

Market Effects of Central Bank Credit Markets Support Programs in Europe

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The analysis and conclusions set forth are those of the authors and do not indicate concurrence by other members of the research staff or the Board of Governors.

Outline

- ▶ Novel **credit policy component** of monetary policy surprises
- ▶ **Investor perceptions of credit risk**
Easing credit surprises
 - cause declines in option-implied uncertainty about credit risk (at least in part is driven by decline in VRP)
 - suggest a more stable outlook on credit risk dynamics over the following months
- ▶ **Functioning of primary and secondary corporate debt markets**
Easing credit surprises
 - cause net and gross corporate bond issuance to increase
 - with largest response in investment grade issuance
- ▶ Local channel of **unconventional monetary policy**

Literature: Type, Period, and Region

- ▶ Large-scale purchases of **Treasuries** and **MBS** by the **Fed**: include Krishnamurthy and Vissing-Jorgensen (2011) and Gilchrist and Zakrajsek (2013)
- ▶ Purchases of **corporate bonds/ETFs**
 - **pre-COVID**
 - ▷ **ECB** and **BoE**: De Santis et al. (2018), Abidi and Miquel-Flores (2018), D'Amico and Kaminska (2019), Todorov (2020), Makinen et al. (2020) and Pegoraro and Montagna (2021)
 - **post-COVID**
 - ▷ **Fed**: Gilchrist et al. (2020), Nozawa and Qiu (2020), D'Amico et al. (2020)
 - ▷ **ECB**: Demirgüç-Kunt et al. (2020)

Literature: Results

- ▶ In general, program announcements contributed to declines in corporate bond spreads and improvements in liquidity
- ▶ While these changes are most pronounced for program-eligible securities, they apply more broadly

Contributions to Literature

- ▶ Using responses in credit spreads and OIS rates to **isolate credit surprises** in ECB announcements
- ▶ Quantifying the effect of a **unit** of surprise easing of credit accommodation associated with the ECB announcements, **net** of concurrent general/non-credit-specific surprise monetary easing

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- ▶ **Credit policy surprise** is the component of CDS index spread moves left unexplained by policy rate, forward guidance and sovereign bond purchases surprises generated by ECB communications
- ▶ We proxy the latter surprises by:
 - first principal component of the ECB Governing Council press-release window overnight index swap (OIS) rate changes
 - first 3 principal components of press-conference window OIS rate changes
- ▶ **Tightening** surprise – unexpected **tightening**

Construction of Credit Policy Component of Monetary Policy Surprises

- ▶ Regressions of daily changes in iTraxx Main and Crossover indexes on days of ECB Governing Council meetings

Dependent Variable	Main Index	Crossover Index
Press Release PC1	0.34 (0.25)	1.64 (1.18)
Press Conference PC1	-0.11 (0.66)	0.58 2.41
Press Conference PC2	-1.32 (0.83)	-5.91 (3.84)
Press Conference PC3	-1.53 (1.18)	-8.44 (5.16)
R^2	0.18	0.25

- ▶ If a relevant announcement is not from scheduled meetings – credit policy surprises are raw CDS index spread moves

Select ECB Announcements

Date	Description
2016-03-10	announcement of CSPP and targeted longer-term refinancing operations, TLTRO II
2016-06-02	announcement of specific date for commencement of CSPP and TLTRO II
2019-03-07	launch of targeted longer-term refinancing operations, TLTRO III
2019-09-12	changing modalities of the new series of quarterly targeted longer-term refinancing operations (TLTRO III)
2020-03-12	additional long term refinancing operation (LTROs); more favorable terms for TLTRO III; temporary envelope of additional net asset purchases of €120 billion - contribution from the private sector purchase programmes
2020-03-18	announcement of the Pandemic Emergency Purchase Programme (PEPP), a Corporate Sector Purchase Programme (CSPP) expansion; (announced post market close and so treated as being as of the next day)
2020-03-25	decision to remove certain limits on PEPP
2020-04-07	announcement of a portfolio of collateral measures
2020-04-22	'Fallen angels' made eligible collateral for Eurosystem credit operations
2020-04-30	easing TLTRO III conditions; new series of non-targeted pandemic emergency longer-term refinancing operations (PELTROs); statement of the Governing Council's preparedness to increase the size of the PEPP and adjust its composition
2020-06-04	expansion of PEPP: amount increased by €600 billion to a total of €1,350 billion
2020-12-10	expansion of PEPP: amount increased by €500 billion to a total of €1,850 billion; horizon lengthened to at least the end of March 2022
2021-03-11	increase in the pace of purchases under the PEPP over the following quarter

