BANK OF ENGLAND

Staff Working Paper No. 719
The impact of the Bank of England's Corporate Bond Purchase Scheme on yield spreads

Lena Boneva, Calebe de Roure and Ben Morley

March 2018

Staff Working Paper No. 719
The impact of the Bank of England's Corporate Bond Purchase Scheme on yield spreads

Lena Boneva,[1] Calebe de Roure[2] and Ben Morley[3]

Abstract

As part of its August 2016 policy package, the Bank of England announced a scheme to purchase up to £10 billion of corporate bonds. Only sterling investment-grade bonds issued by firms making a 'material' contribution to the UK economy were eligible to be purchased. So eligible bonds constitute a natural treatment group to estimate the announcement effect of the policy in a difference-in-differences approach. Our results suggest that the scheme reduced spreads of eligible bonds by 13–14 basis points compared to foreign bonds issued by the same set of firms, and by 2–5 basis points compared to ineligible sterling corporate bonds. But because of spillover effects, these estimates should be interpreted as a lower bound.

Key words: Central bank asset purchases, corporate bond, announcement effect.

JEL classification: E43, E58, G12.

---

(1) Bank of England and CEPR. Email: lena.boneva@bankofengland.co.uk
(2) Reserve Bank of Australia. Email: derourec@rba.gov.au. Corresponding author.
(3) Bank of England. Email: ben.morley@bankofengland.co.uk

1 Introduction

After the UK's vote to leave the EU, the Bank of England (BoE) announced a scheme to purchase up to £10 bn of corporate bonds. The Corporate Bond Purchase Scheme (CBPS) was announced on 4th August 2016. A list of eligible bonds was first published on 12th September and purchases commenced on 27th September 2016. These purchases were aimed at stimulating investment activity by lowering corporate bond yields which reduces firms' borrowing costs and stimulates new issuance.

To evaluate the impact of the CBPS, this paper investigates the announcement effect of the Bank of England's Corporate Bond Purchase Scheme on corporate spreads. To tackle this question, we exploit the fact that the BoE announced that it would purchase sterling investment-grade bonds issued by firms that make a "material" contribution to the UK economy, which constitutes a natural treatment group. The definition of "material" relates to the geographical distribution of a firm's activity and not necessarily to its economic performance.[1] Because the announcement of the CBPS caught the market by surprise, we can estimate the announcement effect of the policy on the spreads of eligible bonds in a difference-in-differences approach.

We find that compared to sterling investment-grade corporate bonds that are not eligible for the CBPS, the spreads of eligible bonds decreased by about 2-5bps after the announcement of the scheme. However, comparing two groups of sterling denominated bonds is likely to underestimate the effect of the purchases because it does not account for the impact of portfolio rebalancing. The yields of ineligible assets also benefit from the purchases as corporate bond investors adjust their portfolios, selling eligible bonds and buying ineligible assets. To control for this substitution effect, we compare yield spreads of eligible sterling bonds with

---

[1]According to the Consolidated Market Notice of 12th September 2016, a material contribution to the UK economy is defined as "significant employment in the UK, or with their headquarters in the UK", or a "company that generates significant revenues in the UK, serves a large number of customers in the UK, or has a number of operating sites in the UK". The market notice is available at: `https://www.bankofengland.co.uk/markets/market-notices/2016/asset-purchase-facility-corporate-bond-purchase-scheme-market-notice-august-2016`. Given this information, market participants could mostly infer which bonds would be eligible to be purchased.

those of USD and EUR bonds issued by the same set of firms, which are by definition ineligible. This comparison is unproblematic because yield spreads are the difference between the bond yield and the riskless bond of same maturity and for this reason have no currency denomination. Compared to corporate bonds denominated in USD, spreads of sterling assets fell by 13.8bps, and compared to EUR bonds by 13bps after the policy was announced.[2]

To identify the announcement effect of the CBPS in a difference-in-differences approach, we assume that the spreads of eligible and ineligible bonds followed comparable trends before the policy announcement. Figures 1a and 1b illustrate that assumption. Figure 1a compares the yield spread of eligible and ineligible sterling denominated bonds, and Figure 1b compares the yield spread from bonds of eligible issuers denominated in sterling and in US dollars. Both figures present a similar pattern: yield spreads follow a parallel trend before the treatment, the treatment affects treatment and control groups differently and after the shock they return to a parallel trend. To assess the validity of our analysis, we estimate our difference-in-differences specification using placebo treatment days that vary around the actual announcement day of the policy. Our placebo estimates ahead of the policy announcement are insignificant which provides support for the "common trends" assumption.

