03:00	02.11.2007	03.08.2020
NO Norges Bank Daily FX Purchases	1	94	94	Fri	04:00	30.08.2013	31.08.2020
NO Retail Sales	5	241	383	Fri	04:00	08.03.2002	27.08.2020
NO Trade Balance	4	232	368	Mon	04:00	15.03.2002	17.08.2020
NO Unemployment Rate	1	232	232	Fri	04:00	04.03.2002	28.08.2020
NO Unemployment Rate AKU	1	207	207	Wed	04:00	28.11.2003	26.08.2020
PL Average Gross Wages & PL Employment	4	200	736	Tue	08:00	17.11.2004	19.08.2020
PL Base Rate Announcement	1	197	197	Wed	07:30	21.01.2004	14.07.2020
PL Budget Balance	3	221	471	Mon	09:00	18.03.2002	18.08.2020
PL CPI	2	290	580	Fri	08:00	15.03.2002	14.08.2020
PL Construction Output	1	81	81	Thu	08:00	17.10.2014	21.08.2020
PL Core CPI	4	208	416	Tue	08:00	26.08.2002	17.08.2020
PL Current Account	9	263	931	Fri	08:00	28.03.2002	13.08.2020
PL GDP	3	124	196	Fri	04:00	21.03.2002	31.08.2020
PL Monetary Aggregates	5	232	476	Fri	08:00	14.03.2002	24.08.2020
PL NBP Inflation Expectations	1	60	60	Fri	08:00	30.06.2011	30.06.2016
PL Official Reserves	1	140	140	Fri	08:00	07.10.2009	07.08.2020
PL PPI & PL Sold Industrial Output	4	234	927	Wed	08:00	18.03.2002	20.08.2020
PL Retail Sales & PL Retail Sales Real	3	226	523	Fri	04:00	20.09.2002	21.08.2020
PL Unemployment Rate & PL Unemployment Rate Quarterly	2	233	251	Tue	04:00	21.03.2002	25.08.2020
PT CPI & PT CPI EU Harmonized	8	272	1073	Wed	06:00	14.03.2002	31.08.2020
PT Construction Works Index	1	57	57	Tue	06:00	11.08.2008	11.07.2013
PT Consumer Confidence & PT Economic Climate Indicator	2	205	365	Thu	04:30	03.03.2004	28.08.2020
PT Current Account Balance	1	114	114	Thu	06:00	18.03.2002	20.08.2020

Table IA.2: Overview Macro News (continued)

Description	Nid	Nt	Nr	Day	Time	First	Last
PT GDP	2	134	266	Fri	06:00	30.04.2002	31.08.2020
PT Industrial Production	2	224	444	Fri	06:00	06.11.2002	30.07.2020
PT Industrial Sales	2	126	250	Tue	06:00	08.11.2002	08.07.2013
PT Labour Costs	1	66	66	Fri	06:00	21.05.2002	13.08.2020
PT PPI	2	231	462	Tue	06:00	27.03.2002	19.08.2020
PT Retail Sales	2	222	442	Fri	06:00	05.11.2002	28.08.2020
PT Trade Balance	1	211	211	Fri	06:00	04.12.2003	07.08.2020
PT Unemployment Rate	1	77	77	Wed	06:00	21.05.2002	05.08.2020
SE Average House Prices	1	142	142	Thu	03:30	14.02.2008	05.12.2019
SE Budget Balance	1	230	230	Fri	03:30	06.03.2002	07.08.2020
SE CPI	9	233	1145	Thu	03:30	14.03.2002	12.08.2020
SE Current Account Balance	1	81	81	Fri	03:30	13.03.2002	08.06.2020
SE GDP	2	95	190	Fri	03:30	07.03.2002	28.08.2020
SE Household Consumption	2	87	174	Fri	03:30	07.04.2014	10.08.2020
SE Household Lending	1	165	165	Thu	03:30	25.10.2007	27.08.2020
SE Industry Capacity	1	53	53	Fri	03:30	14.05.2008	21.08.2020
SE PES Unemployment Rate	1	199	199	Wed	ON	12.01.2005	11.08.2020
SE PMI Manufacturing	1	198	198	Mon	02:30	01.12.2004	03.08.2020
SE PMI Services & Composite	2	110	139	Wed	02:30	05.06.2012	05.08.2020
SE PPI	2	233	466	Thu	03:30	04.03.2002	25.08.2020
SE Production Indices	9	247	1110	Thu	03:30	19.03.2002	05.08.2020
SE Retail Sales	2	234	468	Fri	03:30	19.03.2002	27.08.2020
SE Service Production	2	84	168	Fri	03:30	06.12.2010	06.11.2017
SE Survey Confidence	6	235	602	Wed	03:00	04.03.2002	27.08.2020
SE Total No. of Employees	1	53	53	Thu	03:30	13.05.2008	20.08.2020
SE Trade Balance	1	232	232	Mon	03:30	25.03.2002	27.08.2020
SE Unemployment Rate & SE Unemployment Rate Trend	4	228	412	Thu	03:30	14.03.2002	20.08.2020
SE Wages Non-Manual Workers	1	144	144	Fri	03:30	30.05.2008	31.08.2020
UK BBA Loans for House Purchase	1	154	154	Tue	04:30	27.03.2007	27.01.2020
UK BRC Sales Like-For-Like	1	125	125	Tue	ON	08.03.2011	11.08.2020
UK BRC Shop Price Index	1	126	126	Wed	ON	09.03.2011	29.07.2020
UK CBI Sales	2	132	196	Thu	06:00	27.07.2010	25.08.2020
UK CBI Surveys	3	133	300	Thu	06:00	17.06.2010	21.08.2020
UK Car Prod.	2	61	122	Thu	04:30	23.04.2002	24.05.2007
UK Coincident and Leading Indicator	2	67	127	Wed	10:30	24.07.2002	11.03.2008
UK Construction Output	2	96	192	Fri	04:30	09.08.2013	12.08.2020
UK Expenditure Data	12	252	1026	Fri	04:30	27.03.2002	12.08.2020
UK GfK Consumer Confidence	1	236	236	Fri	ON	27.03.2002	21.08.2020
UK Halifax House Prices	4	212	421	Thu	03:00	07.03.2002	07.08.2019
UK Hometrack Housing Survey	2	72	140	Mon	ON	29.09.2008	26.09.2014
UK House Price Index	1	60	60	Wed	04:30	19.07.2016	19.08.2020
UK Index of Services	2	178	308	Fri	04:30	20.10.2006	12.08.2020
UK Industrial Production & UK Manufacturing Production	4	233	932	Tue	04:30	12.03.2002	12.08.2020
UK Jobs Report	9	232	1335	Wed	04:30	20.03.2002	11.08.2020
UK Lloyds Business Barometer	2	123	123	Fri	ON	28.03.2011	28.08.2020
UK Markit UK PMI Manufacturing	1	229	229	Mon	04:30	04.05.2004	21.08.2020
UK Markit/CIPS UK Construction PMI	1	197	197	Tue	04:30	05.05.2004	06.08.2020
UK Monetary Aggregates	17	508	2408	Tue	04:30	04.03.2002	21.08.2020
UK NIESR GDP Estimate	1	175	175	Tue	10:00	08.09.2003	11.06.2018
UK Nationwide Consumer Confidence	2	82	82	Wed	ON	07.09.2005	15.06.2012
UK Nationwide House Prices	2	232	464	Thu	ON	04.04.2002	31.07.2020
UK New Car Registrations	1	149	149	Thu	04:00	05.03.2009	05.08.2020
UK ONS House Price	1	150	150	Tue	04:30	08.12.2003	17.05.2016
UK Official Reserves Changes	1	230	230	Wed	04:30	05.03.2002	05.08.2020
UK PMI and Official Reserves	2	228	337	Wed	04:30	06.05.2004	21.08.2020
UK Price Indices	19	359	2862	Tue	04:30	11.03.2002	19.08.2020
UK RICS House Price Balance	1	210	210	Tue	ON	17.02.2004	13.08.2020
UK Retail Sales Ex Auto & UK Retail Sales Incl. Auto	4	232	736	Thu	04:30	21.03.2002	21.08.2020
UK Rightmove House Prices	2	190	378	Mon	ON	20.06.2005	17.08.2020
UK Total Business Investment	2	150	298	Thu	04:30	26.03.2002	12.08.2020
UK Trade Balance	4	233	644	Tue	04:30	11.03.2002	12.08.2020
US ADP Employment Change	1	181	181	Wed	08:15	02.08.2006	05.08.2020
US Budget Statement	1	233	233	Wed	14:00	21.03.2002	12.08.2020
US Building Permits & US Housing Starts	4	231	729	Tue	08:30	20.03.2002	18.08.2020
US Business Inventories	1	232	232	Fri	10:00	14.03.2002	14.08.2020
US CPI and Earnings Data	9	233	1459	Wed	08:30	21.03.2002	12.08.2020
US Car Sales	2	97	172	Wed	ON	04.03.2002	03.06.2020
US Challenger Job Cuts	1	177	177	Thu	07:30	05.12.2006	06.08.2020
US Chicago Purchasing Manager	1	231	231	Fri	09:45	28.03.2002	28.08.2020
US Conference Board Indices	3	232	340	Tue	10:00	26.03.2002	25.08.2020
US Confidence Indicator and Mortgage Applications	2	903	928	Wed	07:00	14.01.2004	26.08.2020
US Consumer Credit	1	233	233	Fri	15:00	08.03.2002	07.08.2020
US Current Account Balance	1	78	78	Thu	08:30	14.03.2002	19.06.2020

Table IA.2: Overview Macro News (continued)

Description	Nid	Nt	Nr	Day	Time	First	Last
US Durable Goods	6	464	1307	Thu	10:00	06.03.2002	26.08.2020
US EIA Weekly Petroleum Report	1	965	965	Wed	10:30	06.03.2002	26.08.2020
US Empire Manufacturing	1	224	224	Mon	08:30	15.11.2002	17.08.2020
US Employment Cost Index	1	77	77	Fri	08:30	25.04.2002	31.07.2020
US Employment Report	14	233	1911	Fri	08:30	08.03.2002	07.08.2020
US Existing Home Sales	2	232	413	Thu	10:00	25.03.2002	21.08.2020
US Export and Import Prices	5	231	610	Thu	08:30	14.03.2002	13.08.2020
US FHFA House Prices	2	159	209	Tue	09:00	25.03.2008	25.08.2020
US GDP, GDP Price Index, PCE	5	224	554	Thu	08:30	26.04.2002	27.08.2020
US Help Wanted Index	1	66	66	Thu	10:00	30.01.2003	26.06.2008
US IBD/TIPP Economic Optimism	1	126	126	Tue	10:00	11.07.2006	06.12.2016
US ICSC Chain Store Sales	2	60	60	Thu	10:30	12.04.2007	06.09.2012
US ISM Milwaukee	1	105	105	Fri	10:00	31.07.2007	29.04.2016
US ISM New York	1	59	59	Tue	09:45	02.02.2012	02.12.2016
US ISM Non-Manufacturing	1	233	233	Wed	10:00	05.03.2002	05.08.2020
US ISM Releases	5	254	824	Mon	10:00	01.03.2002	03.08.2020
US Inventories and Trade Balance	4	299	510	Fri	10:00	11.03.2002	28.08.2020
US JOLTS Job Openings	1	129	129	Tue	10:00	09.11.2010	10.08.2020
US Jobless Claims	2	1012	2002	Thu	08:30	07.03.2002	27.08.2020
US Leading Index	1	232	232	Thu	10:00	21.03.2002	20.08.2020
US Markit US Composite PMI & US Markit US Services PMI	2	177	353	Wed	09:45	26.03.2014	21.08.2020
US Markit US Manufacturing PMI	1	221	221	Mon	09:45	24.05.2012	21.08.2020
US Mortgage Foreclosures and Delinquencies	2	56	100	Thu	10:00	15.06.2007	17.08.2020
US NAHB Housing Market Index	1	219	219	Mon	10:00	15.04.2003	17.08.2020
US NFIB Small Business Optimism	1	141	141	Tue	07:30	10.11.2009	11.08.2020
US Net Long-term TIC Flows & US Total Net TIC Flows	2	200	375	Tue	09:00	18.10.2004	17.08.2020
US New Home Sales	2	230	410	Wed	10:00	27.03.2002	25.08.2020
US Nonfarm Productivity & US Unit Labor Costs	2	154	308	Thu	08:30	07.03.2002	14.08.2020
US PCE, Personal Income and Spending	7	234	1253	Fri	08:30	01.03.2002	28.08.2020
US PPI	8	233	1075	Tue	08:30	15.03.2002	11.08.2020
US Pending Home Sales	2	194	338	Thu	10:00	02.05.2005	27.08.2020
US Production and Capacity Utilization	3	232	575	Fri	09:15	15.03.2002	14.08.2020
US Retail Sales	4	232	721	Fri	08:30	13.03.2002	14.08.2020
US S&P Case-Shiller Index	6	175	724	Tue	09:00	27.12.2006	25.08.2020
US Survey Confidence	3	911	1397	Thu	09:45	28.01.2004	27.08.2020
US Trade Balance	1	233	233	Thu	08:30	19.03.2002	05.08.2020
US University of Michigan Surveys	5	465	1089	Fri	09:45	01.03.2002	28.08.2020
Total: 382	1,026	76,099	149,574				

The first column contains the country code and description of each news series. The data covers eleven euro area countries (AT Austria, BE Belgium, DE Germany, EA euro area aggregate, ES Spain, FR France, GR Greece, IE Ireland, IT Italy, NL Netherlands, PT Portugal), six other European countries (CH Switzerland, DK Denmark, NO Norway, PL Poland, SE Sweden, UK United Kingdom), two Asian countries (CN China, JP Japan) and the US. Nid refers to the number of underlying data series or transformations, Nt refers to the total number of unique release periods, and Nr refers to the total number of underlying data points. The remaining columns contain the most common release day, the most common release time (ON indicates overnight), and the first and last release in our sample.

