

ECB communication and its impact on financial markets

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Abstract

Using an extensive dataset on public speaking events by ECB and euro area National Central Bank (NCB) officials, we show that communication outside of ECB regular monetary policy meeting days has a significant effect on daily movements in Eonia rates, market-based inflation expectations and sovereign bond rates. The remarks of ECB presidents are most important and the market reaction to them is comparable in size to those on ECB meeting days. In addition, ECB presidents' remarks given ahead of meetings with policy changes have a significant effect on Eonia rates of the same sign as the subsequent policy decision. Our results suggest that communication outside of regular meeting days contain a monetary policy signal and, thus, highlight the importance of this communication when studying the effects of monetary policy.

Keywords: Monetary policy, communication, financial markets.

JEL codes: E03, E50, E61.

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1 Introduction

We examine the importance of various dimensions of the European Central Bank's and the Eurosystem's communication for financial markets. In particular, we distinguish the effects of "central bank actions" on financial market movements on monetary policy decision days (MPDs), and pure "central bank communication" effects, occurring outside of decision days.¹ For the communication outside of monetary policy meeting days (CoMPDs) we consider speaking events of (i) ECB presidents, (ii) other members of the ECB Executive Board (EB), (iii) ECB Governing Council members representing the French, German, Italian and Spanish national central banks (NCBs), and (iv) European Parliament hearings of the ECB president.

CoMPD events are part of an extensive dataset based on speaking events of ECB and euro area NCB officials that we compiled using Bloomberg. We have matched these events with daily and intraday movements of euro area financial instruments, such as Eonia rates at different maturities. Consequently, one contribution of this paper is to construct an *Euro Area Communication Event-Study Database* (EA-CED) containing daily and high-frequency changes of several financial variables around different ECB/Eurosystem communication events. This database provides ample opportunity to investigate the effect of central bank communication (including actions) on financial markets.

We first document that there are frequent ECB/Eurosystem communication events outside of regular ECB MPDs. For the period 1999 to 2019, there are about 185 CoMPDs on average per year, compared to 12 MPDs. In addition, we observe that CoMPDs increased during the financial crisis of 2007-2008, peaking in 2013, the year the ECB introduced forward guidance on interest rates. Interestingly, the ECB president has delivered fewer speeches since the financial crisis while the number of speaking events of other Governing Council members have increased over the years.

In a second step, we use an event study approach on daily data to study whether CoMPDs are associated with significant movements in financial markets. We find that various forms of CoMPDs have significant effects on interbank rates (Eonia), on country-specific sovereign bond yields, and market-based inflation expectations at different maturities. These results are robust to controlling for other relevant economic events like main macroeconomic releases for the euro area and the U.S., and the Federal Reserve's monetary policy events. With respect to the type of speaker, we find that speaking events of the ECB president have the strongest effect on daily movements. These results hold systematically and are not driven by a few key speeches, such as Mario Draghi's "Whatever it takes" speech in the summer of London 2012 among others, or by the communication of a particular ECB president. However, we also find that there is a difference between the effect of CoMPDs before and after the financial crisis. In the pre-crisis period, it is mostly the communication of NCB governors and ECB EB members that moves markets. In the post-crisis period, it is mostly the ECB president's communication.

In a third step, we investigate the interaction between speeches ahead of a GC meeting and the sign of the upcoming monetary policy decision. We find that days with ECB presidents's speaking events in the weeks ahead of a meeting with a policy change (easing or tightening) are associated, on average, with significant movements of the Eonia rates of the same *sign* as the upcoming

¹We define MPDs as ECB Governing Council meeting days. Note that for notational simplicity, we label everything that happens on MPDs as "actions" even though communication also plays a role on MPDs. The key aspect in our work is the differentiation between the flow of information "on" vs "off" MPDs.

monetary policy action. For instance, Eonia rates at shorter maturities decrease on days with ECB presidents speeches given ahead of meetings with easing decisions. In contrast, medium to long-term Eonia rates increase on days with speeches ahead of meetings with a tightening decision.² Bloomberg news coverage of these speaking events corroborates our finding, revealing that some of the remarks given during these events indicate a clear signal about the upcoming policy move.

Finally, we use intraday data to match more closely the timing of the CoMPDs with market movements. This allows us to better identify the effect of various forms of ECB communication on financial markets. Our results show evidence of systematic movements in the Eonia yield curve around tight windows of CoMPDs, in line with our findings of the daily regression analysis. These movements are large and statistically different from movements of the same variables on comparable windows of typical “non-event” trading days, in particular for speaking events of ECB presidents.

Overall, our results confirm the importance of central bank communication and highlight the importance of communication outside of meeting days for understanding the transmission of monetary policy to financial markets. It suggests that looking only at announcements during monetary policy meetings to identify monetary policy shocks or surprises, neglects policy signals from the communication of ECB policy makers before the day of the actual policy meeting.

There are numerous studies that look at the role of central bank communication for movements in financial markets. In this strand of literature, the most traditional approach has been to assess market fluctuations around central bank communication on regular decision announcement days (Gürkaynak et al. (2005), Nakamura and Steinsson (2018) for the Fed and Altavilla et al. (2019) and Andrade and Ferroni (2021) for the ECB, among others). More recently, the literature has expanded towards studying central bank communication outside of regular meeting days, i.e. in the form of speeches or Congress/Parliament hearings (see Kohn and Sack (2004), Kliesen et al. (2019), Neuhierl and Weber (2019) and Istrefi et al. (2020) for the Fed, Ehrmann and Fratzscher (2007) for the Fed, Bank of England (BoE) and the ECB, Ehrmann et al. (2014), Gertler and Horvath (2018), Tillmann and Walter (2019) and Leombroni et al. (2021) for the ECB, among others).

Focusing on the ECB and Eurosystem communication, we relate closely to this strand of the literature. We contribute to it by providing a complete analysis of the market’s reaction to central bank communication, using an approach that covers systematically the scheduled remarks given by Eurosystem officials. While previous papers have looked at different communication events separately and for selected financial variables, we cover these events altogether and study their effect on a broad set of financial variables. In addition, most of these studies have looked at periods before or after the financial crisis. We cover the period from 1999 to 2019 and, thereby, can document that how much is communicated and by whom has changed over time. For instance, we find that the ECB presidents’ remarks are market movers post-crisis while remarks of other Governing Council members matter mostly in the pre-crisis period.³ Finally, we plan to make our

²We define a meeting with a policy change as a meeting where a change of one or more monetary policy instruments was announced. We consider changes in both conventional and unconventional (asset purchases, liquidity measures and Outright Monetary Transactions) policy instruments.

³For instance, Ehrmann and Fratzscher (2007) analyze market reaction to statements (speeches, testimonies, interviews) by committee members of the Federal Reserve, the Bank of England, and the ECB, for the period 1999 to 2004. Ehrmann et al. (2014) tested which factors (macro news and statements by policymakers and politicians) have affected the euro exchange rate over the years 2009-2011. Gertler and Horvath (2018) study the financial market impact

database publicly available for researchers interested in central bank communication.

The rest of the paper is organized as follows. [Section 2](#) provides a description of the Euro Area Communication Event-Study Database. [Section 3](#) and [Section 4](#) present our main empirical findings on daily and intraday data, respectively. [Section 5](#) concludes and mentions possible research extensions of this analysis.

2 Data

We compiled three datasets to analyze the effects of the ECB's and the Eurosystem's communication on financial markets, labeled as *ECB Events*, *Control Events*, and *Financial Markets*, which we describe in detail in this section.

The *ECB Events* dataset collects information on different ECB-related communication events, including the title, date, and time of the event as well as the speaker's name. Our list comprises the following:

- (i) ECB Governing Council monetary policy meetings (ECBGCM).
- (ii) ECB monetary policy accounts' publication.
- (iii) ECB president hearings at the European Parliament.⁴
- (iv) Speaking events by ECB presidents and other Executive Board (EB) members.
- (v) Speaking events by governors of four NCBs: Bundesbank, Banque de France, Banca d'Italia, and Banco de España.
- (vi) Speaking events by Single Supervisory Mechanism (SSM) Chairs.

The source of these events is Bloomberg's (BBG) Econ page. From there, we downloaded a list with the title, date, and time (hour and minute) of all ECB-related events for the period 1999-2019. Then, from this list, we selected the events described in *ECB Events* above. We subsequently checked the dataset for reporting errors, such as double entries or events for which the time is misreported. [Table 1](#) reports the number of observations, source, and the longest available sample for each of our events.

We compared some items of this database against other data sources. First, we matched the date and time of ECB policy decision announcements (and press conferences) with the list provided in [Altavilla et al. \(2019\)](#). Second, we compared speaking events of the ECB president and the other five Executive Board members with the ECB speech database (ECBDB) as provided on the ECB website.⁵ We can match around 73% of the speeches in the ECBDB (1664 out of the 2295 speeches in the ECBDB for the period 1999-2019) while the remaining 983 events from our BBG dataset are not part of the ECBDB. Finally, we only kept the speaking events for which a timestamp is reported in BBG, resulting in a total of 3777 events.

of ECB Governing Council communication during 2008-2014. [Tillmann and Walter \(2019\)](#) looked at market's effect of diverging tone communication in ECB and the Bundesbank speeches. [Leombroni et al. \(2021\)](#) looked at the effect of ECB policy announcements and ECB president speeches on sovereign spreads for the period 2009-2014.

⁴The ECB president and other Executive Board members appear regularly before the European Parliament, report on recent ECB's monetary policy and other tasks, and answer to questions of the members of the Parliament.

⁵The ECB provides an Excel file of speeches given by ECB officials on its website.

Table 1: Communication events

Type of event	Sample	Source	Observations
Regular events with communication on monetary policy			
ECBGC monetary policy meetings	1999-2019	BBG/ Altavilla et al. (2019)	270
ECB Monetary Policy Accounts	2015-2019	BBG	42
CoMPDs			
Speeches			
ECB presidents	1999-2019	BBG/ECBDB	605
Other ECB Executive Board members	1999-2019	BBG/ECBDB	2042
Bundesbank presidents	1999-2019	BBG	537
Banque de France governors	1999-2019	BBG	190
Banca d'Italia governors	2004-2019	BBG	130
Banco de España governors	1999-2019	BBG	163
SSM Chairs	2014-2019	BBG	86
ECB president hearings at the EP	1999-2019	BBG/ECBDB	95

Note: The table shows the different types of communication events in our ECB event database. For each type, we report the longest available sample, the source, and the number of observations.

