Monetary Policy and Sovereign Risk*

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Abstract

This paper estimates the effects of monetary policy on sovereign risk. We use proprietary intraday credit default swap (CDS) data on five European countries and identify the effects of monetary policy on CDS premia in a small time window around the European Central Bank (ECB) monetary policy announcements. We construct monetary policy surprises for the press release and conference windows separately and show that there are two channels with effects of opposite sign. We then use stock price surprises to disentangle and interpret the two effects in terms of a standard monetary policy channel, in which CDS premia and interest rates co-move positively, and an information channel, in which they co-move negatively. We find that the information channel is quantitatively the most important. The results are robust across samples, maturities of CDS and model specifications.

Key words: Sovereign risk; credit default Swap; monetary policy; high-frequency identification; redenomination risk

JEL Classification: E52; E58; G12; G15

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1 Introduction

What is the relationship between monetary policy and sovereign credit risk premia? In this paper, we investigate the connection between risk-free interest rates and sovereign CDS premia using a high-frequency identification strategy.

We document that monetary policy decisions impact sovereign risk premia through two separate channels of opposite sign. Using intraday data on sovereign CDS for five European countries and leveraging the timing of monetary policy announcements as well as their split into a press release and a press conference, we are able to isolate and interpret these two channels. The first channel, characterized by a positive relation between interest rates and CDS premia, can be interpreted as a standard monetary tightening (easing), which increases (decreases) the financing cost of the government and moves CDS premia in the same direction as the policy rate. The second channel, featuring a negative relation between interest rates and CDS premia, is consistent with the information channel of the central bank, according to which a tightening (easing) signals good (bad) news for the economy.

First, we take advantage of the split of policy announcements into a press release and a press conference window and we find suggestive evidence of two different channels at play. Then, we directly test the information channel interpretation using the strategy proposed in Jarociński and Karadi (2020).

The idea behind a differential impact of surprises from monetary policy decisions and communications during the press release and the conference window is that, up to 2014, the press release did not include any information about the economic outlook besides those conveyed by the changes in the policy rate. Instead, during the press conference, ECB officials addressed the reasons for the policy changes and additional policy measures other than those about the policy rates.

We find that, up to 2014, an increase in the interest rate during the release window is associated with an increase in the sovereign CDS premia, whereas an increase during the conference has the opposite sign. After 2014, the press release started to include also a statement about the economic outlook, whereas the conference was used to clarify details of the release statement and to answer journalists' questions. When using the second subsample (i.e from 2014 up to 2022), we find that the evidence of the information channel of monetary policy on sovereign risk premia fades and, in particular, that the coefficients for the interest rate surprises in the conference window become

statistically indistinguishable from zero at all maturities. We interpret these results as suggestive evidence of the two channels at play, which can be clearly separated using the press release and conference windows up to 2014 but seem to confound thereafter.

We then move to a more direct test of this interpretation. We follow the strategy used in Jarociński and Karadi (2020) to classify windows into "monetary events," in which interest rates and stock prices move in opposite directions, and "information events," in which interest rates and stock prices co-move positively. The logic of this classification is based on the idea that a negative co-movement between interests and stock prices reflects the impact of a standard monetary policy shock, whereas a positive co-movement reflects the effect of new information about future fundamentals.

We add to the specification an interaction term to allow for heterogeneous effects of monetary policy announcements depending on whether it is a monetary or information event. We find that the information dummy–i.e. a dummy variable that takes on the value one when the event is classified as an "information event–"interacted with the interest rate surprise during the press release has robustly a large negative coefficient. Instead, the interest rate surprise not interacted with the information dummy has robustly a positive coefficient. Moreover, once we control for this additional term, the surprise in the conference window has a much smaller negative impact on the premium than the interaction term, and is again statistically indistinguishable from zero in the second part of the sample. We investigate this pattern and find that it is very robust to different CDS maturities, samples, and measures of the policy rate.

Finally, we interpret these findings as confirming the evidence that the ECB can have an impact on sovereign risk premia by either surprising the markets with policy changes, or by providing its views on the economic outlook as well as forward guidance. The former channel generates positive co-movements between rates and CDS premia, the latter negative co-movements. Surprisingly, the information channel of monetary policy communications appears to have a substantially greater effect than a standard monetary policy shock, and it has a large impact on short-dated CDS as well.

The analysis employs a panel of five European countries, namely France, Ireland, Italy, Spain, and Portugal. We choose these countries because the consensus is that, after the 2011-2012 sovereign debt crisis generated substantial volatility in sovereign risk premia, monetary policy contributed to a large extent to their reduction both at the peak of the crisis and in the follow-

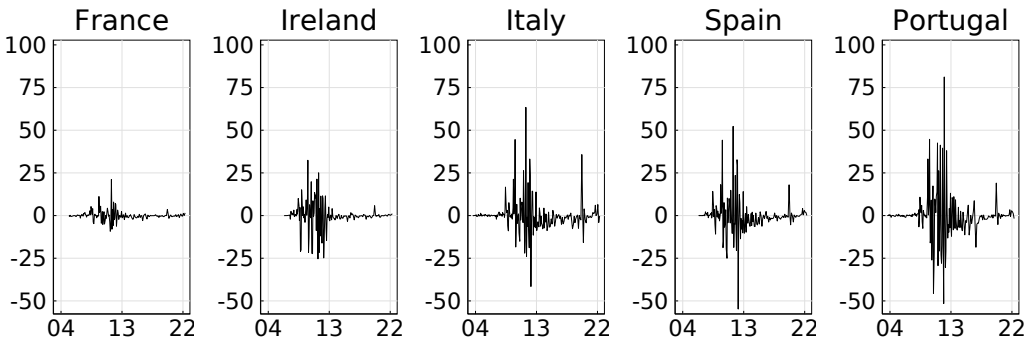


Figure 1: CDS changes on the ECB monetary policy announcements days.

ing years. Figure (1) shows the daily CDS changes in the days of monetary policy decisions for the sample 2004-2022. The plots clearly show that there is substantial volatility, even for France, which is usually considered a "core" country–i.e. a country with a very low perceived risk of default–has experienced some variation in CDS premia. We exclude Greece from the analysis because, after triggering in 2012, Greek CDS have basically not been traded for a couple of years.

For each country, we use a unique dataset with intraday snapshots of CDS quotes, which allow us to isolate their variation around the monetary policy announcement. With these data, we can control for the anticipation effect documented in the literature (for example in Lange et al. (2003) and Carpenter and Demiralp (2006)).

To measure monetary policy surprises we use the change in Overnight Indexed Swap (OIS) rates around the press release and press conference windows. We consider OIS rates at different maturities to capture the effects of both conventional and unconventional monetary policy surprises.

