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What moves markets?☆

Mark Kerssenfischer [a], Maik Schmeling [b,c,*]

[a] Deutsche Bundesbank, Mainzer Landstraße 46, Frankfurt am Main, 60325, Germany
[b] Goethe University Frankfurt, House of Finance, Theodor-W.-Adorno-Platz 3, Frankfurt, 60629, Germany
[c] Center for Economic Policy Research, 33 Great Sutton Street, London, EC1V 0DX, United Kingdom

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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 and find that news account for up to 35% of bond and stock price movements in the United States and euro area since 2002. This suggests 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, spillover effects between the US and euro area, and the predictability of monetary policy shocks.

1. Introduction

A key question in macro-finance is to what extent macro news drive asset prices. 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 using 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, debt auctions, 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. In this regard, our paper is more ambitious: we want to quantify the *total* explanatory power of macro news for asset return variation. 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 roughly 100,000 scheduled news releases and 1200 unscheduled events over a period of more than 18 years. We use this database in tandem

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* Corresponding author at: Goethe University Frankfurt, House of Finance, Theodor-W.-Adorno-Platz 3, Frankfurt, 60629, Germany.
E-mail address: schmeling@finance.uni-frankfurt.de (M. Schmeling).

[1] Regarding monetary policy, see e.g. Kuttner (2001), Cochrane and Piazzesi (2002), Bernanke and Kuttner (2005), Gürkaynak et al. (2005), Nakamura and Steinsson (2018), Cieslak and Schrimpf (2019), Leombroni et al. (2021), Kroencke et al. (2021) and Swanson (2021). Regarding macro data releases, see e.g. Andersen et al. (2003), Altavilla et al. (2017) and Gürkaynak et al. (2020). Regarding debt auctions, see e.g. Gorodnichenko et al. (2023) and Phillot (2023). Regarding uncertainty shocks, see e.g. Piffer and Podstawski (2018). Regarding oil shocks, see e.g. Känzig (2021).

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with high-frequency asset price changes at the 15-minute frequency going back to 2002. The assets 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 then estimate the net impact of news on asset prices by regressing squared returns on event dummies that cover tight windows of −15 to +30 min around a news release, while controlling for (intraday) seasonalities and lagged variance. This regression approach allows us to estimate variance shares, i.e. the portion of asset price variation that is due to macro news.

Based on this new macro news database, we document the following stylized facts about news and asset prices. First, out of the wealth of news releases that continuously hit the market, only a small subset of news systematically affects return variation. The top 50–75 most important news releases already account for the lion's share of explained return variance across assets and increasing the set of macro news beyond this set of news does not add significant explanatory power. However, these 50–75 news releases alone can explain a large share of asset price variation, e.g. up to 35% for US yield changes. This number seems large relative to the existing literature, typically based on a handful of scheduled macro news, which finds that news can only explain less than 5% of stock price and bond yield variation.[2] That a large share of asset price movements can be traced back to observable news is noteworthy in itself but it also speaks to the recent literature on non-news driven returns by providing a benchmark for the amount of return variation that is potentially unrelated to macro news (see, e.g. Gabaix and Koijen, 2021, on the importance of flows in inelastic markets for driving return variation).

Second, the importance of scheduled macro news for asset returns is very unevenly distributed, even within the above-mentioned subset of highly important news. As an example, consider US ten-year government bond yield changes and two "important" news releases that significantly move asset prices: the US employment report and the ISM release. Employment report releases increases the variance of yield changes by a factor of about 30 relative to the unconditional variance but only by a factor of about five around US ISM releases. Similarly stark differences exist for other news and assets in both currency areas. Hence, our database allows us to estimate the statistical and economic significance of different types of news for bond yield and stock return variation. These results should be useful for future work in macro-finance, since they can be used to determine which type of news announcements to control for in empirical work. For example, Bauer and Swanson (2023) argue that one should control for important macro news announcements when interpreting the information content of high-frequency monetary policy shocks, 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 applications, an important question is which news matter for which type of asset class. Our results provide answers to this question.

We further decompose asset price variation due to news into different *economic types* of news to better understand the sources of asset price movements. To do so, we classify scheduled macro news into four different categories and further differentiate between foreign and domestic news, i.e. domestic and foreign news about growth, inflation, fiscal policy, and monetary policy. Based on this decomposition, a third stylized fact is that there are stark differences across assets and currency areas regarding the types of news that matter most. For US yields, we find growth news to be the most important driver, whereas euro area yields are dominated by news about monetary policy and ad hoc (unscheduled) news. Furthermore, US yield variation is dominated by domestic (US) news whereas foreign news are more important for euro area yield changes. A somewhat different picture emerges for equity markets, which are more strongly driven by foreign news and for which monetary policy news are relatively more important in both currency areas. These results contribute to a literature that tests for spillovers in international financial markets (e.g. Albagli et al., 2019; Kim and Ochoa, 2023) and provides new evidence based on much larger samples of macro news in the US and euro area.

Fourth, we contribute to the literature by documenting the importance of ad hoc, unscheduled news for asset prices, which are typically neglected in empirical work. We find that unscheduled news are an important driver of return variation, and especially so for stock markets in both currency areas. However, ad hoc news do *not* explain the bulk of *jumps* in asset prices. Especially for yields in the US and euro area, the overwhelming majority of news coinciding with jumps are *scheduled* macro news. This finding is relevant in light of the literature on jumps in asset prices (see, e.g. Ait-Sahalia et al., 2012; Johannes, 2004; Wachter and Zhu, 2022) that typically assumes random arrival times of jumps. Our empirical finding that jumps tend to occur around scheduled news releases favors alternative approaches (e.g. Kim and Wright, 2014).

In additional empirical work, we benchmark our findings to recent work by Gürkaynak et al. (2020) who estimate a latent factor model and show that news releases can explain *all* yield variation in tight event windows for a small set of highly important news. Our empirical approach is different from theirs, allows for different effects of news on asset price variance across different news releases, and nets out the effect of intraday seasonalities on return variance. Nevertheless, we show that the (Gürkaynak et al., 2020) approach yields very similar R^2s compared to our results when focusing on a small set of highly important news. However, the more we expand the set of news releases, the more our R^2 estimates decrease relative to those based on the Gürkaynak et al. (2020) assumption. This finding seems intuitive and has direct implications for future empirical work in this area. When working with a few highly important news, assuming that returns in tight event windows are fully driven by news seems justified. However, researchers employing larger sets of macro news need to take into account that different news releases can have very different

[2] For bond yields, Altavilla et al. (2017) find that macro *surprises*, i.e. the difference between headline figures and survey expectations, explain around 30% of the bond yield changes in 30 min windows around releases, which translates into an unconditional R^2 of 3% since only few observations contain news releases. Gürkaynak et al. (2020), in contrast, argue that virtually 100% of yield curve movements in tight event windows are due to news. But again, this is true only for a few tight intraday windows (roughly one event window every other trading day). For stock markets, 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 macro announcements.

effects on asset price variance. In addition, it is important to control for intraday seasonalities and lagged volatility in order to not overstate the importance of news.