Note that we use the term “speaking events” instead of speeches because not all of the events take the form of a speech and, for a small number of events, the BBG event relates to multiple speakers in the same venue.⁶

[Figure 1](#) shows the evolution of ECB-related communication since 1999. We observe that there is a considerable amount of communication outside of monetary policy meeting days (CoMPDs). On average, over our sample, there are 185 CoMPDs events per year compared to 12 ECB Governing Council policy meetings. The beginning of the euro started off with extensive communication from all the ECB/Eurosystem officials, with about 180 speaking events in 1999. In the following years, CoMPDs decreased and then picked up during the financial crisis of 2007-2008, culminating in 2013, the year the ECB announced forward guidance on interest rates. Overall, while ECB EB members and NCB governors have increased their speaking time over years, the ECB president has delivered fewer speeches, especially since the financial crisis.⁷

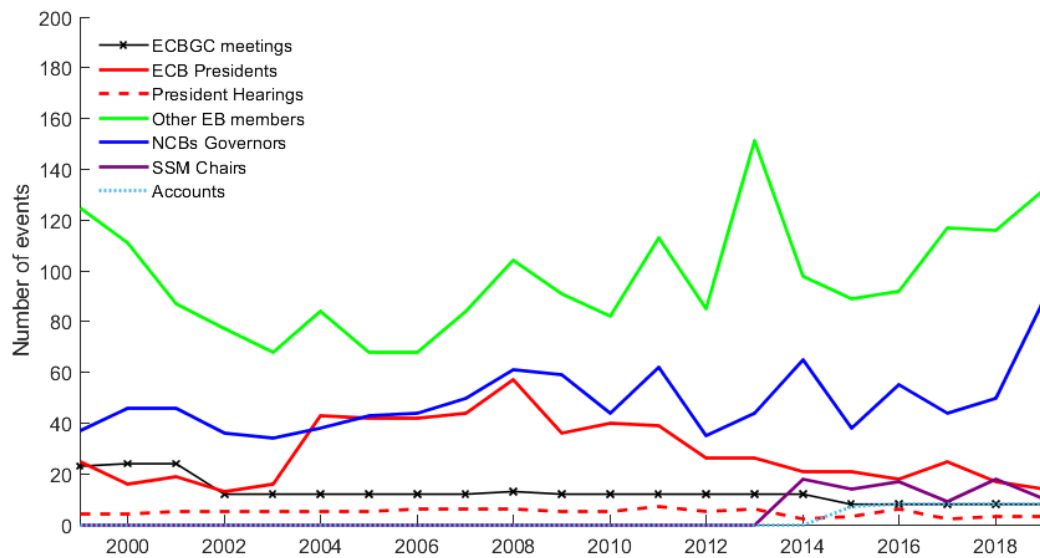
Our second dataset, *Control Events*, consists of date and time of several events that we use as control variables in our event-study regressions:

- Major macroeconomic releases for the euro area: real GDP growth, HICP and PPI inflation, unemployment, Purchasing Managers’ Indices (services, manufacturing, composite), industrial production, and several surveys releases (e.g. consumer, services and industrial

⁶We have 16 multiple speakers events for the ECB presidents and the EB members; for instance, “ECB’s Draghi and Praet Speak on Eurosystem and CSDs: Frankfurt”, on May 8, 2012, or “ECB’s Trichet, Stark, Weber, Papademos Speak in Frankfurt”, on September 7, 2007.

⁷[Istrefi et al. \(2020\)](#) show a similar trend for the Federal Reserve Chair speeches, suggesting a cautious communication policy.

Figure 1: ECB/Eurosystem communication events



Note: Number of speeches by the ECB president, other members of the ECB Executive Board, NCB governors (BdF, Buba, BdI, BdE) and the SSM Chair; number of EU Parliament Hearings of the ECB president, ECB Governing Council monetary policy meetings and Accounts' publications. All events are displayed at an annual frequency.

confidence).

- Selected major U.S. macroeconomic releases: real GDP growth, Non-Farm Payrolls, and Initial Jobless Claims.
- FOMC monetary policy decisions days.

Our third dataset, *Financial Markets*, consists of daily and minute-by-minute quotes for a large range of financial variables:

- EONIA OIS forward rates with maturities of one month to 20 years.
- Inflation-linked swap (ILS) rates with maturities of one year to 10 years, which we use to compute medium-term (2Y/2Y) and long-term (5Y/5Y) marked-based inflation expectations.
- Sovereign bond yields of Germany, France, Italy and Spain for maturities of three months up to 10 years. We also compute sovereign spreads for Italy and Spain versus Germany at two, five, and 10 years maturities.
- Euro exchange rates (EUR/USD and EUR NEER).
- Stock market indices (ES50, FTSE100, CAC40, DAX).
- Volatility indices (VIX and V2X).

Daily quotes of these financial variables are taken from Bloomberg while the minute-by-minute quotes are obtained from Thomson Reuters Eikon.⁸

⁸The starting date on which the different financial instruments are available varies. We indicate the respective starting date for each instrument in the regression tables.

Finally, we match the *ECB Events* with the *Financial Markets* dataset and compile a *Euro Area Communication Event-Study Database (EA-CED)* containing daily and intraday changes of several financial variables around our set of ECB/Eurosystem communication events.

3 Empirical analysis: An event study using daily data

This section uses daily data to estimate the effects of ECB and Eurosystem communication on financial market variables.

3.1 ECB communication and market activity

To evaluate the effect of CoMPDs on our set of financial variables, we specify the following baseline regression:

$$|\Delta FV_t| = c + \rho |\Delta FV_{t-1}| + \beta_1 \text{ECBPresident}_t + \beta_2 \text{ECBBoard}_t + \beta_3 \text{ECBhearing}_t + \beta_4 \text{NCB}_t + \beta_5 \text{ECBGC}_t + \gamma \text{FOMC}_t + \theta W_t + u_t, \quad (1)$$

where c is an intercept, $|\Delta FV_t|$ denotes the absolute change of a given financial variable (FV) on day t , computed as the absolute difference between the closing price on day t and the closing price on day $t - 1$, in basis points. $|\Delta FV_{t-1}|$ is the lag of the respective financial variable

$\text{ECBPresident}_t, \text{ECBBoard}_t, \text{ECBhearing}_t, \text{NCB}_t$ are indicator variables equal to one if there was a speaking event of the ECB president, a member of the ECB's Executive Board other than the president, an ECB president parliament hearing, or a speaking event by an NCB governor, respectively, on day t ; otherwise the indicator is equal to zero.⁹ In our baseline estimation, we move events that are given after trading hours to the next day and drop those given on weekends.¹⁰

ECBGC_t represents days of ECB Governing Council meetings and FOMC_t indicates the Federal Reserve's monetary policy decisions' days. Since the FOMC statements are published at 8.30pm CET, i.e. after the closure of markets in Europe, the FOMC event is counted towards the next day. The variable W_t contains a variety of control variables: two indicator variables for EA and U.S. macroeconomic releases respectively, day of the week indicators, and month of the year indicator variables. Note that we pool the macro releases of the euro area into a single indicator labeled EAMR_t and days of U.S. releases are indicated as USMR_t .

In the following, we first discuss results for the effect of ECB and Eurosystem communication on financial variables that are most closely related to monetary policy, such as Eonia rates and ILSs. [Table 2](#) show regressions results, using equation (1), for the Eonia rates for one-month to 10-year maturities and for the ILS two-year-on-two-year (2y2y) and five-year-on-five-year inflation expectations (5y5y), as indicated by the column names. Rows indicate the coefficient of the respective explanatory variable as well as the p-value, in parenthesis, of a two-sided t-test; bold numbers indicate a rejection of the null hypothesis $\beta_i = 0$ (or $\gamma = 0$ respectively), at the 10% level.

⁹We do not use events of items (ii) and (iv) of the *ECB Events* dataset due to too short sample availability.

¹⁰Speeches with a BBG stamp at or after 4pm are close to the end of market trading hours for most financial variables and, therefore, we count them towards the next trading day; this is the case for 193 (548) speeches of the ECB president (Executive Board) out of a total of 600 (2042).

We observe that, on average over the full sample, the Eonia rates and inflation expectations react significantly on ECB Governing Council meetings days ($ECBGC_t$). Significant movements in medium to long-term Eonia rates and ILSs are also associated with ECB president and NCB governors' speaking events. In contrast, neither speaking events of the Executive Board nor parliament hearings show large or significant effects on the average absolute daily changes.

In terms of magnitude, we find that Eonia rates react stronger on monetary policy meeting days than on days with CoMPDs. However, taking into account different frequencies of ECBGC meetings and CoMPDs, we find that the effect of ECB president speeches on Eonia rates is sizeable. Over our sample, the average number of speeches (rounded down to the next integer) given by the ECB president per quarter is seven while there are two ECBGC meetings per quarter. Thus, the quarterly effect from speeches on the 5Y Eonia rate is 2.38 basis points compared to 3.50 basis points from ECBGC meetings per quarter. With respect to market-based inflation expectations, the cumulative quarterly effect is, in fact, stronger for remarks by the ECB president than on days with ECB Governing Council meetings. Finally, we also find that the FOMC meetings move Eonia rates and the 2Y2Y ILS inflation expectations. Results for the other control variables are not reported here for reasons of legibility but are available upon request.

In a next step, we check whether the effects of CoMPDs communication have varied over time by interacting our variables of interest in equation (1) with indicator variables for the period before 2008 (1999 to 2007) and during/after 2008 (2008-2019). Results are shown in Table 3. The label "x pre" and "x post" show the coefficients for the pre- and post-2008 period, respectively.

First, we observe that the average daily absolute change of Eonia rates in the two samples reflect different monetary policy regimes. In the post-2008 period, which is characterized by short-term interest rates being at very low levels and close to the effective lower bound, the estimated intercept for the Eonia rates is considerably smaller for maturities of up to 2Y. Furthermore, we observe that the effect of ECB President communication comes mainly from the post-2008 period while the communication from other policymakers (ECB Executive Board and NCB governors) had more impact in the pre-crisis period.

Further, ECBGC meetings before the crisis have mostly affected the short-end of the yield curve (up to two years). After 2008, ECBGC meetings have a significant effect on the short- *and* the long-end of this curve, likely reflecting the unconventional monetary policy tools adopted by the ECB since the reach of the effective lower bound on policy rates.

Interestingly, we find no significant reaction of short- to medium-term Eonia on the days of FOMC decisions, in the post-crisis sample. On one hand this could reflect the fact that the Fed, differently from the ECB, reached the zero lower bound relatively early in the sample and used forward guidance on interest rates starting from December 2008. On the other hand, the Fed also started policy normalization by the end of 2015 by increasing the Fed Funds Rate several times in our sample. The fact that, on average, Eonia short- and medium-term rates do not appear to respond on the Fed's monetary policy days could also reflect credibility on the ECB forward guidance on rates, and thus for the ability of the Eurosystem, through its monetary policy actions, to better insulate EA financial conditions from the forces driving U.S. and global financial conditions.