The effect of the asset purchase program on yield spreads may come from two channels. First, the presence of a large market participant increases market liquidity, i.e. reduces the illiquidity premium. Investors readjust their portfolio of sterling corporate bonds: selling eligible assets, and buying ineligible ones. Second, a lower level of yields in the secondary market reduce companies' funding costs when they decide to issue debt in the future, which can improve their profitability and thereby lower their credit risk premia. This effect reinforces the reduction in yield spreads.

Related studies on the impact from central bank government bond purchases have focused on government bonds; see e.g. Joyce et al. (2011), Breedon et al. (2012) and McLaren et al. (2014) for the U.K., Eser and Schwaab (2011) and Krishnamurthy et al. (2017) for the euro area, and Gagnon et al. (2011), D'Amico

---

[2]This effect can be seen as a lower boundary of the announcement effect as foreign bonds of eligible issuers might also benefit from CBPS.

Figure 1: Yield Spreads

(a) Sterling denominated bonds

(b) Sterling and USD denominated bonds of eligible issuers
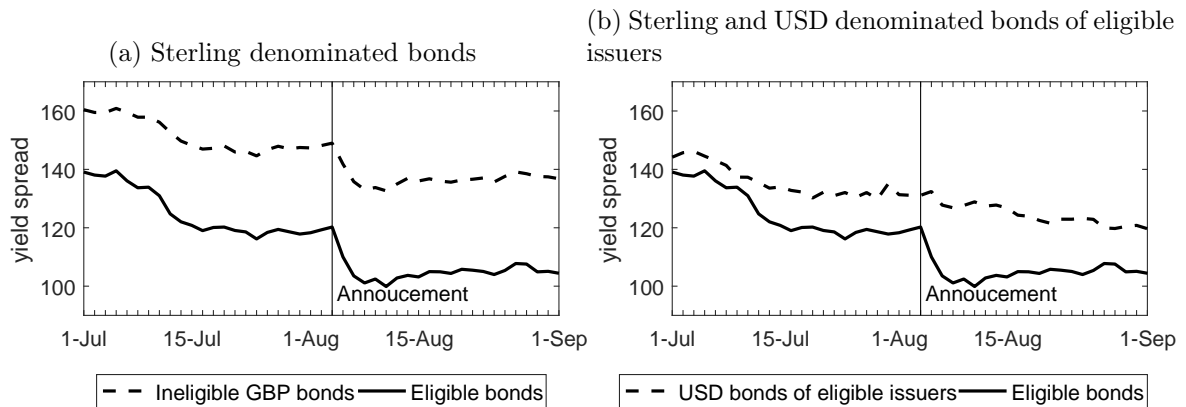
Notes: The left panel reports yield spreads of eligible and ineligible sterling denominated bonds. The right panel reports yield spreads of USD and sterling denominated bonds of eligible issuers. USD denominated bonds are ineligible.

et al. (2012), and D'Amico and King (2013) for the US. Previous work on corporate bond purchases is scarce: Beirne et al. (2011) who estimate the effect of the ECB's covered bond purchase program (CBPP) that took place between 2009 and 2010. They find that the CBPP lowered euro area covered bond yields by about 12bps. Suganuma and Ueno (2017) examine the effects and transmission mechanism of the Bank of Japan's corporate and government bond purchases. They find that the BoJ's bond purchases have lowered corporate bond spreads primarily via the default risk channel, the local and global supply channel and the risk-taking channel. Our study contributes to this literature by estimating the impact of the BoE's CBPS.