As a final empirical exercise, we provide an application of our news database to the importance of monetary policy shocks for asset prices (e.g., Kuttner, 2001; Gürkaynak et al., 2005). More specifically, we test whether monetary policy shocks, i.e. two-year yield changes in tight event windows around monetary policy decisions, are predictable by publicly available news released *before* the monetary policy decision takes place (see e.g. Miranda-Agrippino and Ricco, 2021; Neuhierl and Weber, 2021). In a recent paper, Bauer and Swanson (2023) argue that such predictability is in line with a "response to news" channel, i.e. the central bank responds to news that hit the market prior to a monetary policy meeting. If market participants have imperfect knowledge of the central bank's reaction function, such publicly available information can predict monetary policy "surprises". We test for such a channel based on our large set of macro releases and indeed find that some news have predictive power for 2-year yield changes around monetary policy announcements by the Federal Reserve and the European Central Bank. Our results thus support a recent literature (e.g. Schmeling et al., 2022; Bauer and Swanson, 2023; Swanson, 2023b) that highlights the role of imperfect knowledge about a central bank's reaction function for asset price reactions to monetary policy news.

We provide several additional results and robustness checks in a separate Appendix. For example, we provide a list of the largest market movements during our sample period and coinciding news (if any), we check the sensitivity of our main results to changes in the length of event windows, we provide details on the importance of different news releases, and document the impact of intraday seasonalities for asset price variance.

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.[3] If not mentioned otherwise, we use a 45-minute window for all events, i.e. from 15 min prior to 30 min after the news release. Internet Appendix A provides details.

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 23 h of trading per day in the US and up to 20 h in the euro area. For US assets, for example, we usually have one "overnight window" (from the end of trading at 5 p.m. till 6:15 p.m.) and up to 92 intraday windows (from 6:15 p.m. to 6:30 p.m., .., 4:45 p.m. to 5:00 p.m.) per trading day. If not stated otherwise, henceforth all times refer to US Eastern Time. In total, we have roughly 360,000 observations for US and 260,000 observations for EA assets.

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 tight 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. Internet Appendix A provides further details on our high-frequency asset prices, including basic descriptive statistics for US and euro area yield changes and stock returns.

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.[4] 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 1000 different underlying series or transformations) with over 75,000 distinct releases (comprising almost 150,000 distinct data points). Table 3 in Internet Appendix B provides details.

[3] 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.

[4] 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.

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 up to one year maturity), notes (up to ten years maturity) and bonds (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 14,000 auction-related news events. Table 4 in Internet Appendix B 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 speeches by Federal Open Market Committe (FOMC) members 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 speeches by Governing Council (GC) members other than the ECB president.[5] 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.

Regarding Fed and ECB speeches, we try to start with the full universe of speeches by FOMC and GC members and then filter out speeches that did contain information relevant to financial markets. Our filtering approach is similar but not identical to Swanson (2023a) and Swanson and Jayawickrema (2023), Internet Appendix B.2 provides details.

Table 5 in Internet Appendix B shows the types of announcements whereas Table 6 lists the number of events per news type. In total, we include over 10,000 central bank news events.

For most central bank news, we use the usual 45 min window. The only exception are press conferences and speeches, for which windows end 15 min 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 min prior to 60 min 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. Some 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 severely understates 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 (2011) and Ait-Sahalia et al. (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. Lastly, Wolfers and Zitzewitz (2018) identify key events related to the 2016 US presidential election and Bianchi et al. (2023) identify statements by Donald Trump 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 news sources such as Factiva or Bloomberg. In total, we collect over 1200 clearly identifiable news events. Table 7 in Internet Appendix B gives an overview.

For ad hoc events, we usually use a 75-minute event window from 15 min prior to 60 min 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.

[5] Regarding ECB news, 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; and (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).

3. Which news move markets?

This Section reports the main results of our empirical analysis using the news database described above. Section 3.1 reports results for the dummy regressions identifying the most important news events in our database. Section 3.2 presents our main result and estimates the share of market movements that can be attributed to news. Sections 3.3–3.4 decompose the explained R^2 into types of economic news as well as into domestic and foreign news. Section 3.5 studies the different role of news across the return distribution, linking our results to the literature on jumps. Section 3.6 shows how our baseline results change when we assume that *all* market movements around selected news are fully explained by news. Section 3.7 discusses our main findings and Section 3.8, lastly, applies our database to the predictability of monetary policy shocks.

3.1. Estimating the importance of news

We estimate the impact of news on asset prices by running the following dummy regression separately for each asset:

$$y_t^2 = \alpha + \sum_i^N \beta_i \cdot D_{it} + \lambda_j \cdot FE_{jt} + \gamma_k \cdot vol_{kt} + \epsilon_t \tag{1}$$

where y_t are returns (i.e. either bond yield changes or stock price returns) and D_{it} are dummy variables that equal one if a given news series i is released around that window, with $N = 450$.[6] The coefficients β_i thus measure the effect of news item i on the conditional second moment of returns. Since $E[y] \approx 0$ for all returns, their uncentered second moments are identical to their variances for all practical purposes (see Internet Appendix A). We will thus refer to β_i as the impact of news on the conditional variance of returns. FE_{jt} includes several calendar-based fixed-effects and vol_{kt} includes various lagged volatility measures.[7]

Here and in the following analyses, we conduct inference based on a bootstrap, i.e. we first estimate all coefficients in the full sample and then re-run the entire estimation 1000 times using bootstrap samples with replacement. See Internet Appendix C for details. We use this bootstrap approach for two main reasons. First, we will make extensive use of variance shares (R^2s), for which we need to simulate confidence intervals. Second, we will frequently define sets of "important news", the composition of which are based on the statistical significance of β_is from the regression in Eq. (1) above. The bootstrap allows us to take the selection uncertainty associated with defining sets of important news into account.

Fig. 1 lists the 25 most important scheduled releases, as judged by the mean (bootstrap) t-statistic across all eight assets. Table 12 in Internet Appendix D contains results for all 450 news types. Unsurprisingly, the US employment report is by far the most important news release and US news clearly dominate overall, with 17 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 et al. (2020), who show that news from the Federal Reserve are more important than news coming out of other countries' central banks and Swanson (2023a) and Swanson and Jayawickrema (2023), who highlight the importance of Fed Chair speeches. Two other releases in Fig. 1 concern Treasury auctions. This is in line with Gorodnichenko et al. (2023), who study auction results to identify "debt demand shocks" and Phillot (2023) who studies auction announcements to identify "debt supply shocks". Of the most important non-US news, three relate to monetary policy, namely ECB press releases, the subsequent press conferences, and speeches by the ECB president.

3.2. Share of explained market movements

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

$$\Omega(k) = \frac{\sum_{i=1}^k E\left(y_t^2 | D_{it} = 1\right) P\left(D_{it} = 1\right)}{E\left(y_t^2\right)} = \frac{\sum_{i=1}^k \hat{\beta}_i \cdot P\left(D_{it} = 1\right)}{E\left(y_t^2\right)} \tag{2}$$

where k is the rank of each news release for a given asset (for most assets, $k = 1$ is the US employment report, see Fig. 1). The $\hat{\beta}_i$s in Eq. (2) correspond to estimates of the effect of news i on the conditional second moment. Weighing each coefficient by the frequency of releases and summing over all news gives us the second-moment share explained by all news. Since $E[y] \approx 0$ in tight event windows as discussed above, this measure is very close to a variance share and we thus label it R^2 for simplicity.[8]

Since we control for time fixed-effects and past volatility in Eq. (1), Eq. (2) attributes only that part of the volatility to news that goes above and beyond these effects. This is a rather conservative approach compared to the event study literature, which typically attributes *all* return variance around a news release as explained by the news (in line with Gürkaynak et al., 2020). We further discuss this issue in Section 3.6 below.