Finally, the effect of ECBGC and ECB president communication on market-based measures of inflation expectations is only significant in the post-2008 sample. Among other factors, this could

Table 2: Daily frequency: Eonia and ILS

Predictor/Maturity	Eonia						ILS	
	1M	3M	1Y	2Y	5Y	10Y	2Y2Y	5Y5Y
Intercept	0.52 (0.00)	0.47 (0.00)	1.05 (0.00)	1.50 (0.00)	1.70 (0.00)	1.84 (0.00)	2.02 (0.00)	1.30 (0.00)
Own lag	0.32 (0.00)	0.31 (0.00)	0.33 (0.00)	0.28 (0.00)	0.24 (0.00)	0.21 (0.00)	0.52 (0.00)	0.37 (0.00)
ECB President	0.18 (0.16)	-0.00 (1.00)	0.09 (0.37)	0.33 (0.03)	0.34 (0.02)	0.09 (0.53)	0.89 (0.06)	0.32 (0.01)
ECB Board	0.02 (0.66)	-0.00 (0.99)	-0.00 (0.97)	-0.03 (0.73)	0.02 (0.86)	0.08 (0.47)	-0.21 (0.50)	-0.08 (0.26)
ECB hearing	0.11 (0.59)	-0.08 (0.51)	-0.05 (0.81)	-0.03 (0.91)	-0.03 (0.92)	0.06 (0.87)	0.99 (0.51)	0.03 (0.88)
NCB	0.05 (0.42)	0.03 (0.59)	0.06 (0.52)	0.18 (0.15)	0.17 (0.15)	0.22 (0.09)	-0.05 (0.87)	0.18 (0.04)
ECBGC	0.95 (0.00)	1.29 (0.00)	1.66 (0.00)	1.60 (0.00)	1.75 (0.00)	1.41 (0.00)	0.58 (0.31)	0.33 (0.08)
FOMC	0.02 (0.88)	0.23 (0.09)	0.26 (0.14)	0.50 (0.05)	0.81 (0.01)	1.03 (0.00)	1.48 (0.02)	0.02 (0.93)
EA macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day of week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
adj.R2	0.73	0.67	0.55	0.56	0.46	0.45	0.55	0.48
T	5459	5450	5459	5230	3795	3769	4050	4089
Start year	1999	1999	1999	1999	2005	2005	2004	2004

Note: The table shows the estimated coefficient values of the regression described in eq. (1). Values in parenthesis show p-values. Standard errors are computed using the HAC estimator of Newey and West (1987) with a bandwidth of $0.75T^{1/3}$. Bold numbers indicate significance at the 10% level. The dependent variables are absolute daily changes in Eonia rates or ILS inflation expectations (all in basis points), respectively. The number of speaking events that are available for this regression specification is shown in Table A.1. T denotes the sample size and “Start year” shows the earliest year for which we have data; due to data availability this may differ across financial variables and maturity.

also reflect the attention of markets to those measures of expectations, especially the 5Y/5Y ILS, after the Jackson Hole speech of Mario Draghi in 2014.

So far, we have presented results for Eonia rates and ILS inflation expectations, which are key variable for the measurement of monetary policy effects. [Tables A.5 to A.8](#) show results of the same type of regression as in eq. (1) for the sovereign yields of Germany, France, Italy, and Spain. We find that speaking events by the ECB president have a significant and systematic impact on the sovereign yields of Germany and France, which are considered to be safe assets. In turn, speaking events by the Executive Board show a significant effect on longer yield of Germany and France.

[Table 4](#) provides an overview of the results for the different groups of variables in our *Financial Markets* dataset over the entire sample.¹¹ In the table, the Xs indicate instances where the types of communications shown in the different columns have a significant systematic impact on the variables shown in the rows. Overall, we conclude that while ECB monetary policy announcements have a significant systematic impact on financial markets, communication outside of regular policy meeting days is also important for several financial variables.

Results are robust to several sensitivity checks for key ECB president speeches and the timing when some speeches are given. First, we check that our results are not driven by a few key ECB president speeches that are already scrutinized in the public media and the academic literature. For instance, we dropped the “Whatever it takes” speech of July 26, 2012, in London delivered by Mario Draghi; details for other speeches are given in [Section A.2](#). Regression results are shown in [Table A.2](#) and virtually unchanged to the baseline results.

Second, we also checked for (i) different timing conventions of how to count speeches close to/after market closure and (ii) including CoMPDs on weekends by counting them on the next Monday (available upon request). [Table A.3](#) shows results when dropping speeches given after 4.00pm entirely instead of attributing them to the next day; results are overall robust.

Finally, we also investigated the role of ECB president-specific fixed effects. Results are reported in [Table A.9](#). While we find that the estimated fixed-effect of Trichet and Draghi differ from Duisenberg, the difference between Trichet and Draghi are small, i.e. results are neither driven by Draghi nor Trichet’s presidency alone.

¹¹Detailed tables for each instrument are available upon request.

Table 3: Daily frequency pre- and post-2008: Eonia and ILS

Predictor/Maturity	Eonia						ILS	
	1M	3M	1Y	2Y	5Y	10Y	2Y2Y	5Y5Y
Intercept x pre	0.72 (0.00)	0.73 (0.00)	1.75 (0.00)	2.36 (0.00)	2.34 (0.00)	1.89 (0.00)	3.56 (0.00)	1.77 (0.00)
Intercept x post	-0.08 (0.86)	0.68 (0.01)	0.86 (0.04)	1.16 (0.03)	2.51 (0.00)	2.29 (0.00)	0.96 (0.39)	1.61 (0.00)
Own lag x pre	0.22 (0.00)	0.18 (0.00)	0.19 (0.00)	0.12 (0.00)	0.02 (0.64)	0.06 (0.21)	0.29 (0.00)	0.28 (0.00)
Own lag x post	0.47 (0.00)	0.40 (0.00)	0.38 (0.00)	0.38 (0.00)	0.27 (0.00)	0.22 (0.00)	0.55 (0.00)	0.39 (0.00)
ECB-P x pre	0.13 (0.65)	-0.24 (0.02)	-0.23 (0.16)	0.09 (0.75)	-0.02 (0.95)	-0.16 (0.57)	0.26 (0.68)	0.16 (0.50)
ECB-P x post	0.19 (0.06)	0.14 (0.12)	0.27 (0.04)	0.40 (0.01)	0.38 (0.02)	0.15 (0.36)	1.08 (0.10)	0.37 (0.01)
ECB-B x pre	0.18 (0.12)	0.12 (0.14)	0.25 (0.05)	0.23 (0.22)	0.58 (0.04)	0.76 (0.01)	0.02 (0.96)	-0.19 (0.25)
ECB-B x post	-0.01 (0.85)	-0.01 (0.82)	-0.02 (0.78)	-0.03 (0.77)	-0.04 (0.68)	-0.04 (0.72)	-0.23 (0.52)	-0.02 (0.77)
ECB-PH x pre	0.06 (0.86)	-0.27 (0.15)	-0.21 (0.49)	-0.52 (0.14)	-1.50 (0.00)	-1.05 (0.00)	0.58 (0.54)	-0.40 (0.21)
ECB-PH x post	0.13 (0.61)	0.09 (0.48)	0.08 (0.73)	0.30 (0.40)	0.43 (0.25)	0.42 (0.39)	1.20 (0.56)	0.19 (0.48)
NCB x pre	0.22 (0.07)	0.24 (0.03)	0.28 (0.09)	0.51 (0.05)	0.64 (0.05)	0.49 (0.13)	-0.73 (0.13)	0.13 (0.51)
NCB x post	-0.01 (0.88)	-0.06 (0.30)	0.00 (0.97)	0.08 (0.50)	0.10 (0.43)	0.16 (0.25)	0.19 (0.58)	0.21 (0.03)
ECBGC x pre	0.83 (0.02)	1.12 (0.00)	1.06 (0.00)	0.58 (0.07)	0.76 (0.16)	0.79 (0.09)	-0.52 (0.58)	0.25 (0.52)
ECBGC x post	1.08 (0.00)	1.47 (0.00)	2.20 (0.00)	2.39 (0.00)	2.00 (0.00)	1.56 (0.00)	1.05 (0.11)	0.35 (0.09)
FOMC x pre	0.19 (0.41)	0.39 (0.08)	0.59 (0.04)	1.17 (0.02)	1.00 (0.07)	1.27 (0.01)	0.38 (0.63)	0.26 (0.56)
FOMC x post	-0.17 (0.36)	0.07 (0.66)	-0.06 (0.77)	-0.03 (0.89)	0.80 (0.02)	0.99 (0.01)	1.80 (0.03)	-0.05 (0.82)
EA macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day of week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
adj.R2	0.73	0.67	0.55	0.56	0.46	0.45	0.55	0.48
T	5459	5450	5459	5230	3795	3769	4050	4089
Start year	1999	1999	1999	1999	2005	2005	2004	2004

Note: The table shows the estimated coefficient values of the regression described in eq. (1), where the main explanatory variables are interacted with indicator variables for the period before and after 2008, denoted by “x pre” and “x post”. Values in parenthesis show p-values. Standard errors are computed using the HAC estimator of [Newey and West \(1987\)](#) with a bandwidth of $0.75T^{1/3}$. Bold numbers indicate significance at the 10% level. The dependent variables are absolute daily changes in the Eonia rates or ILS (both in basis points), respectively. The number of speaking events that are available for this regression specification is shown in [Table A.1](#). T denotes the sample size and “Start year” shows the earliest year for which we have data; due to data availability this may differ across financial variables and maturity.

Table 4: Results by type of communication and of financial variable

Fin.Variables	ECBGC	ECB President	ECB EB	NCB	Hearings
Eonia rates	X	X		X	
German sovereign yields	X	X	X		
French sovereign yields	X	X	X		
Italian sovereign yields	X				
Spanish sovereign yields	X				
ILS	X	X		X	
FX	X				
VIX	X				
Stocks	X				X

Note: X denotes significant effects on different variables or maturities of each group of financial indicators in the rows of specific communication events shown in the columns.

3.2 Communication before meetings with monetary policy changes

We further investigate whether CoMPDs before meetings with monetary policy changes move markets significantly in anticipation of policy actions. Media coverage of public remarks of ECB officials suggests that there are instances of clear policy signals in CoMPDs. For instance, Bloomberg News reported the following after a speech of the ECB president in June 2011:

“We are taking the decision progressively to anchor inflation expectations,” Trichet said at a [non-GC meeting] press conference in Amsterdam today [...] “As far as we’re concerned, we’re in strong vigilance mode,” he said, repeating a phrase the ECB uses to indicate a rate increase is imminent. The euro rose more than a cent after the comment to \$1.435 at 1:50 p.m. in New York.”

Indeed, the ECBGC raised the main refinancing operations rate of the Eurosystem by 25 basis points on its next meeting on July 7, 2011.

