A market-based history of ECB policy events

Andrew Benito

February, 2022

Introduction

This report provides an analysis of financial market reactions to ECB policy events.

It summarises intra-day reactions in financial markets at the time of each of the ECB's scheduled policy meetings. It is structured around 7 distinct phases in ECB history.[1]

The results document the rising importance of unconventional monetary policy within distinct phases in ECB history. Recent ECB policy action has emphasised the need to 'preserve favourable financing conditions'. Should maintaining recent financial conditions assume the role of an intermediate target of policy, it risks supporting asset prices indiscriminately and suppressing financial markets' role in price discovery.

Seven Phases in ECB History

Hartmann and Smets (2018) describe distinct phases in ECB history at a business cycle frequency.[2]

The ECB's *first interest rate cycle* (to June 2003) was followed by an era of *recovery and rising imbalances* in the mid-2000s, which preceded the *financial turmoil* of 2007/08. The *great financial crisis and its great recession* followed in the aftermath of that turmoil (Oct.2008 to Apr. 2010). The Euro area's *sovereign debt crisis and doom loop* followed (May 2010 to June 2013) as the links between stretched sovereign balance sheets and impaired national banking systems were exposed and intensified. A *low inflation recovery and effective lower bound* phase followed from mid-2013 and some of its economic features were intensified in the era of Coronavirus.

The report investigates how financial markets responded to ECB communications at its policy events - which capture both monetary and non-monetary news - during each phase in ECB history.

[1] The R Markdown file that reproduces this note (including data analysis) is available on request.

[2] The seven phases used here are based on Hartmann and Smets (2019), with an obvious extension for the period of the Coronavirus. Data for market reactions are drawn from the Altavilla *et al* (2019) Monetary Policy Event-Study Database.

Table 1: A classification of ECB history (at business cycle frequency)

Period	Description
1: Jan.1999 - June 2003	The First Interest Rate Cycle
2: July 2003 - July 2007	Recovery and Rising Imbalances
3: Aug. 2007 - Sept. 2008	Financial Turmoil
4: Oct. 2008 - Apr. 2010	The Great Financial Crisis and Its Great Recession
5: May 2010 - June 2013	The Sovereign Debt Crisis and Its Doom Loop
6: July 2013 - Jan. 2020	Low Inflation Recovery and Effective Lower Bound
7: Feb. 2020 -	Coronavirus

Classifying ECB Policy Events

Policy events are classified based on which type of macro news predominated at each policy event, and then grouped into the distinct phases in ECB history.

	$cov(Yield, Equities) > 0$	$cov(Yield, Equities) \leq 0$
$Var(y^{short/mid}) > Var(y^{long})$	Growth	Conventional Monetary Policy
$Var(y^{short/mid}) \leq Var(y^{long})$	Risk premium	Unconventional Monetary Policy

Table 2: Classification of Central Bank News at Policy Events

One of four types of macro news can predominate at each policy event, depending on the financial market reaction: growth news, risk premium news, conventional monetary policy (i.e. short rate expectations) and unconventional monetary policy (i.e. via longer-term rates). This classification summarised in Tables 2 and 3 borrows from Cieslak and Schrimpf (2019).

Shock	Yield (short)	Yield (long)	Equities	Co-movement(Yields, Equity)
Monetary policy:	$\uparrow\uparrow$	$\uparrow$	$\downarrow\downarrow$	$-$
Growth:	$\uparrow\uparrow$	$\uparrow$	$\uparrow\uparrow$	$+$
Risk premium:	$\downarrow$	$\downarrow\downarrow$	$\downarrow\downarrow$	$+$

Table 3: Shocks and their Implied Co-movement for Yields and Equities

The intuition for the classification is standard. If financial markets react to ECB communication at a policy event with interest rate expectations and equities responding in the same direction, then this could reflect either growth news (e.g. a more upbeat outlook communicated by the ECB, raising both yields and equities) or a risk premium event (e.g. a reduced risk premium). Under predominantly growth news, this response will be greater at short and intermediate maturity yields than at the long-end. By contrast, a predominantly risk premium event would imply a bigger reaction at the long-end.

By contrast, monetary policy news implies that interest rate expectations and equities respond in opposite directions. For instance, an easier policy stance would imply yields

decline and equities rise, absent news about a weaker outlook. When the news is predominantly about conventional monetary policy then the reaction is greater in short- and intermediate maturity yields with lower short-rate expectations. When the news is predominantly about unconventional monetary policy, especially quantitative easing, the reaction will be greater in long rates.[3]

Cieslak andS chrimpf (2019) draw attention to central banks having distinct, perhaps better, information about the outlook than investors. This can then be conveyed to investors through a central bank's updated outlook as a source of non-monetary news. The increased prominence of non-monetary news as a feature of policy events has coincided with central banks, included the ECB, providing more details on their economic forecasts over timee, discussed further below.

Reading the News at ECB policy events

Conventional monetary policy news Turning to the data, it is worth beginning with 2y OIS rates as a summary indicator of conventional monetary policy.[4]

2y OIS rates The distributions of market reactions in terms of 2y OIS rates share one common feature across the different phases in ECB history: the distributions are quite symmetric around a zero market reaction. Yet, the histograms illustrate some differences. One notable feature of the July 2013 to Jan. 2020 period known as *low inflation recovery and effective lower bound* is its narrower distribution in the market reaction of 2y OIS rates than in the other phases of ECB history. This period began with the ECB's first use of forward guidance on July 4, 2013. Forward guidance was associated with a lower incidence of major market surprises. The analysis uses the monetary event window defined by Altavilla *et al* (2019) as the post-Press Conference median price in the 15:40 to 15:50 (CET) interval less the pre-Press Release median price in the 13:25 to 13:35 (CET) window.[5]

That can be contrasted with the August 2007 to 2008 period of *financial turmoil* and the resulting wider spread of market reactions at ECB policy events. The ECB may have faced greater difficulty in steering market rates in this period of financial dislocation, including in the run-up to those policy events. This phase was then associated with a larger spread of responses as the ECB communicated its own latest latest messages at the policy meeting. To a lesser degree, the period of the *sovereign debt crisis and its doom loop* also saw a wider spread of market reactions.

Money market curve Changes in the money market curve across individual policy events are shown in Figure 2.[6] The chart illustrates two points. First, while market reactions across the short-end of the money market curve were typically small, there was a sizable

[3]Specifically, the change in yield for 10y and 2y yields on Italian sovereign bonds are used to gauge the size of reaction in $y^(long)$ versus $y^(short)$.

[4]Gertler and Karadi (2015), for instance, refer to the 2y OIS rate as the single best indicator of monetary policy.

[5]Leombroni *et al* (2018) distinguish target and communication shocks as distinct shocks based on the news conveyed in the press release and press conference.

[6]2y OIS rates are available from Dec. 1999, 3y rates from October 2002, 4y to 10y rates from August 2011.