Literature Review. A number of theoretical papers that followed from the seminal works of Aguiar and Gopinath (2006) and Arellano (2008) tried to understand which are the determinants of sovereign risk and risk premia associated to sovereign defaults. Among those, Arellano et al. (2020) studied the interaction between monetary policy and sovereign default risk in a New Keynesian framework, extended to include optimal sovereign defaults. The authors document a robust positive correlation of sovereign spreads with nominal interest rates, estimated on a sample of ten emerging markets whose

central banks are inflation targeters. They argue that this result crucially depends on the reaction function of the monetary authority, because a decrease in productivity generates at the same time an increase in spreads and an inflationary push. Inflation targeters would then react by tightening their monetary policy stance, thus generating the positive correlation between the variables. In the calibrated model and in the counterfactual exercise, debt growth is the main driver of spreads, and a low interest rate pushes down the price of debt and stimulates output, thus increasing debt accumulation and the spread despite the reaction of the monetary authority.

In Chernov et al. (2020), the authors argue that a monetary policy loosening by the central bank could produce a rise in sovereign CDS premia. They develop an equilibrium macro-finance model to explain the relatively high levels of sovereign default premia observed in the US after the 2008 financial crisis. Our empirical findings using European data imply that, despite the presence of a standard monetary policy channel that goes in the opposite direction, the information channel is compatible with a negative correlation between policy rates and CDS premia. In fact, we find that the latter is quantitatively even more important than the standard monetary channel, and provide evidence that supports the interpretation that the mechanism operates through a revision of the expectations on the economic outlook.

This paper contributes to the literature on the high-frequency estimation of the effects of monetary policy as in Gertler and Karadi (2015), Nakamura and Steinsson (2018), Cieslak and Schrimpf (2019), Lunsford (2020), and Miranda-Agrippino and Ricco (2021) among others. It is also related to the estimation of the effects of monetary policy on credit risk as in Krishnamurthy and Vissing-Jorgensen (2011) and Gilchrist and Zakrajšek (2013).

The closest paper to this is Leombroni et al. (2021). The authors study how central bank communication affects the sovereign bond spread between peripheral and core countries in the Eurozone. Their identification strategy is essentially equivalent to a structural VAR, in which two shocks are identified with the surprises to interest rates and stock prices around policy announcements and a Cholesky ordering with the rate first and the stock market second. On the other hand, our identification is based on a sign restriction in place of the Cholesky ordering.

We proceed in the analysis as follows. Section 2 describes the dataset on CDS quotes, the details of the press release and conference windows, and the calculations of policy surprises. Section 3 introduces the methodology and discusses the results. In the last part of the section, we extend the

baseline analysis to the term structure of sovereign risk and to the effects of monetary policy announcements on some of its components, redenomination and recovery risk. Finally, section 4 concludes. The remaining results and tables can be found in the Appendix.

2 Data

In this work we use data on surprises around monetary policy events for OIS rates, the stock market and CDS quotes. The first two series are obtained from a larger dataset encompassing monetary policy surprises for a wide array of financial variables. We directly construct CDS surprises from proprietary raw intraday data.

2.1 Data on Monetary Policy Surprises

Monetary policy surprises for OIS rates and stock prices are obtained from the dataset of Altavilla et al. (2019), which is constructed along the lines of Gürkaynak et al. (2005). The underlying tick data come from the Thomson Reuters Tick History database, whereby the authors measure and report changes in asset prices over the relevant policy windows. One of the advantages of using European data compared to, say, developing countries as in Arellano et al. (2020), is that the protocol followed by the ECB for the monetary policy announcements is clear and informative for the different tools available to the monetary authority. In particular, each announcement is divided into two separate windows: the press release window and the conference window.

At 13:45 CET, the statement summarizing the economic outlook for the Euro area and policy decisions is uploaded to the ECB's web page. The press release window, which lasts from 13:35 CET to 14:00 CET, thus includes all the trades that occur following the release of the news as well as asset price changes ten minutes prior to the release that possibly reflect information leaks.

During the conference, which lasts from 14:30 CET to 15:30 CET, the president of the ECB reads a statement supplementing the press release with additional details on the economic outlook and the policy decisions. The statement is followed at 14:45 CET by the Q&A section, that lasts until the end of the conference, in which the president addresses questions by

journalists[1].

Unexpected policy decisions or communications would produce changes in financial assets' prices. These surprises for financial variables are measured as the differences between the median prices in the 10-minutes-after windows and the 10-minutes-before windows, that is the median price of 14:00-14:10 CET (post-release window) minus the median of 13:25-13:35 CET (pre-release window), and the median of 15:40-15:50 CET (post-conference window) minus the median of 14:15-14:25 CET (pre-conference window)[2]. This gives two high-frequency complementary measures of the monetary policy surprise, with the release surprise reflecting both policy changes and information on the economic outlook, and the conference surprise reflecting the additional information provided in the conference and answers to journalists' questions.

Before 2015 the press release statement included exclusively the policy decision about policy rates, whereas all other information about additional policies were discussed only in the press conference. Hence, before 2015, the economic outlook was entirely discussed in the conference window, whereas from 2015 onward the outlook has been part of the press release statement along with all the other important policy decisions. We will show in the next sections that this is consistent with our findings and motivates separate analyses for the samples 2004-2022 and 2014-2022.

We obtain from the dataset surprises for the Overnight Index Swap (OIS) rates at different maturities, which is the fixed leg of an overnight swap contract on the Eonia rate, and surprises for the Euro Stoxx 50, a market capitalization-weighted stock-market index including 50 blue-chip companies from 11 Eurozone countries. In addition, we follow Altavilla et al. (2019) in using the surprises on German Bund at same maturities as proxies for the OIS rates at five and ten years before 09/2011, as the OIS rates were not available.

2.2 Data on Credit Default Swaps

Part of the contribution of this work is to analyze a unique dataset of CDS. CDS are traded in over-the-counter markets and therefore finding high-quality intraday data is not easy. Data are provided by Intercontinental

[1]Starting 21 July 2022 the ECB moved the announcement of its monetary policy decisions to 14:15 CET, and the start of ECB press conference changed to 14:45 CET.

[2]After 21 July 2022 the windows are shifted according to new event times.

Exchange, Inc. (ICE), a leading operator of global exchanges and clearing houses that also operates as market maker for CDS Index Option trades in the U.S. and Europe. On the quality of the data, Mayordomo et al. (2014) compares several CDS databases and shows that the quotes by Credit Market Analysis (CMA), which has been acquired by ICE in 2016, lead the price discovery process in comparison with quotes distributed by other providers.

We use CDS quotes denominated in USD because these contracts are more liquid then the euro-denominated counterparts. For the same reason, in the baseline regressions we analyze CDS with a five-year maturity. The CDS premium is computed as the average of the bid and ask quotes (that is, the mid-price).