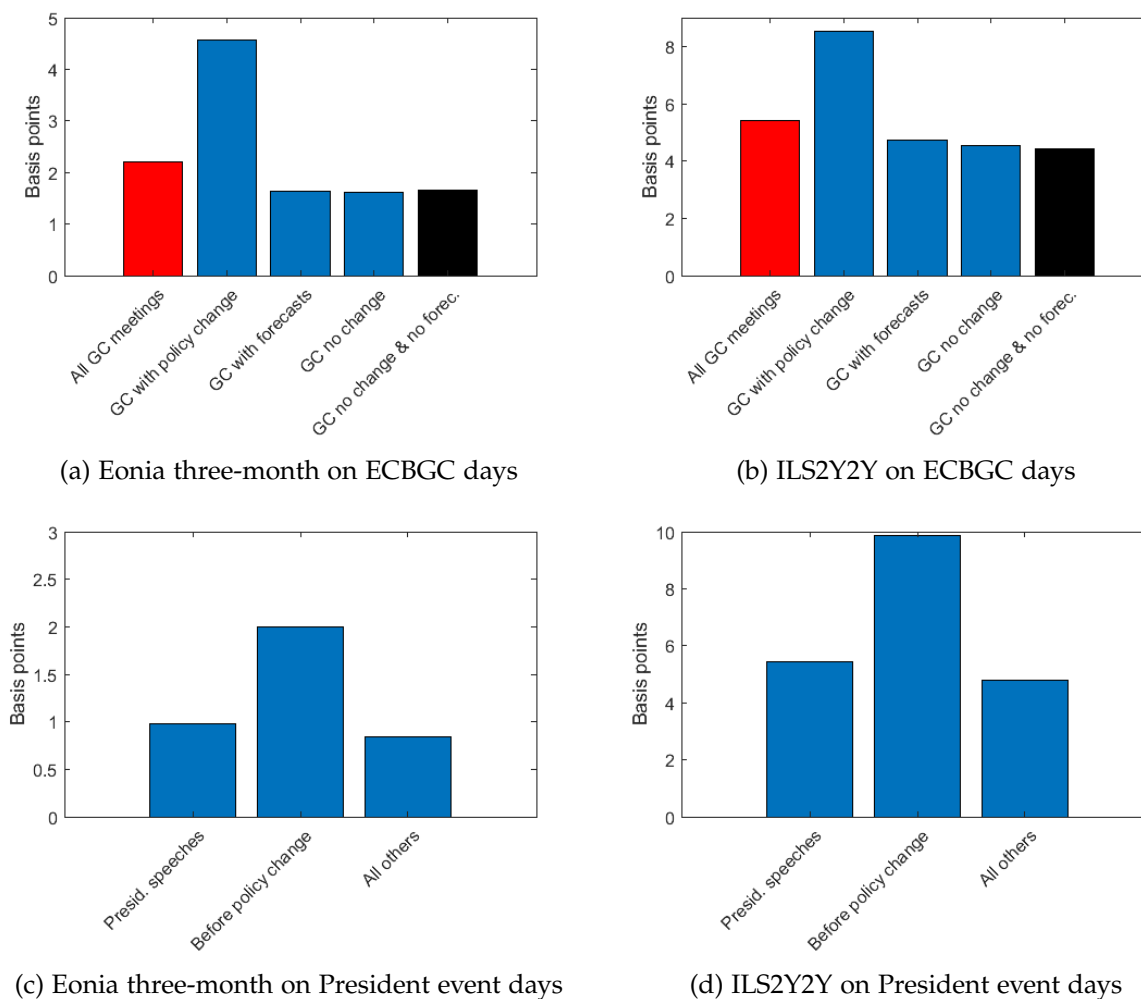
To this aim, we construct a “policy stance” indicator, differentiating between monetary policy decisions with no change in monetary policy and with decisions that indicate policy easing or tightening (defined below). We proceed first by collecting the dates of ECB monetary policy changes in regular ECBGC meetings, for both conventional and unconventional measures, for the period of 1999 to 2019. We define monetary policy changes as easing (tightening) if one of the following three criteria is met: (i) a decrease (increase) in at least one of the three key ECB interest rates was announced, (ii) new unconventional measures were announced that aimed at providing more (less) monetary stimulus, or (iii) the parameters of unconventional measures were adjusted to provide more (less) stimulus. In other words, this definition focuses on actual changes in policy tools not on possible market perceptions due to differences between policy decisions and market expectations. Overall, this definition leads to 43 events with conventional policy changes and 15 events with changes in (one or several) unconventional tools.¹²

Before proceeding with a formal investigation, we look first at some stylized facts on market movements at different communication days, focusing on ECBGC meetings and ECB

¹²The unconventional measures that we take into account include announcements regarding (the introduction of or the change in the parameters of) asset purchases (APP), liquidity measures (LTRO and TLTRO), OMT, and the introduction of a Two-tier system for remunerating excess reserve holdings. We do not take into account forward guidance on rates and asset purchases because measuring changes in forward guidance is more difficult.

president speaking events. In Figure 2 we plot daily absolute changes of the three-month Eonia rate and the ILS2Y2Y inflation expectations. In Panel (a) and (b) we see that the larger movements happen on days of ECBGC meetings with a policy change. Further, we do not see a difference whether the ECBGC meeting corresponds with new ECB/Eurosystem macroeconomic forecasts or not. Interestingly, in Panel (c) and (d), we observe also that market movements are stronger on days with ECB presidents speaking events ahead of meetings with policy changes.

Figure 2: Mean absolute changes in EONIA three-month rates and ILS2Y2Y



Note: Panel (a) and (b) present mean absolute changes computed at a daily frequency over different ECBGC monetary policy meeting days (all meetings, meetings with policy changes, meetings with new ECB/Eurosystem staff macroeconomic forecasts, meetings with no policy changes and meetings with neither policy changes nor forecasts). Panel (c) and (d) display mean absolute changes computed at a daily frequency on days of speaking events of ECB presidents for (i) all speaking events, (ii) speaking events given ahead (within three weeks) of meetings with policy change, and (iii) the remaining other speaking events.

We investigate these effects more formally below, by looking at the interaction effect of the CoMPDs within two (three) weeks ahead of a GC meeting with a variable denoting future easing or tightening policy change decisions, following our description above.¹³ The regression then

¹³The typical window between ECBGC meetings has been four weeks until 2014 and six weeks since then. We decided to take speeches given in the second half of the inter-meeting period, thus two and three weeks ahead of the

takes the following form:

$$\begin{aligned}
\Delta FV_t = & c + \rho \Delta FV_{t-1} + \beta_1 \text{ECB-P}_t + \beta_2 \text{ECB-P}_t \times \text{FE}_t + \beta_3 \text{ECB-P}_t \times \text{FT}_t \\
& \beta_4 \text{ECB-B}_t + \beta_5 \text{ECB-B}_t \times \text{FE}_t + \beta_6 \text{ECB-B}_t \times \text{FT}_t \\
& \beta_7 \text{ECB-PH}_t + \beta_8 \text{ECB-PH}_t \times \text{FE}_t + \beta_9 \text{ECB-PH}_t \times \text{FT}_t \\
& \beta_{10} \text{NCB}_t + \beta_{11} \text{NCB}_t \times \text{FE}_t + \beta_{12} \text{NCB}_t \times \text{FT}_t \\
& \alpha_1 \text{ECBGC}_t + \alpha_2 \text{ECBGC}_t^E + \alpha_3 \text{ECBGC}_t^T \\
& \gamma_1 \text{FE}_t + \gamma_2 \text{FT}_t + \gamma_3 \text{FOMC}_t + \theta W_t + u_t,
\end{aligned} \tag{2}$$

where ΔFV_t denotes the daily change in the financial variable, FE and FT represent indicator variables for “Future Easing” and “Future Tightening” policy actions, equal to one on each day in the two (three) weeks ahead, but excluding the day itself, of an ECBGC with an easing (tightening) policy change. The reference category of this regression with category variables is a meeting with no policy change. The interaction effect of CoMPDs and the upcoming monetary policy decision is captured by $\beta_2, \beta_3, \beta_5, \beta_6, \beta_8, \beta_9, \beta_{11}$, and β_{12} for easing and tightening decisions, respectively. The coefficient α_2 (α_3) captures the effect of ECBGC easing (tightening) decisions and the coefficient γ_1 (γ_2) measures the average daily change in FV before a GC easing (tightening) announcement. ECB-P and ECB-B denote speeches by ECB president and ECB Executive Board, respectively. ECB-PH denote ECB president parliament hearings and NCB the speaking events by NCB governors.

Table 5 shows the results for the Eonia rates and the ILS market-based inflation expectations; Panel D. in Table A.1 shows the number of speaking events per type of speaker used in this regression. We find that short-term Eonia rates fall on days with ECB president’s speeches given in the weeks before meetings with an easing policy change. In other words, Eonia moves in the same direction as implied by the upcoming change in monetary policy. In contrast, ECB president parliament hearings have a strong signal for the long-end of the Eonia’s yield curve, as long-term rates compress significantly ahead of a future easing. These results suggest that there is an easing signal in the CoMPDs by the ECB presidents ahead of policy meetings with monetary policy accommodation. Results are also strong and significant for the interaction term with speaking events of ECB presidents before tightening decisions (estimates for “ECB-P \times Future Tightening” variable). We observe that medium- to long-term Eonia rates increase on days with speeches before tightening decisions.

Interestingly, with regard to Eonia, the estimates for the indicator variables “Future Easing” and “Future Tightening” are also statistically significant and have the same sign as the upcoming policy change. This suggest that markets anticipate the change in the direction of policy ahead the policy meeting. In terms of magnitudes, the cumulative change over 15 trading days (three weeks) in 1M Eonia before an ECBGC tightening decision is about 15 basis points. This magnitude corresponds to around 3/5 of a typical 25 basis point rate increase following a monetary policy tightening decision. Results are similar for the coefficient of “Future Easing”.

Overall, our results show that ECB president speaking events ahead of ECBGC meetings with monetary policy changes move markets in the same direction as the upcoming decision. This suggests that these speeches are informative with respect to future policy.

meeting, in respective periods.

