

# Are all ECB asset purchases the same? Different rationales, different effects

Christophe Blot<sup>1,2</sup>    Caroline Bozou<sup>1</sup>  
Jérôme Creel<sup>1,3</sup>    Paul Hubert<sup>4,1</sup>

<sup>1</sup>Sciences Po - OFCE

<sup>2</sup>Université Paris-Nanterre

<sup>3</sup>ESCP Business School

<sup>4</sup>Banque de France

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# Motivation

Consider two **identical** ECB asset purchases:

- ▶ Same asset (say, 10-year French bonds, OAT)
- ▶ Same amount (say, 1000€)
- ▶ Same counterpart (say, a given commercial bank)
- ▶ But two **separate** programs: PSPP and PEPP

Our research question

- ▶ Are the financial market effects of PSPP and PEPP **similar**?
- ▶ Why have **two** programs?

# This paper

## Institutional background

- ▶ PSPP/PEPP are 2 separate programs that purchase **identical** assets
- ▶ Some operational differences on paper, but **minor** in practice
- ▶ The major difference rests on the communicated rationale: **deflationary** risks in 2015 for PSPP, **sovereign** risks in 2020 for PEPP

## Framework

- ▶ The 2 communicated rationales suggest a different **conditional path** (i.e. reaction function) for each program
- ▶ We exploit the **unique setting** of ECB asset purchases to identify whether communicating a rationale for a policy matters for its effects

## Empirical question

- ▶ We document the relative impact of PSPP and PEPP on both **inflation swaps** and **sovereign spreads**
- ▶ We estimate **announcement** effects and **implementation** effects

# Some differences in operational designs

Program **size**: PEPP perceived as much larger than PSPP

- ▶ PEPP first announcement: 750 €bn over a year
- ▶ PSPP first announcement: 60 €bn/month over 18 months, so 1080 €bn

Horizon: **Open-ended** for PSPP, not PEPP

- ▶ PSPP initially announced as "temporary" and for 18 months only
- ▶ Extended multiple times since then, PEPP end-date already postponed twice

**Pre-determined flows** for PSPP, "flexible manner" for PEPP

- ▶ PSPP flows determined at the monthly frequency, not at the weekly one
- ▶ Variability of weekly flows is comparable: 6.41 and 6.62 €bn

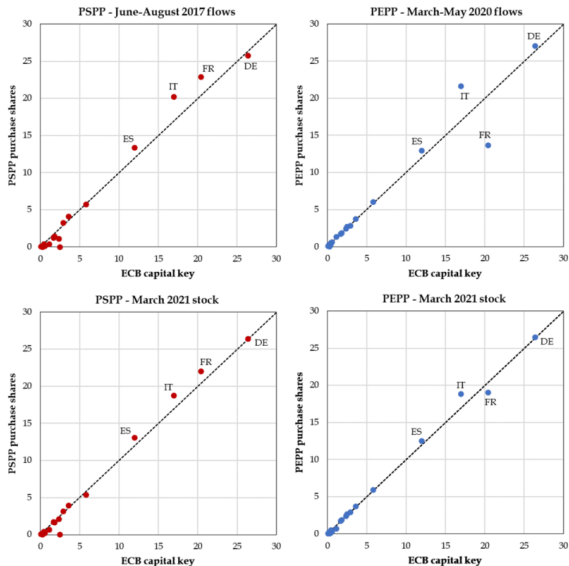
Capital key for PSPP, "**flexible manner**" for PEPP

- ▶ Capital key (small) deviations for PSPP purchases
- ▶ Sep2017 Q&A, Draghi: "always been temporary deviations from the capital key"
- ▶ Only FR & IT purchases deviate for PEPP purchases, during 1st months only
- ▶ PEPP purchases are aligned with capital key for 17 out of 19 countries