Table IA.3: Overview Bond Auction News

Description	N	Day	Time	First	Last
DE Auction Issuance Plan	18	Thu	04:00	19.12.2002	19.12.2019
DE Auction Result Bill	310	Mon	05:30	10.01.2005	24.08.2020
DE Auction Result Bond	104	Wed	05:30	26.01.2005	26.08.2020
DE Auction Result Note	561	Wed	05:30	05.01.2005	25.08.2020
ES Auction Result Bond or Note	373	Thu	04:30	20.10.2005	06.08.2020
ES Auction Result Bill	376	Tue	04:30	19.10.2005	25.08.2020
FR Auction Result Bond or Note	483	Thu	04:45	02.01.2004	20.08.2020
FR Auction Result Bill	1196	Mon	09:00	29.11.2004	31.08.2020
IT Auction Result Bond or Note	594	Thu	05:00	13.09.2005	28.08.2020
IT Auction Result Bill	408	Wed	05:00	12.09.2005	27.08.2020
US Auction Announcement Bill	1933	Thu	11:00	04.03.2002	27.08.2020
US Auction Announcement Bond	192	Thu	11:00	22.07.2004	13.08.2020
US Auction Announcement Note	543	Thu	11:00	21.03.2002	20.08.2020
US Auction Result Bill	2282	Tue	11:30	05.03.2002	31.08.2020
US Auction Result Bond	193	Thu	13:00	27.07.2004	20.08.2020
US Auction Result Note	1132	Wed	13:00	27.03.2002	27.08.2020
Total: 16	10698				

N refers to the number of releases. The remaining columns contain the most common release day, the most common release time, and the first and last release in our sample.

Table IA.4: Overview over Types of Central Bank Announcements

Central Bank	Press Release	Press Conference[1]	Speech[1]	Ad Hoc Press Release	Minutes	Other
Fed	Federal Open Market Committee (FOMC)		Chair[2]	✓	✓	Beige Book Releases,[3] Discount Rate Minutes, Statements by other FOMC members
ECB	Governing Council (GC)		President[4]	✓	✓	Economic Bulletin,[5] Statements by other GC members
BoE	Monetary Policy Committee		Governor	✓	✓[6]	Inflation Reports[6]
BoJ	Policy Board		Governor	✓	✓	Monthly Report,[7] Summary of Opinion
SNB	Governing Board		Chairman[8]	×	×	Quarterly Bulletin[9]
Riksbank	Executive Board		×	×	✓	×
BoC	✓	×	×	×	×	×
RBA	✓	×	×	×	×	×

[1] When we have no exact timestamp for the end of press conferences or speeches, we set the window end to +60min after the event start, otherwise to +15min after the event end. For all other events, we use the usual $[-15, +30]$ minute window.

[2] Includes testimonies by the Federal Reserve Chair before Congress.

[3] Includes releases of the Monetary Policy Report and of the Prepared Testimony Statement, if those did not occur simultaneously with the testimony.

[4] Includes hearings by the ECB President at the European Parliament.

[5] Called "Monthly Bulletin" prior to 2015.

[6] Prior to May 2015, BoE Inflation Report events also cover the subsequent press conference. Since August 2015, BoE minutes and Inflation Reports are released simultaneously with scheduled MPC decisions; since November 2019, "Inflation Report" replaced by "Monetary Policy Report".

[7] Report of Recent Economic and Financial Developments (till 2015), Outlook Report (since 2016). The Monthly Report consists of two parts. Till June 2008, the "The Bank's View" summary was released prior to "The Background" document. From July 2008 till the end of 2015, both parts were released sim-ultaneously. Since 2016 both documents are again released separately and "The Bank's View" is released simultaneously with the policy decision press re-lease.

[8] Includes annual General Meeting of Shareholders.

[9] Previously called "Monetary Policy Report".

Table IA.5: Overview Central Bank News

Description	N	N*	Day	Time	First	Last
Fed: Press Release	155	8	Wed	14:00	20.03.2002	29.07.2020
Fed: Press Conference	46	2	Wed	14:30	27.04.2011	29.07.2020
Fed: Speech by Chair	239	129	Wed	10:00	07.03.2002	27.08.2020
Fed: Ad Hoc Press Release	56	56	Mon	02:15	17.08.2007	12.08.2020
Fed: Minutes	149	0	Wed	14:00	22.03.2002	19.08.2020
Fed: Beige Book	165	0	Wed	14:00	07.03.2002	15.07.2020
Fed: Discount Rate Minutes	147	0	Tue	14:00	02.04.2002	25.08.2020
Fed: Statement by FOMC member	22	22	Fri	09:00	28.06.2013	23.09.2019
ECB: Press Release	202	3	Thu	07:45	07.03.2002	16.07.2020
ECB: Press Conference	195	1	Thu	08:30	07.03.2002	16.07.2020
ECB: Speech by President	576	491	Mon	ON	19.04.2002	26.06.2020
ECB: Ad Hoc Press Release	99	99	Thu	02:15	24.10.2002	26.06.2020
ECB: Accounts	45	0	Thu	07:30	19.02.2015	20.08.2020
ECB: Economic Bulletin	199	0	Thu	04:00	14.03.2002	30.07.2020
ECB: Statement by GC member	36	36	Fri	02:15	28.10.2002	19.05.2020
ECB: MRO	887	0	Tue	05:15	15.03.2002	25.08.2020
ECB: (T)LTRO	343	0	Wed	05:15	24.04.2002	26.08.2020
ECB: other Refi Op	744	0	Wed	04:45	08.11.2004	28.08.2020
ECB: (T)LTRO Repayment	122	0	Fri	06:00	25.01.2013	01.06.2020
ECB: Weekly Financial Statement	946	0	Tue	09:00	01.03.2002	25.08.2020
ECB: Securities Markets Programme	120	0	Mon	09:30	17.05.2010	03.09.2012
ECB: Asset Purchase Programmes	205	0	Mon	09:45	26.01.2015	25.05.2020
BoE: Press Release	207	4	Thu	07:00	07.03.2002	06.08.2020
BoE: Press Conference	22	0	Thu	07:30	06.08.2015	06.08.2020
BoE: Speech by Governor	43	43	Tue	05:15	20.09.2002	28.08.2020
BoE: Ad Hoc Press Release	22	22	Tue	09:00	11.03.2008	17.06.2014
BoE: Minutes	154	0	Wed	04:30	20.03.2002	13.03.2020
BoE: Inflation Reports	53	0	Wed	05:30	15.05.2002	13.05.2015
BoJ: Press Release	246	10	Tue	02:15	20.03.2002	15.07.2020
BoJ: Press Conference	82	3	Tue	02:30	17.07.2003	15.07.2020
BoJ: Speech by Governor	6	6	Thu	02:15	12.08.2010	23.02.2012
BoJ: Ad Hoc Press Release	15	15	Mon	02:15	30.10.2002	06.07.2015
BoJ: Minutes	221	0	Fri	02:15	05.03.2002	20.07.2020
BoJ: Monthly Report	183	0	Wed	02:15	22.03.2002	16.07.2020
BoJ: Summary of Opinions	38	0	Mon	02:15	08.01.2016	27.07.2020
SNB: Press Release	84	14	Thu	03:30	21.03.2002	18.06.2020
SNB: Press Conference	40	2	Thu	04:00	14.06.2002	18.06.2020
SNB: Speech by Chair	10	4	Fri	04:00	17.03.2003	26.04.2019
SNB: Quarterly Bulletin	55	0	Wed	09:00	09.01.2007	24.06.2020
Riksbank: Press Release	125	5	Thu	03:30	19.03.2002	01.07.2020
Riksbank: Press Conference	109	0	Thu	05:00	26.04.2002	01.07.2020
Riksbank: Minutes	128	0	Wed	03:30	08.04.2002	10.07.2020
BoC: Press Release	148	0	Wed	09:00	05.03.2002	15.07.2020
RBA: Press Release	205	0	Tue	02:15	06.03.2002	04.08.2020
Total: 44	7894					

N refers to the number of events, N^* to the number of unscheduled events. The remaining columns contain the most common release day, the most common release time (ON indicates overnight), and the first and last release in our sample.

B.2. Other news sources and classification

Beyond Bloomberg, we gather macroeconomic data releases from various other sources.

US Treasury Auctions. For each auction, we extract the exact timestamps of the announcement and of the publication of the auction results from the Treasury website.[23]

German Bond Auctions. Data is from the website of the German debt management agency.[24] In 2012, the usual release time of auction results changed from shortly after 11:00 a.m. to shortly after 11:30 a.m.

ECB Releases. We use the ECB website to obtain dates of various data releases, such as the Bank Lending Survey and the Survey of Professional Forecasters,[25] the ECB's weekly financial statements,[26] announcements regarding open market operations,[27], various ad hoc announcements,[28] and speeches by the ECB president and other ECB Governing Council members.[29]

Fed Releases. Most releases are from the Federal Reserve website.[30] Some speeches, especially those by FOMC members other than the FOMC Chair are from the Federal Reserve Bank of St. Louis' "FOMC Speak" database.[31]

WPS. Data for "Weekly Petroleum Status Reports" are from the US Energy Information Administration (EIA) website.[32] In March 2003, the release time changed from 9:00 a.m. to 10:30 a.m.[33] Since September 2008, releases that do not occur on Wednesdays are released at 11:00 a.m.

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[23]https://www.treasurydirect.gov/instit/annceresult/press/preanre/preanre.htm
[24]https://www.deutsche-finanzagentur.de
[25]https://www.ecb.europa.eu/stats/ecb_surveys/html/index.en.html
[26]https://www.ecb.europa.eu/press/pr/wfs/html/index.en.html
[27]https://www.ecb.europa.eu/mopo/implement/omo/html/top_history.en.html
[28]https://www.ecb.europa.eu/mopo/implement/omo/html/communication-history.en.html
[29]https://www.ecb.europa.eu/press/key/html/downloads.en.html
[30]https://www.federalreserve.gov/newsevents/pressreleases.htm
[31]https://www.stlouisfed.org/fomcspeak
[32]https://www.eia.gov/petroleum/supply/weekly/schedule.php
[33]https://www.govinfo.gov/content/pkg/FR-2003-02-12/pdf/03-3480.pdf

Table IA.6: Overview Ad hoc News

Description	N	Day	First	Last
Iraq War	19	Mon	23.09.2002	07.04.2003
Global Financial Crisis	123	Mon	24.07.2007	27.12.2010
European Sovereign Debt Crisis	638	Mon	14.07.2009	26.11.2018
Covid-19	23	Fri	31.01.2020	21.07.2020
Sovereign Credit Ratings	128	Fri	02.05.2006	28.04.2020
OPEC	27	Wed	24.09.2003	09.03.2020
Trump	85	Tue	05.12.2016	12.05.2020
Other Unscheduled Event	65	Tue	18.04.2002	05.05.2020
Total: 8	1108			

N refers to the number of unique events. The remaining columns contain the most common event day and the first and last event in our sample.