Table 5: Daily frequency: Eonia and ILS, ΔFV_t , 2001 to 2019

Predictor/Maturity	Eonia						ILS	
	1M	3M	1Y	2Y	5Y	10Y	2Y2Y	5Y5Y
Intercept	-0.02 (0.92)	-0.00 (0.99)	-0.13 (0.44)	-0.16 (0.45)	-0.24 (0.37)	-0.28 (0.27)	0.41 (0.31)	-0.10 (0.59)
Own lag	-0.08 (0.17)	0.05 (0.29)	0.01 (0.52)	-0.00 (0.84)	-0.03 (0.15)	-0.05 (0.03)	-0.41 (0.00)	-0.21 (0.00)
ECB-P	0.08 (0.59)	-0.00 (0.95)	-0.18 (0.22)	-0.35 (0.09)	-0.57 (0.01)	-0.55 (0.02)	-0.40 (0.37)	-0.14 (0.42)
ECB-P x Future Easing	-1.32 (0.03)	-1.15 (0.01)	-1.54 (0.00)	-1.00 (0.12)	1.48 (0.10)	1.90 (0.05)	4.83 (0.14)	-1.08 (0.36)
ECB-P x Future Tightening	0.40 (0.24)	0.55 (0.14)	1.43 (0.02)	1.95 (0.01)	2.23 (0.01)	1.68 (0.02)	8.46 (0.11)	0.26 (0.69)
ECB-B	-0.05 (0.44)	-0.04 (0.47)	-0.03 (0.73)	-0.04 (0.79)	-0.06 (0.67)	-0.10 (0.50)	0.09 (0.76)	-0.12 (0.22)
ECB-B x Future Easing	0.68 (0.01)	0.37 (0.15)	0.48 (0.20)	0.74 (0.08)	0.64 (0.22)	0.75 (0.21)	0.19 (0.84)	0.81 (0.08)
ECB-B x Future Tightening	0.02 (0.97)	0.06 (0.81)	0.04 (0.93)	0.31 (0.62)	0.66 (0.32)	0.89 (0.14)	1.19 (0.52)	-0.18 (0.70)
ECB-PH	-0.09 (0.72)	0.14 (0.35)	-0.03 (0.93)	-0.13 (0.78)	0.11 (0.85)	0.08 (0.90)	2.07 (0.31)	-0.17 (0.59)
ECB-PH x Future Easing	-1.14 (0.36)	-0.64 (0.25)	-0.78 (0.21)	-1.43 (0.13)	-3.05 (0.03)	-3.73 (0.02)	1.71 (0.52)	-2.48 (0.19)
ECB-PH x Future Tightening	0.86 (0.28)	0.55 (0.29)	0.55 (0.56)	0.86 (0.54)	0.73 (0.54)	0.27 (0.79)	3.53 (0.54)	1.20 (0.23)
NCB	0.02 (0.79)	-0.02 (0.75)	-0.00 (0.97)	-0.10 (0.59)	-0.02 (0.93)	0.01 (0.96)	0.24 (0.51)	0.10 (0.40)
NCB x Future Easing	-0.26 (0.48)	-0.05 (0.86)	-0.04 (0.91)	-0.34 (0.52)	0.40 (0.59)	0.64 (0.43)	2.45 (0.16)	0.21 (0.69)
NCB x Future Tightening	-0.24 (0.55)	0.17 (0.64)	-0.07 (0.90)	-0.04 (0.96)	-0.43 (0.59)	-0.52 (0.46)	-3.40 (0.34)	-0.65 (0.32)
Future Easing	-0.95 (0.00)	-0.64 (0.00)	-0.65 (0.00)	-0.69 (0.00)	-0.92 (0.01)	-0.86 (0.06)	-0.69 (0.38)	-0.01 (0.96)
Future Tightening	1.02 (0.00)	0.40 (0.00)	0.16 (0.39)	-0.06 (0.81)	-0.30 (0.33)	-0.34 (0.22)	0.31 (0.56)	0.34 (0.06)
ECBGC	0.42 (0.02)	0.34 (0.13)	0.12 (0.76)	-0.27 (0.55)	-0.33 (0.52)	-0.00 (1.00)	-1.37 (0.09)	0.10 (0.73)
ECBGC Easing	-4.73 (0.01)	-3.74 (0.02)	-1.75 (0.23)	-0.11 (0.94)	1.40 (0.43)	1.55 (0.44)	-1.45 (0.69)	1.38 (0.13)
ECBGC Tightening	1.97 (0.00)	0.01 (0.98)	-0.99 (0.49)	-1.65 (0.39)	-1.14 (0.50)	-0.93 (0.46)	-1.23 (0.54)	0.29 (0.46)
FOMC	-0.12 (0.46)	-0.22 (0.18)	-0.39 (0.12)	-0.55 (0.13)	-1.25 (0.01)	-1.24 (0.01)	-0.55 (0.50)	0.19 (0.47)
EA macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day of week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
T	4957	4957	4957	4957	3795	3769	4050	4089
Start year	2001	2001	2001	2001	2005	2005	2004	2004

Note: The table shows the coefficient values of the regression described in eq. (2). Values in parenthesis show p-values. Standard errors are computed using the HAC estimator of Newey and West (1987) with a bandwidth of $0.75T^{1/3}$. Bold numbers indicate significance at the 10% level. The dependent variables are daily changes in the Eonia rates or ILS inflation expectations (both in basis points), respectively. We consider data starting in 2001 (or whenever the series is available) since before ECB Governing Council meetings were scheduled every two weeks, which is too short for our definition of “Future Easing” and “Future Tightening”. The number of speeches that is available for this regression specification is shown in Table A.1.

Narratives from Bloomberg News coverage of ECB president communication ahead of GC meetings support this result. We collected and read all Bloomberg News relating to ECB presidents' speaking events before tightening and easing decisions. First, we notice that almost all events received a BBG News report immediately or within a few hours from the time the event was scheduled.¹⁴ Second, we manually read the text of the BBG News report and find that around 24% (12 out of the 51 events) of the ECB president's speaking events ahead of meetings with policy changes contain a clear signal for the next policy move. This signal is often expressed both in the quote from the speech and in the interpretation of the journalists (see [Table A.10](#) for all the quotes with such signals). For instance, a quote with a clear easing signal is the following:

Trichet Says ECB May Cut Interest Rates Again Next Week, "I consider it possible that the Governing Council would decrease interest rates once again at its next meeting," Trichet said in a speech in Madrid today. BBG, October 27, 2008

4 Intraday event study

In the following, we perform an event study with intraday data as an alternative quantification of the effect of CoMPDs on key financial variables. To this aim, we use information from our *ECB Event* dataset on the scheduled time of the event and the minute-by-minute quote data from our *Financial Markets* dataset. In addition, we use insights from the analysis of the BBG news as a guide on the length of the event window. These elements allow us to construct intraday asset price changes in a narrow window around communication events, akin to the literature focusing on ECB monetary policy announcements on regular meeting days (e.g. [Altavilla et al. \(2019\)](#) and [Andrade and Ferroni \(2021\)](#)).

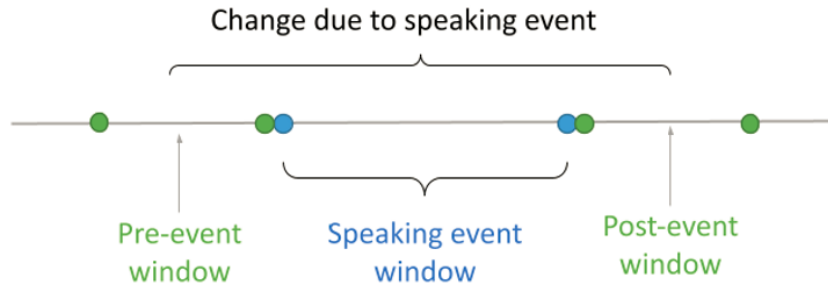
Different from the daily regression analysis, the left-hand-side variable is not uniquely defined when considering intraday data because different speaking events have varying time stamps. Therefore, we cannot run the same type of regressions as in equation (1) to assess statistical significance of the intra-day movements around our communication events. Instead, we investigate whether high-frequency changes around our CoMPDs events are significantly different from "typical" intra-day change, which we define below, of the same window length.

We decide on the length of the event window based on insights from the analysis of the BBG News. We saw that the majority of ECB president speeches ahead of a policy meeting with changes get a news report within 1.5 to 3 hours after the scheduled time of the event. We use this timing as a baseline assumption about the length of CoMPDs in minutes. To construct the high-frequency changes around CoMPDs we take the difference between the median of the quotes during 60 minutes after the end of the event ("post-event window") with the median quote over 60 minutes before the event ("pre-event window"). The starting time of the event is based on the BBG calendar. We assume a window of 90 minutes for each speaking event ("speaking event window") starting from the scheduled time indicated in the BBG calendar (see [Figure 3](#) for an illustration).

The description of the algorithm below gives details on how we proceed with the comparison of high-frequency CoMPD event changes with 'typical' high-frequency non-event changes. The

¹⁴The majority ($\approx 60\%$) received a news report within one and a half to three hours from the scheduled event time.

Figure 3: Speaking event timeline



Note: The start of the speaking event is based on BBG calendar. We set the pre- and post-event window to 60 min and the speaking event window (the speaking event length) to 90 minutes.

idea is to first construct median changes of financial variables on non-event days using the same window length as for the CoMPD events.

Simulation algorithm for non-event days: Let D_{ne} denote the set of “non-event” trading dates, i.e. dates on which we do not have an event in our database.¹⁵ Let “pre-event window” and “post-event window” denote the time window over which we take the before and after median quotes, and let “speaking event window” denote the time period in between the windows, respectively. For $j = 1, \dots, J$, do the following steps:

1. Draw N random days, with replacement, from D_{ne} ;
2. Draw N random times, with replacement, that are within the trading hours;
3. Compute the asset price changes for each of the N date+time combinations and store them as $\{s_{j,n}\}_{n=1}^N$, using “pre-event window” and “post-event window” equal to 60 minutes and “speaking event window” equal to 90 minutes;
4. Compute $S_j = g(\{s_{j,n}\}_{n=1}^N)$, where $g(\cdot)$ can represent the median, the mean or quantiles of $\{s_{j,n}\}_{n=1}^N$;

After J iterations, we obtain a set of draws, $\{S_j^N\}_{j=1}^J$, of our statistic of interest on non-event days. We can use $\{S_j^N\}_{j=1}^J$ to compute percentiles of asset price changes occurring on non-event days and compare them to asset price changes around CoMPDs. This gives us an idea of whether the size of CoMPDs is large relative to movements on non-event days.

Table 6 shows the median of absolute intra-day changes around CoMPDs. Numbers in boldface indicate that we assess the changes to be larger than the 90% percentile of median absolute changes on a non-event day, simulated by the algorithm described above. Values in brackets show the respective 90% percentiles. Overall, the results confirm the findings of the daily frequency analysis. In particular, on average over the full sample, ECB president speaking events seem to have an impact on Eonia rates at all maturities, which is larger than typical movements

¹⁵Events include speaking events by the ECB presidents, Board members, NCB governors, euro area or US macro releases, ECBGC meetings, FOMC meetings, etc.

over similar time windows during days without monetary policy events. This high-frequency analysis shows a significantly larger change around speaking events of Executive Board members (excl. the president), especially on medium to long-term Eonia rates.

Following the same logic, Table 7 shows median intra-day changes (not in absolute terms) of Eonia rates at different maturities around CoMPDs. Again, the results confirm the findings of the daily frequency analysis on Eonia rates, especially for communication of ECB presidents.