→ We argue that these differences on paper are **minor in practice**

# Capital key deviations

Figure 1: PSPP and PEPP purchase breakdowns



# Major difference in their rationale

PSPP was introduced in 2015 to counter **deflationary** risks

- ▶ "inflation dynamics have continued to be weaker than expected"
- ▶ "further fall in market-based measures of inflation expectations"
- ▶ "expected inflation stand at, or close to, their historical lows"
- ▶ Purchases conditional to "a sustained adjustment in the path of inflation"

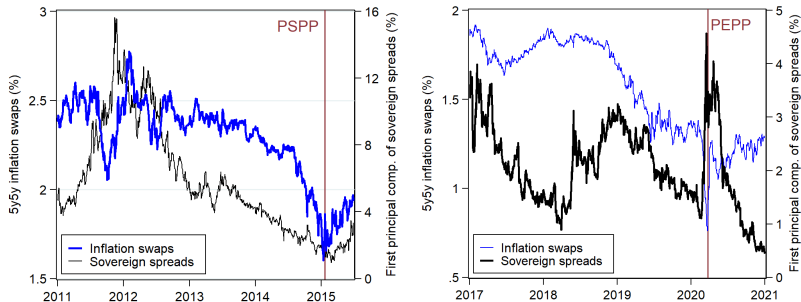
PEPP was introduced in 2020 to counter **sovereign** risks

- ▶ Six days after "we are not here to close spreads"
- ▶ "fully committed to avoid any fragmentation"
- ▶ "high spreads impair the transmission of monetary policy"
- ▶ "the ECB will not tolerate any risks to the smooth transmission of its monetary policy in **all** jurisdictions of the euro area"
- ▶ Press articles (WSJ, FT, Reuters) show that PEPP was clearly interpreted as being about sovereign risks Quotes
- ▶ The **flexibility announcement** reinforces this rationale

→ We argue that this is the **key difference** between the two programs

# Target variables for both programs

Figure 2: Inflation swaps and sovereign spreads



The first principal component maximizes the common variance (72%) across the 10 sovereign spreads with Germany (Euro12 minus Luxemburg), to reduce the weight on outliers. Correlation with the mean of the 10 spreads = 0.95.

# Some potential confounding factors

Not just the rationale is different, the **economic context** is too

**Financial stress** much higher during Covid-19 crisis

- ▶ Isolate the role of how different market conditions are
- ▶ Need to control for liquidity and volatility

**Fed's asset purchases** on the downside in 2015, expansionary in 2020

- ▶ Control for US monetary policy stance

Massive **fiscal stimulus** in response to Covid-19 crisis

- ▶ Fiscal plans announced on different days than PEPP announcements
- ▶ Estimated PEPP effects go in the opposite direction of fiscal stimulus effects
  - ▶ Worsen sustainability issues for most indebted countries, so higher spreads
  - ▶ Positive effect of excess demand on inflation, so higher inflation swaps
  - ▶ If fiscal stimulus is a confounding factor, "true" PEPP effect on spreads and swaps would be even more negative



# Empirical approach

Two complementary empirical approaches:

## 1. Announcement effects - Event-study

- ▶ Investors learn which variable enters the reaction function
  - ▶ Daily frequency
  - ▶ High-frequency identification (control for anticipation effects)
  - ▶ Also enable to control for other policy decisions

## 2. Implementation effects - Flow analysis

- ▶ Investors learn about the reaction function parameter
  - ▶ ECB publishes purchase flows
  - ▶ Weekly frequency
  - ▶ Enable to measure the actual effects of asset purchases
  - ▶ Control for the reverse causality of purchase flows

# Preview

## Main results

- ▶ PSPP and PEPP have **different** financial market effects
- ▶ PSPP positively affects **inflation swaps** (but PEPP does not)
- ▶ PEPP negatively affects **sovereign spreads** (but PSPP less or not)
- ▶ PSPP and PEPP are **not substitutes**

## Policy implications

- ▶ **Communicating a rationale** for a given policy is key in determining the effects of that policy
- ▶ Benefit of asset purchases (vs. interest rate policy): same instrument could help reach **two (or more?) objectives**