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[6] The 450 series consist of 382 macro news, 16 bond auction news, 44 central bank news and 8 types of ad hoc events (see Internet Appendix B for details).

[7] Following Ghysels et al. (2006), who find that "realized power" measures are the best predictor of future volatility, vol_t includes cumulated past squared returns over different horizons, namely 15 min, one hour, two hours and a day, week, month and quarter (σ^f with $f \in \{15m, 1h, 2h, d, w, m, q\}$), e.g. $\sigma^{15m} = y_{t-1}^2$ for intraday returns and $\sigma^d = \sum_{k=1}^{92} y_{t-k}^2$ if we have 92 observations within the last 24 h. The fixed-effects include hour-of-day, day-of-week, overnight and "over-weekend" dummies. Internet Appendix D.4 provides details.

[8] We thank an anonymous referee for pointing this out.

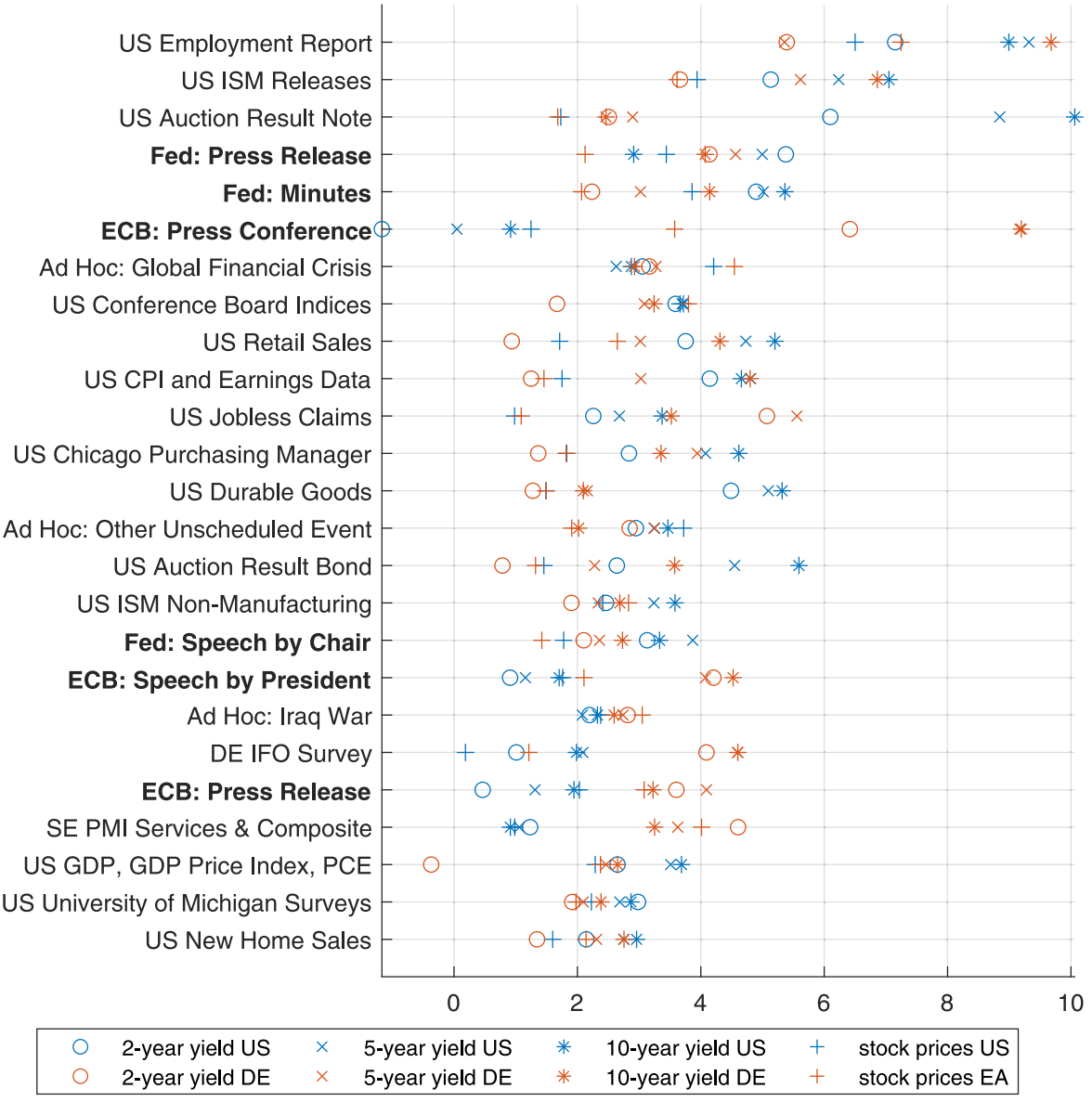

Fig. 1. Most Important News. Each symbol-color combination refers to a t-statistic of β_i from a separate regression, one for each of the eight assets we study, see Eq. (1). Each row label refers to a different news release. Monetary policy announcements are in bold font. See Figure 3 in Internet Appendix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

Fig. 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 the five most important types of news alone account for roughly 5%–10% of total variance, for the top 30 news this share rises to around 15%–25%, and the top 50 news account for roughly 20%–30% of all market movements.[9] For both US and EA assets, the explanatory power of news is highest for short- and medium term yields and lowest for stock returns.

The second-to-last entry in Fig. 2 is based on a variable selection method. In particular, we employ LASSO with 5-fold cross validation to identify "important" news and compute the R^2 from Eq. (2) for the news items selected by the LASSO approach.

[9] A potential problem here is that we first select important news based on their t-stat in Eq. (2) and then compute R^2s based on the selected set of news. To take this selection uncertainty into account in our bootstrap, we first regress bootstrapped squared returns/yield changes on news and then select the top 5, 10, ...news according to their t-statistic in each simulation run. In other words, a news item that is selected as being in the set of, say, top 5 news in the full sample need not be selected in the top 5 group in (some of) the bootstrap samples. This news item would then be recorded with a coefficient of zero in this simulation run, decrease the variance share according to Eq. (2) of this news item, and lead to a wider confidence interval in Fig. 2.