Table 6: Intraday frequency: Eonia $|\Delta FV_t|$, 1999 to 2019

Predictor/Maturity	Eonia					
	1M	3M	1Y	2Y	5Y	10Y
ECB-P	0.15 [0.13]	0.20 [0.15]	0.40 [0.33]	0.55 [0.50]	0.51 [0.54]	0.80 [0.72]
ECB-B	0.10 [0.13]	0.15 [0.15]	0.36 [0.33]	0.50 [0.50]	0.60 [0.54]	0.80 [0.72]
NCBs	0.10 [0.13]	0.15 [0.15]	0.30 [0.33]	0.48 [0.50]	0.50 [0.54]	0.68 [0.72]

Note: Values in brackets show the 90% percentile of the simulated medians. Values in boldface indicate that the median surprise of the absolute change in the financial variable is larger than 90% of the medians of the simulated surprises. We set $J = 500$ and $D = 300$ in all simulations.

Table 7: Intraday frequency: Eonia ΔFV_t , 1999 to 2019

Predictor/Maturity	Eonia					
	1M	3M	1Y	2Y	5Y	10Y
Panel A. 10% quantile						
ECB-P	-0.60 [-0.60]	-0.53 [-0.60]	-1.50 [-1.00]	-1.90 [-1.50]	-1.30 [-1.20]	-1.56 [-1.61]
ECB-B	-0.60 [-0.60]	-0.50 [-0.60]	-1.00 [-1.00]	-1.43 [-1.50]	-1.20 [-1.20]	-1.60 [-1.61]
NCBs	-0.50 [-0.60]	-0.50 [-0.60]	-1.00 [-1.00]	-1.40 [-1.50]	-1.15 [-1.20]	-1.50 [-1.61]
Panel B. 90% quantile						
ECB-P	0.45 [0.60]	0.50 [0.56]	1.00 [1.00]	1.40 [1.40]	1.20 [1.10]	1.75 [1.52]
ECB-B	0.50 [0.60]	0.50 [0.56]	1.00 [1.00]	1.30 [1.40]	1.30 [1.10]	1.75 [1.52]
NCBs	0.50 [0.60]	0.50 [0.56]	0.95 [1.00]	1.30 [1.40]	1.05 [1.10]	1.60 [1.52]

Note: The values show the 10% (Panel A.) and 90% (Panel B.) percentile of the distribution of surprises on event-days. Values in brackets show the 10% (90%) percentile of the simulated 10% (90%) percentiles in Panel A. (Panel B.). We set $J = 500$ and $D = 300$ in all simulations.

5 Concluding remarks

We estimate the effects of ECB and Eurosystem communication on key financial market variables for the period 1999 to 2019. We document that markets react significantly not only on regular ECB Governing Council meetings days but also to speaking events outside of meeting days, in

particular when the remarks are provided by the ECB president. We find a significant effect of speaking events by other members of the ECB Board and NCB governors (Germany, France, Italy and Spain) on daily market movements mostly before the financial crisis. Moreover, we show that communication events given by ECB presidents in the three (two) weeks *before* meetings with an easing (tightening) policy change lead to a decrease (increase) in Eonia rates at different maturities, i.e. the sign of the change is aligned with the intended policy direction of the upcoming monetary policy announcement. These results are robust to controlling for days with major macroeconomic releases for the euro area and the U.S as well as to including the FOMC's monetary policy decisions. A first analysis based on intraday (minute-by-minute) data shows similar results for movements of Eonia rates in tight windows around CoMPDs events.

In the near future, we will take into account the content of communication events (topics and tone). In contrast to monetary policy statements, where the topic is narrowly defined to be on monetary policy, speeches cover a broader range of topics with a time-varying intensity. As such, we conjecture that the effects of CoMPDs on market movements would be stronger when focusing on speeches with a higher intensity on monetary policy or economic conditions. Similarly, the tone expressed during these speaking event could also play an important role. Moreover, as we look at different speakers, it might also be important for markets if the speakers convey "a single message" or provide contradicting point of views.

References

- Altavilla, C., Brugnolini, L., Gürkaynak, R., Motto, R., and Ragusa, G. (2019). Measuring euro area monetary policy. *Journal of Monetary Economics*, 108:81–98.
- Andrade, P. and Ferroni, F. (2021). Delphic and odyssean monetary policy shocks: Evidence from the euro area. *Journal of Monetary Economics*, 117:816–832.
- Ehrmann, M. and Fratzscher, M. (2007). Communication by central bank committee members: Different strategies, same effectiveness? *Journal of Money, Credit and Banking*, 39:509–541.
- Ehrmann, M., Osbat, C., and Strýský, J. (2014). The euro exchange rate during the European sovereign debt crisis - Dancing to its own tune? *Journal of International Money and Finance*, 49:319–339.
- Gertler, P. and Horvath, R. (2018). Central bank communication and the yield curve. *Journal of Financial Stability*, 36:336–345.
- Gürkaynak, R. S., Sack, B., and Swanson, E. (2005). Do Actions Speak Louder Than Words? The Response of Asset Prices to Monetary Policy Actions and Statements. *International Journal of Central Banking*, 1(1).
- Istrefi, K., Odendahl, F., and Sestieri, G. (2020). Fed communication on financial stability concerns and monetary policy decisions: Revelations from speeches. Banque de france working paper series no. 779.
- Kliesen, K. L., Levine, B., and Waller, C. J. (2019). Gauging market responses to monetary policy communication. *Federal Reserve Bank of St. Louis Review*, Second Quarter 2019:69–91.
- Kohn, D. L. and Sack, B. (2004). Central bank talk: Does it matter and why? In *Macroeconomics, Monetary Policy, and Financial Stability*, pages 175–206. Ottawa: Bank of Canada.
- Leombroni, M., Vedolin, A., Venter, G., and Whelan, P. (2021). Central bank communication and the yield curve. *Journal of Financial Economics*, forthcoming.
- Nakamura, E. and Steinsson, J. (2018). High-frequency identification of monetary non-neutrality: The information effect. *The Quarterly Journal of Economics*, 133(3):1283–1330.
- Neuhierl, A. and Weber, M. (2019). Monetary policy communication, policy slope, and the stock market. *Journal of Monetary Economics*, 108:140–155.
- Newey, W. K. and West, K. D. (1987). A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix. *Econometrica*, 55(3):703–708.
- Tillmann, P. and Walter, A. (2019). The effect of diverging communication: The case of the ECB and the Bundesbank. *Economics Letters*, 176(C):68–74.

Appendix A Daily frequency regressions

A.1 Number of event days in daily frequency regressions

Table A.1: Number of event days by regression specification; daily frequency: Eonia and ILS

Event/Maturity	Eonia						ILS	
	1M	3M	1Y	2Y	5Y	10Y	2Y2Y	5Y5Y
Panel A. Speech count for Table 2 .								
ECB President	445	443	445	426	332	328	364	373
ECB Board	1298	1296	1298	1228	929	925	980	992
ECB hearing	96	96	96	93	67	66	72	72
NCB	722	719	722	696	538	536	570	574
Panel B. Speech count for pre-2008 period of Table 3 .								
ECB President	191	189	191	172	78	74	110	119
ECB Board	483	481	483	413	114	110	165	177
ECB hearing	44	44	44	41	15	14	20	20
NCB	261	258	261	235	77	75	109	113
Panel C. Speech count for post-2008 period of Table 3 .								
ECB President	254	254	254	254	254	254	254	254
ECB Board	815	815	815	815	815	815	815	815
ECB hearing	52	52	52	52	52	52	52	52
NCB	461	461	461	461	461	461	461	461
Panel D. Speech count for Table 5 .								
ECB-P	486	484	486	465	356	352	392	403
ECB-P x Future Easing	31	31	31	31	27	27	27	27
ECB-P x Future Tightening	20	20	20	20	20	20	20	20
ECB-B	1375	1372	1375	1302	985	979	1036	1050
ECB-B x Future Easing	103	103	103	103	89	89	89	89
ECB-B x Future Tightening	57	57	57	55	43	43	43	43
ECB-PH	96	96	96	93	67	66	72	72
ECB-PH x Future Easing	9	9	9	9	8	8	8	8
ECB-PH x Future Tightening	9	9	9	8	8	8	8	8
NCB	798	796	798	771	595	592	628	634
NCB x Future Easing	63	63	63	62	51	51	51	51
NCB x Future Tightening	34	34	34	33	26	26	26	26
Panel E. Speech count for Table A.4 .								
ECB President	86	85	86	83	65	65	73	76
ECB President ECDB	253	252	253	243	179	177	198	203
ECB Board	430	429	430	404	271	269	292	297
ECB Board ECBDB	662	661	662	630	486	485	508	514
ECB hearing	70	70	70	68	48	48	50	50
Panel F. Speech count for Table A.9 .								
ECB President	445	443	445	426	332	328	364	373
ECB-P x Trichet	246	246	246	246	193	189	225	234
ECB-P x Draghi	136	136	136	136	136	136	136	136

Note: The table shows the number of event days, i.e. days with at least one speech according to our databases, that are used in the daily frequency regressions per financial instrument (column label) and by event type (row label).

A.2 Different compilation of speaking event database

[Table A.2](#) shows the same results as in [Table 2](#) but after excluding some of the most well known speeches of the ECB President from $ECBPresident_t$. In particular, we dropped the “Whatever-it-takes” speech of July 26, 2012, in London delivered by Mario Draghi, the speech delivered by

Mario Draghi at the ECB forum in Sintra on June 27, 2017, the speech delivered by Mario Draghi at the ECB forum in Sintra on June 18, 2019, the speech by Mario Draghi delivered at Jackson Hole in 2014, the speech delivered by Mario Draghi in New York on December 4, 2015, where Mario Draghi announced changes to the UMP stance, the Bund tantrum speech of April 29, 2014, and the ECB Watchers conference on March 27, 2019. Results in [Table 2](#) are robust to excluding these key speeches from our dataset, showing that our baseline results are not driven by a few speech outliers.

Table A.2: Daily frequency: Eonia and ILS; drop “key” speeches

Predictor/Maturity	Eonia						ILS	
	1M	3M	1Y	2Y	5Y	10Y	2Y2Y	5Y5Y
Intercept	0.51 (0.00)	0.47 (0.00)	1.04 (0.00)	1.49 (0.00)	1.69 (0.00)	1.83 (0.00)	2.01 (0.00)	1.30 (0.00)
Own lag	0.32 (0.00)	0.31 (0.00)	0.33 (0.00)	0.28 (0.00)	0.24 (0.00)	0.21 (0.00)	0.52 (0.00)	0.37 (0.00)
ECB President	0.19 (0.14)	-0.00 (1.00)	0.09 (0.38)	0.33 (0.03)	0.31 (0.03)	0.05 (0.72)	0.90 (0.06)	0.30 (0.02)
ECB Board	0.03 (0.64)	0.00 (0.99)	0.00 (0.95)	-0.02 (0.79)	0.03 (0.77)	0.09 (0.38)	-0.20 (0.51)	-0.08 (0.27)
ECB hearing	0.11 (0.59)	-0.08 (0.52)	-0.04 (0.83)	-0.02 (0.93)	-0.02 (0.95)	0.08 (0.84)	1.00 (0.51)	0.04 (0.86)
NCB	0.05 (0.41)	0.03 (0.58)	0.07 (0.48)	0.19 (0.14)	0.18 (0.14)	0.23 (0.08)	-0.04 (0.88)	0.18 (0.04)
ECBGC	0.97 (0.00)	1.29 (0.00)	1.73 (0.00)	1.70 (0.00)	1.89 (0.00)	1.59 (0.00)	0.66 (0.26)	0.36 (0.06)
FOMC	0.02 (0.88)	0.23 (0.09)	0.27 (0.14)	0.51 (0.05)	0.82 (0.01)	1.04 (0.00)	1.48 (0.02)	0.02 (0.91)
EA macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day of week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
adj.R2	0.72	0.67	0.55	0.56	0.46	0.45	0.55	0.48
T	5454	5445	5454	5225	3790	3764	4045	4084
Start year	1999	1999	1999	1999	2005	2005	2004	2004

Note: The table shows the coefficient values of the regression described in eq. (1) but after dropping key speeches from the dataset. Values in parenthesis show p-values. Standard errors are computed using the HAC estimator of [Newey and West \(1987\)](#) with a bandwidth of $0.75T^{1/3}$. Bold numbers indicate significance at the 10% level. The dependent variables are absolute daily changes in the Eonia or ILS (both in basis points), respectively.