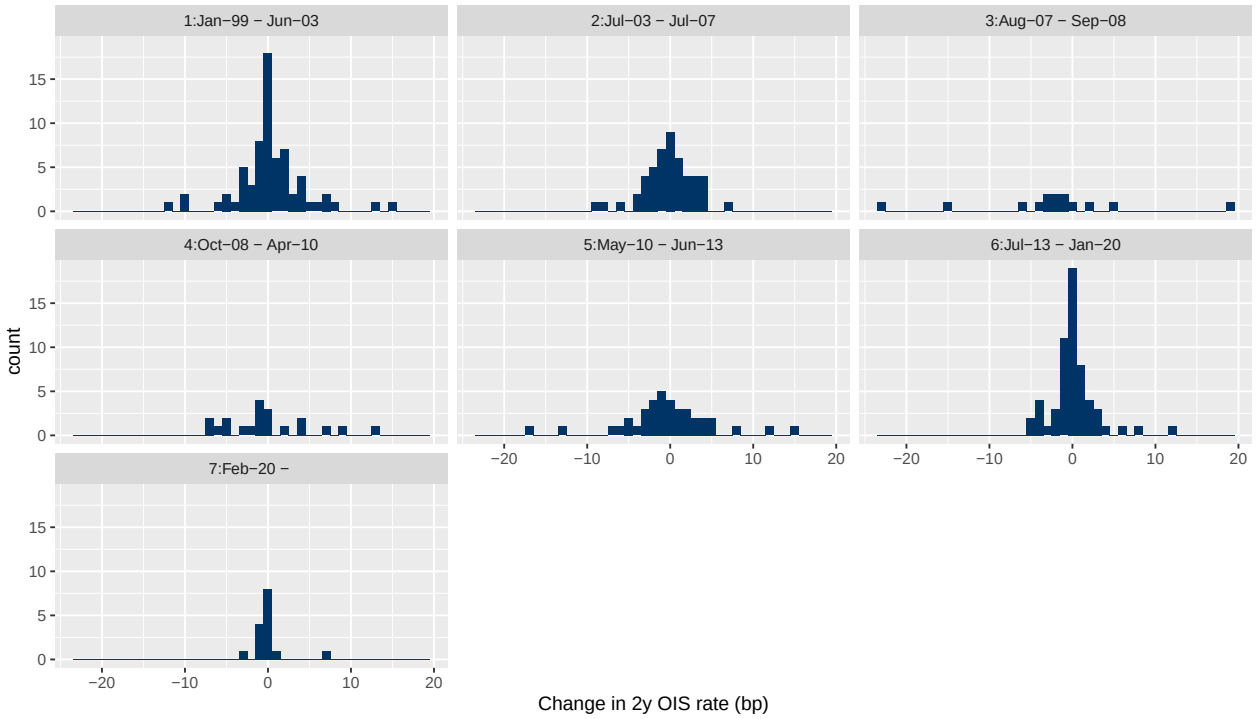

Figure 1: Market Reactions at ECB policy events

market reaction at a small number of policy events. Second, while the interquartile range of responses is narrower at short end of OIS rates, there is a larger incidence of out-sized responses (outliers) than at the longer maturities.

Third, these larger market reactions were predominantly in the earlier part of ECB history. That should not be surprising given how rates have drifted lower and the ECB has had to turn to unconventional policy by the time of the *low inflation recovery and effective lower bound* era. The data below will show that larger market reactions were still obtained in other domains of policy and non-policy news in the later period.

Unconventional monetary policy and non-monetary news Cieslak and Schrimpf (2019) find that the covariance of yield and equity reactions changed from 2013, coinciding with the era of the *low inflation recovery and effective lower bound* alongside the start of ECB forward guidance. The covariance changed from being positive before 2013 to being negative from 2013 onwards. We confirm this feature below. It points to non-monetary news - associated with the growth outlook and risk premia in particular - dominating the monetary news in the earlier period before 2013. As this changed from 2013 onwards to a negative covariance, monetary news predominated.

Table 5 summarises the covariance between yields and equities at different maturities of OIS rates and for each era in ECB history. Several features stand out.

- First, up to and including the era of financial turmoil in 2007/08, the covariance of market reactions in swap rates and equities was generally negative. An increase (reduction) in front-end rates was generally accompanied with a reduction (increase) in

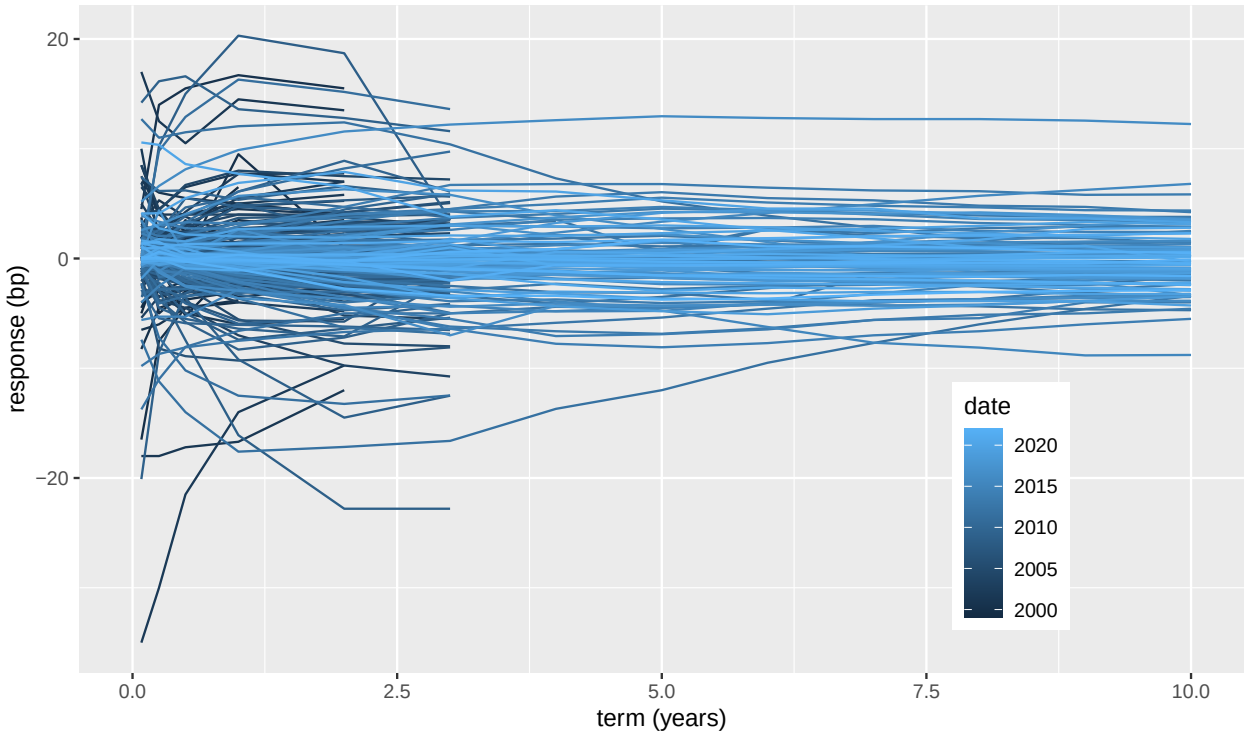

Figure 2: Market Reactions at all ECB Policy Events: OIS rates

equities. As suggested above, this is a symptom of monetary policy dominating any non-monetary news that the ECB conveys at its policy meeting, such as on the growth outlook or through term at least at policy events up to September 2008.