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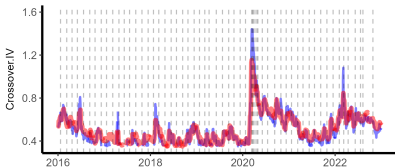
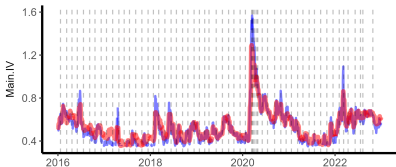
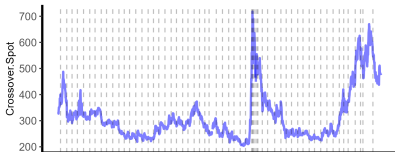
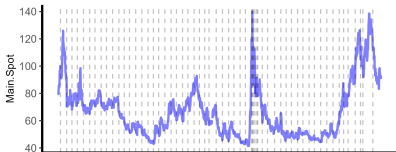
Novel Credit Policy Component of Monetary Policy Surprises

Effects on investor perceptions of credit risk

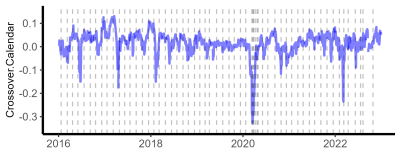
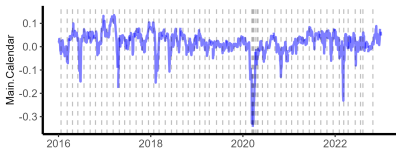
Effects on the functioning of primary and secondary corporate debt markets

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iTraxx Main and Crossover Indexes and their Implied Vols

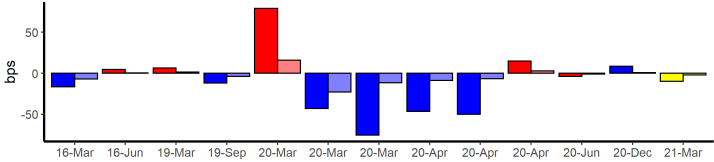


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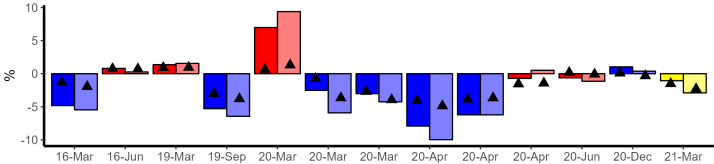


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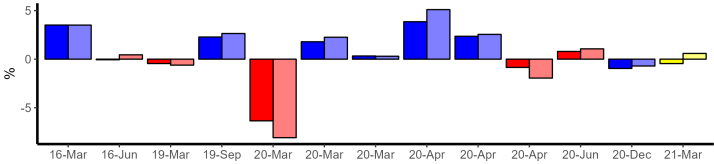
Reactions to Select Events



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Model Specification

$$Y_{it} = \beta C_t + \varepsilon_{it}$$

where

- Y_{it} is the daily change in implied volatility, or the implied volatility calendar spread
 - C_t is our credit surprise measure
-
- ▶ run over all announcement days
 - ▶ C_t from either the Main index or the Crossover index

Option-implied credit spread moments and corporate bond purchase surprises

	<i>Dependent variable:</i>			
	Main.IV	Crossover.IV	Main.Calendar	Crossover.Calendar
Main surprises				
1-month option-implied moments				
Main _t	0.55*** (0.16)	0.38** (0.15)	-0.24*** (0.09)	-0.20*** (0.07)
R ²	0.44	0.36	0.25	0.24
Adjusted R ²	0.43	0.34	0.23	0.23
3-month option-implied moments				
Main _t	0.31*** (0.08)	0.19** (0.09)		
R ²	0.50	0.31		
Adjusted R ²	0.49	0.30		