The availability of intraday observations is uneven over the time span covered by the dataset. We observe a single daily snapshot at 22:30 CET (which includes the New York Stock exchange closing time) starting from 2004, a second snapshot at 17:30 CET starting from 2007, two more snapshots at 12:30 CET and 16:30 CET starting from 2008, and one more at 13:30 CET starting from 2010.

We construct surprises for the CDS by taking the difference between the first available snapshot after 16:29 CET and the last available snapshot before 13:31 CET, hence the monetary policy window for the CDS data is 13:30 to 16:30 CET since 2010. Notably, taking a daily window sometimes leads to substantially different results, suggesting that using daily data is not good enough to rule out price changes that do not depend directly on the monetary policy surprises.

Figure (2) plots the different time series available with Italian data: the daily window has much more volatility than the intraday snapshots and the additional variation does not only come from the time window after the conference, as the difference between the smallest available window including 22:30 CET and daily window shows, but also from an anticipation effect before the announcements. On the other hand, the two windows ending at 17:30 CET and 16:30 CET lead to results that are not qualitatively different than those obtained using the entire window including New York closing time. We proceed with the baseline analysis using the smallest available window including 16:30 CET, keeping in mind the caveat that the window 13:30 - 16:30 CET is only available from 2010 onward.

The dataset contains CDS contracts for several sovereign entities at different maturities. We select contracts on sovereign debt issued by the Treasuries of France, Ireland, Italy, Portugal, and Spain. These countries are

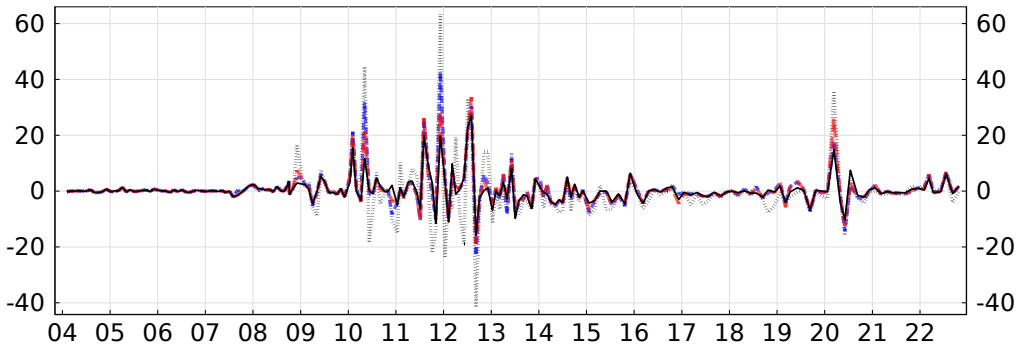


Figure 2: Changes of the Italian five-year CDS premium over different intraday time windows on monetary policy announcement days. The dotted black line, the dashed blue line, the dashed red line and the solid black line depict the daily change and the change over the smallest available window including 22:30, 17:30 and 16:30, respectively.

chosen because are the ones that within the Eurozone displayed a significant volatility in sovereign spreads. We exclude Greece from the sample because CDS data is subject to substantial measurement errors after the 2011-2012 sovereign debt crisis, even though adding Greece to the analysis strengthens the results.

Since 2003, CDS contracts have been subject to a protocol by the International Swaps and Derivatives Association (ISDA) which defined their characteristics (the "2003 definitions"), which currently form the basis of the documentation for CDS transactions. In 2014, an additional contract has been introduced which updates the 2003 ISDA credit derivatives definitions and relevant supplements (the "2003 definitions"). The 2014 definitions revise those from 2003 and add new provisions including, most notably, an amendment addressing the cases in which currency redenomination triggers the CDS contract. The two contracts under different standards are commonly referred to as CR03 and CR14, and their difference, known as ISDA basis, has recently been used by practitioners as a measure of redenomination risk.

With the introduction of the new standardized contract in 2014, the market for CDS has become more liquid and data quality has increased. We will analyze different samples including data between 2004 and 2014, thus addressing possible issues related to both observation frequency and data qual-

ity. Notably, the sample 2014-2022 is not only the one with best data quality and intraday details, but it also coincides with the period in which the press release started to include details about the economic outlook alongside all the other policy choices. We will address these two structural changes by analyzing separately the sample 2014-2022, together with the full sample.

3 Effects of Monetary Policy on Sovereign Risk Premia

This section measures the extent to which sovereign CDS premia react to monetary policy announcements in a small window around the press release and conference. First, we document the different effects of the press release and press conference surprises and interpret them in terms of policy changes and information. Second, we test directly the information hypothesis following the approach proposed by Jarociński and Karadi (2020). Third, we show that monetary policy does not only affect the level of CDS premia, but also the slope of the CDS term structure. Fourth, we follow the same methodology to also study the effect of monetary policy surprises on the ISDA basis.

3.1 Methodology

We follow the literature on high-frequency identification of the effects of monetary policy to estimate how sovereign default risk is affected by ECB's decisions. Sovereign default risk is measured as the CDS premia at five years maturity, which is the most liquid traded tenor. Using the surprises on the OIS interest rate at different maturities as the main regressor, we follow Gürkaynak et al. (2005) and Gertler and Karadi (2015), among many others, and estimate the following fixed-effect model:

$$\Delta D_{it} = \alpha_i + \beta^r \Delta i^r_{tj} + \beta^c \Delta i^c_{tj} + \varepsilon_{itj} \tag{1}$$

where $i \in \{1, \ldots, 5\}$ is the index associated to each of the five countries in the dataset, ΔD_{it} is the surprise of the CDS price in the announcement window t for country i, and Δi_{tj} is the surprise in the OIS rate at maturity j for either the press release window (i^r) or the conference (i^c). Several studies, including Altavilla et al. (2019), argued that the effect of direct

policy changes are strongest on short-term rates (3m-6m), forward guidance is strongest on medium-term rates (2y), and quantitative easing is strongest on longer-term rates (5y-10y). Accordingly we consider different maturities of the OIS rates to capture the effects of all the different tools–conventional and unconventional–available to the monetary authority.

3.2 Results

Table (1) shows the results for the full sample 2004-2022 and Table (2) those using the sample 2014-2022, that differs in the inclusion of information about the economic outlook directly in the press release, and notably does not include the 2011-2012 sovereign debt crisis.

Both tables are somewhat surprising, given the reversion in sign between conference and release that is a robust feature across maturities. In particular, Table (1) shows that interest rate surprises at any maturity during the press conference are negatively correlated with CDS surprises, while in the press release they are positively correlated with CDS surprises.

In Table (2), the correlation for the release window is positive and close to that estimated over the full sample. However, the sign reversion in the conference completely disappears. Overall, these results are in line with the interpretation that the change in OIS rates during the press release contains mostly information about the tightening or easing of monetary policy, whereas the press conference reveals private knowledge that the ECB has on the state of the economy that affect beliefs and prices of financial markets.