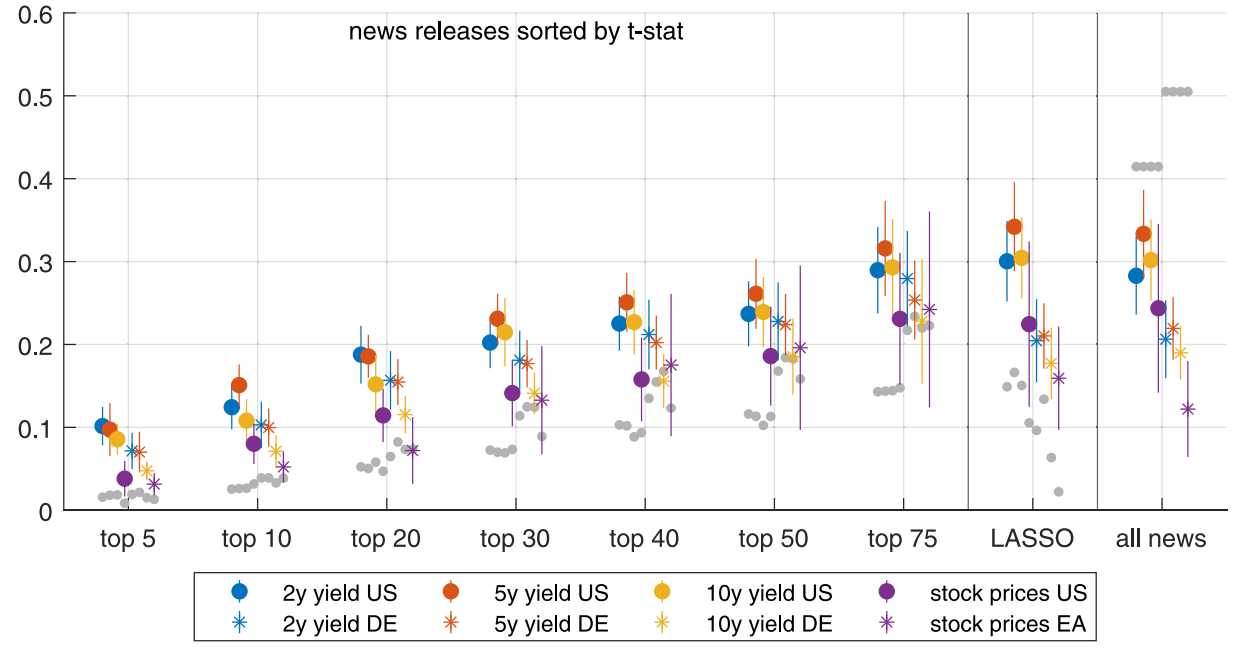

Fig. 2. Explained variance shares. Each symbol refers to the cumulative variance share of an asset explained by news, see Eq. (2). The first entries on the horizontal axis refer to the k most important news types for each asset, determined by their t-statistic from regression (1). The vertical lines mark 95% confidence bands based on bootstrap samples. The second-to-last entry refers to all windows around news that are selected by LASSO. The last entry on the horizontal axis refers to all news. For reference, the grey dots show the percent of observations covered by event windows.

Recall that LASSO selects the set of news that minimize the mean squared error.[10] As before, confidence intervals are also based on the bootstrap procedure outlined above and we let LASSO select the relevant news in each bootstrap simulation.

The results show that R^2s differ strongly across assets. LASSO selects few news items for stock returns, so that R^2s are quite low for US stocks (22% with 65 selected news items) and EA stocks (16% with 17 news selected by LASSO). On the other hand, R^2s are as high as 35% for US 5-year yields (with 102 news items selected by LASSO), which suggest a high importance of macro news for Treasury yields.[11] In what follows, we use the LASSO results as our benchmark. In particular, we use these results when decomposing R^2s into economic categories (Section 3.3) or into domestic and foreign news (Section 3.4) below.

For completeness, the last entry in Fig. 2 ("all news") shows results from Eq. (2) using *all* 450 news types in our database, even if their release has no significant impact on asset prices as judged by the regression in Eq. (1). The share of explained variance is similar to the results based on LASSO, which is intuitive, since most additional news items have no significant impact on returns.

Table 1 reports β estimates from the regression in Eq. (1), scaled by the asset's unconditional variance. This way, each estimate directly tells us how much the release of a news item raises the conditional variance of an asset net of fixed effects and intraday seasonality patterns relative to its unconditional variance. Note that the ranking of news items in Table 1 differs from the ranking in Fig. 1 since the latter ranks news items based on their statistical significance (t-stat) whereas the former ranks news based on their economic significance (β estimate). Hence, these two rankings are complementary and provide different perspectives on the importance of news.

We focus on the top ten news releases for US assets (sorted by the average effect across all four assets). For example, the US employment report raises the conditional second moment of US yields roughly 30-fold, of EA yields roughly 10-fold, and of stock returns roughly threefold. FOMC press releases rank second, as they raise the conditional variance somewhat less for yields but are more important for stock returns.

Another noteworthy feature of Table 1 is that several types of ad hoc news feature prominently in this list especially for stock return variance. These ad hoc news occur less frequently than scheduled news and their effect is thus estimated less precisely (with lower t-stats), which explains why these news feature more prominently in Table 1 than in Fig. 1. In that sense, the prominence of ad hoc news in Table 1 documents the economic significance and importance of accounting for unscheduled news when estimating the response of asset prices to macro surprises. Moreover, the large effect of unscheduled news on variance is relevant for asset pricing

[10] In terms of practical implementation, we use Matlab's built-in function *lasso*, which uses a geometric sequence of 100 different penalty parameters to find the parameter that minimizes the cross-validated mean squared error. We use LASSO only to select important news but coefficient estimates are based on OLS. We also applied other variable selection methods, namely Ridge and elastic net. The elastic net methods yields very similar results to LASSO while Ridge would select more news as important compared to LASSO and elastic net.

[11] For the sake of completeness, LASSO selects 80/102/97 news for US 2-/5-/10-year yields and 55/74/33 news for analogous EA yields.

Table 1
Variance increase of Top 10 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}
US employment report	30.4***	36.5***	29.9***	3.5***	8.6***	11.7***	9.3***	2.8***
Fed: Press release	21.9***	26.2***	28.3***	9.4***	6.4***	7.3***	7.5***	6.6***
BoJ: Ad Hoc press release	16.0*	20.3**	19.3**	13.3*	27.2	19.6*	17.6*	31.6**
Ad Hoc: Iraq war	13.5***	22.2***	16.1***	16.2***	17.1***	15.4***	10.2***	23.8***
Fed: Ad Hoc press release	19.9***	16.6**	10.4**	19.3***	10.0**	6.2**	2.8	6.1***
Ad Hoc: Covid-19	3.1*	11.6**	16.3***	26.7***	2.3	4.4***	8.2***	32.4***
Ad Hoc: Global financial crisis	15.4***	9.8***	6.5***	12.5***	9.1***	6.3***	3.0***	7.0***
Ad Hoc: Other unscheduled event	6.6***	7.9***	7.5***	4.0***	16.7***	11.8***	14.5***	21.0***
ECB: Ad Hoc press release	3.8	6.6*	9.8**	2.9	7.1**	6.4***	9.5***	12.5***
US ISM Releases	4.9***	5.4***	5.5***	1.4***	1.4***	1.8***	2.0***	1.4***

Each entry shows the increase in volatility conditional on a news release relative to the unconditional volatility, i.e. $\hat{\beta}_i / var(y_t)$ from Eq. (1). The ten news are sorted by their average variance increase across all US assets. *,**,*** indicate one-sided p-values below 10, 5 and 1% respectively. See Internet Appendix C for details.

models or hedging decisions more generally. The release of scheduled macro news is, by definition, known in advance so that there is no uncertainty about the timing of a shock whereas both the size and timing of shocks due to ad hoc news are unpredictable. A recent literature has investigated the effect of scheduled news on asset prices, e.g. Savor and Wilson (2014) or Wachter and Zhu (2022) and we will return to the importance of scheduled versus unscheduled news in Section 3.5 below.

3.3. 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 multiple economic categories, namely growth, inflation, fiscal and money. The "growth" category covers macro releases about (expected) real economic activity, "inflation" covers news releases about prices, "fiscal" mostly comprises bond auction news, and "money" mostly comprises central bank announcements, see Internet Appendix B for an overview.

As in Eq. (2), we sum up the weighted $\hat{\beta}_i$ estimates for each economic category. For example, all coefficients for news by the Federal Reserve are attributed to the "money" category. If a news type belongs to multiple economic categories, we allocate its R^2 contribution equally to each category. To be conservative, we apply this decomposition only to news selected by LASSO in the original sample. That means for each asset, the total R^2 across all economic categories is equal to the second-to-last entry in Fig. 2.