# Literature

## Intersection of two strands of the literature

### 1. Effects of central bank asset purchases

- ▶ Guidolin-Neely 2010, Hofmann-Zhu 2010, Krishnamurthy-Vissing-Jorgensen 2011, Gagnon et al 2011, Joyce et al 2011, Glick-Leduc 2012, Wright 2012, Rogers et al 2014, Szczerbowicz 2015, Haitsma et al 2016, Altavilla et al 2016, Ghysels et al 2017, Afonso et al 2018, De Pooter et al 2018, Moessner 2018, Lewis-Roth 2019, Altavilla et al 2019, Pagliari 2020, Altavilla et al 2021, Lhuissier-Nguyen 2021, Costain et al 2021, Swanson 2021

### 2. Central bank communication and policy effectiveness

- ▶ Woodford 2005, Eusepi-Preston 2010, Gurkaynak et al 2010, Schmidt-Nautz 2012, Lunsford 2020, Davig-Foerster 2021, Leombroni et al 2021

## Contribution

- ▶ We document that **two similar policies** may have different financial market effects, if policymakers have highlighted that these policies pursue **different intermediate objectives**

# Event-study analysis

Do policy **announcements** matter?

$$Y_t = \alpha + \beta_{PSPP} \mathbb{I}_t^{PSPP} + \beta_{PEPP} \mathbb{I}_t^{PEPP} + \gamma X_t + \xi_t \quad (1)$$

- ▶  $Y_t$ : daily change in 5year-5year inflation swaps or in the first principal components of EA sovereign spreads with Germany  
(IT, ES, PT, GR, IE, FR, NL, BE, AU, FI)
- ▶  $\mathbb{I}_t^{PSPP}$ : dummy variable for PSPP announcements
- ▶  $\mathbb{I}_t^{PEPP}$ : dummy variable for PEPP announcements
- ▶  $X_t$ : Intraday monetary surprises, VSTOXX, other ECB policy announcements
  
- ▶ OLS estimation with heteroskedasticity-robust standard errors
- ▶ January 2009 - March 2021: 123 policy announcements

# Event-study analysis

## Complementary analyses

- ▶ 10-year inflation swaps
- ▶ Mean of all 10 EA spreads
- ▶ Macro news surprise index of Scotti (2016)
- ▶ Liquidity programs
- ▶ PSPP length extensions
- ▶ First announcement only
- ▶ Dependent variable normalised by recent volatility
- ▶ Daily monetary surprises

# Event-study estimates

- ▶ PSPP announcements **increase** inflation swaps, not PEPP ones

Table 1: Inflation swaps

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Baseline	10-year	Surprises	Liquidity	PSPP <sub>Ext</sub>	1st Ann.	Normaliz.
	Swap5y5y	Swap10y	Swap5y5y	Swap5y5y	Swap5y5y	Swap5y5y	Swap5y5y
PSPP	1.580**	1.347**	1.626***	1.584**	2.189***	3.408***	1.312**
	[2.49]	[2.02]	[2.65]	[2.51]	[3.11]	[26.83]	[2.50]
PEPP	0.096	-0.176	-0.758	-0.096	0.141	-1.624***	-0.400
	[0.08]	[-0.14]	[-0.87]	[-0.07]	[0.12]	[-6.34]	[-0.46]
N	123	123	123	123	123	123	120
R2	0.12	0.16	0.16	0.12	0.14	0.12	0.10

Dependent variable is normalised to a unit-standard deviation. 1 SD = 2.1 bp.