2   Data

Our treatment group includes all corporate bonds that are eligible to be sold to the BoE in the CBPS.[3] In total, there are 339 eligible bonds, issued by 145 different firms. We use two alternative control groups. Our first control group

---

[3]The list of eligible bonds is available from the BoE's webpage: `https://www.bankofengland.co.uk/-/media/boe/files/markets/corporate-bond-purchases/bonds-eligible-for-the-corporate-bond-purchase-scheme.xlsx`

comprises sterling investment-grade corporate bonds that are not eligible for the CBPS according to the program criteria.[4] There are 189 ineligible sterling bonds in our dataset. Our second control group consists of USD and EUR denominated bonds issued by the 145 eligible firms. Specifically, we use 944 bonds denominated in USD, and 666 bonds denominated in EUR.

Table 1: Descriptive statistics

| | Spread (bps) | | | | Bid-Ask (%) | | | |
	Eligible	Ineligible(£)	Ineligible($)	Ineligible(€)	Eligible	Ineligible(£)	Ineligible($)	Ineligible(€)
Mean	131.0	143.6	131.9	95.7	1.07	1.16	0.76	0.66
S.E.	42.9	51.9	69.4	60.7	0.57	0.62	0.62	0.66
Min	42.8	45.8	27.9	5.2	0.18	0.23	0.06	0.06
25 pcl	101.5	106.3	74.3	57.9	0.60	0.71	0.28	0.28
50 pcl	130.1	143.6	119.0	74.2	0.99	1.03	0.61	0.46
75 pcl	154.3	171.9	183.1	115.9	1.46	1.58	1.11	0.72
Max	312.1	311.81	326.8	293.5	4.08	4.26	2.43	3.47
Obs	3,485	1,782	5,625	3,971	1,947	991	5,625	3,971

Notes: Spread is the option adjusted yield relative to a government bond yield with the same maturity. Bid-ask spread is defined as (ask price − bid price)/bid price. Eligible refers to sterling corporate bonds eligible for the CBPS. Ineligible (£) refers to investment-grade corporate bonds denominated in sterling but not eligible for purchase. Ineligible ($, €) refers to bonds of eligible firms but denominated in USD and EUR. The sample comprises two days before the announcement (4th August 2016) and two days after.

Table 1 presents descriptive statistics for corporate spreads, the dependent variable in our regression analysis below. Spreads are computed relative to a government bond yield with the same maturity to control for country-specific monetary policy conditions. We use option adjusted spreads which is a common way to control for bonds with different repayment schedules.[5] Descriptive statistics

[4]The set of ineligible bonds is determined by the subset of bonds within the Bank of America-Merrill Lynch Sterling Corporate Non-Financial Index, which are also not included on the list of eligible bonds on the BoE's webpage.

[5]Option-adjusted corporate bond yields use a dynamic pricing model to account for variable interest rates and variable prepayment schedules of specific bonds. These data are available from Bloomberg.

are reported separately for eligible sterling bonds, ineligible sterling bonds, and ineligible foreign currency bonds. On average, yield spreads are 131bps, 143bps, and 116bps for each of these categories, respectively.

We also report descriptive statistics for bid-ask spreads, which is a control variable in our analysis and proxies for liquidity. On average, bid-ask spreads are between 0.7 and 1.2 percent across our different bond categories.

3   Empirical Analysis

Our data set only contains investment-grade bonds. So any remaining differences between treatment and control group should be primarily due to eligibility status and liquidity. Specifically, we estimate the following difference-in-differences specification:

$$\text{spread}_{it} = \alpha_i + \mu_t + \beta \text{eligible}_i \times \text{CBPS}_t + \delta \text{bid-ask}_{it-1} + u_{it} \qquad (1)$$

where spread_{it} is the option-adjusted yield relative to a government bond yield with the same maturity for bond i on day t, eligible_i is a dummy variable that takes the value of one if bond i is included in the CBPS, CBPS_t is a dummy variable that takes the value of one after the announcement of the policy, and α_i and μ_t are bond and day fixed effects.