Fig. 3 shows the resulting decomposition for each asset and each type of news. We see that news about (expected) growth and money are the most important source of asset price variation in the US and euro area with growth being somewhat more (less) important than money in the US (euro area). News about fiscal matters and inflation rank lowest during our sample period. Ad hoc events, which are often neglected in empirical research, account for a sizeable share of the explained variance even though they occur less often than scheduled macro news.

3.4. Domestic vs. Foreign news

In a similar exercise, we further decompose market movements into domestic and foreign news. Table 2 reports the results.[12] We see a stark contrast between US and euro area assets. For US bond yields, roughly 20% of the variation stems from domestic news, and slightly less than half of that from foreign news.[13] For US stock prices, the opposite is true and foreign news account for almost three times as much variance as domestic news. In contrast, foreign news are more important than domestic news for *all* euro area assets. For two-year and five-year yields, this difference is rather small, but for ten-year yields and stock prices, foreign news are roughly twice as important as domestic news.

To better understand this finding, Table 2 further breaks down the R^2 contribution of domestic and foreign news by category. The table shows that domestic growth news drive yields in the US, but not in the euro area. In fact, domestic growth news explain an insignificant share of euro area yield movements.[14] Foreign growth news in contrast, which include US growth news as an important component, are a major driver of euro area yield variation. In other words, US growth news seem to play an outsized role for both US and euro area yield variation.

[12] We exclude the ad hoc news from Section 2.5 here, because many of these events cannot naturally be categorized into "country of origin".

[13] This is somewhat different from Kim and Ochoa (2023), who find that foreign and domestic news are roughly equally important drivers of US ten-year yields. Compared to us, they use a smaller set of domestic US macro news and use overnight yield changes as a rough proxy for foreign news. Our results also differ from Boehm and Kroner (2023), who find that foreign macro news have essentially no effect on the US stock market. They also use a smaller set of news compared to us, but more importantly, they run regressions of returns on the surprise component of news (difference between actual release and survey expectations), whereas we regress squared returns on release dummies. Hence, our results are not directly comparable to theirs.

[14] To be sure, these results do not imply that euro area yields do not respond to domestic growth at all. Instead, it means that only few domestic growth news releases matter so that the impact of all news from this economic category turns out insignificant.

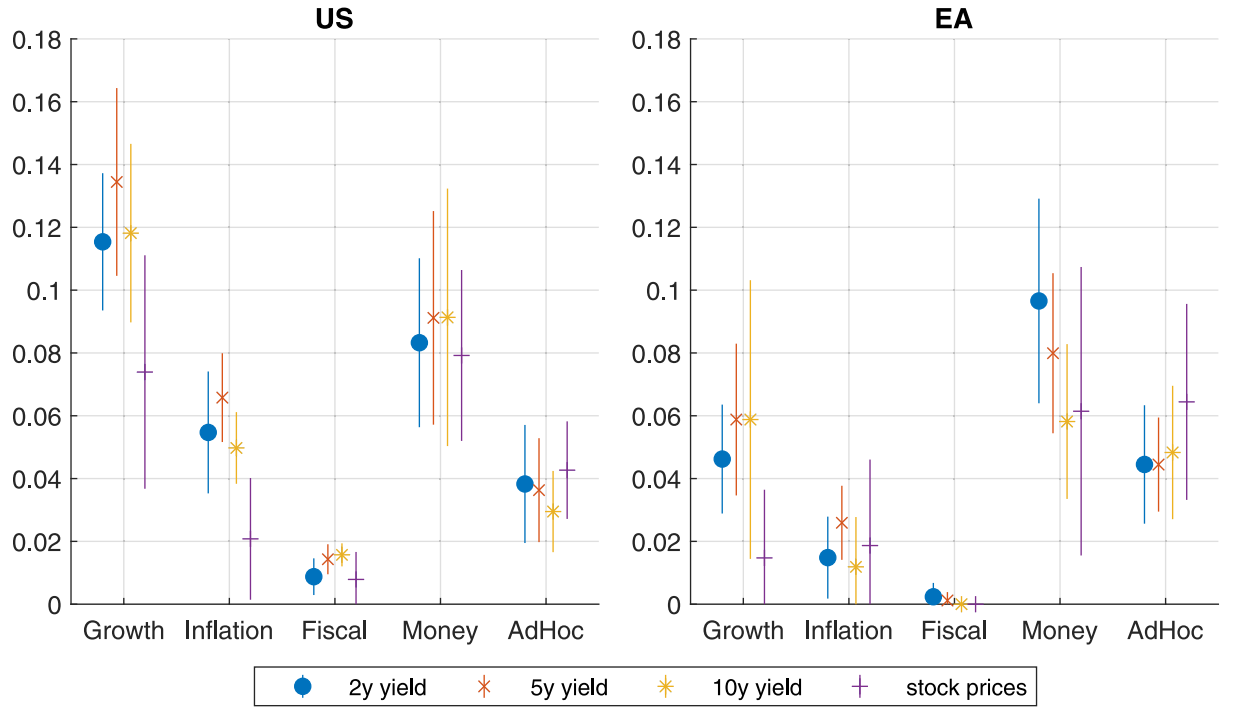

Fig. 3. Explained variance shares by economic category. This figure decomposes the LASSO-based R^2 values (see Fig. 2) into economic categories. See Internet Appendix B for the mapping of news into categories.

Turning to equity price variation, we find that news in the "foreign money" category are important drivers in both the US and euro area, highlighting the important role of global monetary policy news for stock returns. One take-away for the literature on asset price reactions to monetary policy news is that stock prices seem much more sensitive to foreign policy news than bond prices.

3.5. Large vs. Small market movements

An important question in finance is the role of jumps in asset prices and the associated implications for portfolio construction, option pricing, risk management, and, more generally, how markets process information (e.g. Ait-Sahalia and Jacod, 2012; Johannes, 2004; Wachter and Zhu, 2022).[15]

Our results can speak to the literature on jumps and their relation to news. To this end, Fig. 4 plots the frequency of news items per event window along the distribution of asset yield changes/returns, i.e. we count how often, on average, news events coincide with a return in the percentile of the distribution shown on the horizontal axis of Fig. 4. As in the previous sections, we restrict this analysis to "important" news, i.e. those selected by LASSO in the original sample.[16] The results show a distinct U-shaped pattern and paint a clear picture: Extreme yield changes in the 0.1% and 99.9%-tile typically occur with about one macro news release on average in the euro area and more than one news release on average in the US. For jumps in stock prices, this number is lower but still sizeable with 0.75 and 0.4 news releases per event window in the US and euro area, respectively.

A natural interpretation of these results is that macro news releases are important drivers of bond price jumps and, to a lesser degree, jumps in stock prices, which suggests that jumps are closely tied to information processing in financial markets.

An important question in this context is the type of news that can be associated with jumps. Do jumps occur mostly around a certain economic type of news (e.g. monetary policy news)? Do jumps mostly occur around unscheduled, surprising ad hocs news releases or do jumps also occur around scheduled news releases, whose timing is known well in advance and can be factored into e.g. hedging decisions or liquidity provision by market makers?

To better understand these issues, Fig. 5 shows the relative frequency of news events across categories. Since there is little asymmetry between positive and negative jumps, the figure looks at *absolute returns* of different size. Taking US 2-year yields as an example, the figure shows that for the bottom 50% of returns, only 1% of coinciding news were unscheduled ad hoc events. For the largest .1% of absolute yield changes, 8% of news were ad hoc events.