- Second, this pattern changed during May 2010 to June 2013, during the *sovereign debt crisis and its doom loop*. In this period, the covariance between yields and equities was positive at each of 3month, 2y, 5y and 10y maturities. The covaraiance was larger for longer maturities. In this era non-monetary news started to predominate monetary news.

Decisions by the Governing Council to provide more detail on its (staff) macroeconomic projections may have contributed to this pattern. In June 2013, the Governing Council published projections as point forecasts (in addition to the range format previously published) for the first time. In December 2013, greater detail on the forecasts was published alongside an expanded text explaining their key features. This went hand-in-hand with greater non-monetary news being conveyed.

- Third, as highlighted by Cieslak and Schrimpf (2019), the covariance was negative from July 2013 and this continued into the period of Coronavirus (not covered by Cieslak and Schrimpf (2019)). The Coronavirus period is a candidate for risk premium shocks. The negative covariance between yields and equities is especially large at short maturities for the OIS curve.

A wide spread in market reactions, in all asset classes Before focusing on two specific ECB policy events, it is worth noting the large spread in market responses across policy

Table 4: The Covariance of Market Reactions in Yields and Equities

Period	Cov(3mOIS,Equity)	Cov(2yOIS,Equity)	Cov(5yOIS, Equity)	Cov(10yOIS,Equity)
1:Jan-99 - Jun-03	-0.615	0.245	NA	NA
2:Jul-03 - Jul-07	-0.211	-0.223	NA	NA
3:Aug-07 - Sep-08	-0.536	-2.552	NA	NA
4:Oct-08 - Apr-10	-1.435	0.231	NA	NA
5:May-10 - Jun-13	0.140	0.262	0.564	0.991
6:Jul-13 - Jan-20	-0.658	-1.243	-1.703	-1.387
7:Feb-20 -	-2.718	-1.760	-0.875	0.138

Note:
5y and 10y OIS rates are available from Aug.2011 and July 2011, respectively. The equity index is the Euro Stoxx 50 index, SX5E.

events in each asset class. Figures 3 and 4 show the central tendency and spread in responses, including their outliers, across asset classes that span fixed income, equities and foreign exchange markets.

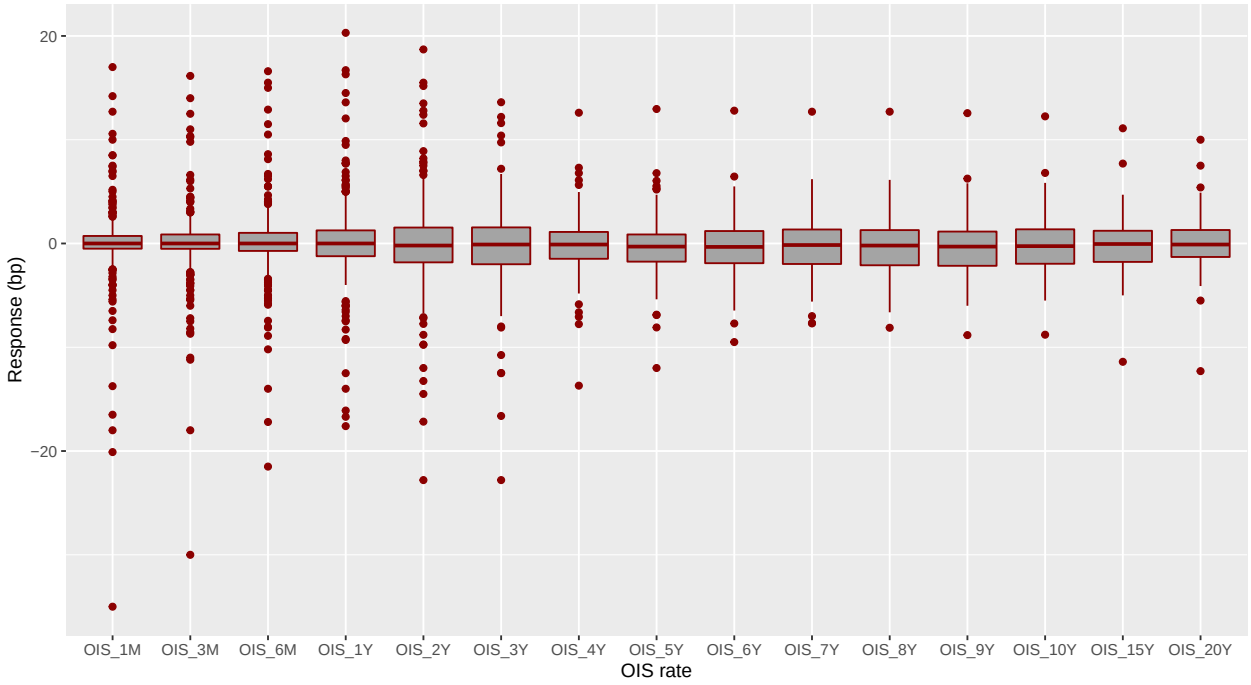

Figure 3: Market reactions in OIS rates across all ECB Policy Events

Correlations among the range of of asset price reactions are also illustrated in Figure 5. Fist, among sovereign yields, Germany's yields are only weakly correlated with those of Italy and Spain, and more strongly with France (at least for 10y yields). Second, Italian and Spanish yields are highly correlated with each other. Third, equity prices are inversely correlated with many interest rates and especially with Italian yields and, to a lesser extent, with the exchange rate.