Table 2 reports the results using sterling investment-grade corporate bonds as control group. Columns (I) use a two day window around the announcement of the purchase program on 4th August 2016.[6] Between the announcement and the first auction 27th September 2016, the BoE released a full list of bonds eligible for the CBPS. To account for this additional information, columns (II) compare two days before the announcement with two days after the first auction. To assess the robustness of our results to the window size, columns (III) use a 7-day window around the announcement.

In all specifications, the interaction term $\text{eligible}_i \times \text{CBPS}_t$ is negative and statistically significant, suggesting that the purchase program reduced corporate

---

[6]The window size is defined similar to Joyce et al. (2011), but our results are robust to using a window size of 7 days

spreads. According to (I), spreads on eligible bonds decreased 2.2bps more than compared to ineligible Sterling investment grade bonds after the announcement of the policy. Comparing the period before the announcement with the period after the first auction, we find a differential reduction of about 5.3bps, see (II). The results in (III) are equivalent to (I), suggesting that our results are robust to the choice of the window size.

However, using ineligible sterling bonds as a control group does not account for portfolio rebalancing effects. To control for these effects, Table 3 repeats our analysis above but using foreign currency bonds as a control group. Columns (I) compare sterling bonds with USD bonds and columns (II) compare sterling bonds with EUR bonds. Both specifications use a two day window around the announcement. In columns (III) we compare sterling bonds with EUR and USD bonds using a window from two days before the announcement to two days after the first auction.

Compared to USD bond spreads, sterling eligible bond spreads declined by about 13bps (columns (I)) and by 13.8bps compared to EUR spreads (columns (II)).[7] The announcement effect is very similar when comparing two days before the announcement with two days after the first auction and pooling USD and EUR bonds as a control group (columns (III)). But compared to the effect on ineligible sterling corporate bonds, foreign currency bonds reacted by about 10bps more to the policy announcement, which can be interpreted as evidence for substitution across sterling denominated assets. In contrast, substituting across assets denominated in different currencies is difficult as a significant proportion of investors in corporate bond markets have a specific mandate per currency. This implies selling Sterling bonds from their portfolio to the BoE requires replacing them with other Sterling bonds. So spreads from ineligible Sterling bonds (i.e. investment grade) benefit from the CBPS purchases too, which explains why the impact is so small compared to foreign currency bonds.

In all specifications, we also control for liquidity using the bid-ask spread. According to Acharya and Pedersen (2005), we would expect that investors have to be adequately compensated to hold less liquid bonds, giving rise to a positive relationship between bid-ask spreads and yields. Notably, this positive relationship

---

[7]When pooling the control group, that effect is 13.3bps.

is present only in specification (II) of Table 2 and (III) of Table 3. All estimations using the two days immediately after the CBPS announcement present a negative relationship between liquidity and price. This finding could indicate a change in market liquidity after the policy announcement, but full-fledged analysis of the impact of CBPS announcement on market liquidity is beyond the scope of this paper.

To identify the impact of the CBPS, we assume that the spreads of eligible and ineligible bonds would have followed the same time trend without the policy intervention. This assumption is difficult to test but is violated if market participants would have expected corporate bond purchases ahead of the programme announcement, for example. In that case, our analysis would underestimate the impact of the CBPS. To investigate whether the "common trend" assumption is valid, Figure 2 graphically illustrates the coefficient estimate $\widehat{\beta}$ from model (1) for different placebo announcement dates ranging from 5 days before the actual announcement to 5 days after and using the US dollar and euro denominated bonds as a control group. Up to the announcement day (t), there is no reduction in the spread of eligible bonds. The effect is not visible ahead of the announcement day itself, suggesting that market participants did not anticipate the policy.

4   Conclusion

This paper investigated the announcement effect of the the Bank of England's Corporate Bond Purchase Scheme on yields. We find that the scheme reduced spreads of eligible bonds by 13-14 bps compared to foreign currency bonds issued by the same set of firms but by only 2-5 bps compared non-eligible sterling corporate bonds.