[15] The role of jumps in relation to macro news has also been investigated in, e.g., Evans (2011), Lahaye et al. (2011) and Rangel (2011).

[16] To give an example: A number of 1.4 for the US 5-year yield in the 0–0.1%-tile means that the largest 0.1% drops in US 5-year yields in our sample on average coincide with 1.4 news releases within the same event window.

Table 2
Explained share of asset price variance by origin and category of news.

(a) US assets	y^{US}_{2y}	y^{US}_{5y}	y^{US}_{10y}	y^{US}_{s}
Domestic	17.6***	20.8***	19.4***	4.6***
Domestic growth	7.5***	8.7***	7.8***	1.4***
Domestic inflation	3.7***	4.6***	4.0***	0.4***
Domestic fiscal	0.5***	1.2***	1.5***	0.3**
Domestic money	5.9***	6.3***	6.1***	2.5***
Foreign	8.6**	9.8***	8.1***	13.6***
Foreign growth	4.0***	4.7***	4.0**	5.9***
Foreign inflation	1.8***	2.0***	1.0**	1.7**
Foreign fiscal	0.4*	0.3	0.1	0.5*
Foreign money	2.4	2.8**	3.0**	5.5***
(b) EA assets	y^{EA}_{2y}	y^{EA}_{5y}	y^{EA}_{10y}	y^{EA}_{s}
Domestic	7.1***	6.8***	3.6**	2.7***
Domestic growth	1.1	1.3	1.1	1.3
Domestic inflation	0.6	0.7	−0.3	
Domestic fiscal	0.2	0.1		
Domestic money	5.2***	4.6***	2.7***	1.4***
Foreign	8.9***	9.8***	9.3***	6.8***
Foreign growth	3.5*	4.6**	4.8***	0.2*
Foreign inflation	0.9	1.9***	1.4**	1.9**
Foreign fiscal				
Foreign money	4.5***	3.4***	3.1**	4.7***

Analogously to Fig. 3, each entry decomposes R^2 values by the origin and category of news. p-values measure how often the R^2 is less or equal to zero across bootstrap samples, see Internet Appendix C for details. All results are based on the set of news selected by LASSO. If no news are selected for a given origin and category, the corresponding entries in the table are empty.

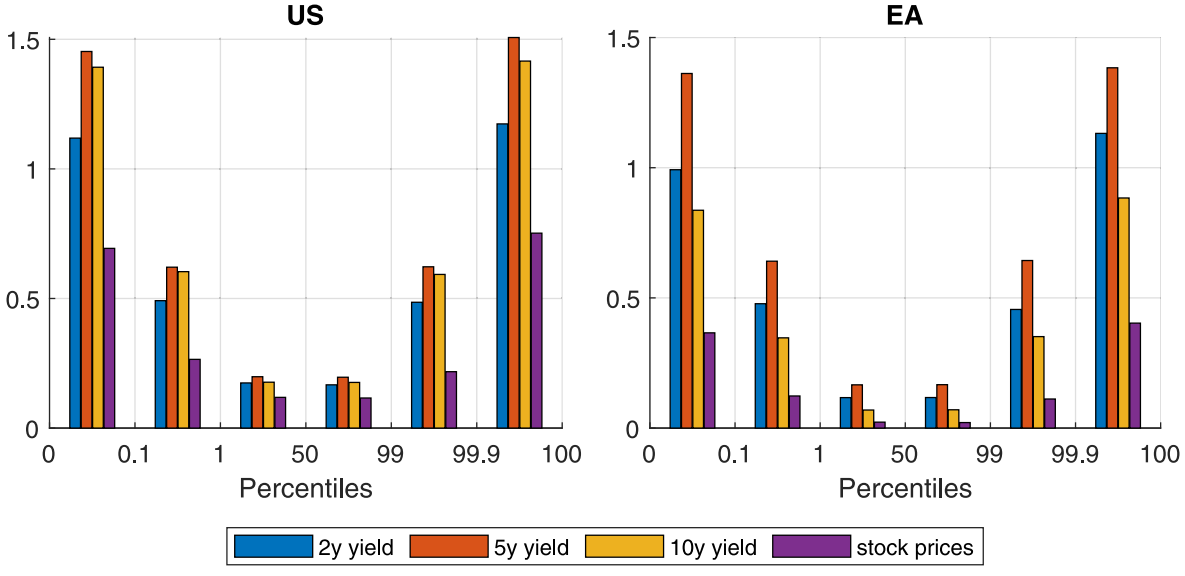

Fig. 4. Average number of important news across the return distribution. For each asset and return percentile, this figure shows the average number of news events per window. In particular, we compute the average of $\sum_i^N \cdot D_{it}$ across all windows t in a given percentile, see Eq. (1). Note that we restrict this analysis to news selected by LASSO in the original sample.

This decomposition highlights two important features of jumps and news. First, the relative importance of news appears to be different for "normal" returns and extreme returns (jumps). For example, inflation news releases account for a larger share of event windows in the tails of the distribution for US returns (e.g. 23% for 2-year yield changes and absolute returns in the 0.1 percentile) but seem less important in the center of the distribution (e.g. 13% for the bottom half of returns). Hence, whereas we do not find a large role for inflation news in driving asset price variation in general (see, e.g., Fig. 3) the importance of inflation news increases sharply for jumps in US bond prices. The opposite is true for news in the category "money" which make up a large share in the

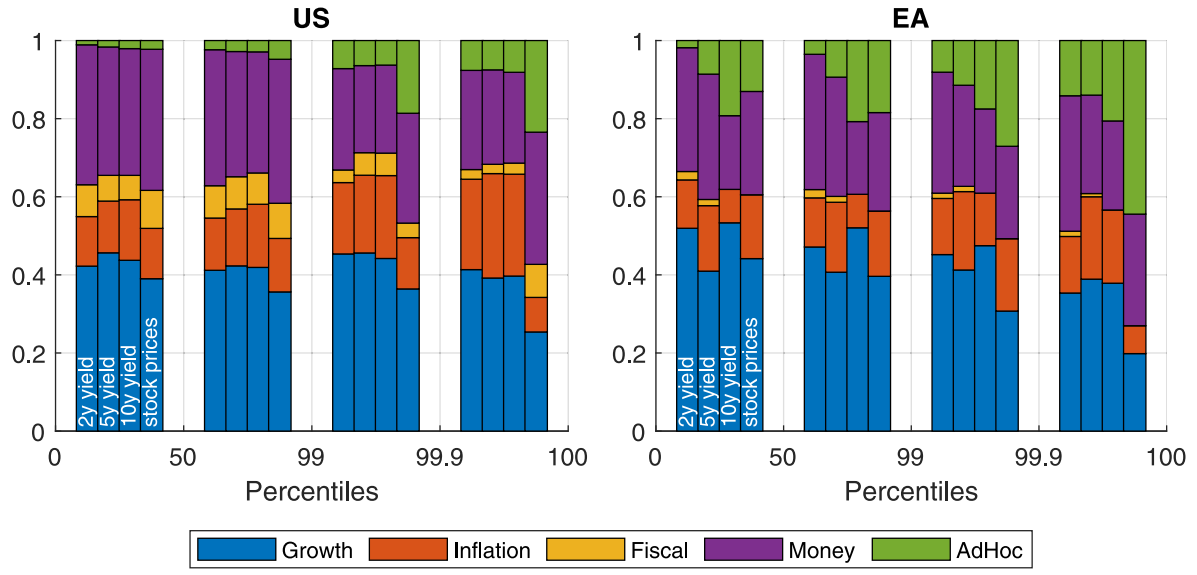

Fig. 5. Share of news categories across the distribution using absolute returns. For each asset and absolute return percentile, this figure looks at all news releases within these windows and shows the relative share of different news categories. See Internet Appendix B for the mapping of news into categories. From left to right, each set of bars refers to 2-, 5-, 10-year yield changes and stock returns. Note that we restrict this analysis to news selected by LASSO in the original sample.

center of the distribution (e.g. 36% for the bottom half of 2-year US yield changes) but are relative less dominant in the tails of the distribution (e.g. 25% for 2-year yield changes in the 0.1 percentile). As a second finding, Fig. 5 shows that "ad hoc news" play a much larger role for jumps in stock returns as compared to yield changes, both in the US and euro area. Especially for yield changes, scheduled macro news seem more important in driving jumps compared to ad hoc news.