Table IA.7: Classification of News into Economic Categories

News Type	Growth	Inflation	Fiscal	Money	Ad Hoc
AT Industrial Production	x				
AT PPI		x			
BE CPI		x			
BE Unemployment Rate	x				
DE Auction Result Bond			x		
DE Auction Result Note			x		
DE CPI Baden Wuerttemberg		x			
DE CPI Hesse		x			
DE CPI Saxony		x			
DE Factory Orders	x				
DE IFO Survey	x				
DE PPI		x			
DE Unemployment Change & DE Unemployment Rate	x				
EA Car Registrations	x				
EA Construction Output	x				
EA Country-level Services PMI (DE, FR, IT)	x				
EA Employment	x				
EA GDP	x				
EA Industrial Production	x				
EA PPI		x			
EA Sentix Investor Confidence	x				
EA ZEW Survey	x				
ES CPI & ES CPI Core & ES CPI EU Harmonised		x			
ES Hotel Occupancy & ES Hotel Price Index		x			
ES Housing Permits	x				
ES Industrial Output & ES Industrial Production	x				
ES Labour Costs		x			
ES Markit Composite PMI & ES Markit Services PMI	x				
ES Markit Manufacturing PMI	x				
ES PPI		x			
ES Unemployment Net	x				
ES Unemployment Rate	x				
FI Consumer Confidence	x				
FI Exports (EUR) & FI Imports (EUR) & FI Trade Balance	x				
FR Auction Result Bond or Note			x		
FR Banque de France business sentiment survey	x				
FR Budget Balance			x		
FR CPI and Wages		x			
FR Consumer Confidence	x				
FR Consumer Spending	x				
FR Housing Permits & FR Housing Starts	x				
FR Industrial Production & FR Manufacturing Production	x				
FR Manufacturing and Business Confidence	x				
FR Non-Farm Payrolls & FR Wages	x	x			
FR Trade Balance	x				
FR Unemployment Data	x				
GR Current Account Balance	x				
GR Unemployment Rate	x				
IE CPI & IE CPI EU Harmonized		x			
IT Budget Balance			x		
IT CPI		x			
IT CPI FOI Index Ex Tobacco		x			
IT Current Account Balance	x				
IT General Government Debt	x		x		
IT Industrial Production	x				
IT PPI		x			
IT Trade Balance Non-Eu (Euros)	x				
IT Unemployment Rate	x				
NL Trade Balance	x				
NL Unemployment Rate	x				
PT Current Account Balance	x				

Table IA.7: Classification of News into Economic Categories (continued)

News Type	Growth	Inflation	Fiscal	Money	Ad Hoc
PT Industrial Sales	x				
CH CPI		x			
CH Money Supply M3				x	
CH Producer, Import Prices		x			
CH Retail Sales	x				
CH Sight Deposits				x	
CH Unemployment Rate	x				
DK CPI & DK CPI EU Harmonized		x			
DK Industrial Production and Orders	x				
DK PPI		x			
DK Retail Sales	x				
DK Unemployment Rate	x				
DK Wholesale Price Index		x			
NO GDP & NO GDP Mainland	x				
NO Manufacturing PMI	x				
PL Monetary Aggregates				x	
SE Budget Balance			x		
SE CPI		x			
SE PMI Manufacturing	x				
SE PMI Services & Composite	x				
SE Service Production	x				
SE Survey Confidence	x				
SE Trade Balance	x				
UK Car Prod.	x				
UK Coincident and Leading Indicator	x				
UK Expenditure Data	x				
UK Halifax House Prices		x			
UK Hometrack Housing Survey	x				
UK Markit UK PMI Manufacturing	x				
UK Monetary Aggregates				x	
UK Official Reserves Changes				x	
UK Price Indices		x			
UK Trade Balance	x				
US Auction Announcement Bill			x		
US Auction Result Bill			x		
US Auction Result Bond			x		
US Auction Result Note			x		
US ADP Employment Change	x				
US Building Permits & US Housing Starts	x				
US Business Inventories	x				
US CPI and Earnings Data	x	x			
US Car Sales	x				
US Chicago Purchasing Manager	x				
US Conference Board Indices	x				
US Consumer Credit	x				
US Durable Goods	x				
US Empire Manufacturing	x				
US Employment Cost Index		x			
US Employment Report	x	x			
US Existing Home Sales	x	x			
US Export and Import Prices		x			
US GDP, GDP Price Index, PCE	x	x			
US Help Wanted Index	x				
US ISM Non-Manufacturing	x				
US ISM Releases	x				
US Inventories and Trade Balance	x				
US Jobless Claims	x				
US Leading Index	x				
US New Home Sales	x	x			
US Nonfarm Productivity & US Unit Labor Costs	x	x			
US PCE, Personal Income and Spending	x	x			

Table IA.7: Classification of News into Economic Categories (continued)

News Type	Growth	Inflation	Fiscal	Money	Ad Hoc
US PPI		x			
US Production and Capacity Utilization	x				
US Retail Sales	x				
US Survey Confidence	x				
US University of Michigan Surveys	x				
CN Actual FDI & CN Contract FDI Cumulative	x				
CN Economic Indices	x	x			
CN GDP and Other Macro Aggregates	x				
CN HSBC Manufacturing PMI	x				
JP Bankruptcies	x				
JP CPI		x			
JP Cabinet Office Indices	x				
JP Convenience Store Sales	x				
JP Export Price Index & JP Import Price Index & JP PPI		x			
JP Machine Tool Orders	x				
JP PPI Services		x			
JP Retail Sales	x				
JP Vehicle Sales	x				
Fed: Press Release				x	
Fed: Press Conference				x	
Fed: Speech by Chair				x	
Fed: Ad Hoc Press Release				x	
Fed: Minutes				x	
Fed: Beige Book				x	
Fed: Discount Rate Minutes				x	
Fed: Statement by FOMC member				x	
ECB: Press Release				x	
ECB: Press Conference				x	
ECB: Ad Hoc Press Release				x	
ECB: Statement by GC member				x	
ECB: (T)LTRO				x	
ECB: (T)LTRO Repayment				x	
ECB: Securities Markets Programme				x	
ECB: Asset Purchase Programmes				x	
BoE: Press Release				x	
BoE: Speech by Governor				x	
BoE: Ad Hoc Press Release				x	
BoE: Inflation Reports				x	
BoJ: Press Release				x	
BoJ: Speech by Governor				x	
BoJ: Ad Hoc Press Release				x	
BoJ: Monthly Report				x	
SNB: Press Conference				x	
BoC: Press Release				x	
Iraq War					x
Global Financial Crisis					x
European Sovereign Debt Crisis					x
Covid-19					x
Sovereign Credit Ratings					x
OPEC					x
Trump					x
Other Unscheduled Event					x

Classification of news into economic categories, used for the decompositions in Section 3.5. The table contains all unscheduled news and all scheduled news that have a significant impact at the 10% level on at least one asset.

C. Further Results

This Section provides tables and figures on additional results and robustness checks discussed in the main text of the paper.
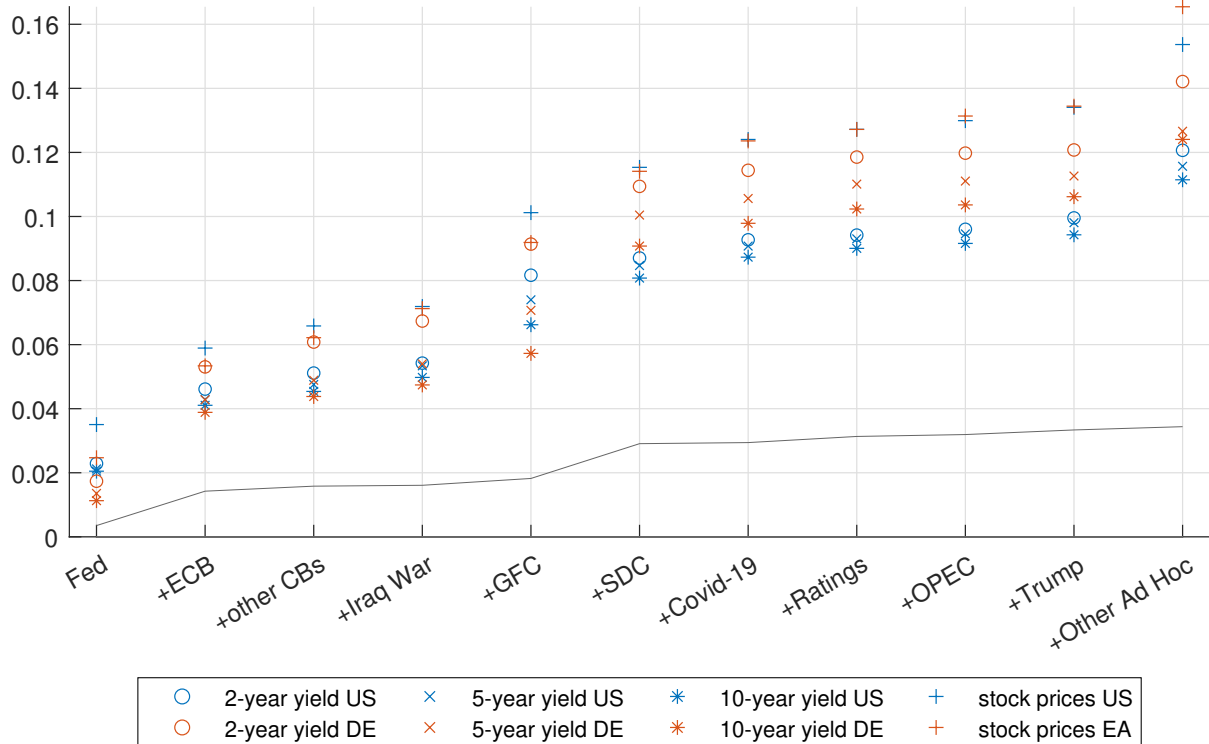
Figure IA.2: Variance shares of unscheduled news. Each symbol refers to the cumulative variance of an asset around selected events, divided by the total variance of the asset, as in Equation (3). The first entry on the x-axis refers to all unscheduled news by the Federal Reserve (such as ad hoc press releases and speeches). The next entries on the x-axis sequentially add other unscheduled news, namely by the European Central Bank, the six other central banks in our dataset (see Table IA.5) and non-monetary ad hoc events (see Table IA.6, "GFC" refers to the Global Financial Crisis, "SDC" to the European Sovereign Debt Crisis, and "Ratings" to Sovereign Credit Ratings). For reference, the solid black lines show the percent of observations covered. The end points are equivalent to the first entries in Figure 2.

Table IA.8: T-Statistics of Scheduled Releases from Dummy Regression

News Type	y_{2y}^{US}	y_{5y}^{US}	y_{10y}^{US}	y_s^{US}	y_{2y}^{EA}	y_{5y}^{EA}	y_{10y}^{EA}	y_s^{EA}
AT Bank Manufacturing PMI	-1.5	-2.0	-1.2	0.2	-1.5	-1.7	-1.5	-0.7
AT CPI	0.5	-0.1	0.3	-0.2	-0.1	0.3	1.1	1.4
AT GDP	-1.8	-2.0	-1.0	-0.5	-1.4	-1.6	-1.9	-0.7
AT Industrial Production	0.1	0.6	0.6	0.8	**2.0**	1.1	0.3	1.2
AT PPI	1.3	**2.9**	**3.2**	0.3	1.6	**2.3**	**2.9**	0.5
AT Wholesale Price Index	-0.1	0.7	0.6	-1.2	-0.4	1.2	0.7	0.7
BE Budget Balance	-0.7	0.8	0.7	0.1	-0.6	-0.3	-0.5	1.0
BE Business Confidence	-1.8	-1.8	-1.5	-3.6	-1.2	-0.4	0.2	-2.7
BE CPI	0.4	1.3	1.3	-0.7	**1.7**	1.4	1.6	-0.6

Table IA.8: T-Statistics of Scheduled Releases from Dummy Regression (continued)