Option-implied credit spread moments and corporate bond purchase surprises

	<i>Dependent variable:</i>			
	Main.IV	Crossover.IV	Main.Calendar	Crossover.Calendar
Crossover surprises				
1-month option-implied moments				
Crossover _t	0.15*** (0.03)	0.11*** (0.03)	-0.06*** (0.02)	-0.05*** (0.02)
R ²	0.45	0.46	0.25	0.25
Adjusted R ²	0.44	0.45	0.24	0.24
3-month option-implied moments				
Crossover _t	0.08*** (0.01)	0.06*** (0.01)		
R ²	0.51	0.49		
Adjusted R ²	0.50	0.48		

Variance risk premium and corporate bond purchase surprises

	<i>Dependent variable:</i>			
	VRP.Main.1m	VRP.Main.3m	VRP.Crossover.1m	VRP.Crossover.3m
surprise.main	2.56*** (0.40)	1.24*** (0.18)		
surprise.cross			0.26* (0.15)	0.15 (0.10)
R ²	0.83	0.78	0.22	0.16
Adjusted R ²	0.83	0.78	0.21	0.14

Note:

* p<0.1; ** p<0.05; *** p<0.01

Variance risk premium and corporate bond purchase surprises: Asymmetries

	<i>Dependent variable:</i>			
	VRP.Main.1m	VRP.Main.3m	VRP.Crossover.1m	VRP.Crossover.3m
surprise.main:DOVISH	2.63*** (0.40)	1.32*** (0.15)		
surprise.main:HAWKISH	1.49** (0.72)	-0.08 (0.31)		
surprise.cross:DOVISH			0.30** (0.15)	0.18* (0.10)
surprise.cross:HAWKISH			-0.17 (0.25)	-0.21 (0.24)
R ²	0.84	0.83	0.28	0.24
Adjusted R ²	0.83	0.83	0.25	0.21

Note:

*p<0.1; **p<0.05; ***p<0.01

Effect on Market Perceptions of Uncertainty

- ▶ Easing credit policy surprises reduced uncertainties around future corporate spreads
- ▶ This decrease in uncertainty (quantity of risk) may be one of the channels through which central bank programs contributed to declines in total compensation investors demanded for carrying credit risk
- ▶ Credit policy surprises affect 1-month volatility more than its 3-month counterpart
- ▶ Accomodative (contractionary) credit policy surprises are associated with lower (higher) Variance Risk Premiums. Effects of accomodative surprises are stronger

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Model Specification, Issuance

- ▶ Aggregate the credit surprise to the monthly frequency to match the issuance data frequency
For any month without any announcement, the surprise is set to zero

- ▶ **Local projections method:**

$$I_{t+h} = \beta_0 + \beta_1 C_t^{monthly} + \beta_2 I_{t-1} + \varepsilon_{t+h}$$

where

- I_t is a measure of corporate bond issuance in month t
 - $C_t^{monthly}$ is our aggregated credit surprise measure
- ▶ $C_t^{monthly}$ from either the Main index or the Crossover index

Net Nonfinancial Issuance

- ▶ Credit policy surprises drive non-financial corporate bond issuance

<i>Dependent variable:</i>								
Nonfinancial net issuance								
	<i>h</i> = 0		<i>h</i> = 1		<i>h</i> = 2		<i>h</i> = 3	
Main _{<i>t</i>}	-0.09 (0.69)		-1.67*** (0.32)		-1.11*** (0.19)		-0.16 (0.25)	
Crossover _{<i>t</i>}		-0.18 (0.25)		-0.46*** (0.09)		-0.27*** (0.07)		-0.05 (0.07)
<i>I</i> _{<i>t-1</i>}	0.00 (0.20)	0.02 (0.20)	0.07 (0.10)	0.09 (0.10)	0.02 (0.13)	-0.01 (0.14)	-0.03 (0.13)	-0.00 (0.13)
Constant	7.06*** (1.76)	6.46*** (1.70)	5.32*** (1.16)	5.25*** (1.17)	6.60*** (1.00)	6.69*** (1.02)	7.16*** (2.20)	7.12*** (2.18)
R ²	0.000	0.269	0.121	0.003	0.045	0.291	0.101	0.004
Adjusted R ²	-0.028	0.248	0.095	-0.028	0.017	0.270	0.074	-0.026