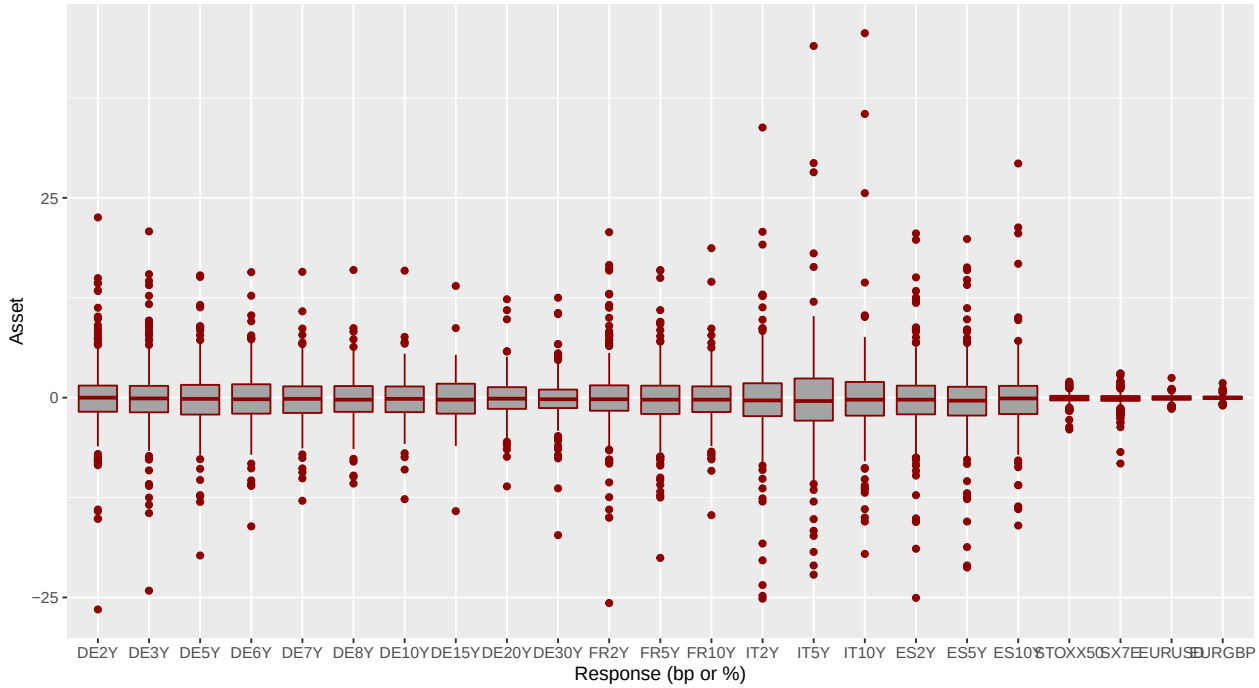

Figure 4: Market Reactions in Sovereign Yields, Equities and Currencies across all ECB Policy Events

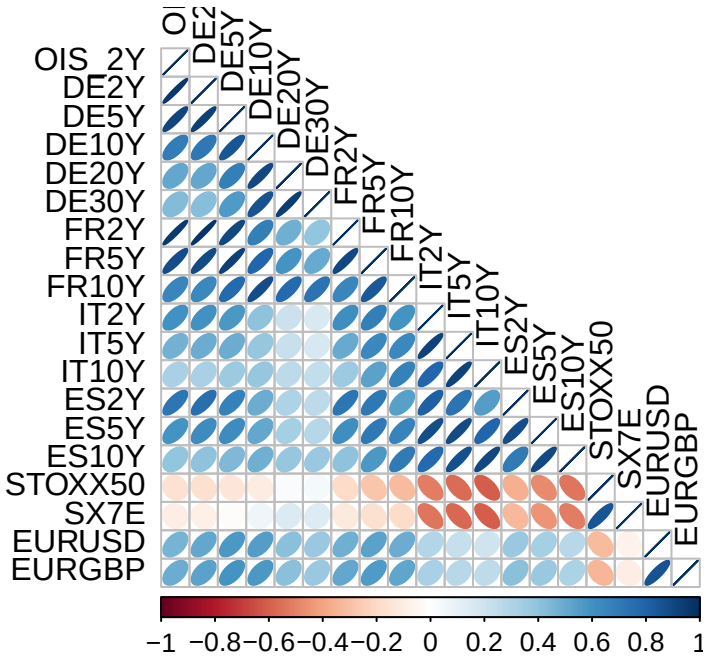

Figure 5: Correlation Matrix of Market Reactions in Sovereign Yields, Equities and Currencies

Case I: The ECB's Quantitative Easing Announcement (Jan. 2015)

It is instructive to focus on individual policy events in greater detail. Two events are highlighted, namely the ECB's QE announcement on January 22, 2015 and the ECB's initial Coronavirus response on March 12, 2020.

Policy announcements The ECB announced its first QE programme at its January 22, 2015 policy meeting. The *Expanded Asset Purchase Programme* included public as well as private sector asset purchases which totalled EUR60bn per month. Those purchases would begin in March and would initially span 18 months, or until a sustained adjustment in inflation consistent with the ECB's inflation objective was evident.

Market reactions Policy action increasingly came to be expected by financial markets in the course of 2014H2 as ECB President Draghi expressed concern about the weak inflation outlook. Nonetheless, the formal announcement of the asset purchase programme resulted in a 'dovish' market reaction as future interest rate expectations, reflected in the OIS curve, declined with those falls being larger (in absolute terms) at longer maturities. The ECB held its main policy rates unchanged at the Jan. 2015 meeting. 3y OIS rates fell modestly, by 3bp, yet the 10y OIS rate fell by almost 9bp and the 20y OIS rate fell by 12 bp. (Figure 6).

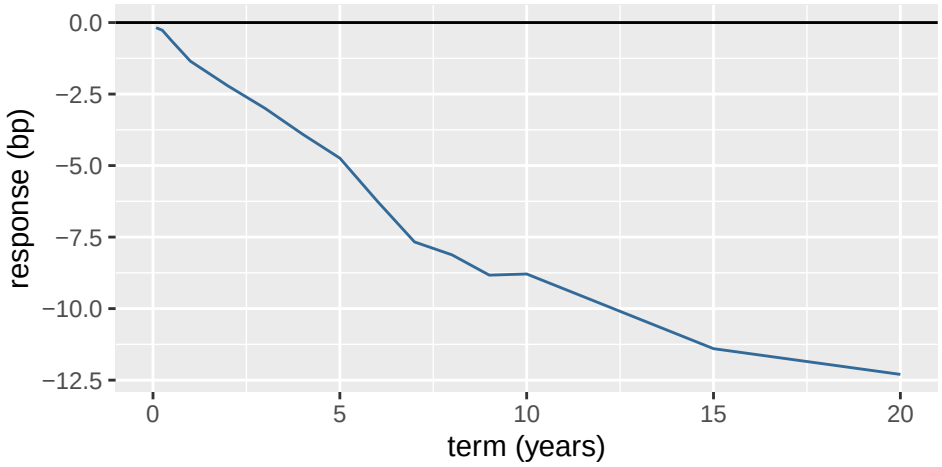

Figure 6: The OIS Curve Market Reaction to the QE announcement on 22 January 2015

What of the market reactions in sovereign yields, equities and foreign exchange? Figure 7 shows the market reaction in sovereign yields for Germany, France, Italy and Spain at 2y, 5y and 10y yields at the time of the January 22 2015 QE announcement.

Not surprisingly, German yields reacted in a way that was similar to the OIS curve reaction described above. 2y yields reacted modestly whereas 10y Bund yields reacted strongly, falling by 12bp. French, Italian and Spanish yields all reacted similarly and sizably. While the reaction in 10y rates was similar to that for Germany, at 12-15bp, it was a little larger than for Germany and 2y and 5y rates, between 5 and 7bp.

Equity markets rose and the Euro weakened on the QE announcement. European equity

indices (Euro Stoxx 50) rose by around 0.5%, with an index of European banks (SX7E) rising a little more. The Euro weakened by around 1.0% against the US Dollar, British Pound and Japanese Yen.