Figure 2: Was the CBPS anticipated by market participants?
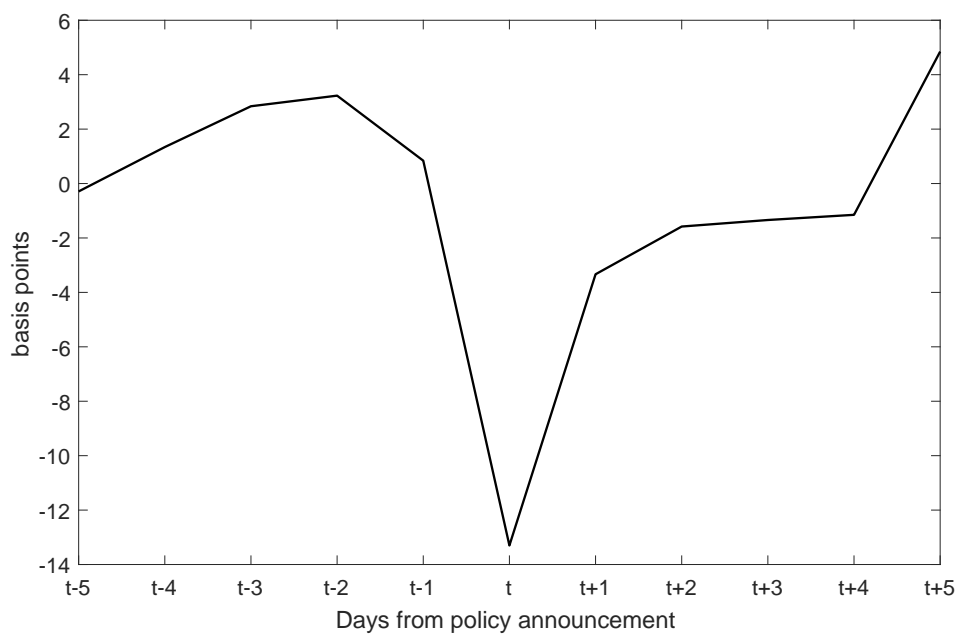
Notes: Placebo estimation of CBPS using the USD and euro denominated bonds as a control group. Placebo treatment dates range from $t-5$ to $t+5$, where t is the actual announcement day of the CBPS.

References

Acharya, V. V. and L. H. Pedersen (2005). Asset pricing with liquidity risk. *Journal of Financial Economics 77*(2), 375–410. 3

Beirne, J., L. Dalitz, J. Ejsing, M. Grothe, S. Manganelli, F. Monar, B. Sahel, M. Susec, J. Tapking, and T. Vong (2011). The impact of the Eurosystem's Covered Bond Purchase Programme on the primary and secondary markets. *ECB Occasional Paper No. 122*. 1

Breedon, F., J. S. Chadha, and A. Waters (2012). The financial market impact of UK quantitative easing. *BIS Working Papers*. 1

D'Amico, S., W. English, D. Lopez-Salido, and E. Nelson (2012). The Federal Reserve's Large-Scale Asset Purchases: rationale and effects. *The Economic Journal 122*, 415–446. 1

D'Amico, S. and T. King (2013). Flow and stock effects of large-scale treasury purchases: evidence on the importance of local supply. *Journal of Financial Economics 108*, 425–448. 1

Eser, F. and B. Schwaab (2011). Evaluating the impact of unconventional monetary policy measures: Empirical evidence from the ECB's Securities Markets Programme. *Journal of Financial Economics 119*, 147–167. 1

Gagnon, J., M. Raskin, J. Remache, and B. Sack (2011). The financial market effects of the Federal Reserve's Large-Scale Asset Purchases. *International Journal of Central Banking 7*, 3–43. 1

Joyce, M., A. Lasaosa, I. Stevens, and M. Tong (2011). The financial market impact of quantitative easing in the United Kingdom. *International Journal of Central Banking 7*(3), 113–161. 6