Gross Nonfinancial Issuance: Total and IG

Dependent variable:								
	h = 0		h = 1		h = 2		h = 3	
Nonfinancial gross total issuance								
Main _t	-0.64*** (0.19)		-0.45** (0.20)		-0.70*** (0.17)		-0.35 (0.30)	
Crossover _t		-0.18*** (0.05)		-0.15*** (0.04)		-0.23*** (0.04)		-0.04 (0.09)
I _{t-1}	-0.02 (0.12)	-0.04 (0.12)	0.07 (0.11)	0.06 (0.10)	-0.19* (0.12)	-0.22** (0.10)	0.23*** (0.08)	0.21** (0.09)
Constant	18.31*** (2.60)	18.74*** (2.55)	16.93*** (2.23)	17.16*** (2.07)	21.85*** (2.19)	22.23*** (2.02)	14.09*** (2.04)	14.52*** (2.17)
R ²	0.06	0.07	0.03	0.05	0.12	0.16	0.07	0.05
Adjusted R ²	0.03	0.04	0.004	0.02	0.10	0.14	0.04	0.02

Nonfinancial gross IG issuance								
Main _t	-0.69*** (0.18)		-0.43*** (0.16)		-0.68*** (0.15)		-0.08 (0.17)	
Crossover _t		-0.20*** (0.04)		-0.14*** (0.03)		-0.19*** (0.04)		0.005 (0.05)
I _{t-1}	-0.09 (0.12)	-0.14 (0.12)	0.12 (0.09)	0.09 (0.08)	-0.24** (0.10)	-0.28*** (0.10)	0.20** (0.09)	0.20** (0.09)
Constant	11.30*** (1.59)	11.78*** (1.57)	9.28*** (1.27)	9.56*** (1.16)	13.00*** (1.31)	13.48*** (1.32)	8.51*** (1.49)	8.62*** (1.53)
R ²	0.13	0.15	0.06	0.09	0.18	0.20	0.05	0.05
Adjusted R ²	0.10	0.12	0.03	0.06	0.16	0.18	0.02	0.02

Primary market: Effects on CDS-bond basis

- ▶ Easing surprises narrow CDS-bond basis (CDS index spread minus par equivalent CDS spread of the same bond portfolio): Surprising!

	<i>Dependent variable:</i>		
	CBB.IG.5y	CBB.HY.Option.Free	Crossover.CBB.Option.Free.PECS
surprise.main	0.56*** (0.08)		
surprise.cross		0.16** (0.06)	0.18 (0.12)
R ²	0.59	0.16	0.06
Adjusted R ²	0.58	0.14	0.04

Note:

* p<0.1; ** p<0.05; *** p<0.01

Effects on Bond Market Functioning

- ▶ Easing credit surprises
 - cause net and gross corporate bond issuance to increase
 - with largest response in investment grade issuance, consistent with *local* channel

- ▶ Easing surprises narrow CDS-bond basis (surprisingly)
 - CDS market may lead cash corporate bond market in price discovery
 - Next slide: evidence that bond markets respond to purchases with a delay

CUSIP-level bond returns on ECB operation dummy

From weekly data of CUSIPs in ECB portfolio identify week of first purchase of each specific CUSIP and run:

$$\Delta p_{i,t} = \beta_0 + \sum_{j=0}^4 \beta_j B_{i,t-j} + \alpha_i + \gamma_t + u_{i,t}$$

$p_{i,t}$: price on CUSIP i in week t , $B_{i,t}$: binary variable = 1 if CUSIP i is *first* purchased in week t and = 0 otherwise.

B_{it}	5.75*
	(3.19)
B_{it-1}	6.17**
	(2.94)
B_{it-2}	5.08*
	(2.83)
B_{it-3}	9.13***
	(2.15)
B_{it-4}	2.35
	(2.60)

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- ▶ Corporate bond (ETF) purchases are a relatively new instrument in central bankers' toolkit
- ▶ Shed light on the efficacy of corporate bond purchase programs by examining how corporate-bond purchase surprises affect:
 - investors' perceptions of credit risk uncertainty
 - primary and secondary debt market functioning
- ▶ Lend support to **efficacy of corporate bond purchases in reducing market stress** and **facilitating funding flows** into corporate sector