On one hand, taking as given the macroeconomic situation, a tightening of monetary policy is associated to higher CDS premia, as it implies a direct increase in the cost of funds for the government and a decrease in net tax revenues as a consequence of the contraction of the real economy.

On the other hand, taking as given the direct effect of the tightening, an increase in interest rates implies good news for the economy, when the output gap is positive and inflation is rising. Good news for the economy are associated to lower sovereign default risk, as the future value of tax payments is expected to be larger.

Symmetrically, a decrease in interest rates can stimulate the economy and reduce interest payments on government debt, thus decreasing sovereign risk. But can also signal a macroeconomic recession which would harm government's ability to repay its debt.

The "information hypothesis" is confirmed by the comparison between

Estimation using smallest available window

	(1)	(2)	(3)	(4)	(5)
	Surprise CR03	Surprise CR03	Surprise CR03	Surprise CR03	Surprise CR03
VARIABLES	02/04-10/22	02/04-10/22	02/04-10/22	02/04-10/22	02/04-10/22
3M release	0.075				
	(0.963)				
3M conference	-0.250**				
	(-4.058)				
1Y release		0.180**			
		(3.283)			
1Y conference		-0.148**			
		(-4.166)			
2Y release			0.195**		
			(4.296)		
2Y conference			-0.131***		
			(-4.688)		
5Y release				0.159**	
				(3.703)	
5Y conference				-0.130**	
				(-4.593)	
10Y release					0.103
					(1.682)
10Y conference					-0.190***
					(-4.726)
Constant	0.229***	0.202***	0.226***	0.263***	0.276***
	(7.248)	(9.051)	(17.795)	(49.570)	(93.576)
Observations	870	870	870	870	870
R-squared	0.010	0.017	0.019	0.015	0.012
Countries	5	5	5	5	5

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 1: Panel regression with country fixed effects for the sample 02/2004 - 10/2022. All the variables are expressed in basis points.

the two samples, as the negative correlation in the conference window disappears precisely when the statement started to include the economic overlook, thus effectively making the conference less informative. The next section investigate further this hypothesis.

3.3 The role of information

We explore now the reversion in sign observed in Tables (1)-(2) by using a similar approach to that introduced by Jarociński and Karadi (2020).

Estimation using the smallest available window

	(1)	(2)	(3)	(4)	(5)
	Surprise CR03	Surprise CR03	Surprise CR03	Surprise CR03	Surprise CR03
VARIABLES	10/14-10/22	10/14-10/22	10/14-10/22	10/14-10/22	10/14-10/22
3M release	0.198				
	(1.973)				
3M conference	0.108				
	(1.193)				
1Y release		0.161*			
		(2.495)			
1Y conference		-0.069			
		(-0.968)			
2Y release			0.148**		
			(2.836)		
2Y conference			-0.020		
			(-0.505)		
5Y release				0.170**	
				(3.092)	
5Y conference				-0.008	
				(-0.262)	
10Y release					0.222*
					(2.693)
10Y conference					0.009
					(0.258)
Constant	-0.483***	-0.409***	-0.366***	-0.331***	-0.291***
	(-6.322)	(-13.106)	(-26.823)	(-210.621)	(-19.339)
Observations	330	330	330	330	330
R-squared	0.055	0.051	0.048	0.048	0.044
Countries	5	5	5	5	5

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: Panel regression with country fixed effects for the sample 10/2014 - 10/2022. All the variables are expressed in basis points.

In their paper, the authors propose to identify two different shocks in monetary policy communications by imposing sign restrictions to a structural VAR. Positive co-movements between interest rates and the stock market signal a so-called "information shock" while negative co-movements identify a traditional monetary policy shock.

In order to capture in a simple way the same idea, we use the high-frequency surprises in the Euro Stoxx 50 and OIS rates to create a dummy variable that takes value equal to one when the relevant OIS rate and Euro Stoxx 50 surprises have the same sign in the release window and zero other-

wise.

This approach requires stronger assumptions than the sign restriction of the structural VAR, because it classifies sharply each press release as either a "monetary policy event'" or an "information event". However, the authors show that this exercise delivers almost identical impulse responses to those produced by the structural VAR, while having the advantage of being simpler to interpret.

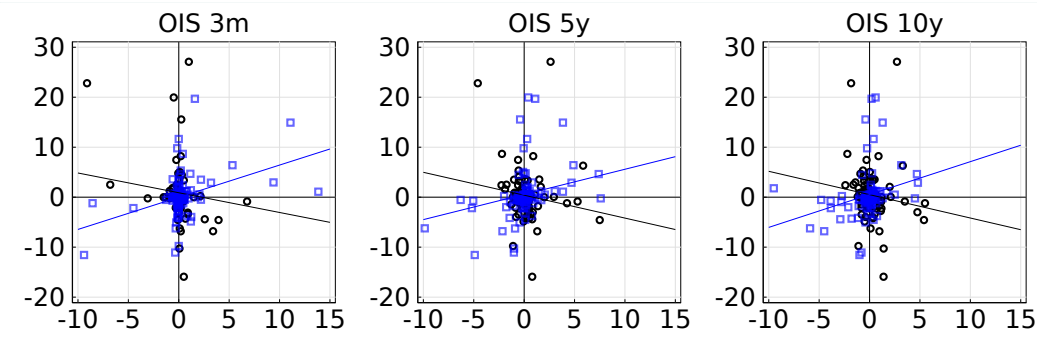


Figure 3: Scatter plots of the CDS surprises on the Italian bond at five years for different OIS maturities. Regressions lines are estimated on the two subsamples (information and monetary events).

A scatter plot of CDS surprises against OIS surprises at different maturities is presented in Figure (3). The blue squares correspond to those days in which interest rates and stock surprises co-move positively, which are classified as an "information events". The black and empty circles correspond instead to the remaining part of the sample, containing monetary policy events. Regression lines show that the correlation between CDS surprises and OIS surprises switches in sign when considering separately the two sub-samples. We thus change the specification of the fixed-effect model to allow for interactions between the dummy and the surprise in the press release:

$$\Delta D_{it} = \alpha_i + \beta^r \Delta i^r_{tj} + \beta^{r,\mathcal{I}} \Delta i^r_{tj} \times \mathbb{I}^{\mathcal{I}}_{tj} + \beta^c \Delta i^c_{tj} + \varepsilon_{itj} \tag{2}$$

where $\mathbb{I}^{\mathcal{I}}_{tj}$ takes on the value 1 if the monetary policy surprise is classified as an "information event" (i.e. OIS rate and the stock market comove positively) and 0 if it is classified as a "monetary policy event" (i.e. the OIS rate and the stock market comove negatively).