Joyce, M., M. Tong, and R. Woods (2011). The United Kingdom's quantitative easing policy: design, operation and impact. *Bank of England Quarterly Bulletin 51*(3), 200–212. 1

Krishnamurthy, A., S. Nagel, and A. Vissing-Jorgensen (2017). ECB policies involving government bond purchases: impacts and channels. *CEPR DP*. 1

McLaren, N., R. Banerjee, and D. Latto (2014). Using changes in auction maturity sectors to help identify the impact of QE on gilt yields. *The Economic Journal 124*, 453–479. 1

Suganuma, K. and Y. Ueno (2017). Effects of corporate and government bond purchases on credit spreads and their transmission mechanism: the case of Japan. *mimeo*. 1

Table 2: The Impact of the Corporate Bond Purchase Scheme: eligible vs. ineligible sterling investment-grade bonds

	(I)		(II)		(III)	
	spread_{it}	spread_{it}	spread_{it}	spread_{it}	spread_{it}	spread_{it}
$\text{CBPS}_t \times \text{eligible}_i$	-2.17***	-2.16***	-5.34***	-5.26***	-2.39***	-2.35***
	(0.68)	(0.68)	(1.11)	(1.11)	(0.81)	(0.81)
CBPS_t	-12.01***		-10.33***		-14.61***	
	(0.58)		(0.98)		(0.67)	
eligible_i	-29.89***		-29.31***		-30.72***	
	(4.49)		(4.39)		(4.57)	
bid-ask_{it-1}	-4.31**	-4.53***	4.21**	-0.91	-4.37***	-3.37**
	(1.99)	(2.27)	(1.89)	(2.29)	(1.37)	(1.43)
Security F.E.	No	Yes	No	Yes	No	Yes
Time F.E.	No	Yes	No	Yes	No	Yes
Adj. within R^2	0.170	0.025	0.193	0.051	0.173	0.019
Obs	1,883	1,879	1,432	1,420	6,614	6,613

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Difference-in-differences estimation: eligible vs ineligible assets. (I) 2 days around the announcement on August 4, 2016, (II) 2 days before the announcement versus 2 days after the first auction on 27th September 2016, (III) 7 days around the announcement. Standard errors are clustered at the bond level. Reported R^2 are within as they are calculated before demeaning the data on the F.E. dimension and take only into account the explanatory power of the exogenous variables.

Table 3: The Impact of the Corporate Bond Purchase Scheme: sterling eligible bonds vs. foreign currency bonds

	(I)		(II)		(III)	
	spread_{it}	spread_{it}	spread_{it}	spread_{it}	spread_{it}	spread_{it}
$\text{CBPS}_t \times \text{eligible}_i$	-12.99***	-12.95***	-13.80***	-13.79***	-13.15***	-13.01***
	(0.40)	(0.40)	(0.41)	(0.40)	(0.68)	(0.66)
CBPS_t	-1.24***		-0.44***		-1.06***	
	(0.13)		(0.15)		(0.30)	
eligible_i	-13.26***		26.21***		-2.52	
	(3.30)		(3.79)		(2.73)	
bid-ask_{it-1}	2.43	-2.82**	0.65	-6.90***	20.22***	7.19***
	(1.64)	(1.23)	(2.36)	(2.09)	(1.92)	(2.49)
Security F.E.	No	Yes	No	Yes	No	Yes
Time F.E.	No	Yes	No	Yes	No	Yes
Adj. within R^2	0.364	0.461	0.254	0.522	0.325	0.174
Obs	4,929	4,925	3,835	3,831	3,781	3,652

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Difference-in-differences estimation: sterling eligible bonds vs foreign currency bonds. (I) 2 days around the announcement on August 4, 2016, and USD bonds as control group, (II) 2 days around the announcement and EUR bonds as control group, (III) 2 days before the announcement versus 2 days after the first auction using USD and EUR bonds as control group. Standard errors are clustered at the bond level. Reported R^2 are within as they are calculated before demeaning the data on the F.E. dimension and take only into account the explanatory power of the exogenous variables.