News Type	y_{2y}^{US}	y_{5y}^{US}	y_{10y}^{US}	y_{s}^{US}	y_{2y}^{EA}	y_{5y}^{EA}	y_{10y}^{EA}	y_{s}^{EA}
BE Consumer Confidence	-1.6	-0.5	0.6	-5.0	-0.7	-0.9	0.4	-3.7
BE GDP	-1.9	-1.1	-1.4	-4.5	-0.7	-0.5	-0.2	-1.6
BE Trade Balance	0.3	-0.3	0.2	0.9	0.7	0.7	-0.3	1.2
BE Unemployment Rate	0.5	0.7	0.9	**2.4**	-0.5	1.1	1.6	1.3
DE Auction Issuance Plan	-1.4	-1.0	-2.1	0.1	-2.1	-0.9	-1.3	-0.6
DE Auction Result Bill	1.4	-0.3	-0.3	1.6	1.6	1.0	-0.0	1.0
DE Auction Result Bond	1.3	0.3	1.5	-2.9	-0.8	1.2	**1.7**	-2.0
DE Auction Result Note	1.6	1.4	**2.6**	-0.6	**3.0**	**5.1**	**4.3**	-3.1
DE CPI	-1.2	-1.4	-1.3	-0.7	1.3	0.5	-0.1	-0.6
DE CPI Baden Wuerttemberg	-0.7	-0.7	-1.3	**1.8**	0.1	0.8	0.6	**2.5**
DE CPI Bavaria	0.8	-0.1	0.9	-0.3	0.1	-0.3	0.1	-0.7
DE CPI Brandenburg	-1.1	-0.9	-0.3	0.3	-0.4	-0.3	1.0	1.4
DE CPI Hesse	1.4	**2.4**	1.4	-0.3	1.1	**2.2**	**1.8**	-1.2
DE CPI North Rhine Westphalia	0.5	0.6	0.1	0.3	0.9	0.3	-0.3	1.1
DE CPI Saxony	0.3	0.5	0.2	0.3	**2.0**	1.5	1.6	0.8
DE Expenditure Data	-0.0	-0.2	-0.3	-1.3	0.8	0.7	-0.6	-0.9
DE Factory Orders	1.3	**2.0**	1.9	**2.0**	1.2	**1.7**	**2.1**	**1.7**
DE GDP	-0.8	-0.8	-0.2	0.3	-0.8	0.2	0.3	0.2
DE GfK Consumer Confidence	-0.8	-0.8	-0.6	-0.9	0.1	-0.9	-0.9	-1.5
DE IFO Survey	**1.8**	**2.5**	**3.6**	1.2	**6.0**	**7.0**	**6.3**	**2.8**
DE Import Price Index	-0.3	0.2	-0.3	-0.4	0.7	0.9	0.9	-0.3
DE Industrial Production	1.6	0.5	-0.5	0.6	0.7	0.6	0.6	1.0
DE Markit Construction PMI	-1.4	-0.1	0.5	0.4	-1.1	-0.9	0.2	0.3
DE PPI	1.0	0.8	1.0	0.1	**1.7**	**1.8**	**1.7**	1.2
DE Retail Sales	0.5	-1.1	-1.7	0.6	1.1	0.0	-1.1	0.4
DE Unemployment Change & DE Unemployment Rate	0.1	0.7	0.3	0.5	**1.8**	1.2	1.1	**2.0**
DE Wholesale Price Index	0.1	1.1	1.1	0.2	1.2	1.3	1.2	0.0
EA Bank Lending Survey	-0.7	-0.6	0.0	-0.7	1.2	0.2	-1.0	-0.5
EA CPI	-0.5	-0.5	-1.5	-0.0	0.3	-0.7	-1.3	0.7
EA CPI Core & EA CPI Estimate	0.1	-0.7	-1.2	-0.6	-0.1	0.7	-0.0	0.9
EA Car Registrations	1.1	**2.1**	**1.8**	-0.6	-0.6	1.1	1.5	-0.5
EA Construction Output	-0.9	-0.9	-1.2	-1.1	**2.1**	1.5	0.0	-1.9
EA Consumer Confidence	-2.2	-1.5	-1.2	-1.5	-3.4	-2.3	-1.7	-1.1
EA Country-level Services PMI (DE, FR, IT)	0.7	**2.0**	**2.3**	0.1	**2.6**	**4.7**	**5.8**	**2.2**
EA Current Account	-1.6	-0.4	-0.3	-0.9	-0.5	0.2	0.9	0.1
EA EC Surveys	0.0	0.2	1.1	-0.9	-0.2	-0.5	0.2	-1.0
EA Employment	-1.5	-0.7	-0.5	-1.0	1.1	0.9	**1.8**	-2.0
EA GDP	-1.7	0.0	0.0	-1.9	**1.9**	0.9	1.1	0.1
EA GDP Components	0.2	-1.0	-1.7	0.3	-0.4	-1.5	-0.7	0.0
EA Industrial New Orders	-0.9	-1.6	-1.2	-2.1	1.3	0.9	0.4	-0.7
EA Industrial Production	0.6	**1.9**	**1.8**	**1.9**	0.8	**1.9**	1.1	1.6
EA Labour Costs	-1.5	-1.9	-1.3	-0.1	1.0	0.3	0.1	1.0
EA M3 & EA M3 Money Supply	-0.1	-0.1	0.4	1.0	0.9	0.8	0.5	-0.2
EA PMI (EA, GR)	-0.3	-1.3	-1.0	0.1	0.8	-1.0	-2.4	-0.2
EA PPI	0.3	**2.0**	1.5	1.4	**2.0**	**2.1**	**1.7**	1.6
EA Retail PMI (incl. country-level releases)	1.0	-0.0	1.0	-0.8	0.4	-0.0	-0.2	-0.2
EA Retail Sales & EA Retail Trade	-0.3	0.2	-0.6	-0.1	1.1	0.7	0.6	0.6
EA Sentix Investor Confidence	1.6	1.1	-0.2	**2.4**	1.1	1.1	1.1	**1.9**
EA Survey of Professional Forecasters	0.6	0.5	0.9	-0.7	-2.1	-1.1	-1.0	-1.5
EA Trade Balance	-0.1	-0.0	0.3	0.1	-0.1	0.2	0.6	1.2
EA Unemployment Rate	-0.8	-1.2	-0.9	-2.1	-0.4	-1.1	-1.2	-2.5
EA ZEW Survey	**1.8**	**1.9**	**2.9**	1.0	**3.4**	**4.8**	**4.8**	**1.7**
ES Auction Result Bond or Note	0.1	-0.8	-1.2	1.0	0.9	1.4	0.8	-1.6
ES Auction Result Bill	1.3	-0.7	-1.4	-3.2	-2.9	-3.1	-2.2	-4.5
ES Budget Balance	-2.4	-1.7	-2.0	-1.0	-1.3	-3.2	-1.0	-1.4
ES CPI & ES CPI Core & ES CPI EU Harmonised	0.9	0.1	0.1	1.5	0.7	0.9	0.9	**1.9**
ES Consumer Confidence	-1.0	-1.3	-1.4	-1.9	0.5	0.3	0.3	-0.8
ES Current Account Balance	-1.1	-0.1	-0.4	-0.1	-0.6	0.3	0.3	-1.1
ES GDP	0.8	-0.4	-0.6	0.1	0.4	1.0	1.4	0.4
ES Hotel Occupancy & ES Hotel Price Index	0.7	1.0	1.0	1.2	1.5	**2.1**	**2.1**	0.4
ES House Mortgage Approvals & ES Total Mortgage Lending	-0.1	-0.1	-0.5	0.4	-0.3	0.1	1.1	1.1
ES House transactions	-0.9	-0.8	-0.7	-1.6	0.9	0.7	0.1	0.9

Table IA.8: T-Statistics of Scheduled Releases from Dummy Regression (continued)

News Type	y_{2y}^{US}	y_{5y}^{US}	y_{10y}^{US}	y_s^{US}	y_{2y}^{EA}	y_{5y}^{EA}	y_{10y}^{EA}	y_s^{EA}
ES Housing Permits	0.7	0.9	1.1	-1.0	**2.1**	**2.4**	**2.3**	-0.2
ES INE House Price Index	-3.0	-2.3	-1.7	-0.1	-3.2	-1.5	-0.8	0.0
ES Industrial Output & ES Industrial Production	1.3	0.9	1.2	0.6	**2.0**	**2.5**	1.6	1.4
ES Labour Costs	-1.2	0.8	0.5	-0.8	**2.5**	**2.0**	**2.0**	1.1
ES Markit Composite PMI & ES Markit Services PMI	**1.9**	**2.0**	**3.1**	**2.2**	-3.2	-1.5	0.2	**3.2**
ES Markit Manufacturing PMI	**2.4**	1.4	**1.8**	0.6	-2.1	-1.5	-0.4	1.3
ES PPI	0.5	0.7	0.6	1.0	-0.3	1.0	1.4	**1.7**
ES Retail Sales	1.5	1.2	1.4	1.0	0.7	1.3	1.1	1.5
ES Trade Balance	-0.9	-0.8	-0.4	0.6	-1.7	-1.6	-0.6	0.1
ES Unemployment Net	**2.0**	**2.5**	**2.1**	**3.7**	**2.4**	**2.8**	**2.7**	**4.6**
ES Unemployment Rate	1.1	**2.4**	**2.1**	**2.8**	0.3	1.3	1.3	**2.6**
FI Business and Consumer Confidence	-1.7	-0.8	-0.5	-1.8	-3.3	-1.9	-1.1	-1.5
FI CPI	0.0	1.2	1.0	0.2	0.1	1.0	1.1	-0.3
FI Consumer Confidence	1.6	0.9	0.6	**1.8**	**2.4**	1.4	0.6	1.6
FI Current Account Balance	-0.4	0.1	0.2	0.2	-1.0	-0.5	-0.0	-0.3
FI Exports (EUR) & FI Imports (EUR) & FI Trade Balance	-2.0	0.7	1.5	0.8	-0.6	0.6	**2.4**	1.6
FI GDP	-1.0	0.3	0.0	-1.5	0.8	0.1	-0.2	-0.5
FI House Price Index & FI House Prices	-3.6	-2.8	-2.0	-1.5	-2.5	-2.5	-2.0	-1.5
FI Industrial Production	-0.9	0.6	1.3	0.4	-0.9	-0.6	0.8	0.5
FI PPI	0.9	1.1	0.8	0.8	-0.9	-1.0	-1.4	0.8
FI Retail Sales & FI Retail Sales Volume	-2.6	-3.6	-3.4	-2.0	-1.9	-2.3	-1.7	-1.9
FI Unemployment Rate	-1.0	0.1	0.2	1.3	1.0	0.8	0.6	1.5
FR Auction Result Bond or Note	0.9	**1.8**	**2.6**	0.7	**1.9**	**3.6**	**4.4**	1.1
FR Auction Result Bill	-3.3	-4.0	-3.9	-6.8	-1.3	-2.8	-2.0	-3.4
FR Banque de France business sentiment survey	**3.4**	**3.1**	**3.0**	**2.8**	**4.7**	**4.1**	**3.8**	**4.3**
FR Budget Balance	-0.1	0.7	0.1	0.3	1.1	1.1	1.0	**1.8**
FR Business Survey Overall Demand	-0.1	0.2	0.2	-0.0	0.2	1.0	1.5	-0.3
FR CPI and Wages	**1.7**	**2.0**	**1.8**	**2.7**	**3.3**	**2.0**	0.6	**2.0**
FR Consumer Confidence	1.4	**2.8**	**3.0**	**2.0**	1.8	1.7	**2.3**	**2.2**
FR Consumer Spending	0.5	1.4	1.3	1.2	1.2	1.0	1.4	**1.9**
FR Current Account Balance	-0.1	0.6	0.1	1.5	-0.2	0.7	0.8	1.2
FR GDP	-0.1	-1.0	-1.0	0.2	-0.7	-0.4	-0.9	-0.4
FR Housing Permits & FR Housing Starts	0.5	1.5	1.6	1.2	**2.5**	**2.0**	**2.2**	1.6
FR Industrial Production & FR Manufacturing Production	1.6	**2.2**	**1.7**	**1.7**	**3.5**	**3.5**	**3.6**	**1.7**
FR Jobseekers Net Change & FR Total Jobseekers	-0.4	-0.5	-0.1	-2.2	-1.9	-2.2	-2.9	-5.1
FR Manufacturing and Business Confidence	**2.2**	**2.3**	**2.4**	**1.8**	**2.5**	**3.0**	**2.0**	**1.7**
FR Non-Farm Payrolls & FR Wages	1.4	**2.0**	**2.2**	0.7	0.6	1.3	1.1	1.6
FR PPI	0.8	0.0	0.2	0.8	0.9	1.3	1.3	0.6
FR Trade Balance	**2.2**	**2.5**	**3.2**	1.6	**3.7**	**2.8**	**2.0**	**2.1**
FR Unemployment Data	0.2	0.7	0.6	-0.8	1.4	**1.8**	**1.8**	0.1
GR CPI & GR CPI EU Harmonized	0.6	0.4	0.6	-0.3	0.9	-1.0	-1.3	-0.4
GR Current Account Balance	1.4	1.6	1.4	0.0	**3.0**	**2.4**	1.6	0.5
GR GDP	0.7	0.7	1.0	1.1	0.8	0.9	1.2	0.5
GR Industrial Production	0.2	0.9	1.0	0.8	0.1	0.7	1.1	0.3
GR Retail Sales	0.5	0.5	0.6	1.6	1.5	1.3	0.9	0.6
GR Unemployment Rate	-0.0	-0.7	-1.1	-0.3	1.2	1.0	**1.8**	-0.1
IE CPI & IE CPI EU Harmonized	-1.7	-0.1	0.1	-0.2	0.6	**1.7**	1.4	0.8
IE Consumer Confidence	-0.0	-1.6	-1.2	-2.4	-3.1	-2.3	-0.6	-2.1
IE Current Account Balance & IE GDP	-1.2	-0.6	-1.7	-1.0	-2.1	-1.9	-1.6	-0.8
IE Industrial Production	-0.2	-0.5	-0.6	-0.4	0.1	-0.6	-1.8	-0.8
IE Investec Composite PMI & IE Investec Services PMI	0.9	0.7	0.5	-1.4	-1.2	-0.9	-1.0	-0.3
IE Investec Manufacturing PMI	0.5	-0.0	-0.1	0.1	-4.0	-2.3	-0.3	-0.2
IE Live Register Change & IE Live Register Level	-2.4	-1.6	-1.7	-2.0	1.0	-0.1	-1.2	-1.8
IE New Private Car Licences & IE New Vehicle Licences	-2.0	-1.2	-0.8	-3.0	-0.4	-0.3	-0.4	-2.7
IE PPI	-0.0	-0.5	-1.4	-0.0	-0.1	0.3	-0.2	1.1
IE Property Prices	0.6	-0.9	-0.5	1.6	0.4	0.4	-0.2	0.8
IE Retail Sales Volume	-0.7	-0.5	-0.3	-0.9	-0.4	0.5	0.9	0.6
IE Trade Balance	0.1	-2.2	-1.4	-1.0	-0.2	-0.2	-0.9	-0.5
IE Ulster Bank Construction PMI	-2.1	-2.9	-3.0	-0.7	-6.8	-6.4	-4.5	-1.6
IE Unemployment Rate	0.4	0.2	-0.4	-1.1	-0.7	0.1	0.6	0.7

Table IA.8: T-Statistics of Scheduled Releases from Dummy Regression (continued)