Estimation using smallest available window

VARIABLES	(1) Surprise CR03 02/04-10/22	(2) Surprise CR03 02/04-10/22	(3) Surprise CR03 02/04-10/22	(4) Surprise CR03 02/04-10/22	(5) Surprise CR03 02/04-10/22
3M release	0.596***				
	(5.596)				
3M release x Information	-1.131***				
	(-4.888)				
3M conference	-0.290***				
	(-4.628)				
1Y release		0.535***			
		(6.148)			
1Y release x Information		-1.002***			
		(-4.673)			
1Y conference		-0.156**			
		(-4.335)			
2Y release			0.442***		
			(6.061)		
2Y release x Information			-1.079**		
			(-4.290)		
2Y conference			-0.130***		
			(-4.646)		
5Y release				0.405***	
				(5.829)	
5Y release x Information				-1.078**	
				(-4.430)	
5Y conference				-0.121**	
				(-4.329)	
10Y release					0.442**
					(4.352)
10Y release x Information					-1.145***
					(-5.458)
10Y conference					-0.186***
					(-4.644)
Constant	0.151***	0.241***	0.296***	0.345***	0.372***
	(4.898)	(9.992)	(15.921)	(18.960)	(20.309)
Observations	870	870	870	870	870
R-squared	0.079	0.067	0.064	0.051	0.038
Number of ID	5	5	5	5	5

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Panel regression with country fixed effects for the sample 02/2004 - 10/2022. All the variables are expressed in basis points.

Results for the sample 2004-2022 are reported in Table (3) and for the sample 2014-2022 in Table (5) in the appendix. We also experiment with alternative specifications that allow for the interaction between Δi^c_{tj} and the dummy constructed on the conference window, but there is no robust indication of a sign reversion for the conference as coefficients are negative.

This suggests that the only channel that operates in the conference is an informational one–see the specification in Table (6) in the appendix.

The comparison between Table (3), and tables (1)-(2) is stark. The two coefficients for the press release display robustly a sign reversion which is in line with the narrative discussed in the previous section, both across maturities and–more surprisingly–also across samples (as shown in the appendix).

The surprises in the conference window still show a similar qualitative behavior as the previous regressions, but the coefficients are substantially smaller than those of the interaction term, suggesting that the information content of the press statement is only complemented to a smaller extent by the conference. For the 2014-2022 sample, Table (5) in the appendix shows that the same qualitative behavior holds for the press release and point estimates for the coefficient are very similar. Over this sample, surprises during the conference window appear to be not significant in explaining CDS surprises also in this specification.

Interestingly, in most regressions, the coefficient for the interaction term is twice as large (with a reversal in sign) than that of the OIS surprise, indicating that the update of expectations is at least as powerful as the direct effect of the change in interest rates. To put numbers to the two effects, a traditional tightening of monetary policy increases the CDS premium by 15 basis points for an increase in the three-month interest rate of 13 basis points, whereas the information channel decreases the CDS premium by more than 15 basis points for the same increase in the short-term rate.

The effects of forward guidance, which operates through medium and long-term rates, are even larger in both cases with a 11-point increase of the spread for the same increase of the ten-year rate and a 22-point decrease through the information channel.

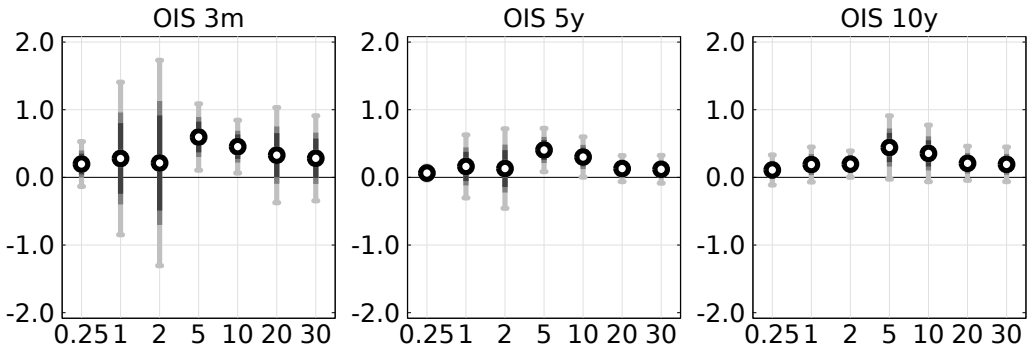
To conclude, the addition of the interaction term seems to be important, and the new regressions show that both the traditional monetary policy and the information channel impact significantly the pricing of sovereign default risk as measured by CDS premia.

3.4 Term Structure of Credit Default Swaps

We now turn to the analysis of whether the effects of traditional monetary policy and information are heterogeneous for different maturities of CDS. We keep specification (2) for all the regressions and we plot in Figure (4) the coefficients for the OIS surprise Δi_j^r and for the interaction term $\Delta i_j^r \times \mathcal{I}_j$.

The remaining coefficients for the press release and the press conference are in the appendix in Figure (6), Figure (7) and Figure (8).

(a) Release



(b) Release × Information

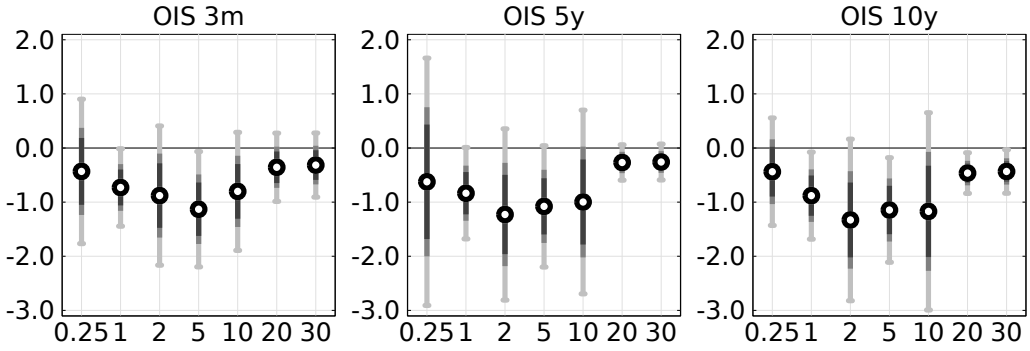


Figure 4: Regression coefficients for specification (2). On the x-axis the maturity for the CDS. Shaded bars indicate the confidence intervals at 99%, 95%, 90%. The first block of plots reports the coefficient β^r for different maturities of Δi^r_j. The second block reports the coefficient $\beta^{r,\mathcal{I}}$ for different maturities of $\Delta i^r_{ij} \times \mathcal{I}_j$. Each plot corresponds to a specification with a different measure of i^r_j.