[Table A.3](#) shows the same results as in [Table 2](#) but after dropping speeches given after 4pm instead of attributing them towards the next day.

Table A.3: Daily frequency: Eonia and ILS; drop speeches after 4.00pm entirely

Predictor/Maturity	Eonia						ILS	
	1M	3M	1Y	2Y	5Y	10Y	2Y2Y	5Y5Y
Intercept	0.52 (0.00)	0.47 (0.00)	1.03 (0.00)	1.48 (0.00)	1.65 (0.00)	1.80 (0.00)	1.98 (0.00)	1.30 (0.00)
Own lag	0.32 (0.00)	0.31 (0.00)	0.33 (0.00)	0.28 (0.00)	0.24 (0.00)	0.21 (0.00)	0.52 (0.00)	0.37 (0.00)
ECB President	0.18 (0.15)	-0.03 (0.72)	0.16 (0.18)	0.44 (0.01)	0.42 (0.01)	0.22 (0.18)	0.77 (0.11)	0.38 (0.01)
ECB Board	-0.01 (0.89)	0.01 (0.82)	0.01 (0.89)	-0.02 (0.80)	0.12 (0.24)	0.18 (0.11)	-0.18 (0.58)	-0.08 (0.31)
ECB hearing	0.18 (0.44)	-0.04 (0.78)	0.05 (0.80)	0.01 (0.97)	0.12 (0.75)	0.04 (0.93)	1.46 (0.42)	0.08 (0.73)
NCB	0.06 (0.42)	0.01 (0.82)	0.08 (0.41)	0.25 (0.08)	0.22 (0.09)	0.22 (0.11)	0.14 (0.70)	0.10 (0.30)
ECBGC	0.95 (0.00)	1.29 (0.00)	1.74 (0.00)	1.71 (0.00)	1.92 (0.00)	1.61 (0.00)	0.67 (0.25)	0.34 (0.07)
FOMC	0.02 (0.89)	0.23 (0.09)	0.27 (0.14)	0.50 (0.05)	0.81 (0.01)	1.04 (0.00)	1.47 (0.03)	0.01 (0.96)
EA macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day of week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
adj.R2	0.72	0.67	0.55	0.56	0.46	0.44	0.55	0.48
T	5459	5450	5459	5230	3795	3769	4050	4089
Start year	1999	1999	1999	1999	2005	2005	2004	2004

Note: The table shows the coefficient values of the regression described in eq. (1) but after dropping speeches given after 4.00pm entirely. Values in parenthesis show pvalues. Standard errors are computed using the HAC estimator of [Newey and West \(1987\)](#) with a bandwidth of $0.75T^{1/3}$. Bold numbers indicate significance at the 10% level. The dependent variables are absolute daily changes in the Eonia or ILS (both in basis points), respectively.

Table A.4: Daily frequency: Eonia and ILS; only speeches available in ECB-DB

Predictor/Maturity	Eonia						ILS	
	1M	3M	1Y	2Y	5Y	10Y	2Y2Y	5Y5Y
Intercept	0.51 (0.00)	0.47 (0.00)	1.05 (0.00)	1.51 (0.00)	1.70 (0.00)	1.85 (0.00)	1.90 (0.00)	1.30 (0.00)
Own lag	0.32 (0.00)	0.31 (0.00)	0.33 (0.00)	0.28 (0.00)	0.24 (0.00)	0.21 (0.00)	0.52 (0.00)	0.37 (0.00)
ECB President	0.16 (0.29)	-0.35 (0.01)	-0.19 (0.35)	0.25 (0.45)	-0.11 (0.74)	-0.57 (0.03)	2.57 (0.05)	0.51 (0.05)
ECB Board	0.09 (0.22)	0.15 (0.04)	0.21 (0.09)	0.21 (0.17)	0.25 (0.13)	0.29 (0.11)	0.53 (0.27)	0.07 (0.51)
ECB hearing	0.26 (0.34)	-0.04 (0.80)	0.04 (0.88)	0.01 (0.97)	0.09 (0.80)	0.05 (0.90)	1.37 (0.52)	0.18 (0.41)
ECBGc	0.94 (0.00)	1.29 (0.00)	1.65 (0.00)	1.57 (0.00)	1.73 (0.00)	1.38 (0.00)	0.69 (0.23)	0.31 (0.09)
FOMC	0.02 (0.87)	0.22 (0.11)	0.25 (0.16)	0.49 (0.06)	0.78 (0.01)	1.00 (0.00)	1.52 (0.02)	0.02 (0.93)
EA macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day of week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
adj.R2	0.73	0.67	0.55	0.56	0.46	0.45	0.55	0.48
T	5459	5450	5459	5230	3795	3769	4050	4089
Start year	1999	1999	1999	1999	2005	2005	2004	2004

Note: The table shows the coefficient values of the regression described in eq. (1) but using only speeches available in the ECB database. Values in parenthesis show p-values. Standard errors are computed using the HAC estimator of [Newey and West \(1987\)](#) with a bandwidth of $0.75T^{1/3}$. Bold numbers indicate significance at the 10% level. The dependent variables are absolute daily changes in the Eonia or ILS (both in basis points), respectively. The number of speeches that is available for this regression specification is shown in [Table A.1](#).

A.3 Sovereign yields

Table A.5: Daily frequency: German sovereign yields

Predictor/Maturity	Sovereign yields							
	1M	3M	1Y	2Y	3Y	5Y	7Y	10Y
Intercept	1.66 (0.00)	1.35 (0.00)	1.43 (0.00)	1.61 (0.00)	1.86 (0.00)	2.11 (0.00)	2.11 (0.00)	2.15 (0.00)
Own lag	0.36 (0.00)	0.31 (0.00)	0.23 (0.00)	0.24 (0.00)	0.20 (0.00)	0.17 (0.00)	0.14 (0.00)	0.13 (0.00)
ECB President	0.29 (0.08)	0.32 (0.04)	0.03 (0.78)	0.41 (0.01)	0.38 (0.01)	0.40 (0.01)	0.25 (0.09)	0.19 (0.17)
ECB Board	0.03 (0.80)	-0.13 (0.10)	0.01 (0.85)	0.08 (0.39)	0.08 (0.41)	0.18 (0.08)	0.21 (0.03)	0.19 (0.04)
ECB hearing	0.45 (0.23)	0.16 (0.47)	0.31 (0.24)	0.38 (0.30)	0.63 (0.14)	0.41 (0.23)	0.40 (0.26)	0.05 (0.86)
NCB	0.35 (0.04)	0.17 (0.21)	0.16 (0.11)	0.10 (0.40)	0.07 (0.54)	0.09 (0.48)	0.00 (1.00)	0.06 (0.60)
ECBGC	1.08 (0.00)	1.02 (0.00)	1.58 (0.00)	1.87 (0.00)	1.65 (0.00)	1.53 (0.00)	1.27 (0.00)	0.98 (0.00)
FOMC	-0.15 (0.64)	0.05 (0.78)	0.37 (0.06)	0.74 (0.01)	0.86 (0.00)	1.13 (0.00)	1.30 (0.00)	1.39 (0.00)
EA macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day of week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
adj.R2	0.68	0.69	0.56	0.51	0.50	0.46	0.44	0.43
T	4462	4462	5473	5473	5473	5473	5473	5473
Start year	2002	2002	1999	1999	1999	1999	1999	1999

Note: The table shows the coefficient values of the regression described in eq. (1). Values in parenthesis show p-values. Standard errors are computed using the HAC estimator of [Newey and West \(1987\)](#) with a bandwidth of $0.75T^{1/3}$. Bold numbers indicate significance at the 10% level. The dependent variables are absolute daily changes in German sovereign yields of different maturities.

Table A.6: Daily frequency: French sovereign yields

Predictor/Maturity	Sovereign yields							
	1M	3M	1Y	2Y	3Y	5Y	7Y	10Y
Intercept	1.16 (0.00)	1.38 (0.00)	1.43 (0.00)	1.76 (0.00)	1.95 (0.00)	2.22 (0.00)	2.16 (0.00)	2.17 (0.00)
Own lag	0.20 (0.00)	0.26 (0.00)	0.27 (0.00)	0.23 (0.00)	0.22 (0.00)	0.16 (0.00)	0.14 (0.00)	0.12 (0.00)
ECB President	0.20 (0.36)	-0.03 (0.84)	0.28 (0.02)	0.44 (0.00)	0.46 (0.01)	0.48 (0.00)	0.30 (0.04)	0.17 (0.24)
ECB Board	-0.01 (0.90)	0.10 (0.47)	0.07 (0.42)	0.04 (0.67)	0.14 (0.23)	0.23 (0.05)	0.25 (0.01)	0.22 (0.03)
ECB hearing	0.33 (0.17)	0.29 (0.29)	0.56 (0.04)	0.44 (0.17)	0.89 (0.11)	0.14 (0.66)	0.29 (0.38)	0.20 (0.56)
NCB	0.04 (0.79)	-0.26 (0.03)	-0.08 (0.40)	0.11 (0.43)	0.10 (0.56)	-0.02 (0.90)	-0.03 (0.79)	0.02 (0.85)
ECBGC	0.38 (0.03)	0.87 (0.01)	0.97 (0.00)	1.72 (0.00)	1.71 (0.00)	1.62 (0.00)	1.38 (0.00)	1.03 (0.00)
FOMC	-0.05 (0.75)	0.09 (0.59)	0.37 (0.11)	0.63 (0.02)	0.83 (0.00)	1.12 (0.00)	1.06 (0.00)	1.11 (0.00)
EA macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day of week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
adj.R2	0.79	0.75	0.63	0.53	0.52	0.47	0.44	0.42
T	5473	5473	5473	5473	5473	5473	5473	5473
Start year	1999	1999	1999	1999	1999	1999	1999	1999

Note: The table shows the coefficient values of the regression described in eq. (1). Values in parenthesis show p-values. Standard errors are computed using the HAC estimator of [Newey and West \(1987\)](#) with a bandwidth of $0.75T^{1/3}$. Bold numbers indicate significance at the 10% level. The dependent variables are absolute daily changes in French sovereign yields of different maturities.