News Type	y_{2y}^{US}	y_{5y}^{US}	y_{10y}^{US}	y_s^{US}	y_{2y}^{EA}	y_{5y}^{EA}	y_{10y}^{EA}	y_s^{EA}
IT Auction Result Bond or Note	-1.7	-2.5	-3.3	-3.5	-0.2	-0.9	-0.8	-2.5
IT Auction Result Bill	0.2	0.1	-0.6	0.9	0.3	-0.1	0.6	-0.2
IT Budget Balance	-0.1	**2.6**	**2.2**	0.7	0.7	**1.7**	**2.0**	**1.8**
IT Business Confidence & IT Economic Sentiment	0.9	0.7	0.5	-0.4	-0.2	-0.8	-0.6	-0.1
IT CPI	0.6	1.3	1.3	-0.2	**1.8**	**1.7**	1.6	-0.3
IT CPI FOI Index Ex Tobacco	**2.4**	0.4	-0.1	-1.0	-1.0	-0.6	-1.4	0.2
IT Consumer Confidence	-0.5	0.1	-0.2	0.6	-0.7	-0.0	-0.1	1.0
IT Current Account Balance	0.6	1.0	1.1	**2.0**	0.9	1.0	1.0	1.3
IT Deficit to GDP	0.8	0.5	0.3	-1.9	0.5	0.4	-0.3	-1.6
IT GDP	0.1	-0.3	-0.8	-1.8	-1.0	-0.9	-0.4	-0.7
IT General Government Debt	**1.7**	**2.4**	**2.2**	0.1	-0.2	0.0	-0.2	0.1
IT Hourly Wages	-0.0	0.6	-0.2	0.5	-0.3	-0.4	-1.1	0.5
IT Industrial Orders & IT Industrial Sales	-0.0	-0.4	-0.0	-1.2	0.5	-0.4	-1.0	-1.3
IT Industrial Production	1.0	**2.0**	**1.7**	1.6	**1.9**	**1.9**	**2.0**	**2.2**
IT Large Company Empl.	-2.8	-2.9	-2.7	-3.2	-0.5	-1.9	-1.8	-3.9
IT New Car Registrations	0.9	-0.2	-0.6	-0.4	0.9	0.2	0.1	-0.4
IT PPI	-1.7	-0.8	-1.4	-1.4	**1.8**	**2.1**	1.1	-0.0
IT Retail Sales	-0.7	-1.6	-0.8	0.4	-0.4	-0.3	-1.3	-0.4
IT Retailers' Confd. General & IT Services Survey	-1.8	-0.9	-1.5	-0.3	-0.4	0.4	0.5	-0.2
IT Trade Balance EU & IT Trade Balance Total	-2.3	-1.2	-2.1	-1.0	-1.9	-2.2	-1.0	0.2
IT Trade Balance Non-Eu (Euros)	0.4	0.4	0.0	-0.5	**1.7**	1.3	0.4	-1.0
IT Unemployment Rate	**2.0**	-0.5	-0.5	-1.0	-2.7	-1.8	-0.4	0.1
IT Unemployment Rate Quarterly	-0.8	-0.4	-0.4	-1.6	1.1	1.0	-0.2	-2.4
NL CPI & NL CPI EU Harmonized	0.6	0.4	-0.0	0.9	0.0	-0.4	0.7	1.6
NL Consumer Confidence	-0.6	0.0	0.4	-0.1	-0.4	0.5	0.4	0.3
NL Consumer Spending	0.2	0.2	0.0	-1.4	-0.8	-1.2	-1.0	-0.5
NL GDP	0.5	0.3	-0.1	-3.1	-1.0	0.6	1.0	-2.3
NL House Price Index	-2.2	-2.2	-2.1	-1.5	-3.6	-2.8	-2.1	-1.2
NL Industrial Sales & NL Manufacturing Production	-1.3	-0.5	-1.6	-0.3	-0.2	0.1	0.9	-0.2
NL Producer Confidence	-0.4	-0.4	0.0	0.8	0.1	-0.6	0.4	1.3
NL Retail Sales	-1.9	-2.7	-2.0	-0.3	-0.8	-0.9	-0.5	0.1
NL Trade Balance	-0.8	-0.7	-0.0	1.4	-1.0	-0.8	-0.6	**1.9**
NL Unemployment Rate	-0.2	0.6	0.1	**1.8**	0.5	0.4	0.4	**2.0**
PT CPI & PT CPI EU Harmonized	-0.1	1.1	1.2	-0.7	-1.1	-0.7	-0.9	-0.6
PT Construction Works Index	-1.8	-2.4	-2.1	-1.8	0.1	-1.2	-0.3	-1.4
PT Consumer Confidence & PT Economic Climate Indicator	0.4	-1.3	-1.9	0.8	0.9	1.1	0.6	-1.0
PT Current Account Balance	0.6	0.4	1.1	0.7	**2.0**	**2.1**	**2.0**	**1.9**
PT GDP	1.2	0.5	0.9	1.0	0.2	1.3	0.3	0.5
PT Industrial Production	-0.4	0.1	1.6	0.7	0.0	0.3	0.4	1.0
PT Industrial Sales	-0.9	0.1	0.8	-1.1	**1.8**	1.5	1.0	-0.5
PT Labour Costs	0.4	0.2	-1.2	0.0	1.1	-1.4	-0.9	1.2
PT PPI	1.1	0.0	-0.6	0.5	0.1	0.0	-0.1	1.0
PT Retail Sales	0.9	0.9	0.4	0.7	0.6	-0.2	-0.6	0.5
PT Trade Balance	-0.4	-1.4	-0.5	0.7	-0.3	-0.2	-0.2	-1.4
PT Unemployment Rate	-0.1	-1.4	-2.3	-0.5	0.0	-1.7	-1.7	-1.0
CH CPI	0.8	0.9	0.7	1.2	**3.2**	**2.3**	**1.8**	1.5
CH Consumer Confidence	0.0	0.0	0.1	-0.8	0.5	-0.1	0.0	-1.4
CH Credit Suisse Survey	0.8	-0.1	0.2	-0.9	1.1	0.6	-0.1	1.0
CH Foreign Currency Reserves	-0.1	-0.9	-0.5	0.4	-1.2	-1.7	-0.2	-0.2
CH GDP	-0.9	-2.0	-2.0	-0.4	-0.9	-1.8	-2.3	-0.4
CH Industrial Output	-0.7	-0.9	-1.1	0.6	0.3	-0.1	0.0	0.2
CH KOF Leading Indicator	-1.0	0.4	0.1	0.8	0.7	0.4	0.9	0.9
CH Money Supply M3	**2.4**	**3.4**	**4.3**	**4.3**	**1.9**	**3.0**	**3.8**	**6.7**
CH PMI Manufacturing	0.6	1.2	0.8	-0.6	0.8	0.0	-0.0	-0.1
CH Producer, Import Prices	**2.2**	**2.2**	**2.7**	**2.0**	**2.4**	**2.5**	**3.0**	**2.5**
CH Real Estate Index Family Homes	-2.4	-0.4	-0.3	0.0	-1.2	-2.2	-1.1	0.8
CH Retail Sales	**1.9**	**1.9**	**2.4**	**1.9**	**1.7**	**2.3**	**2.8**	**2.8**
CH Sight Deposits	**3.8**	**5.0**	**4.3**	**2.7**	-3.0	0.0	**1.7**	**3.9**
CH Trade Balance	1.2	0.8	1.0	-0.7	0.9	0.2	-0.6	-0.4
CH Trade Data	-2.4	-2.2	-2.1	-0.8	-2.1	-0.9	-0.4	-1.0
CH UBS Consumption Indicator	-2.7	-1.5	-0.7	0.1	0.8	1.1	1.0	-0.1
CH Unemployment Rate	-0.3	0.2	-0.6	1.3	**1.8**	0.7	-0.1	0.9
DK CPI & DK CPI EU Harmonized	-0.0	0.4	0.2	1.2	-1.6	-0.6	0.2	**2.0**

News Type	y_{2y}^{US}	y_{5y}^{US}	y_{10y}^{US}	y_{s}^{US}	y_{2y}^{EA}	y_{5y}^{EA}	y_{10y}^{EA}	y_{s}^{EA}
DK Change in Currency Reserves & DK Foreign Reserves	-1.7	-2.5	-1.7	-0.6	1.6	0.4	1.3	0.1
DK Consumer Confidence	-0.7	-0.3	-0.7	-1.0	0.2	-0.4	-0.0	-0.1
DK Danish PMI Survey	1.0	0.1	0.7	-0.7	1.3	1.4	0.2	0.0
DK GDP	-0.2	-1.0	-1.3	-0.6	-2.5	-1.3	-0.8	-1.4
DK Industrial Production and Orders	-2.4	-0.3	0.1	**1.9**	-0.2	0.1	-0.0	1.5
DK New Car Registration	-0.4	-0.4	-1.3	-3.1	-1.0	-2.5	-2.9	-1.5
DK PPI	1.1	1.3	1.2	0.6	-0.8	0.3	**1.8**	0.9
DK Retail Sales	0.2	-0.5	-0.3	**2.4**	-0.3	0.4	0.7	**1.9**
DK Trade & Current Account Balance	0.2	1.2	1.2	0.8	1.3	1.1	1.4	1.4
DK Unemployment Rate	-0.4	-0.7	0.0	1.1	-0.2	0.0	0.1	**2.3**
DK Wholesale Price Index	0.7	1.4	1.5	1.2	**2.0**	**2.3**	**2.2**	**1.9**
NO CPI & NO CPI Underlying & NO PPI including Oil	-0.8	-0.9	-0.4	-1.1	-0.6	-0.2	-0.1	-1.7
NO Consumer Confidence	-0.1	-0.3	0.2	0.0	-1.1	-1.2	0.3	0.5
NO Credit Indicator Growth	0.1	1.0	1.6	0.4	-0.2	0.9	0.6	-0.2
NO Deposit Rates & NO Norwegian Overnight Rate	0.6	-0.2	-0.3	-0.9	-1.7	-2.2	-2.4	0.6
NO GDP & NO GDP Mainland	0.2	1.2	**1.7**	**2.0**	1.1	1.2	1.5	1.5
NO Ind Prod Manufacturing & NO Industrial Production	-0.5	-0.4	0.0	0.3	0.7	-0.2	-0.7	-0.7
NO Manufacturing PMI	-0.4	1.2	1.0	**1.7**	1.4	**3.0**	**3.6**	**3.3**
NO Norges Bank Daily FX Purchases	1.0	1.0	1.1	1.1	1.0	0.1	0.8	0.8
NO Retail Sales	0.2	0.2	0.0	0.3	1.0	0.2	0.1	0.8
NO Trade Balance	-0.5	0.5	-0.0	1.0	0.2	0.0	-0.8	0.1
NO Unemployment Rate	-0.2	-0.6	-0.3	-0.2	-1.1	-1.2	-1.8	0.8
NO Unemployment Rate AKU	-1.3	-1.7	-1.6	-1.7	-2.2	-2.2	-1.9	-1.1
PL Average Gross Wages & PL Employment	-3.9	-3.2	-2.9	-1.8	-1.3	-1.5	-1.0	-1.1
PL Base Rate Announcement	-2.9	-2.5	-3.3	-2.1	-1.8	-2.5	-2.2	-3.5
PL Budget Balance	0.9	1.5	1.5	0.5	0.5	0.4	0.8	1.0
PL CPI	-1.9	-2.7	-2.7	-1.1	-1.5	-2.7	-2.9	-1.0
PL Construction Output	-0.2	-1.3	-2.1	-1.5	-3.2	-1.7	-1.2	-1.8
PL Core CPI	-2.7	-2.8	-3.4	-2.2	-1.8	-2.3	-2.8	-1.3
PL Current Account	-0.5	-0.1	-0.9	-1.3	-0.6	-1.9	-1.7	-1.1
PL GDP	0.1	-0.1	-0.0	0.9	-1.9	-0.3	0.3	-0.1
PL Monetary Aggregates	0.9	0.1	0.4	**2.2**	1.0	1.0	0.6	**2.0**
PL NBP Inflation Expectations	-2.3	-1.8	-1.6	0.0	-3.4	-1.8	-1.0	0.3
PL Official Reserves	-7.2	-5.7	-4.5	-2.9	-4.0	-3.3	-3.5	-2.7
PL PPI & PL Sold Industrial Output	0.7	0.5	0.9	0.6	1.2	0.8	1.2	0.4
PL Retail Sales & PL Retail Sales Real	-2.5	-2.1	-1.6	-0.1	0.8	0.2	-0.6	-0.6
PL Unemployment Rate & PL Unemployment Rate Quarterly	-0.2	0.5	-0.1	-1.0	-1.4	-1.5	-0.9	0.0
SE Average House Prices	-2.6	-1.5	-1.6	-0.6	-2.3	-1.2	-0.4	-0.6
SE Budget Balance	0.9	0.9	1.4	0.7	1.4	1.4	**1.7**	1.0
SE CPI	1.3	1.6	1.0	**1.8**	**2.2**	**2.2**	**1.7**	**1.7**
SE Current Account Balance	-0.4	-0.3	-0.1	0.9	0.8	0.4	-0.2	0.9
SE GDP	-0.4	0.3	0.4	-0.5	-1.2	-1.3	-0.9	0.3
SE Household Consumption	1.0	1.5	1.3	-0.2	-1.7	-0.2	0.3	-0.7
SE Household Lending	-2.2	-1.2	-0.5	-1.7	-2.4	-1.2	-0.9	-1.9
SE Industry Capacity	-2.4	-0.4	-1.0	-0.4	0.2	-0.7	-0.0	-0.5
SE PES Unemployment Rate	-1.4	-0.3	0.5	-0.3	-3.1	-0.9	0.5	0.2
SE PMI Manufacturing	1.3	1.3	1.1	-1.1	**4.7**	**3.4**	1.4	-0.1
SE PMI Services & Composite	**6.9**	**7.0**	**6.5**	**5.4**	**6.9**	**5.2**	**4.1**	**4.7**
SE PPI	0.0	-0.1	-0.5	-0.2	0.6	0.9	0.7	0.7
SE Production Indices	-0.9	-0.0	-0.7	-2.3	-1.0	-0.7	-1.3	-2.2
SE Retail Sales	1.4	0.4	0.1	1.0	0.4	-0.0	-0.5	0.7
SE Service Production	1.4	0.6	0.6	**2.9**	1.4	0.8	-0.4	**1.8**
SE Survey Confidence	-0.9	0.4	0.3	0.1	1.5	1.2	1.2	**1.9**
SE Total No. of Employees	1.0	0.8	1.4	0.9	-0.4	0.3	0.1	-0.0
SE Trade Balance	**1.6**	1.0	1.6	**2.0**	0.9	0.4	0.5	**2.3**
SE Unemployment Rate & SE Unemployment Rate Trend	0.5	1.0	1.3	0.3	-0.4	-0.7	0.5	-0.5
SE Wages Non-Manual Workers	-1.5	-1.6	-2.0	-0.4	-0.9	-1.2	-1.0	-0.1
UK BBA Loans for House Purchase	0.8	-0.1	-0.3	0.5	-0.7	-0.3	-1.6	-1.6
UK BRC Sales Like-For-Like	-2.4	-1.6	-0.9	-0.6	-4.3	-3.4	-1.5	0.4
UK BRC Shop Price Index	-1.0	0.9	1.2	0.7	-3.8	-1.0	0.3	1.2
UK CBI Sales	-0.3	-0.0	-0.3	-1.1	0.5	-1.4	0.3	0.6
UK CBI Surveys	0.2	0.8	0.5	-1.9	-0.5	-1.0	-0.9	-2.1