The robust finding across CDS and OIS maturities is the main message of the previous sections: there is a sign reversion between OIS surprise and the interaction term, which we interpret as evidence of the presence of both a traditional monetary policy channel and an information channel. The latter is quantitatively large, with and elasticity for the 3-month CDS around -1,

which means that a 25 basis points tightening can decrease the CDS premium roughly by the same amount when interpreted as good news for the economy in the short run. The rest of the coefficients in the appendix also confirm the robustness of the regressions, with either a negative or non-significant coefficient β^r.

3.5 ISDA Basis

This section studies monetary policy effects on the ISDA basis–defined as the difference between the premium of the CDS contract specified using the 2014 restructuring clauses and that of the contract specified using the 2003 definitions–and whether the same channels identified before continue to play a similar role.

The ISDA basis is usually considered by practitioners a measure of redenomination risk, that is the risk of a country redenominating its debt in a currency different than that used when the debt was initially issued. This is the case because restructuring clauses under the 2003 and 2014 definitions have changed the set of currencies in which it is possible to redenominate debt without triggering the CDS contract. However, this only applies to G7 countries, in our case France and Italy, for which, a debt redenomination in a new currency would trigger the CDS contract under the 2014 clauses but not that under the 2003 definitions.

Moreover, as pointed out by Duffie and Thukral (2012) and Kremens (2018), this was not the only change that ISDA introduced to restructuring clauses in 2014. A second change was the introduction of the asset package delivery (APD), a reform in the calculation of the recovery value that was a direct response to the Greek debt restructuring of 2012.

Therefore the ISDA basis measures both redenomination and recovery risk for G7 countries and only recovery risk for non-G7 countries. Given how the ISDA basis is constructed, the only sample available for analysis is that ranging from 2014 to 2022.

Results are somewhat similar to those for sovereign default risk in the sense that point estimates display the characteristic sign inversion between coefficients of the OIS surprise and the interaction term. However estimates are statistically significant only in the case of the 3-month maturity and, generally, sensitivities and effects of information compared to that of standard monetary policy are smaller than in the case of sovereign default risk. Table (4) reports the estimates for the fixed effect model with the OIS surprise in

Estimation using the smallest available window

VARIABLES	(1) Surprise CR14 - CR03 10/14-10/22	(2) Surprise CR14 - CR03 10/14-10/22	(3) Surprise CR14 - CR03 10/14-10/22	(4) Surprise CR14 - CR03 10/14-10/22	(5) Surprise CR14 - CR03 10/14-10/22
3M release	0.136***				
	(4.785)				
3M release x Information	-0.224**				
	(-4.534)				
1Y release		0.105			
		(2.085)			
1Y release x Information		-0.181			
		(-1.946)			
2Y release			0.081		
			(1.723)		
2Y release x Information			-0.170		
			(-1.842)		
5Y release				0.081	
				(1.579)	
5Y release x Information				-0.230*	
				(-2.294)	
10Y release					0.093
					(1.327)
10Y release x Information					-0.253*
					(-2.579)
Constant	0.105**	0.128***	0.127***	0.138***	0.153***
	(3.262)	(10.133)	(13.703)	(11.482)	(7.083)
Observations	330	330	330	330	330
R-squared	0.035	0.035	0.032	0.029	0.021
Countries	5	5	5	5	5

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Panel regression with country fixed effects for the sample 10/2014 - 10/2022. All the variables are expressed in basis points.

the press release and the interaction with the information dummy constructed as before. Surprises during the press conference are added in Table (7) in the appendix, but are not significantly different from zero in line with Table (5). Interestingly, the interactions with longer maturities in columns 4 and 5 of Table (4) seem to be significant and, for all the maturities, the point estimates imply similar sensitivities for traditional policy surprises and information surprises with opposite sign.

To conclude, we find that there is some evidence for a sign reversal also in the case of redenomination and recovery risks, even though less pronounced than in the findings from the previous sections. Default and–to some extent–

redenomination and recovery risks co-move in response to unexpected policy changes and the two channels–standard monetary policy and information–seem to be both important and robust across specifications, samples, and maturities.

4 Conclusions

This paper studies the effects of monetary policy announcements on sovereign risk premia, measured by CDS quotes. We show that the central bank can affect sovereign risk premia through two channels with opposite signs. We investigate these channels using data on the press release and conference windows, and validate our interpretation using data on stock prices.

We show that during the press release two separate channels contribute to changes in sovereign risk premia: a standard monetary policy channel, which implies that an increase in interest rates raises CDS premia, and an information channel, which affects CDS premia with an opposite sign. On the other hand, interest rate surprises during the conference window affect sovereign risk premia only via the information channel. Changes in stock prices confirm this interpretation because on average CDS premia co-move negatively (positively) with interest rates when stock prices co-move positively (negatively) with interest rates. These findings are robust across specifications, measures for the policy rate, and maturities. Moreover, redenomination and recovery risk–measured by the ISDA basis–display a pattern somewhat similar to that of default risk premia, as we find evidence that, in some cases, an information shock reduces the ISDA basis, whereas a pure interest rate tightening increases it.

In terms of assessing the effects of monetary policy decisions and communication on financial markets, we provide additional evidence that it is crucial to distinguish between pure monetary policy shocks and information shocks by looking at the co-movement between interest rate and stock market surprises. Otherwise, the presence of offsetting effects from the two different types of shocks could yield a misleading evaluation of policy interventions.

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Appendix

A Additional Figures

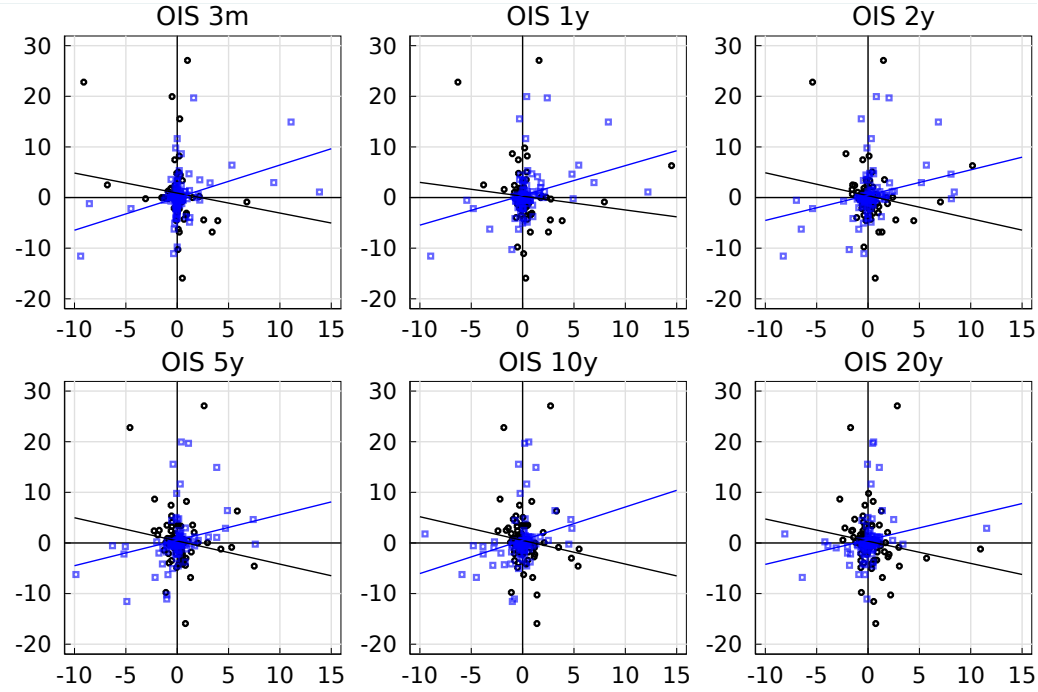

Figure 5: Scatter plots of the CDS surprises on the Italian bond at five years for different OIS maturities. Regressions lines are estimated on the two subsamples (information and monetary events).