# Event-study estimates

- ▶ Both PSPP and PEPP announcements **reduce** spreads
- ▶ But the PEPP effect is **more than twice** the PSPP effect

Table 2: Sovereign spreads

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Baseline	Mean	Surprises	Liquidity	PSPP <sub>Ext</sub>	1st Ann.	Normaliz.
	PCA_spd	Mean_spd	PCA_spd	PCA_spd	PCA_spd	PCA_spd	PCA_spd
PSPP	-0.752** [-2.37]	-0.899*** [-3.72]	-0.742** [-2.41]	-0.750** [-2.35]	-0.876** [-2.04]	-0.166 [-1.31]	-0.831** [-2.14]
PEPP	-1.863** [-2.36]	-2.024* [-1.91]	-2.043** [-2.20]	-1.960** [-2.41]	-1.872** [-2.38]	-4.031*** [-13.11]	-1.085** [-2.38]
N	123	123	123	123	123	123	120
R2	0.40	0.34	0.40	0.40	0.40	0.41	0.33

Dependent variable is normalised to a unit-standard deviation. 1 SD = 18 bp.

Country spreads

# Flow analysis

Does **implementation** matter?

To control for endogeneity issues - reverse causality especially -, we proceed in two steps:

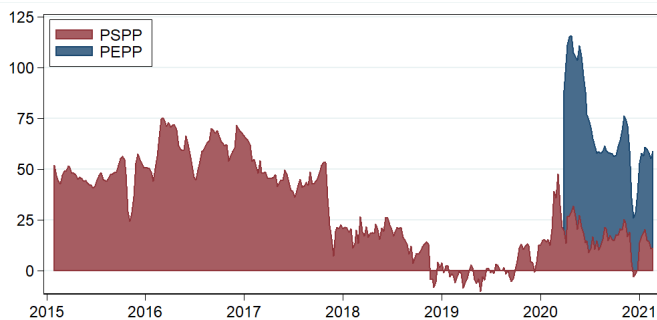
1. Identify exogenous variations in PSPP/PEPP weekly flows
2. Estimate the effect of these exog. variations on swaps and spreads



# PSPP and PEPP weekly flows

- ▶ The ECB publishes data on weekly net asset purchases

Figure 3: PSPP and PEPP (4-week cumulated) flows



# Flow analysis

First-stage

$$Z_t = \alpha + \sum_{i=1}^2 \rho_i Z_{t-i} + \sum_{i=1}^2 \beta_i PCA1_{t-i} + \sum_{i=1}^2 \omega_i PCA2_{t-i} + \sum_{i=1}^2 \phi_i Swap5y5y_{t-i} + \gamma X_t + \epsilon_t^Z \quad (2)$$

- ▶  $Z_t$ : PSPP or PEPP weekly flows
- ▶  $PCA1_t$ : First principal component of sovereign spreads
- ▶  $PCA2_t$ : Second principal component of sovereign spreads
- ▶  $Swap5y5y_t$ : 5year-5year inflation swaps
- ▶  $X_t$ : VSTOXX, Macro news surprise (Scotti 2016), Inflation
- ▶  $\epsilon_t^Z$ : Exogenous variations in PSPP or PEPP weekly flows

Residuals

# Flow analysis

## Second-stage

$$Y_t = \alpha + \rho Y_{t-1} + \beta_{PSPP} \epsilon_t^{PSPP} + \gamma X_t + \xi_t \quad (3)$$

$$Y_t = \alpha + \rho Y_{t-1} + \beta_{PEPP} \epsilon_t^{PEPP} + \beta_{PSPP} \epsilon_t^{PSPP} + \gamma X_t + \xi_t \quad (4)$$

- ▶  $Y_t$ : (end-of-week) 5y5y inflation swaps or 1<sup>st</sup>PC of sovereign spreads
- ▶  $\epsilon_t^Z$ : Exogenous variations in PSPP or PEPP weekly flows
- ▶  $X_t$ : VSTOXX, Macro news surprise (Scotti 2016), lag of raw PSPP or PEPP flows, and US monetary surprises
  
- ▶ OLS estimation with heteroskedasticity-robust standard errors
- ▶ PSPP eq.(3): March 2015 (w14) - March 2021 (w10)
- ▶ PEPP eq.(4): April 2020 (w15) - March 2021 (w10)

# Flow estimates

- ▶ PSPP **increases** inflation swaps, but does not affect spreads
- ▶ PEPP **reduces** sovereign spreads, but does not affect swaps