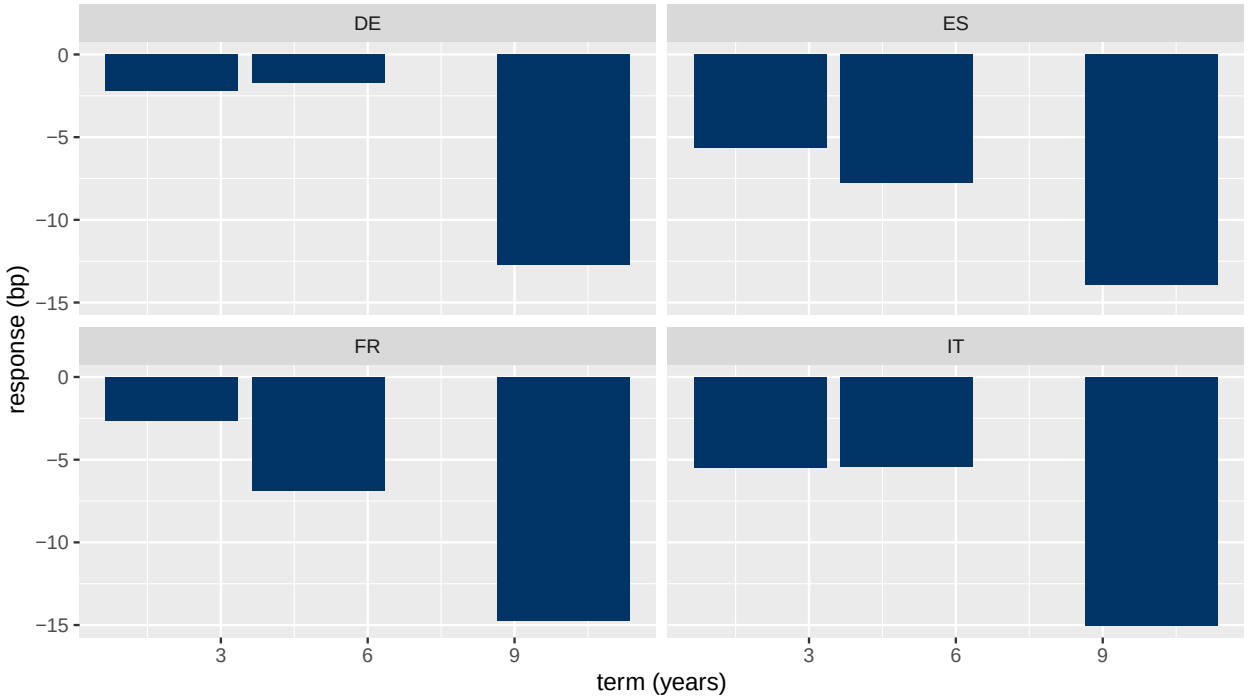

Figure 7: Response in Sovereign Yields to the QE announcement on 22 January 2015

Case II: Coronavirus - The (Initial) ECB Policy and Market Response

Policy announcements By March 2020 the ECB Governing Council had identified Coronavirus as a large common economic shock that was exogenous in nature. Yet, the policy announcements at the ECB March 12 meeting were well short of what financial markets had expected. The market reaction was symptomatic of a substantial tightening in unconventional monetary policy, given prior expectations for the day. One interpretation (especially in the light of subsequent policy announcements) would be that the ECB was initially slower than expected in adapting policy to a quickly-evolving pandemic.

The March 12 policy announcements included an additional EUR120bn in asset purchases to be implemented by the end of 2020. These would be implemented under an added, temporary envelope for the Asset Purchase Programme (APP) that required purchases across jurisdictions in line with the ECB's capital key. While financial markets had priced 8bp of a cut in the deposit rate, the ECB did not lower its key policy rates. Nonetheless, the ECB did introduce a series of targeted long-term repo operations (TLTROs) that allowed, for the first time, a bank to borrow at 25bp below the ECB policy rate on its deposit rate facility if the bank in question reached certain lending benchmarks. This was a substantial subsidy

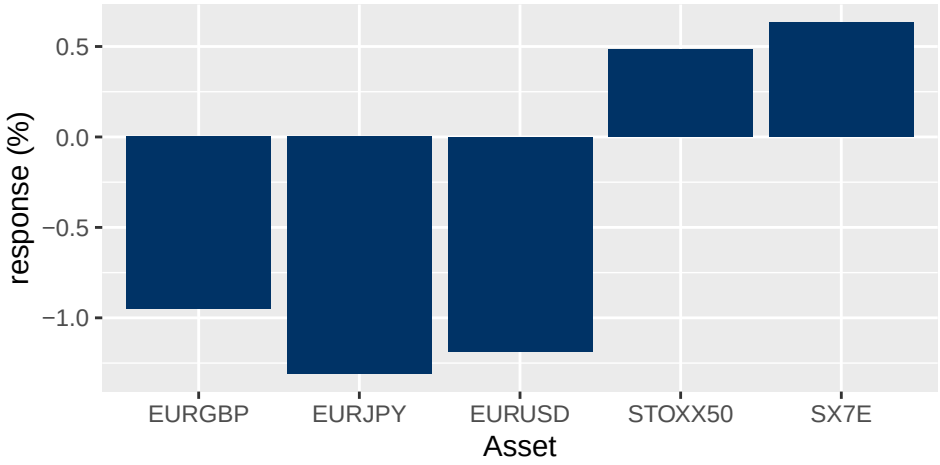

Figure 8: Response in Currency and Equity Markets to the QE announcement on 22 January 2015

(even a 'helicopter drop' of money injected into banks) for those banks that met a lending benchmark.

Within a week, at an unscheduled meeting on March 18 (and therefore not covered by the ECB Event Study Database), the Governing Council announced a new Pandemic Emergency Purchase Programme (PEPP) focused on buying sovereign debt with an envelope set at EUR750bn until the end of the year. Moreover, these purchases provided for significant discretion, at least temporarily, to depart from purchases being in-line with the capital key. At an April 30 scheduled meeting, the Governing Council announced additional long-term refinancing operations.

The Covid-19-related QE programme, PEPP, was subsequently increased by EUR600bn on June 4 while extending the programme's duration by 6 months, and then again in December (with a 9-month extension to end-March 2022 and an additional EUR500bn envelope. The ECB increased the attractiveness of term funding provided through the Targeted Long-term Repo operations (TLTROs) providing these at more deeply subsidised rates. Take-up by banks of such generous liquidity was substantial.

Market reactions The key features of the market response to the March 12 announcements were the following. *First*, the OIS curve shifted higher, especially at the front-end which had been priced for a rate cut, but the ECB chose to leave its key policy rates unchanged and its deposit facility rate at -0.5%. 2y OIS rates rose by 7bp around the time of the announcements and Press Conference. 5y OIS rates rose by almost 4bp.

Second, among the most noteworthy market reactions was the marked widening in BTP/Bund spreads - which saw Italian 10y yields push this 46bp wider. This coincided with President Lagarde commenting at the Press Conference that "it is not the job of the ECB to close the spread." Markets were far from prepared for such a message and the policy package that went with it.