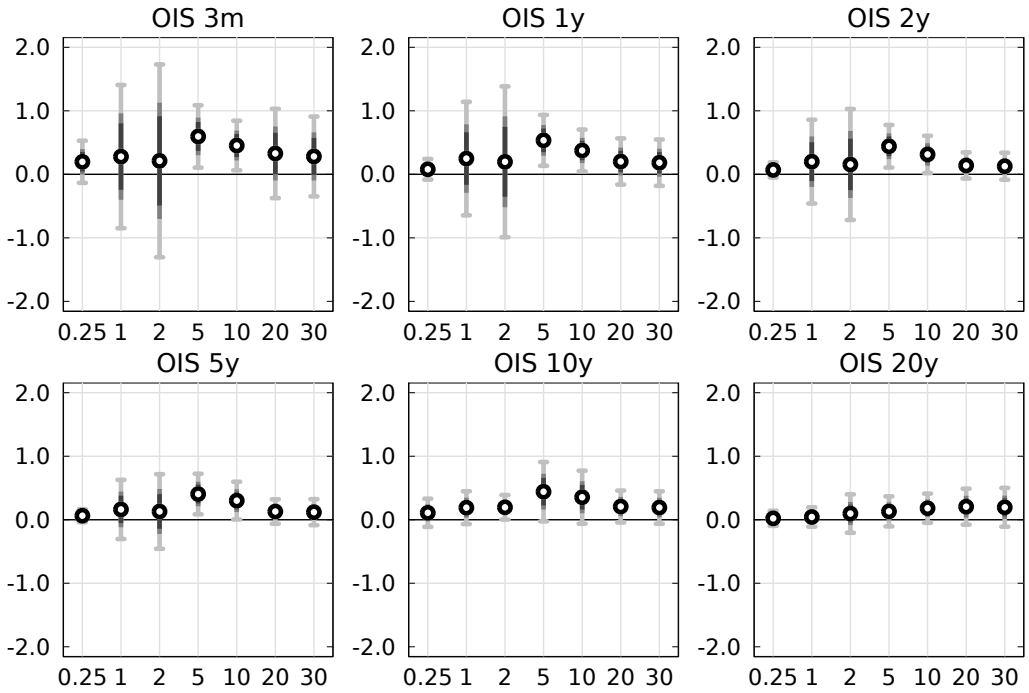

Figure 6: Regression coefficients for variable "release" in specification (2). On the x-axis the maturity for the CDS. Shaded bars indicate the confidence intervals at 99%, 95%, 90%. The figure reports the coefficient β^c for different maturities of Δi_j^c. Each plot corresponds to a specification with a different measure of i_j^c.

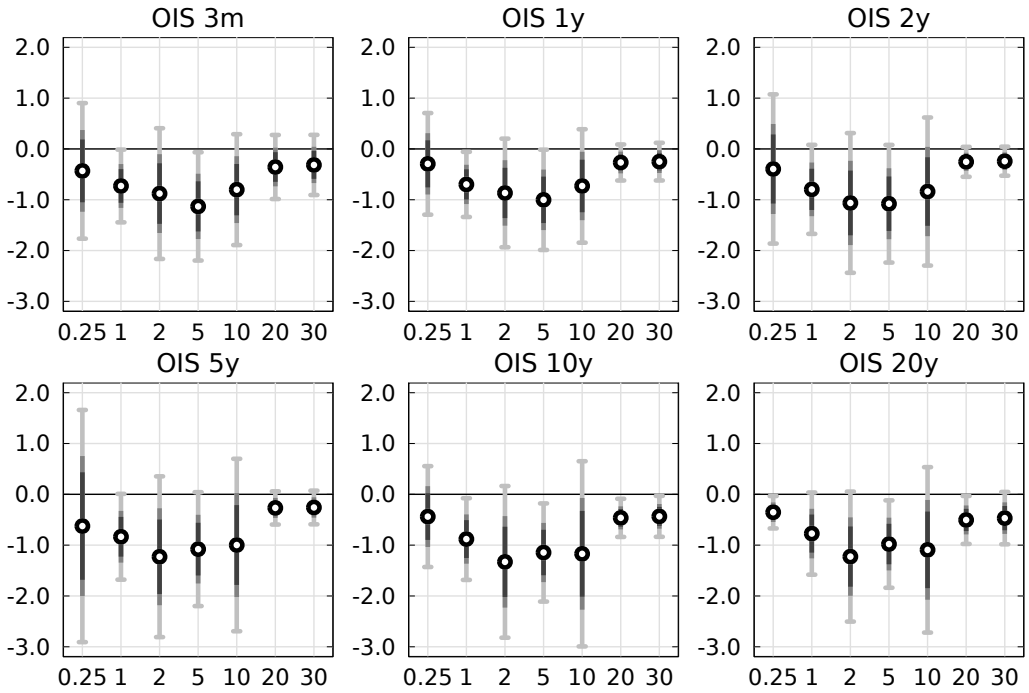

Figure 7: Regression coefficients for variable "release × information" in specification (2). On the x-axis the maturity for the CDS. Shaded bars indicate the confidence intervals at 99%, 95%, 90%. The figure reports the coefficient β^c for different maturities of Δi_j^c. Each plot corresponds to a specification with a different measure of i_j^c.