These findings have clear implications for theoretical work in asset pricing. First, in terms of the economic type of news, inflation news seem more important for jumps in US yields than e.g. news about monetary policy or fiscal policy, which speaks to the type of shocks in theoretical models that can plausibly drive jumps in bonds.

Second, models with jumps in asset prices typically assume random arrival times of jumps, which is not supported by our results, at least not for bonds. Specifically, jumps in yields do not occur randomly but are concentrated around scheduled news releases as shown above. In this vein, Kim and Wright (2014) build a term structure model with jumps at deterministic times rather than random arrivals, which is well in line with the evidence documented above. For equities, models with jumps at random arrival times might be more realistic (e.g. Maheu and McCurdy, 2004; Evans, 2011), since jumps in stock markets occur outside of macro news release windows more often than for government bonds (Fig. 4) and because ad hoc news are relatively more important for stocks than for yields (Fig. 5). However, even for equities we find that a large share of extreme returns co-occur with a scheduled news release, which is at odds with purely random arrival times.

3.6. Do news fully explain returns in tight event windows?

A core assumption in the event study literature is that all asset price changes can be attributed to the respective news event around which they occur. In the case of central bank announcements, e.g., the debate is not *whether* but *why* announcements move markets.[17] In a recent paper, Gürkaynak et al. (2020) provide evidence supporting this assumption, not only for central bank announcements but also for macroeconomic data releases. They report R^2s of close to 100% for US bond yield changes around selected US macro news.[18]

Taken at face value, this evidence implies that our baseline approach in Eq. (2), which controls for time-fixed effects and past volatility, might be overly restrictive. We should instead attribute the entire market movements to news, even if the news occurred early in the trading day or during crisis periods, when volatility is expected to be higher. A natural question thus is how the share

[17] Central bank announcement might move markets because they reveal news about the current policy rate target (Kuttner, 2001), about the future path of rates (Gürkaynak et al., 2005), or about asset purchases (Altavilla et al., 2019; Swanson, 2021, 2023b). Apart from these monetary news, announcements might also reveal news about the state of the economy (Nakamura and Steinsson, 2018; Jarociński and Karadi, 2020) or change market participant's risk aversion (Cieslak and Schrimpf, 2019; Kroencke et al., 2021).

[18] Gürkaynak et al. (2020) 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.

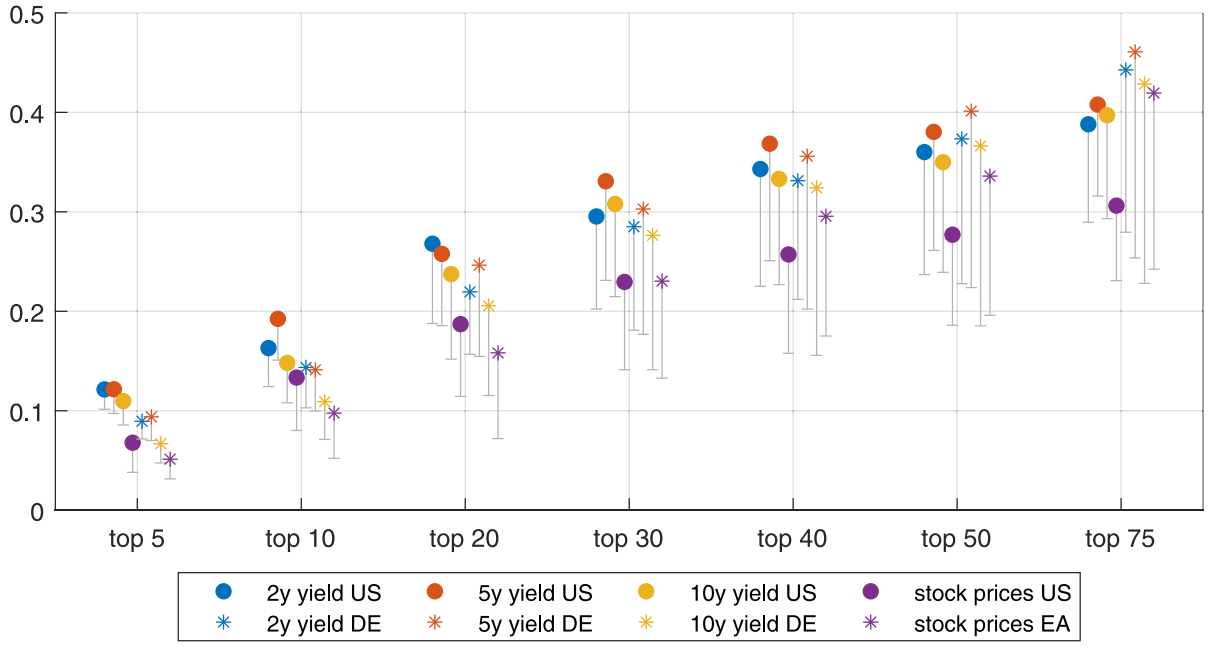

Fig. 6. Explained variance shares when treating the entire market movement around news as explained. Each symbol refers to the cumulative variance of an asset around selected windows, divided by the total variance of the asset. This R^2 corresponds to Eq. (3) and is motivated by the evidence in Gürkaynak et al. (2020). For reference, the grey lines show our baseline R^2 values based on Eq. (2). The horizontal axis refers to the k most important news types for each asset, see Fig. 2 for details.

of explained market movements would change if we adopted this less restrictive assumption? To answer this question, we compute an alternative R^2 measure according to Eq. (3):

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

where $\Omega^{GKW}(k)$ measures the share of total variance that occurs around the top k most important releases.[19] As before, our event windows usually start 15 min before and end 30 min after each event so that $\Omega^{GKW}(k)$ only picks up the variance in a tight window around the news event. This way, we do not falsely attribute price changes to other events on the same day. However, even with tight event windows, the causality assumption is less convincing for less important types of news.

Hence, Fig. 6 shows by how much the share of explained variance increases when we apply the less restrictive assumption on an expanding set of news. For the top ten news, e.g., the R^2s are very similar and only slightly higher when we ascribe the entire market reaction to news, instead of only the marginal increase in variance as in Eq. (2). Increasing the set of news items leads to larger and larger discrepancies between the two approaches. For example, we observe large differences in R^2s of up to 20% for 10-year euro area yields when comparing R^2s for the 75 most important news (top 75).

The key take-away from this exercise for future empirical work is that the Gürkaynak et al. (2020) assumption and the more conservative approach employed in our paper yield almost identical results for a select group of highly important news releases, but not beyond. When working with larger sets of (less important) macro releases, ascribing all return variation to a news release – as is standard in event studies – may be less appropriate, even when using tight event windows.