Figure 10 shows the 2y, 5y and 10y sovereign yield responses for Germany, France, Italy and

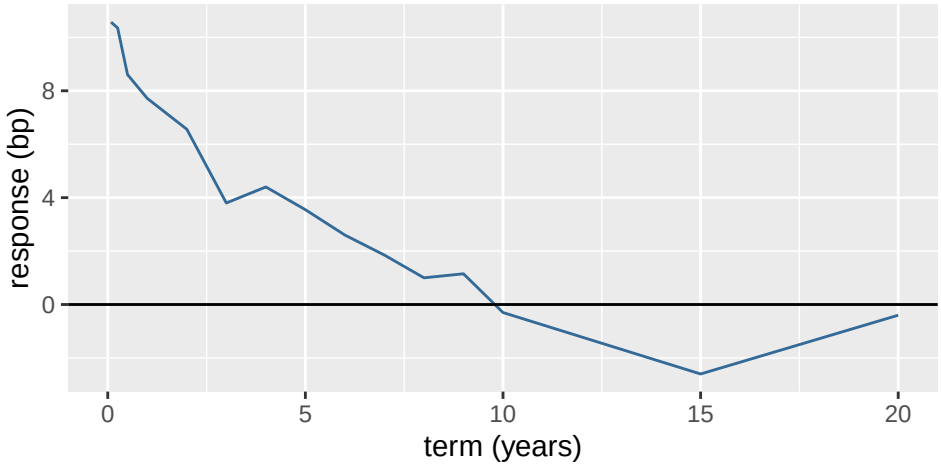

Figure 9: The OIS Curve Market Reaction on 12 March, 2020

Spain on March 12. Not surprisingly, the German sovereign yield comes closest to resembling the risk-free reaction in the OIS curve described above. The 2y yield rose almost 7bp and the 10y yield was virtually unchanged. By contrast, longer-term yields rose quite significantly in France, Spain and especially in Italy. The 10y yield rose by 15bp and 17bp in France and Spain, respectively. It rose by 46bp in Italy in what was a remarkably large market reaction. As the ECB chose not to validate market expectations for a substantial expansion in QE, markets priced an additional risk premium into the Italian sovereign yield curve.

Third, equity prices fell sharply. The Euro Stoxx 50 fell by 4.0% and banks' equity prices (SX7E) fell by 8.2%. These were the single largest equity market reactions recorded in our sample of 278 policy events. The covariance between the yield and equity market reaction was negative.

On our classification system, the negative covariance between higher rates and lower equities implies tighter monetary policy. In the OIS curve, the reaction was larger at shorter maturities - a symptom of a conventional monetary policy that was not eased as expected. Yet, in several other respects, the larger reaction at longer maturities in sovereign yield curve, notably in the periphery, was a symptom of *unconventional* monetary policy not easing as expected. The ECB had chosen to support banks (via TLTROs and, arguably, by not cutting its key policy rates) although its unconventional policy support for sovereigns was viewed as modest relative to the scale of the economic shock.[7]

On April 22 2020, the ECB announced that it would not allow credit rating downgrades to affect collateral values. Instead existing ratings would apply until September 2021. On one view, this is simply the ECB ensuring market functioning and the basic plumbing of Euro-system credit operations remained resilient to the possibility of rating downgrades. But on another view, this decision was the 'smoking gun' for a deliberate, quasi-fiscal aim of squeezing risk premiums in response to an impaired market assessment of sovereign credit quality.

[7]On this view, the sharp 8% fall in banks' equity prices owed to the expected cyclicality of bank earnings, and occurred despite the subsidised term funding being offered to the sector via TLTROs.