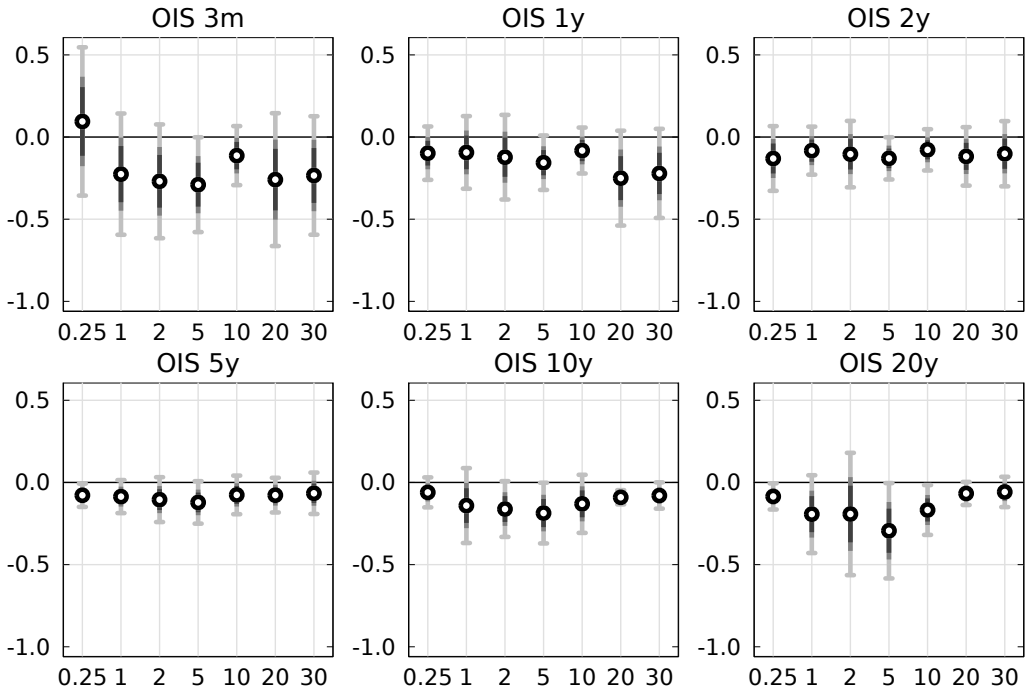

Figure 8: Regression coefficients for variable "conference" in specification (2). On the x-axis the maturity for the CDS. Shaded bars indicate the confidence intervals at 99%, 95%, 90%. The figure reports the coefficient β^c for different maturities of Δi_j^c. Each plot corresponds to a specification with a different measure of i_j^c.

B Additional Tables

Estimation using the smallest available window					
	(1)	(2)	(3)	(4)	(5)
	Surprise CR03	Surprise CR03	Surprise CR03	Surprise CR03	Surprise CR03
VARIABLES	10/14-10/22	10/14-10/22	10/14-10/22	10/14-10/22	10/14-10/22
3M release	0.575*				
	(2.567)				
3M release x Information	-0.552**				
	(-2.934)				
3M conference	0.057				
	(0.712)				
1Y release		0.287**			
		(2.961)			
1Y release x Information		-0.289**			
		(-3.220)			
1Y conference		-0.143			
		(-1.738)			
2Y release			0.193**		
			(3.199)		
2Y release x Information			-0.198*		
			(-2.761)		
2Y conference			-0.052		
			(-1.247)		
5Y release				0.181**	
				(3.328)	
5Y release x Information				-0.103	
				(-1.804)	
5Y conference				-0.018	
				(-0.618)	
10Y release					0.294**
					(3.240)
10Y release x Information					-0.421**
					(-4.174)
10Y conference					-0.003
					(-0.082)
Constant	-0.519***	-0.356***	-0.327***	-0.318***	-0.233***
	(-5.886)	(-16.133)	(-21.494)	(-43.938)	(-10.039)
Observations	330	330	330	330	330
R-squared	0.153	0.088	0.062	0.050	0.066
Number of ID	5	5	5	5	5

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Panel regression with country fixed effects for the sample 10/2014 - 10/2022. All the variables are expressed in basis points.

Estimation using smallest available window

	(1)	(2)	(3)	(4)	(5)
	Surprise CR03	Surprise CR03	Surprise CR03	Surprise CR03	Surprise CR03
VARIABLES	02/04-10/22	02/04-10/22	02/04-10/22	02/04-10/22	02/04-10/22
3M release	0.596***				
	(5.578)				
3M release x Information	-1.135***				
	(-4.895)				
3M conference	-0.066				
	(-1.336)				
3M conference x Information	-0.597*				
	(-2.502)				
1Y release		0.547***			
		(6.190)			
1Y release x Information		-1.063***			
		(-4.908)			
1Y conference		-0.053			
		(-1.670)			
1Y conference x Information		-0.300			
		(-1.961)			
2Y release			0.458***		
			(6.040)		
2Y release x Information			-1.166**		
			(-4.436)		
2Y conference			-0.028		
			(-1.087)		
2Y conference x Information			-0.294*		
			(-2.361)		
5Y release				0.424***	
				(5.733)	
5Y release x Information				-1.208***	
				(-4.760)	
5Y conference				0.003	
				(0.114)	
5Y conference x Information				-0.373**	
				(-2.847)	
10Y release					0.487**
					(4.246)
10Y release x Information					-1.343***
					(-5.713)
10Y conference					0.020
					(0.400)
10Y conference x Information					-0.514**
					(-2.824)
Constant	0.067	0.157*	0.197**	0.219**	0.255***
	(1.310)	(2.775)	(4.012)	(4.378)	(6.284)
Observations	870	870	870	870	870
R-squared	0.091	0.077	0.076	0.069	0.055
Number of ID	5	5	5	5	5

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Panel regression with country fixed effects for the sample 02/2004 - 10/2022. All the variables are expressed in basis points.

Estimation using the smallest available window

VARIABLES	(1) Surprise CR14 - CR03 10/14-10/22	(2) Surprise CR14 - CR03 10/14-10/22	(3) Surprise CR14 - CR03 10/14-10/22	(4) Surprise CR14 - CR03 10/14-10/22	(5) Surprise CR14 - CR03 10/14-10/22
3M release	0.136***				
	(4.876)				
3M release x Information	-0.221***				
	(-4.705)				
3M conference	0.078				
	(0.552)				
1Y release		0.107			
		(2.032)			
1Y release x Information		-0.186			
		(-1.902)			
1Y conference		-0.020			
		(-0.649)			
2Y release			0.081		
			(1.677)		
2Y release x Information			-0.169		
			(-1.769)		
2Y conference			0.001		
			(0.038)		
5Y release				0.081	
				(1.567)	
5Y release x Information				-0.221*	
				(-2.222)	
5Y conference				0.010	
				(0.657)	
10Y release					0.093
					(1.314)
10Y release x Information					-0.253*
					(-2.679)
10Y conference					0.001
					(0.074)
Constant	0.098*	0.130***	0.127***	0.136***	0.153***
	(2.702)	(9.603)	(11.396)	(11.484)	(6.979)
Observations	330	330	330	330	330
R-squared	0.037	0.035	0.032	0.029	0.021
Countries	5	5	5	5	5

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: Panel regression with country fixed effects for the sample 10/2014 - 10/2022. All the variables are expressed in basis points.