Table IA.8: T-Statistics of Scheduled Releases from Dummy Regression (continued)

News Type	y_{2y}^{US}	y_{5y}^{US}	y_{10y}^{US}	y_s^{US}	y_{2y}^{EA}	y_{5y}^{EA}	y_{10y}^{EA}	y_s^{EA}
UK Car Prod.	1.0	1.2	1.0	1.4	1.3	1.1	1.2	**1.7**
UK Coincident and Leading Indicator	1.1	0.2	0.9	**2.1**	1.5	**2.3**	1.5	**2.2**
UK Construction Output	-0.4	-1.2	-1.2	1.0	-2.3	-2.2	-2.3	-1.2
UK Expenditure Data	0.1	0.4	0.9	**2.3**	1.6	**1.7**	1.3	**1.8**
UK GfK Consumer Confidence	-2.0	-0.5	-0.7	0.3	-0.8	-1.5	-1.7	0.5
UK Halifax House Prices	-1.5	0.4	0.2	0.4	1.5	1.0	0.6	**1.8**
UK Hometrack Housing Survey	-1.6	-0.1	1.2	1.5	1.3	**1.9**	1.0	**1.9**
UK House Price Index	-1.6	-0.5	0.1	-0.6	-2.5	-2.0	-1.6	-1.4
UK Index of Services	-0.3	0.4	-0.1	-2.0	-0.1	0.1	0.2	-1.9
UK Industrial Production & UK Manufacturing Production	-2.2	-0.7	0.2	0.2	0.3	0.0	-0.8	0.7
UK Jobs Report	-0.2	-0.7	-0.7	1.6	-0.5	-1.7	-1.3	0.0
UK Lloyds Business Barometer	-1.2	-0.5	0.8	-0.7	-1.6	0.2	0.5	0.1
UK Markit UK PMI Manufacturing	0.5	0.2	1.2	**2.3**	-0.1	1.1	**1.7**	**2.4**
UK Markit/CIPS UK Construction PMI	0.3	-0.8	-0.3	-0.6	-0.5	-0.3	-2.4	-1.3
UK Monetary Aggregates	0.6	**2.8**	**2.2**	1.8	**2.5**	**2.5**	**2.2**	**2.4**
UK NIESR GDP Estimate	0.7	0.3	0.3	-1.0	1.5	0.3	-1.2	0.4
UK Nationwide Consumer Confidence	0.8	-0.4	-1.1	-0.8	1.2	0.7	0.4	0.4
UK Nationwide House Prices	0.6	0.9	0.3	0.3	0.7	0.8	-0.1	0.9
UK New Car Registrations	0.2	-0.3	-0.9	0.1	-1.4	-0.3	-0.1	-0.5
UK ONS House Price	-0.5	-0.0	0.2	-0.5	-0.6	-0.4	-0.4	-1.2
UK Official Reserves Changes	**2.0**	**2.4**	**2.9**	**2.8**	1.8	**2.1**	**2.9**	**2.8**
UK PMI and Official Reserves	-1.7	-2.1	-2.4	-3.0	-1.7	-2.3	-2.8	-3.1
UK Price Indices	1.2	1.5	0.7	1.1	**2.4**	**2.0**	1.1	1.5
UK RICS House Price Balance	-0.4	-0.6	-1.0	-2.8	-1.0	0.1	-0.1	-2.3
UK Retail Sales Ex Auto & UK Retail Sales Incl. Auto	-0.6	-1.3	-1.0	-1.0	-1.1	-1.2	-0.8	-1.4
UK Rightmove House Prices	-0.3	-0.6	-0.6	-0.8	-1.6	-1.7	-1.0	-0.0
UK Total Business Investment	0.4	-1.9	-1.7	-1.7	-1.8	-2.0	-2.0	-0.7
UK Trade Balance	**2.0**	1.1	0.9	-0.1	1.0	1.0	0.5	1.4
US Auction Announcement Bill	**2.5**	**3.1**	**3.5**	1.8	**4.7**	**5.5**	**5.8**	**5.2**
US Auction Announcement Bond	-1.7	-2.7	-2.5	-2.0	-1.7	-0.4	0.1	-0.6
US Auction Announcement Note	-0.6	-0.0	0.3	-0.2	-0.4	-0.8	-0.1	-1.7
US Auction Result Bill	**2.0**	**2.6**	**1.9**	0.4	0.4	-0.9	-1.7	0.6
US Auction Result Bond	**5.2**	**7.6**	**8.9**	**2.1**	**2.6**	**4.9**	**7.1**	**2.1**
US Auction Result Note	**8.9**	**12.8**	**12.9**	**2.0**	**5.2**	**6.1**	**6.3**	1.4
US ADP Employment Change	**4.0**	**5.0**	**5.5**	**2.0**	0.2	1.5	**3.5**	1.6
US Budget Statement	-0.2	-0.3	0.2	0.6	1.3	1.2	0.3	0.3
US Building Permits & US Housing Starts	**4.2**	**3.4**	**3.4**	1.4	**1.9**	**2.9**	**2.8**	1.5
US Business Inventories	0.1	0.2	0.9	-0.4	0.6	1.6	**1.7**	0.2
US CPI and Earnings Data	**6.8**	**7.4**	**7.1**	**4.3**	**3.4**	**5.2**	**6.1**	**3.1**
US Car Sales	0.6	1.4	**1.8**	1.4	**2.1**	1.5	**1.7**	**1.9**
US Challenger Job Cuts	0.3	-0.7	-0.9	-0.8	-0.1	-0.1	-0.1	-0.6
US Chicago Purchasing Manager	**5.5**	**7.2**	**6.6**	**4.0**	**3.5**	**5.0**	**5.6**	**3.7**
US Conference Board Indices	**4.9**	**4.8**	**4.8**	**5.6**	**3.1**	**4.5**	**4.6**	**4.8**
US Confidence Indicator and Mortgage Applications	-2.5	-3.2	-2.0	-2.0	-3.1	-3.3	-3.6	-3.7
US Consumer Credit	**2.0**	**2.8**	**2.5**	0.8	**2.3**	1.8	1.9	**2.0**
US Current Account Balance	0.7	0.5	0.1	-0.5	0.2	-0.6	-0.5	-0.9
US Durable Goods	**5.8**	**6.4**	**6.8**	**3.6**	**3.2**	**4.4**	**4.0**	**2.7**
US EIA Weekly Petroleum Report	-2.2	-2.1	-1.9	-1.7	-1.6	-1.1	-1.9	-2.4
US Empire Manufacturing	1.4	**3.0**	**3.2**	1.9	0.7	**1.9**	**2.6**	0.0
US Employment Cost Index	**3.3**	**3.5**	**3.5**	**3.0**	**2.9**	**3.1**	**3.9**	**2.2**
US Employment Report	**12.9**	**14.2**	**14.3**	**12.4**	**9.6**	**12.0**	**13.7**	**11.8**
US Existing Home Sales	**4.1**	**4.2**	**3.5**	**4.4**	**3.5**	**3.0**	**2.8**	**3.2**
US Export and Import Prices	**1.7**	**1.9**	1.5	0.5	0.4	1.6	1.2	0.7
US FHFA House Prices	-1.5	-0.6	0.0	-0.6	-0.3	-1.0	0.6	0.3
US GDP, GDP Price Index, PCE	**5.1**	**5.5**	**5.3**	**3.3**	**2.4**	**4.1**	**3.8**	**4.4**
US Help Wanted Index	0.6	0.6	0.3	**2.0**	**1.7**	1.5	1.5	1.0
US IBD/TIPP Economic Optimism	-1.4	0.0	-0.7	1.3	-1.8	-1.6	-0.1	0.8
US ICSC Chain Store Sales	0.2	0.1	0.7	1.0	-0.8	-0.4	0.1	1.0
US ISM Milwaukee	-1.0	-0.2	0.4	0.0	0.1	0.3	-0.7	-0.1
US ISM New York	-2.5	-1.8	-2.5	-0.1	-4.3	-1.6	-1.8	-1.4
US ISM Non-Manufacturing	**4.4**	**5.6**	**5.8**	**5.1**	**2.9**	**3.9**	**3.7**	**4.6**
US ISM Releases	**8.6**	**9.8**	**10.1**	**7.3**	**5.7**	**7.1**	**7.9**	**6.4**
US Inventories and Trade Balance	-0.7	-0.7	-0.6	**3.3**	-2.0	-1.5	0.1	1.3

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Table IA.8: T-Statistics of Scheduled Releases from Dummy Regression (continued)