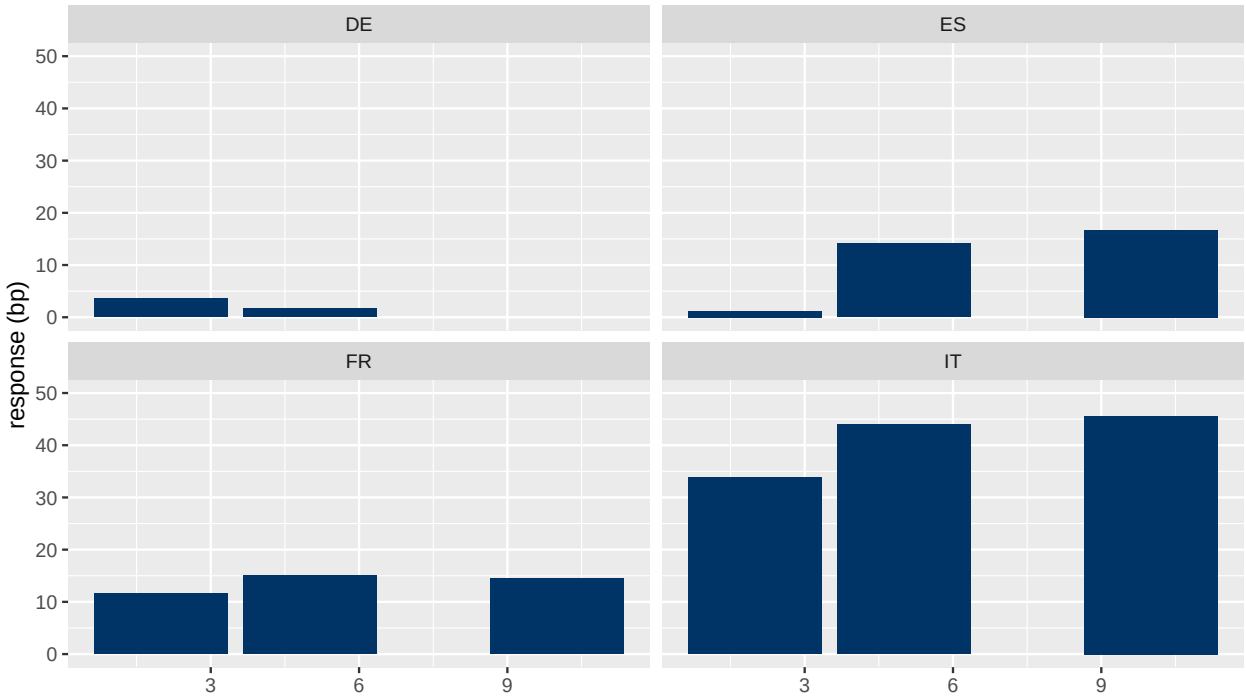

Figure 10: Response in Sovereign Yields on 12 March 2020

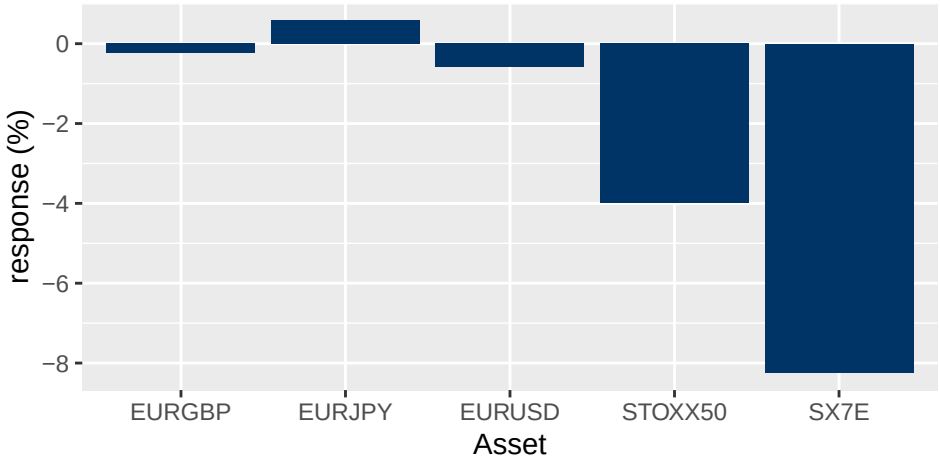

Figure 11: Response in Currency and Equity Markets on 12 March 2020

By June, the OIS curve had no longer priced rate cuts and was not surprised by unchanged policy rates at the June meeting. The increased capacity of the PEPP and President Lagarde's emphasis in the June Press Conference on the flexibility in the purchase programme (across jurisdictions, asset classes and over time) - meant that the ECB could push back quickly against any unwelcome widening in spreads. This saw Italian yields fall by a full 20bp for 5y and 10y yields at the June meeting. The tone, and the implied scope for the ECB to use its discretion in a way that could lower peripheral spreads, was very different from that at the March meeting.

The Monetary Policy Database covers ECB policy events up to the March 11 2021 meeting of the Governing Council. We gauge how the initial policy response – the substantial market disappointment at the March 12 2020 policy event – evolved at later policy events. Overall, this exercise points to the ECB learning, or being drawn into, operating on risk premiums. Arguably, the latter was facilitated by governments acting to underpin sovereign risk including through the July 2020 decision to agree an EU Recovery Fund.

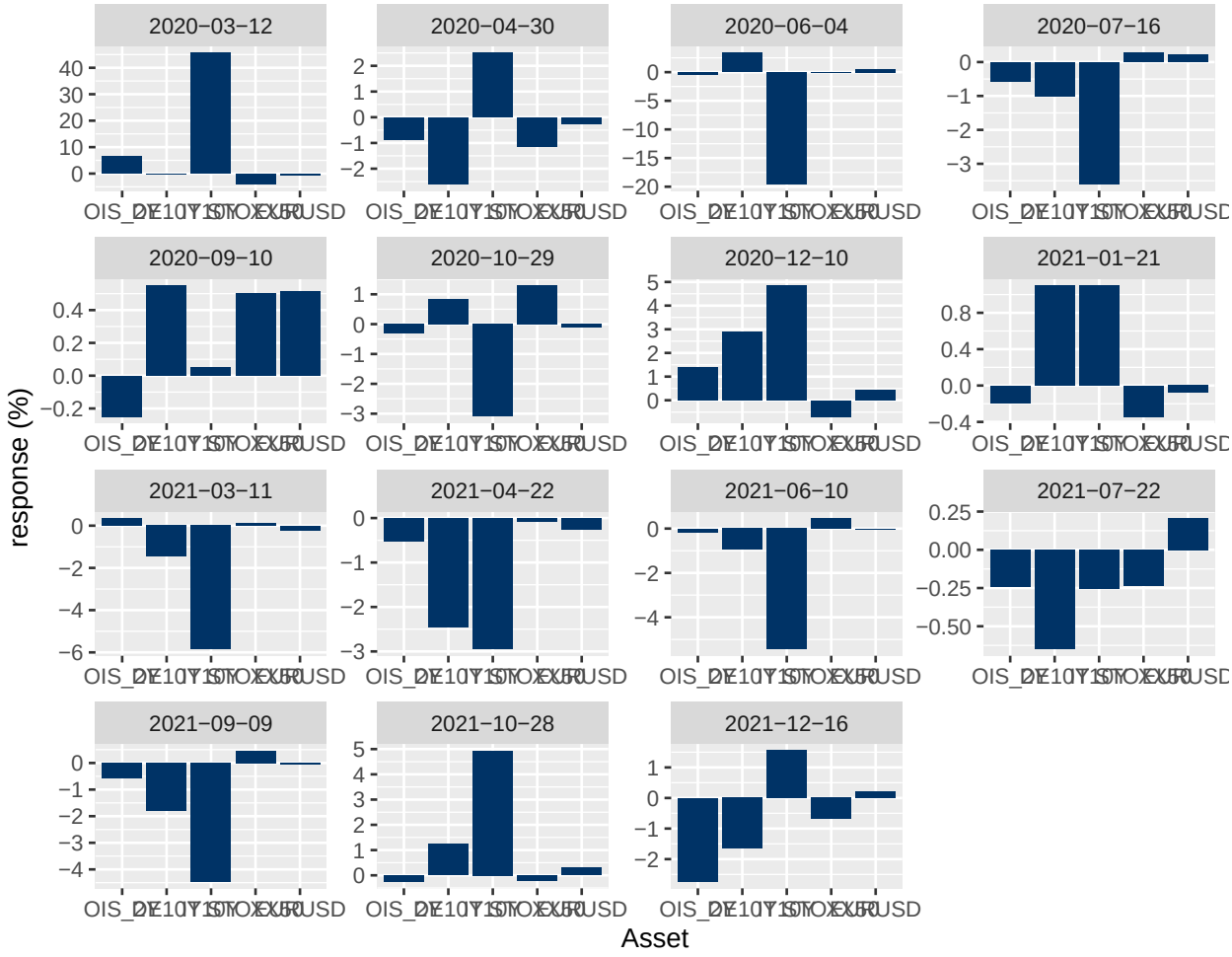

Figure 12: How Responses Evolved Across Policy Events During Coronavirus

The April 30 policy event met with a much more modest widening in Italy's sovereign spread relative to Germany. The June 4 event compressed the spread meaningfully as yields on

10y Italian sovereign debt fell by almost 20bp. Other sizable falls in the spread occurred at the July 16 and October 29 meetings. Financial markets interpreted ECB communications at these events as going some way to walk back from ECB President Lagarde's earlier message that it was not the ECB's job to "close the spread". In July 2020, Europe had announced its EUR750bn EU Recovery Fund that would issue EU-level debt and direct proceeds disproportionately to those parts of Europe disproportionately affected by the pandemic, especially the periphery. This environment made it easier for the ECB to aim to reduce risk premia in what was a 'quasi-fiscal' use of the ECB balance sheet.

Classifying Policy Events in the ECB's Seven Phases

There is a fundamental difference between the high frequency exercise conducted here (identifying news using intra-day data at policy events) and the seven phases of ECB history (based on a business cycle frequency). Related to that difference, arguably the primary challenge for central bank policy is to steer market expectations of the *systematic* component of policy. This challenge is quite fundamentally different from the policy and economic surprises associated with policy communications at policy events.