Table 3: Inflation swaps and sovereign spreads

	Swap5y5y				PCA_spd			
	t	t+1	t+2	t+3	t	t+1	t+2	t+3
$\epsilon_{PSPP}$	0.021** [2.27]	0.026** [2.31]	0.038*** [2.76]	0.042** [2.59]	-0.004 [-0.21]	-0.027 [-1.44]	-0.008 [-0.39]	-0.025 [-0.91]
N	312	311	310	309	312	311	310	309
R2	0.97	0.94	0.92	0.89	0.89	0.82	0.74	0.69
$\epsilon_{PEPP}$	0.032 [0.92]	0.056 [1.17]	0.062 [1.35]	0.043 [0.87]	-0.073** [-2.04]	-0.109** [-2.17]	-0.093* [-1.84]	-0.080 [-1.35]
N	49	48	47	46	49	48	47	46
R2	0.94	0.88	0.84	0.82	0.98	0.97	0.95	0.93

The dependent variables and PSPP/PEPP weekly flows are normalised to a unit-SD.

Country spreads

# Robustness

## Complementary analyses

- ▶ Mean of sovereign spreads
- ▶ Same sample length (49 obs) for both programs
- ▶ Sovereign CISS in first-stage
- ▶ No controls (inflation, macro news, VSTOXX) in first-stage
- ▶ Lagged controls (inflation, macro news, VSTOXX) in first-stage
- ▶ Effect on first principal component of spreads in second-stage
- ▶ Including Covid-19 deaths (see Ortman-Tripier 2021)

# The role of capital key deviations

- ▶ Is the effect of PEPP **mechanically** driven by capital key deviations?
- ▶ **Only** French and Italian bond purchases deviated, in **opposite** directions

Two hypotheses:

1. **No** PEPP responses of other countries' spreads
2. PEPP responses of FR and IT spreads **opposed**

	PCA ex.FR/IT	Mean ex.FR/IT	Spd.IT	Spd.FR
<b>Event-study analysis</b>				
PSPP	-0.722** [-2.26]	-0.844*** [-3.23]	-0.897*** [-3.09]	-0.458 [-1.00]
PEPP	-1.830** [-2.24]	-1.870* [-1.80]	-2.206** [-2.47]	-1.048** [-2.61]
N	123	123	123	123
R2	0.34	0.27	0.53	0.34
<b>Flow analysis</b>				
$\epsilon_{PSPP}$	-0.003 [-0.15]	0.013 [0.81]	0.009 [0.65]	-0.006 [-0.44]
N	312	312	312	312
R2	0.91	0.97	0.94	0.88
$\epsilon_{PEPP}$	-0.067** [-2.13]	-0.023* [-1.75]	-0.053* [-1.99]	-0.072* [-1.69]
N	49	49	49	49
R2	0.98	0.98	0.98	0.96

→ PEPP capital key deviations **not driving** differentiated PSPP/PEPP effects

# Conclusion

What this paper documents:

- ▶ PSPP and PEPP have **different** financial market effects
- ▶ PSPP positively affects **inflation expectations** (but PEPP does not)
- ▶ PEPP negatively affects **sovereign spreads** (but PSPP less or not)
- ▶ PSPP and PEPP are **not substitutes**

What differs between the 2 programs suggests:

- ▶ **Communicating a rationale** for a given policy (clarifying its reaction function) is key in determining its effects
- ▶ Benefit of asset purchases (vs. interest rate policy): same instrument could help reach **two (or more?) objectives**

## Appendix



# Press articles 1

## Financial Times - 19 March 2020

- ▶ “Economists have been calling for the ECB to increase its bond-buying programme, which has already collected €2.6tn of assets, particularly since the borrowing costs of southern eurozone countries — including Italy and Greece — began rising sharply”
- ▶ “Ms Lagarde was also forced to beat a hasty retreat and to issue an apology to the rest of the council last week after she said it was not the ECB’s role to “close the spread” in sovereign debt markets — referring to the gap between Italian and German bond yields that is a key risk indicator for Italy.”