3.7. Discussion of main results

Before moving on to a particular empirical application of our database, we now briefly discuss how to interpret our main findings. In particular, we discuss conditions under which our results are more likely to over- or underestimate the explanatory power of news.

Our approach is based on the standard idea in the event study literature that asset prices are driven by news in tight event windows around a release. Contrary to many other papers in this literature (see, e.g., the discussion of Gürkaynak et al. (2020) in the previous section), though, we do not mechanically assign *all* asset price variation in tight event windows to the news release but allow for heterogeneity in the importance of news via the regression in Eq. (1). Empirically, we find that only 50–75 news items are

[19] Eq. (3) abstracts from simultaneous news, i.e. $D_{it} = 1$ for multiple news i. For such time periods t, to avoid double-counting, we attribute the market movements only to the news i with the highest rank k.

relevant for asset prices. Moreover, since asset prices most likely would have moved to some extent anyways ("background noise"), we control for time-of-day and calendar fixed effects as well as autocorrelation in return variance. Our results on R^2 in Fig. 2 can thus be seen as conservative, which is corroborated by the analysis in Fig. 6.

On the other hand, we might in some cases erroneously identify a "news" event based on the subsequent market reaction (post hoc ergo propter hoc fallacy).[20] To guard against this effect, we adopt a conservative approach and 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 make the news database available to other researchers. In any case, this issue is mostly relevant for unscheduled news, which do not account for the bulk of R^2. Hence, dropping some potentially controversial events from our database would only moderately affect our results.

Turning to the explanatory power of news for asset prices more generally, we may well underestimate the importance 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 et al., 2016; Michaelides et al., 2015; Hendershott et al., 2015) or unofficial communication of central bankers with the private sector (Cieslak et al., 2019). Second, our event database omits events for which the timing is unclear and might not fully capture the effect of news that diffuse only gradually to the public (Hong et al., 2000). Third, we do not include a vast array of corporate news, such as earnings releases, which would surely increase the R^2 especially for stock returns. 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.

Still, our results provide a useful benchmark for the literature on non-news driven volatility. To give a few examples, Edmans et al. (2022) show that investor sentiment that is unrelated to macro news has predictive power for stock and bond returns, albeit with low R^2s. Brandt and Kavajecz (2004) find that on days without major news, one quarter of the daily variation in US bond yields can be explained by orderflow imbalances, which they link to the aggregation of heterogeneous private information. Gabaix et al. (2006) argue that trades by large institutional investors cause market jumps, even in the absence of important fundamental news and even if they do not convey private information. Lastly, Gabaix and Koijen (2021) point to capital flows across different investor types as a major source of asset price variation. Our results should be relevant for these models since they provide bounds on how much return variation is left to explain by such effects after accounting for the direct effect of new macro information on asset prices.

3.8. Application: Predictability of monetary policy surprises

A recent literature has documented that monetary policy "surprises", measured as high-frequency changes of asset prices around central bank announcements (e.g., Gürkaynak et al., 2005), 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 whereas Neuhierl and Weber (2021) show that asset returns exhibit momentum around monetary policy news.

Bauer and Swanson (2023) argue that such predictability is consistent with a channel in which the Fed responds to (public) news in a way that is imperfectly understood by market participants. In other words, even if a central bank and all market participants have access to the same information, imperfect knowledge about a central bank's reaction function can lead to predictability of monetary policy "surprises".[21] Our extensive data set allows us to investigate which type of news has predictive ability for monetary policy surprises to shed further light on this channel for the US Fed as well as the ECB.[22]

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 2-year yield changes in narrow windows around other news between day t and $t-1$, where $t-1$ denotes the day of the previous press release or press conference (*not* the previous calendar day). In essence, we ask what the market's reaction to macro news since the last central bank announcement, measured by 2-year yield changes in tight events around macro news, tells us about monetary policy surprises at the next meeting. Since the signs of the coefficients in such regressions are hard to interpret, we focus on and report F-tests, i.e. tests for the joint significance of slope coefficients. We run these regressions with all news selected by the LASSO procedure detailed above and, in addition, for four different subsets of news to better understand the nature of monetary policy surprise predictability. Specifically, we distinguish between domestic and foreign macro news, domestic and foreign central bank news events, as well as ad hoc (unscheduled) events.

Table 3 reports results for these regressions, where each column represents a regression of monetary policy shocks on the set of news indicated in the column heading. The last columns report results for a regression of monetary policy shocks on all news using LASSO to pick out the set of relevant news.

[20] For example, Baker et al. (2021) find that next-day newspaper reports identify proximate causes for 88% of US stock market jumps (defined as daily absolute price changes ≥2.5%) in the post-war period.

[21] In this regard, Cieslak (2018) and Schmeling et al. (2022) provide evidence that the Federal Reserve has frequently surprised market participants by responding more strongly to news than expected.

[22] 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.

Table 3
Predictive regressions by news category.

(a) FOMC surprises						
	Domestic macro	Foreign macro	Domestic CB	Foreign CBs	Ad Hoc	LASSO
F	1.30	0.56	0.74	1.87***	0.60	7.82***
Adj. R^2	0.02	−0.03	−0.01	0.18	−0.02	0.22
(b) ECB surprises						
	Domestic macro	Foreign macro	Domestic CB	Foreign CBs	Ad Hoc	LASSO
F	2.67***	1.15	2.64***	1.80**	2.78***	15.57***
Adj. R^2	0.08	0.01	0.09	0.11	0.07	0.13

Each column in each panel refers to a separate regression. The dependent variable is 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 LASSO with 5-fold cross validation to select relevant regressors from the set of all news.

Our results qualitatively confirm prior evidence and show 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 8% (ECB surprises and domestic macro news) to 18% (FOMC surprises and foreign central bank news). When regressing monetary policy shocks jointly on *all* news selected by LASSO, these adj. R^2s are 22% for FOMC surprises and 13% for ECB surprises.

Overall, our results thus corroborate recent work by Bauer and Swanson (2023) and Swanson (2023b). Complementing their results, we find that news prior to monetary policy meetings are significantly related to subsequent monetary policy surprises, indicating that market participants have imperfect knowledge about the central bank's reaction function and lending credence to the existence of a "response to news channel".[23]

4. Conclusion

Using a large time-stamped event database together with continuous high-frequency asset price changes, we find that a large share of US and euro area asset price movements can be attributed to clearly identifiable news events. Specifically, our estimates suggest that 15%–35% of bond yield changes and stock return variance in these two currency areas can be attributed to the release of macro news, which is much higher than previous estimates in the literature based on less comprehensive databases.

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 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 in which asset prices move in the absence of macroeconomic news. Our estimates suggest that such models would have to match about two thirds of the total asset price variation by means of other mechanisms, e.g. noise trading or flows. Third, our results have implications for asset pricing models with jumps, since we show that, especially for bonds, the majority of news coinciding with jumps are scheduled news. This suggests that jumps do not have random arrival times, as often assumed in the literature, but that their timing is tied to release schedules, which are known in advance.

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.

Data availability

We will make the news event database publicly available. High-frequency asset price data were purchased from data vendors and cannot be made publicly available by us.

[23] Our results are complementary, since (Bauer and Swanson, 2023) focus on a small set of important macro news for which they can measure the surprise component of the news by comparing survey estimates and headline numbers. We instead use the market reaction to news itself to measure surprises and hence can focus on a much larger set of news. Hence, results from our and their paper cannot be directly compared.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.jmoneco.2024.103560.

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