Table A.7: Daily frequency: Italian sovereign yields

Predictor/Maturity	Sovereign yields							
	1M	3M	1Y	2Y	3Y	5Y	7Y	10Y
Intercept	2.65 (0.00)	1.82 (0.00)	2.11 (0.00)	2.25 (0.00)	2.48 (0.00)	2.79 (0.00)	2.81 (0.00)	2.64 (0.00)
Own lag	0.41 (0.00)	0.46 (0.00)	0.47 (0.00)	0.44 (0.00)	0.41 (0.00)	0.35 (0.00)	0.29 (0.00)	0.28 (0.00)
ECB President	-0.12 (0.77)	-0.11 (0.69)	-0.14 (0.67)	0.18 (0.61)	0.09 (0.78)	0.15 (0.58)	-0.00 (0.99)	-0.06 (0.77)
ECB Board	0.30 (0.33)	-0.03 (0.90)	0.16 (0.41)	-0.06 (0.77)	-0.06 (0.77)	-0.07 (0.68)	0.08 (0.59)	0.15 (0.25)
ECB hearing	-0.67 (0.36)	0.26 (0.63)	0.25 (0.72)	0.40 (0.52)	0.68 (0.34)	0.68 (0.30)	0.04 (0.95)	0.28 (0.54)
NCB	-0.46 (0.15)	0.28 (0.37)	0.04 (0.88)	0.40 (0.24)	0.44 (0.19)	0.25 (0.30)	0.19 (0.36)	0.14 (0.38)
ECBGC	0.42 (0.33)	0.16 (0.68)	1.36 (0.00)	1.60 (0.00)	1.48 (0.00)	1.76 (0.00)	1.64 (0.00)	1.62 (0.00)
FOMC	0.03 (0.95)	0.05 (0.90)	0.07 (0.79)	0.19 (0.62)	0.61 (0.12)	0.50 (0.18)	0.64 (0.09)	0.64 (0.08)
EA macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day of week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
adj.R2	0.67	0.63	0.60	0.58	0.56	0.54	0.52	0.49
T	5473	5473	5473	5473	5473	5473	5473	5473
Start year	1999	1999	1999	1999	1999	1999	1999	1999

Note: The table shows the coefficient values of the regression described in eq. (1). Values in parenthesis show p-values. Standard errors are computed using the HAC estimator of [Newey and West \(1987\)](#) with a bandwidth of $0.75T^{1/3}$. Bold numbers indicate significance at the 10% level. The dependent variables are absolute daily changes in Italian sovereign yields of different maturities.

Table A.8: Daily frequency: Spanish sovereign yields

Predictor/Maturity	Sovereign yields							
	1M	3M	1Y	2Y	3Y	5Y	7Y	10Y
Intercept	0.94	1.58	2.20	2.58	2.72	2.95	3.01	2.92
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Own lag	0.47	0.34	0.31	0.36	0.36	0.30	0.27	0.26
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ECB President	0.32	0.18	-0.05	0.14	0.17	0.22	0.11	0.07
	(0.22)	(0.51)	(0.84)	(0.59)	(0.47)	(0.31)	(0.57)	(0.73)
ECB Board	0.07	0.14	0.05	-0.22	-0.19	-0.14	-0.03	-0.02
	(0.77)	(0.46)	(0.76)	(0.20)	(0.24)	(0.37)	(0.81)	(0.90)
ECB hearing	1.22	1.17	0.67	0.82	0.44	0.66	0.62	0.44
	(0.36)	(0.25)	(0.38)	(0.21)	(0.48)	(0.33)	(0.28)	(0.39)
NCB	0.20	0.40	0.32	0.07	-0.02	0.00	-0.07	-0.09
	(0.36)	(0.07)	(0.18)	(0.75)	(0.93)	(0.99)	(0.63)	(0.55)
ECBGC	0.74	0.79	1.23	2.06	1.95	1.85	1.66	1.70
	(0.03)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
FOMC	-0.05	-0.23	-0.38	0.65	0.58	0.83	0.93	1.01
	(0.88)	(0.41)	(0.22)	(0.09)	(0.14)	(0.03)	(0.03)	(0.01)
EA macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day of week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
adj.R2	0.67	0.75	0.73	0.60	0.57	0.54	0.51	0.49
T	5473	5473	5473	5473	5473	5473	5473	5473
Start year	1999	1999	1999	1999	1999	1999	1999	1999

Note: The table shows the coefficient values of the regression described in eq. (1). Values in parenthesis show p-values. Standard errors are computed using the HAC estimator of [Newey and West \(1987\)](#) with a bandwidth of $0.75T^{1/3}$. Bold numbers indicate significance at the 10% level. The dependent variables are absolute daily changes in Spanish sovereign yields of different maturities.

A.4 President fixed effects

Table A.9: Daily frequency: Eonia and ILS; ECB-President fixed effect

Predictor/Maturity	Eonia						ILS	
	1M	3M	1Y	2Y	5Y	10Y	2Y2Y	5Y5Y
Intercept	0.94 (0.00)	1.01 (0.00)	2.19 (0.00)	2.52 (0.00)	1.01 (0.00)	1.35 (0.00)	0.95 (0.04)	0.83 (0.00)
Ownlag	0.28 (0.00)	0.24 (0.00)	0.19 (0.00)	0.16 (0.00)	0.15 (0.00)	0.18 (0.00)	0.45 (0.00)	0.31 (0.00)
ECBPresident	-0.05 (0.83)	-0.01 (0.97)	-0.07 (0.81)	0.00 (1.00)	0.85 (0.20)	1.50 (0.05)	-0.33 (0.49)	0.31 (0.50)
ECBPTrichet	0.38 (0.23)	-0.00 (0.99)	0.16 (0.65)	0.27 (0.70)	-0.78 (0.27)	-1.64 (0.04)	1.16 (0.18)	-0.05 (0.91)
ECBPDraghi	-0.01 (0.97)	0.02 (0.92)	0.20 (0.53)	0.23 (0.73)	-0.56 (0.41)	-1.38 (0.08)	0.23 (0.63)	-0.16 (0.74)
TrichetFE	-0.18 (0.11)	-0.30 (0.00)	-0.44 (0.00)	0.02 (0.93)	1.76 (0.00)	1.08 (0.00)	2.81 (0.00)	1.07 (0.00)
DraghiFE	-0.80 (0.00)	-0.91 (0.00)	-1.85 (0.00)	-1.90 (0.00)	0.30 (0.22)	0.24 (0.47)	0.04 (0.88)	0.23 (0.06)
EA macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
US macro release	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day of week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: The table shows the coefficient values of the regression described in eq. (1) but after dropping speeches given after 5pm entirely. Values in parenthesis show p-values. Standard errors are computed using the HAC estimator of [Newey and West \(1987\)](#) with a bandwidth of $0.75T^{1/3}$. Bold numbers indicate significance at the 10% level. The dependent variables are absolute daily changes in the Eonia or ILS (both in basis points), respectively.

A.5 Speaking events with strong policy signals

Table A.10: ECB President speaking events with strong policy signals before meetings with changes

Date	BBG event	Quote from BBG news
Strong tightening signal		
18-Nov-2005	"ECB's Trichet Speaks at European Banking Congress in Frankfurt"	"The governing council is ready to take a decision to move interest rates," Trichet said in a speech to a banking conference in Frankfurt today. The ECB will "withdraw some of the accommodation" of its current policy stance.
20-Nov-2006	"ECB's Trichet Briefs Reporters in Sydney after BIS Meeting"	European Central Bank President Jean-Claude Trichet said he and his Group of 10 colleagues must be "strongly vigilant" about the risk of inflation because of dynamic global growth. "We have to continue to be, in particular as regards my own institution, strongly vigilant,"... Trichet has used the term "strong vigilance" in the past to signal an imminent rate increase.
28-Jun-2011	"ECB's Trichet, Wellink, BoK's Choong-soo Kim Speak in Amsterdam"	"We're taking the decision progressively to anchor inflation expectations," Trichet said at a press conference in Amsterdam today following a seminar with central bankers from the Asia-Pacific region. "As far as we're concerned, we're in strong vigilance mode," he said, repeating a phrase the ECB uses to indicate a rate increase is imminent.
Strong easing signal		
03-Jun-2003	"ECB's Duisenberg, Fed's Greenspan Speak at Monetary Conference"	European Central Bank President Wim Duisenberg signaled the bank may cut interest rates this week to the lowest in more than half a century as the euro's appreciation reduces inflation in the 12-nation area. "Inflationary pressures have declined significantly over recent months and this assessment will be reflected in our deliberations on monetary policy,"
27-Oct-2008	"ECB's Trichet Gives A Speech in Madrid"	Trichet Says ECB May Cut Interest Rates Again Next Week, "I consider it possible that the Governing Council would decrease interest rates once again at its next meeting," Trichet said in a speech in Madrid today. "It is not a certainty, it is a possibility."
21-Nov-2008	"ECB's Trichet Speaks in Frankfurt"	"We have a new rendez-vous in December we also have a new element which we take into account, the new staff projections of the euro system. On the basis of all this information we will have to take our decision, we already said we would decrease rates, there is nothing new there."
20-Feb-2009	"ECB's Trichet Speaks in Paris"	Trichet said that while the bank may lower interest rates further next month, cutting the benchmark to zero brings "a certain number of inconveniences."
24-Mar-2009	"ECB's Trichet Speaks at Conference in Mexico City"	Trichet Says ECB Interest Rates Could Be Cut Further (Update1) "Our main policy rates are not at their lowest level and they could diminish further," Trichet said today at an ...
28-Apr-2009	"ECB's Trichet Speaks at Chatham House Conference, New York Fed"	The ECB president also indicated that "the ECB will do whatever is necessary to fight the risk of deflation."
26-Jul-2012	"ECB's Draghi Speaking at Global Investment Forum in the U.K."	Speaking at an investment conference in London, Draghi said: "Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough."
26-May-2014	"ECB President Draghi Speaks in Sintra, Portugal"	ECB President Mario Draghi says at ECB Forum in Sintra, Portugal that "what we need to be particularly watchful for at the moment is the potential for a negative spiral to take hold between low inflation, falling inflation expectations and credit, in particular in stressed countries."
20-Nov-2015	"ECB's Mario Draghi Speaks at Euro Finance Week"	"If we decide that the current trajectory of our policy is not sufficient to achieve that objective, we will do what we must to raise inflation as quickly as possible," Draghi said in a speech in Frankfurt on Friday.