Despite these important differences, classifying the news at each policy event within the seven phases is an interesting empirical exercise. Each policy event represents a key opportunity for the ECB to take stock of the latest conjunctural indicators and provide its own policy response, including by steering financial markets.

Figure 11 summarises the results from the classification, apportioning the types of macro news at ECB policy events according to the seven phases in ECB history. Several points stand out.

- First, across the full sample of policy events, 31.0% of the market reactions are classified as reflecting growth news, 16.4% as risk premium events; 30.5% as conventional monetary policy news and 22.1% as unconventional monetary policy news. Non-monetary news is therefore an important feature of news across policy events, with most of that referring to the news the central bank conveys to investors about the growth outlook.
- Second, the exercise classifies both the QE announcement in Jan. 2015 and the March 12 initial Coronavirus policy response as predominantly news about Unconventional monetary policy. By contrast, none of the policy meetings during the *great financial crisis* are classified as representing predominantly unconventional monetary policy news.
- Third, arguably the most striking feature is that the contribution from unconventional monetary policy news has increased markedly through ECB history. By the time of the *low inflation recovery and effective lower bound* unconventional monetary policy news came to dominate other forms of macro news, at around 40% of events.
- Fourth, differences between this high frequency exercise based on policy events and a business cycle frequency exercise are apparent. For example, risk premium events are a pretty steady fraction of policy events (until the Coronavirus period). This serves as a reminder that macro news in the higher frequency exercise of gauging the market

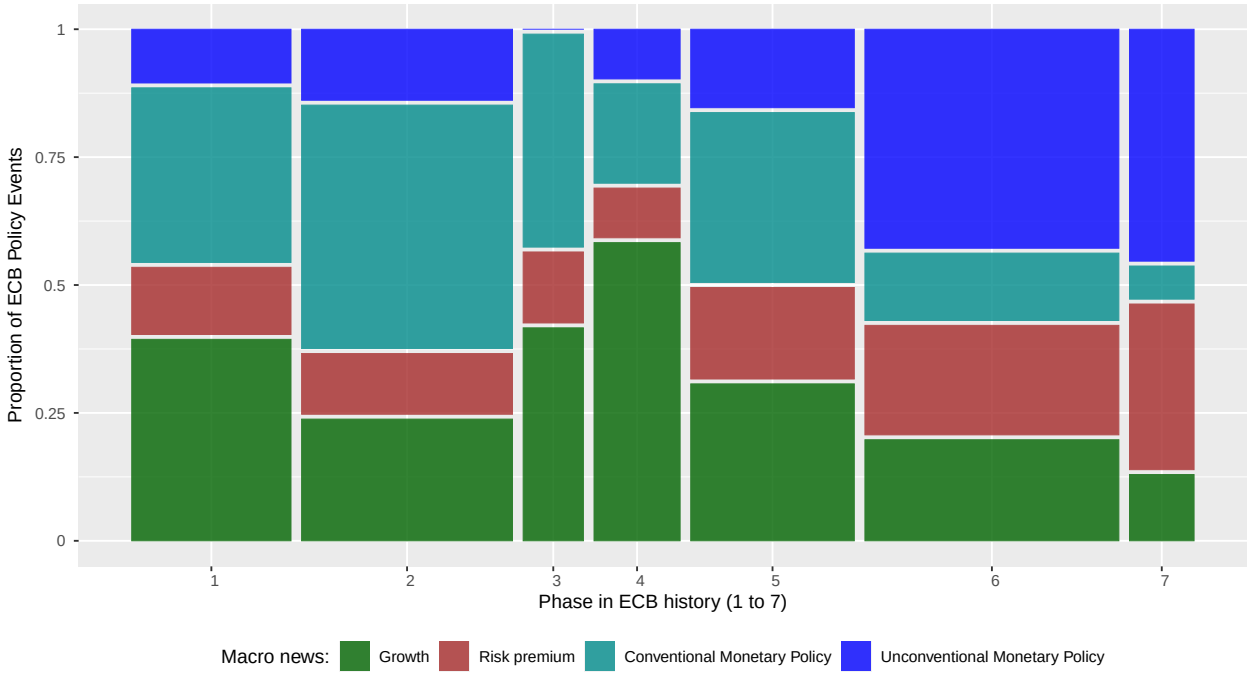

Figure 13: Macro News at ECB Policy Events by ECB Phase

reaction at a policy event is different in character to the underlying business cycle frequency of news in a particular period.

- Fifth, growth and conventional policy news have both varied significantly as factors from policy events. Growth news predominated during the *great financial crisis and its great recession*, dominating at around one half of policy events, compared with representing around 15% of events during the *low inflation recovery and effective lower bound* period.

Concluding Remarks

During the seven 'ages' of the ECB, the Governing Council has faced an astonishing range of challenges that could barely have been contemplated at the ECB's inception just over 20 years ago. These challenges have exposed the incomplete nature of economic and monetary union. They have generally increased demands on the ECB to 'innovate' in its setting of policy, while simultaneously complicating such innovation absent a deepening of the bloc's economic union and governance.

Examining policy events offers one, albeit partial, window into identifying macro news during the ECB's rich history. From a financial markets perspective, ECB policy events have been a prime source of market volatility (and opportunity). The shift from conventional to unconventional monetary policy has changed the financial markets in which such news is primarily expressed, from OIS rates to sovereign yields and especially peripheral spreads.

Recent ECB policy action has emphasised the need to 'preserve favourable financing con-

ditions'. Amid low inflation and the shortfall in aggregate demand that have accompanied the Coronavirus, this emphasis is understandable. Yet, should maintaining recent financial conditions assume the role of an intermediate target of policy it risks supporting asset prices indiscriminately and suppressing financial markets' role in price discovery.

Compared with a pre-crisis era of central banking that emphasised the need for policy to be based on identifying the source of the shock, less discriminate support for financial markets could carry some, longer-term, risks.

Data Annex

The annual frequency of the 278 policy events in the event study database is shown below.

Table 5: Frequency of ECB policy meetings

year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
n	23	24	24	12	12	12	12	12	12	13	12	12	12	12	12	12	8	8	8	8	8	8	8

References

Altavilla, C., Brugnolini, L., Gurkaynak, R.S., Motto, R. and Ragusa, G., (2019), 'Measuring euro area monetary policy', *Journal of Monetary Economics*, 108, 162-179.

Cieslak, A. and Schrimpf, A., (2019), 'Non-monetary news in central bank communication', *Journal of International Economics* 118, 293-315.

Gertler, M. and Karadi, P., (2015), 'Monetary policy surprises, credit costs and economic activity', *American Economic Journal: Macroeconomics*, 7, 44-76.

Hartmann, P. and Smets, F., (2018), 'The European Central Bank's Monetary Policy during its First 20 years', *Brookings Papers on Economic Activity*, 1-118.

Leombroni, M., Vedolin, A., Venter, G. and Whelan, P., (2018), 'Central Bank Communication and the Yield Curve', CEPR Discussion Paper No. DP12970.