## Wall Street Journal - 19 March 2020

- ▶ “The decision came during an unscheduled late-night conference call among top ECB officials, on a day when borrowing costs for governments like Italy and Spain jumped as the virus roiled and shuttered the region.”
- ▶ “Last Thursday, ECB President Christine Lagarde stressed at a news conference that the bank was “not here to close spreads,” suggesting it wouldn’t intervene to narrow the difference in borrowing costs between Germany and Italy.”

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## Press articles 2

### Reuters - 19 March 2020

- ▶ “Although global stocks continued to fall after the ECB’s move, the euro held broadly steady and bond yields in the bloc’s periphery tumbled, with Italy leading the way with a 90 basis point drop on its 10-year benchmark.”
- ▶ “This was seen as a clear indication that it will not tolerate the surge in yield spreads between euro zone members seen in Italy and Greece in recent days.”

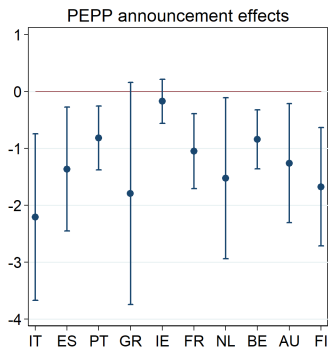
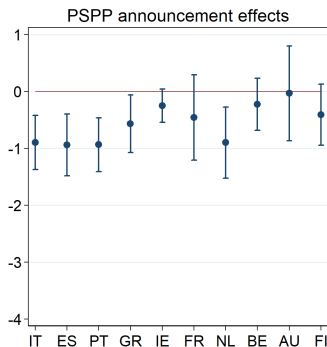
### Financial Times - 19 March 2020 - Christine Lagarde’s op-ed

- ▶ “Risk-free rates have moved up and government bond yields — benchmarks that are key to the pricing of all assets — have increased everywhere and become more dispersed. These developments impair the smooth transmission of our monetary policy across the euro area and put price stability at risk.”
- ▶ “As a result, the European Central Bank’s governing council has created a new Pandemic Emergency Purchase Programme of up to €750bn until the end of the year on top of the €120b in extra purchases announced on March 12.”

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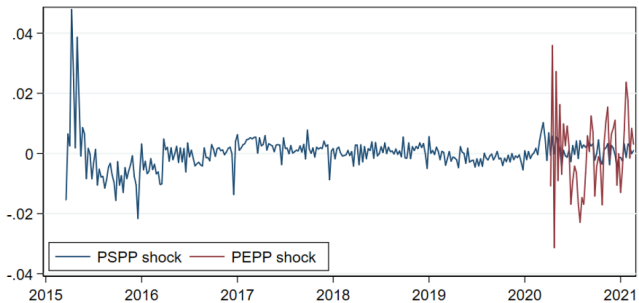
# Event-study estimates

Figure 4: Individual country spreads



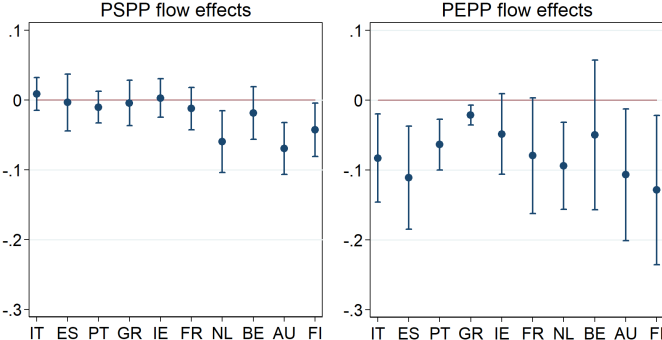
# PSPP and PEPP weekly flows

Figure 5: Exogenous variations in PSPP and PEPP weekly flows



# Flow estimates

Figure 6: Individual country spreads



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