| News Type	y_{2y}^{US}	y_{5y}^{US}	y_{10y}^{US}	y_s^{US}	y_{2y}^{EA}	y_{5y}^{EA}	y_{10y}^{EA}	y_s^{EA}
US JOLTS Job Openings	-3.3	-2.5	-2.2	-0.8	-1.8	-1.4	-1.3	-1.8
US Jobless Claims	**5.4**	**5.9**	**6.1**	**4.9**	**7.6**	**7.5**	**6.5**	**5.0**
US Leading Index	1.3	**2.7**	**3.2**	**4.3**	**2.5**	**3.4**	**3.3**	**2.9**
US Markit US Composite PMI & US Markit US Services PMI	0.6	-0.0	-0.8	0.3	-3.8	-2.6	-0.6	-1.0
US Markit US Manufacturing PMI	-2.5	-0.7	-0.8	-0.5	-3.5	-2.0	-1.6	-2.9
US Mortgage Foreclosures and Delinquencies	0.3	0.8	0.7	0.8	-0.3	-0.1	0.4	0.6
US NAHB Housing Market Index	0.1	0.1	0.5	0.4	-0.9	-0.9	0.4	0.1
US NFIB Small Business Optimism	-0.6	-0.7	0.0	-1.2	-0.3	-0.5	-0.8	-0.5
US Net Long-term TIC Flows & US Total Net TIC Flows	-3.5	-3.5	-2.2	-2.8	-3.6	-3.1	-1.9	-3.4
US New Home Sales	**3.2**	**4.2**	**4.1**	**3.1**	**1.9**	**3.3**	**2.7**	**3.5**
US Nonfarm Productivity & US Unit Labor Costs	**2.5**	**2.1**	**2.2**	0.7	**1.6**	1.1	1.0	1.5
US PCE, Personal Income and Spending	**1.8**	**2.1**	**2.5**	-1.2	0.2	1.3	0.7	-0.6
US PPI	**4.3**	**4.9**	**5.2**	**2.9**	**3.4**	**3.3**	**3.4**	**3.2**
US Pending Home Sales	-0.5	-1.0	-0.5	0.6	-0.5	-0.1	0.3	0.8
US Production and Capacity Utilization	**3.1**	**3.8**	**3.0**	-0.5	**2.3**	**2.4**	**2.6**	0.2
US Retail Sales	**6.1**	**6.7**	**6.5**	**3.4**	**2.3**	**3.6**	**4.4**	**4.1**
US S&P Case-Shiller Index	-0.2	-0.1	-0.6	-1.2	-1.5	-1.6	-1.6	-0.5
US Survey Confidence	-0.6	-0.5	-0.5	**3.2**	-1.3	-1.1	-0.1	0.3
US Trade Balance	-0.4	0.4	0.5	1.0	-0.7	-0.8	0.3	1.5
US University of Michigan Surveys	**5.2**	**5.1**	**5.2**	**6.2**	**3.0**	**3.7**	**4.2**	**4.8**
CN Actual FDI & CN Contract FDI Cumulative	**1.9**	1.2	1.2	**1.8**	**1.8**	0.8	0.3	**1.7**
CN CPI	-0.9	-1.1	-1.3	0.1	-0.8	-0.8	-0.9	0.1
CN Economic Indices	-0.5	0.1	0.5	-0.2	**2.1**	**2.6**	**2.2**	0.4
CN FDI	-2.3	-1.0	-0.3	-1.3	-2.1	-1.8	-0.8	-0.4
CN Foreign Reserves	-0.4	-1.6	-1.6	-2.3	-0.9	-1.3	-1.3	-2.8
CN GDP and Other Macro Aggregates	**1.7**	**1.7**	1.2	1.3	**2.6**	**2.3**	1.7	1.8
CN HSBC Composite PMI & CN HSBC Services PMI	-2.6	-2.2	-2.1	-1.1	-1.8	-1.9	-0.5	-1.6
CN HSBC Manufacturing PMI	-1.3	0.1	1.0	**1.9**	-1.1	-0.5	0.7	1.1
CN Industrial Profits	-1.2	-1.7	-1.4	-2.4	-2.8	-1.8	-0.8	-2.7
CN Manpower Survey	-0.1	-0.1	-1.2	-1.9	0.4	-0.4	-1.4	-1.7
CN Monetetary Aggregates	-1.1	-0.7	-0.5	1.3	-0.5	-0.1	-0.1	1.1
CN PMI	-1.0	-2.1	-1.8	-2.3	-0.5	-0.1	0.4	-1.4
CN PPI & CN Purchasing Price Index	1.0	1.1	0.7	0.2	0.8	0.7	0.6	0.0
CN Swift Global Payments CNY	0.5	1.4	0.8	0.1	-2.2	-0.2	1.2	-0.1
CN Trade Data	0.6	0.2	0.3	0.6	0.6	0.9	0.9	0.7
CN Trade Data (CNY)	-0.7	-0.5	-0.5	-0.2	-1.7	-1.8	-0.2	0.9
CN Wholesale Price Index	-3.3	-3.9	-3.9	-1.9	0.4	-0.6	-1.6	-1.4
JP All Industry Activity Index	0.2	0.2	-0.2	-1.7	-0.6	-0.5	-1.4	-2.1
JP BSI Large All Industry & JP BSI Large Manufacturing	-0.7	-0.5	0.1	-0.4	-1.1	-0.5	-0.3	-0.4
JP Bank Lending and Monetary Aggregates	-0.3	0.9	0.3	-0.0	-0.1	-0.5	-0.9	0.0
JP Bankruptcies	1.5	1.4	1.5	**1.9**	1.2	1.6	1.4	**2.4**
JP CPI	1.1	0.9	0.8	**1.9**	0.7	1.0	0.6	0.5
JP Cabinet Office Indices	0.9	0.4	0.0	0.3	1.6	**1.9**	1.6	0.4
JP Capacity Utilization & JP Industrial Production	1.4	1.1	1.0	1.5	1.3	1.6	1.3	0.3
JP Capital Spending and Company Earnings	-0.0	-0.4	-1.0	-1.0	0.1	-0.4	-1.4	-0.8
JP Consumer Confidence	-0.3	-0.2	-0.2	-1.2	-0.3	-0.2	-0.6	-1.7
JP Convenience Store Sales	0.5	0.5	0.5	**2.1**	0.6	0.6	0.3	1.4
JP Current Account	0.4	0.4	0.5	-1.9	-1.3	-1.0	-0.9	-1.8
JP Earnings Data	-0.1	-0.3	0.3	-0.4	-0.8	-0.9	-1.0	-1.4
JP Eco Watchters Survey	-1.1	-1.9	-1.3	-1.4	-0.3	0.2	0.5	-2.2
JP Export Price Index & JP Import Price Index & JP PPI	0.9	0.4	0.2	0.7	1.5	1.4	0.9	**1.8**
JP Foreign Investment	-2.6	-2.8	-1.8	0.1	-3.5	-2.9	-1.7	-1.1
JP GDP and Components	-1.5	0.4	0.4	-1.0	-0.6	0.0	0.3	-0.9
JP Household Spending & JP Overall Household Spending	0.3	0.5	0.3	0.5	0.4	1.2	1.2	0.5
JP Household Spending and Employment Data	-1.2	-0.7	-0.2	-2.1	-0.9	-1.0	-0.6	-0.8
JP Housing Loans	-2.0	-1.9	-1.5	-1.5	-1.4	-1.6	-2.1	-1.4
JP Housing Starts and Construction	0.1	-0.4	-1.1	-1.4	-0.3	-0.3	-0.5	-2.2
JP Loans, Discounts Corp	-1.6	-1.0	-0.2	0.3	-1.7	-0.8	0.8	-0.7
JP M2 and M3	-1.0	-0.7	0.2	-0.8	-3.2	-2.5	-0.7	-1.5
JP Machine Orders	0.5	1.0	1.3	1.1	-0.4	-0.8	-1.0	0.1
JP Machine Tool Orders	**2.1**	**2.0**	**1.9**	0.9	**2.4**	**2.1**	1.3	**1.8**

Table IA.8: T-Statistics of Scheduled Releases from Dummy Regression (continued)

News Type	y_{2y}^{US}	y_{5y}^{US}	y_{10y}^{US}	y_{s}^{US}	y_{2y}^{EA}	y_{5y}^{EA}	y_{10y}^{EA}	y_{s}^{EA}
JP Manpower Survey	-0.2	0.2	0.9	1.4	-0.7	-0.6	0.9	1.2
JP Markit Services PMI & JP Markit/JMMA Composite PMI	-2.2	-2.2	-1.6	0.2	-2.9	-1.7	-1.3	0.0
JP Markit/JMMA Manufacturing PMI	-0.9	-1.2	-0.9	-0.5	-1.7	-1.8	-0.5	-0.7
JP Monetary Base	0.9	1.0	0.6	-0.7	0.5	0.5	0.0	-0.7
JP Nationwide Dept Sales	-0.0	-0.4	-0.6	-1.0	0.0	0.3	0.6	-0.8
JP Official Reserve Assets	-0.9	-0.9	0.0	-2.1	-3.0	-3.4	-3.1	-2.2
JP PPI Services	0.7	**1.7**	**1.7**	1.4	0.4	0.9	1.3	1.4
JP Retail Sales	1.3	1.1	0.9	0.7	**2.0**	1.4	0.7	0.6
JP Small Business Confidence	-0.0	-0.0	0.2	-0.8	-0.5	-0.4	-0.5	-0.4
JP Supermarket Sales	-0.3	0.1	-0.1	-0.1	-0.2	0.1	0.3	0.5
JP Tankan Surveys, Capital Spending and Company Profits	0.1	-1.5	-1.7	0.2	-1.6	-1.5	-1.8	-0.5
JP Tertiary Industry Index	-1.0	-0.5	0.1	0.5	0.4	0.3	1.2	0.9
JP Tokyo Avg Office Vacancies	-1.5	-0.7	-0.5	0.7	0.2	0.9	0.9	0.5
JP Tokyo Condominium Sales	-1.0	-0.5	0.2	0.6	-0.3	-1.1	-0.9	0.7
JP Tokyo Dept Store Sales	-0.0	0.7	0.7	1.2	0.1	-0.2	-0.5	0.9
JP Trade Balance	0.5	0.3	0.3	0.4	1.5	1.2	1.1	-0.1
JP Vehicle Production	1.0	1.3	1.3	0.3	-0.2	-0.6	-0.5	1.3
JP Vehicle Sales	0.8	**1.8**	1.4	**2.2**	1.3	1.0	0.4	**2.1**
Fed: Press Release	**9.4**	**9.7**	**8.3**	**8.1**	**7.1**	**8.3**	**8.5**	**7.6**
Fed: Press Conference	**2.6**	**3.4**	**3.2**	**3.0**	1.2	**2.8**	**3.9**	**3.3**
Fed: Speech by Chair	**4.3**	**5.6**	**5.2**	**4.2**	**3.4**	**4.4**	**4.4**	**3.0**
Fed: Minutes	**7.4**	**8.3**	**8.4**	**5.3**	**4.2**	**6.1**	**6.7**	**4.0**
Fed: Beige Book	**2.1**	**2.9**	**2.6**	1.6	1.5	1.5	1.5	**1.9**
Fed: Discount Rate Minutes	0.7	0.4	0.5	**1.7**	1.5	**1.8**	1.5	**2.1**
ECB: Press Release	0.2	0.8	1.4	**2.0**	**5.1**	**5.3**	**3.3**	**4.1**
ECB: Press Conference	-0.8	**2.7**	**3.7**	0.6	**11.6**	**13.4**	**12.5**	**5.5**
ECB: Speech by President	-2.0	-1.2	-1.0	-1.6	0.7	0.9	0.9	-1.8
ECB: Accounts	-1.0	-1.8	-1.1	-0.2	1.3	1.4	1.2	-1.3
ECB: Economic Bulletin	-1.0	0.3	0.3	0.5	0.5	0.1	-0.1	1.3
ECB: MRO	1.0	0.3	0.2	-0.6	0.4	-0.6	-0.1	-0.8
ECB: (T)LTRO	-2.0	-1.3	-0.3	-1.2	**2.2**	1.4	1.6	-0.2
ECB: other Refi Op	-0.9	-2.3	-1.9	-4.5	-1.4	-1.3	0.1	-3.4
ECB: (T)LTRO Repayment	1.0	0.7	0.8	**2.5**	1.5	1.6	1.0	**4.0**
ECB: Weekly Financial Statement	-2.0	-3.6	-3.7	-14.5	1.0	0.3	-1.0	-7.8
ECB: Securities Markets Programme	-3.2	-1.0	-1.1	**3.3**	-0.8	-0.9	-0.7	**2.6**
ECB: Asset Purchase Programmes	-2.2	-0.7	-1.8	**2.9**	-4.9	-5.4	-3.5	-1.7
BoE: Press Release	0.9	1.0	1.2	**2.5**	**3.6**	**3.0**	**3.1**	**2.4**
BoE: Press Conference	-2.4	-2.1	-1.6	-1.2	-2.7	-1.7	-0.5	-1.0
BoE: Minutes	0.5	1.0	0.8	-1.6	0.5	1.1	1.5	0.4
BoE: Inflation Reports	-0.4	0.8	0.6	-1.2	0.8	0.9	**1.8**	0.3
BoJ: Press Release	0.2	0.8	1.4	1.6	1.3	0.6	**2.0**	0.9
BoJ: Press Conference	1.5	1.5	1.2	-0.6	0.2	0.8	0.5	0.4
BoJ: Minutes	-0.1	-1.6	-0.9	-0.5	0.8	0.5	0.5	-1.3
BoJ: Monthly Report	-0.1	0.3	0.7	0.0	**1.6**	**2.1**	**1.8**	1.3
BoJ: Summary of Opinions	-0.7	-0.8	-0.2	-0.9	-1.9	-1.2	0.3	-1.0
SNB: Press Release	0.5	1.2	0.5	-0.3	-0.1	-0.2	-0.3	-0.8
SNB: Press Conference	**2.4**	**2.3**	**2.3**	0.4	**2.1**	**2.2**	**1.8**	1.0
SNB: Speech by Chair	1.0	-0.1	-0.8	1.1	-0.4	0.5	0.4	1.1
SNB: Quarterly Bulletin	-0.8	-1.1	-1.6	0.3	-2.3	-2.6	-2.3	-0.8
Riksbank: Press Release	0.6	0.7	0.2	0.9	1.3	0.8	0.6	1.6
Riksbank: Press Conference	-1.9	-2.7	-1.9	-0.2	0.6	-0.2	-0.6	-1.1
Riksbank: Minutes	-0.4	0.7	0.9	-2.1	0.8	0.6	0.9	0.5
BoC: Press Release	0.4	**1.8**	1.5	-0.9	0.4	0.7	1.4	0.1
RBA: Press Release	-0.8	-0.4	-0.5	0.7	1.4	0.9	0.9	0.0

T-statistics of scheduled news releases, see dummy regressions in Equation (1). Significant effects at the 10% level are in bold. News types with significant effects on at least one asset are also in bold.

Figure IA.3: Important Scheduled News

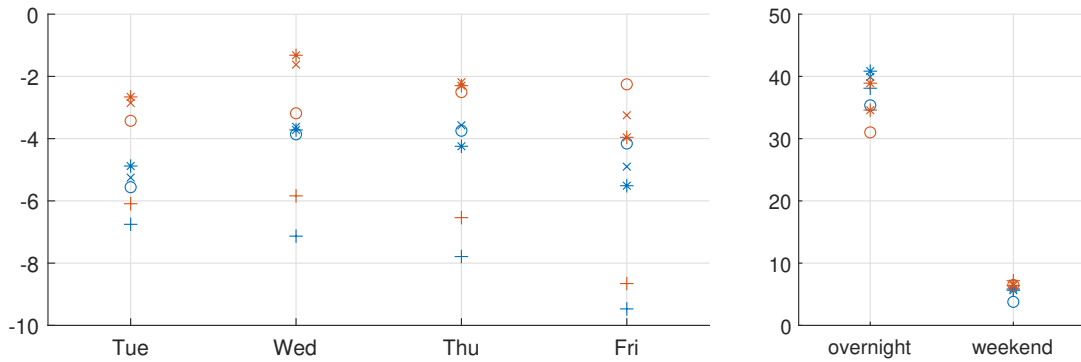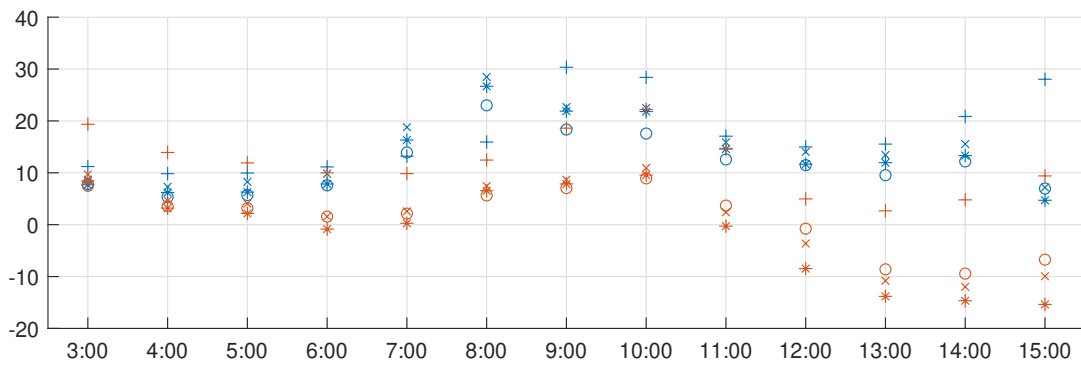**(a)** Rank 26-50
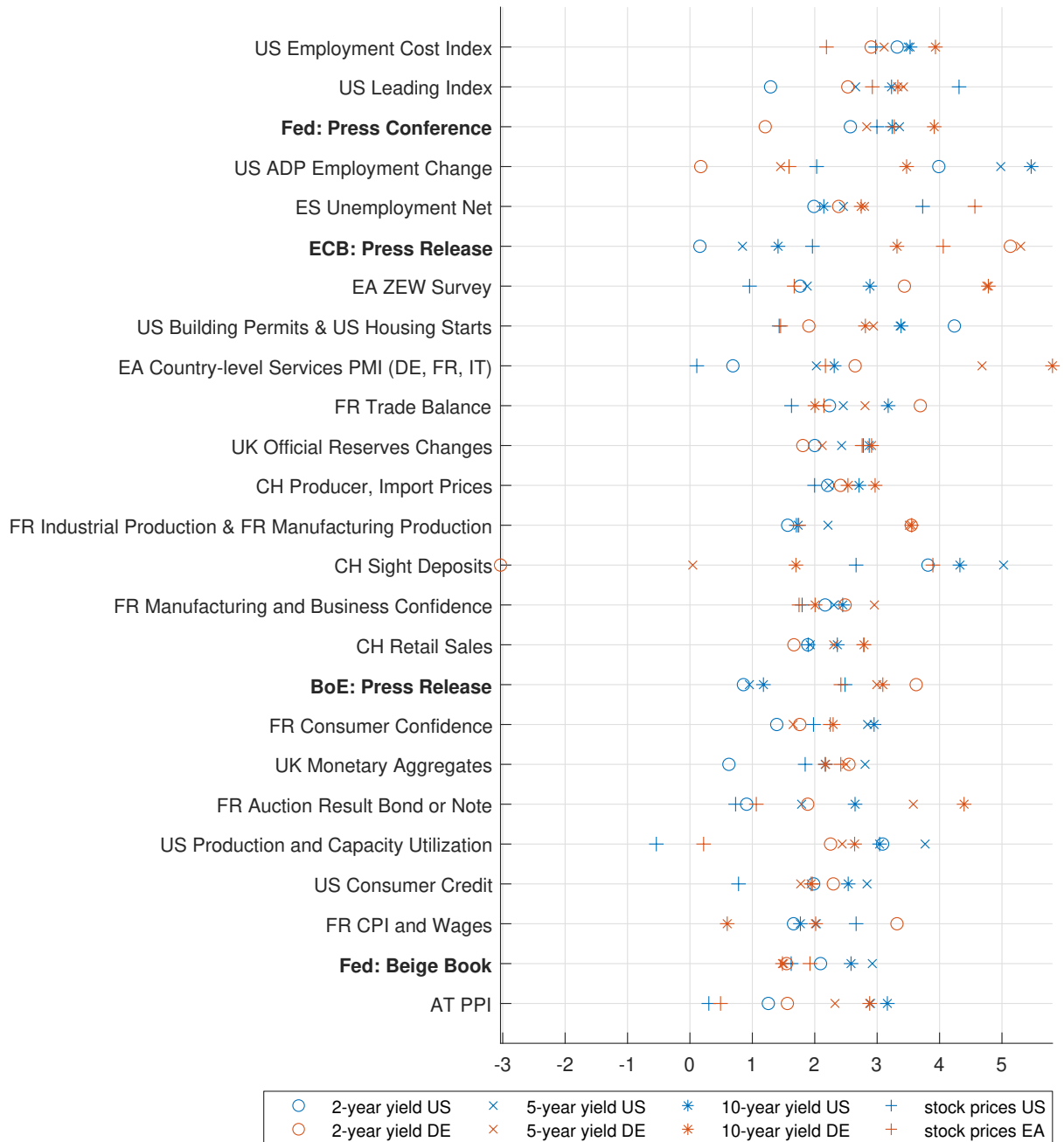
(b) Rank 51-75

Each symbol-color combination refers to a t-statistic of β_i from a separate regression, one for each of the eight assets we study, see Equation (1). Each row label refers to a different news release. Monetary policy announcements are in bold font. Figure 1 shows results for the 25 most important news.
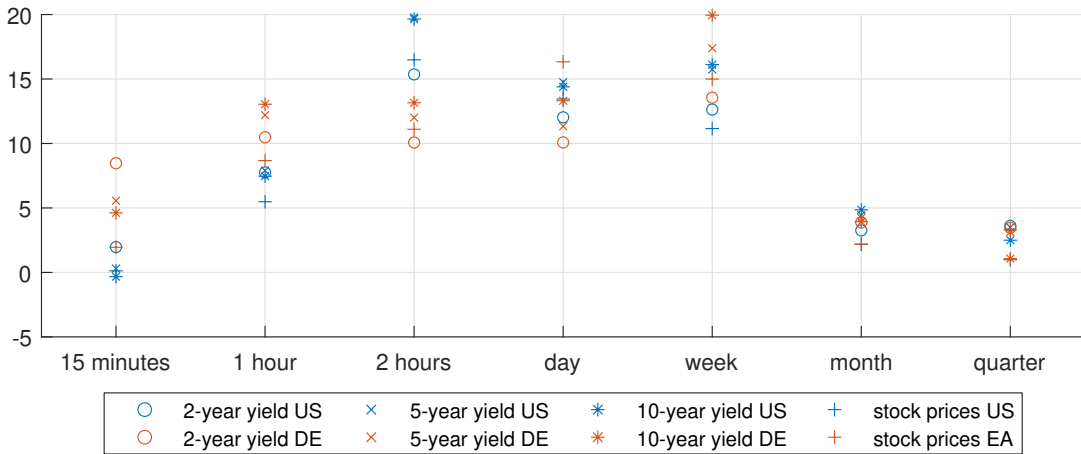
Figure IA.4: Fixed-Effects from Regression (1)

(a) day of the week and overnight

(b) hour within day

(c) past volatility

○ 2-year yield US	× 5-year yield US	＊ 10-year yield US	+ stock prices US
○ 2-year yield DE	× 5-year yield DE	＊ 10-year yield DE	+ stock prices EA

T-statistics of fixed-effects included in Equation (1). Base case is Monday prior to 3:00 a.m. Each hour dummy captures price movements over the subsequent hour, i.e. the 3 p.m. dummy covers 3 p.m .to 4 p.m. and so forth. The "weekend dummy" captures any time span greater than 24 hours, i.e. not only weekends but also public holidays. Panel (c) refers to the realized power measures included in Equation (1), i.e. the sum of $|\Delta y_t|$ over the previous 15 minutes, 1 hour, 2 hours, day, week, month and quarter.

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Figure IA.5: Actual and Fitted Intraday Volatility Patterns
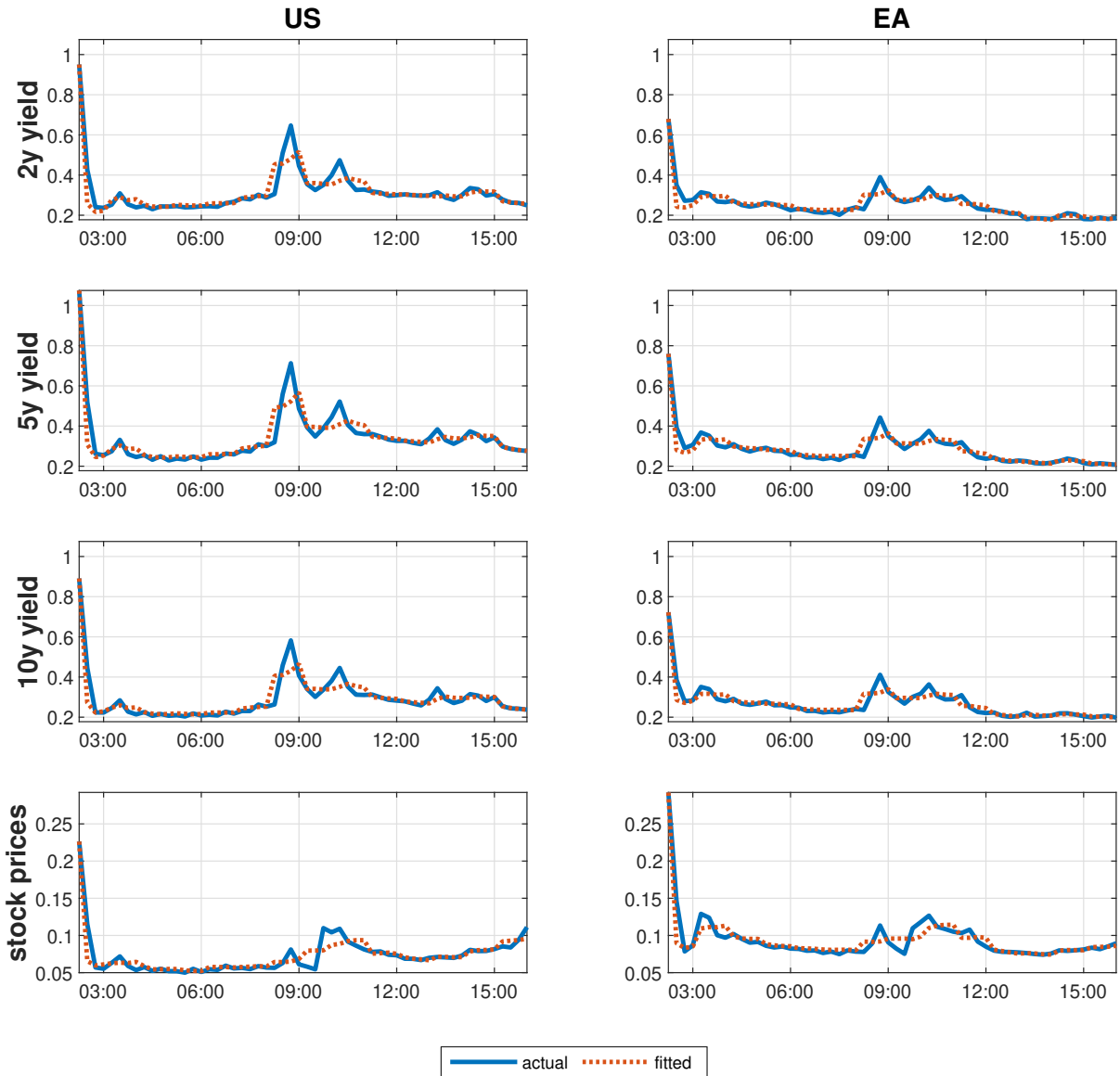
This figure shows the volatility pattern of each asset price through the day (cf. Figure 3 in Andersen et al., 2003). The solid line is the intraday pattern of the absolute residual $|\epsilon_t|$, where ϵ_t is the residual from Equation (1) excluding calendar-based fixed-effects and lagged volatility measures, i.e. from the following regression: $|\Delta y_t| = \alpha + \sum_i^{N_i} \beta_i \cdot D_{it} + \epsilon_t$. The dashed line is the fitted intraday pattern of $|\epsilon_t|$ using the calendar-based fixed-effects and lagged volatility measures from Equation (1), i.e. the fitted values from the following regression: $|\epsilon_t| = \alpha + \lambda \cdot FE + \gamma \cdot vol$. All values refer to averages throughout the day. The first value at 2:15 captures all overnight windows, the remaining 55 values refer to 15-minute windows.