2 The impact of the corporate sector purchase programme on corporate bond markets and the financing of euro area non-financial corporations

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This article reviews the impact of the ECB's corporate sector purchase programme (CSPP) on corporate bond markets and the financing of euro area non-financial corporations (NFCs). It finds that the CSPP has led to a significant easing in financing conditions for euro area NFCs, including declines in corporate bond spreads, improved supply conditions in the corporate bond primary market and increased bank lending to NFCs that do not have access to bond-based financing. The operational set-up of the CSPP, in particular its flexibility and adaptability, minimises any impact that could be detrimental to the functioning of the corporate bond market.

1 Introduction

The CSPP forms part of the ECB's asset purchase programme (APP). Its purpose is to ease financing conditions in the real economy. In broad terms, the CSPP consists of purchases by the Eurosystem of investment-grade euro-denominated bonds issued by non-bank corporations (i.e. NFCs and insurance corporations) established in the euro area. The CSPP helps businesses across the euro area to gain better access to credit, boost investment, create jobs and thereby support overall economic growth. This is a precondition for inflation to return to, and stabilise at, levels below, but close to, 2% over the medium term.

The CSPP was announced on 10 March 2016 and purchases started on 8 June 2016. At the time of the announcement, euro area annual HICP inflation was slightly negative and real GDP growth was relatively weak, with risks to the outlook tilted to the downside. The Governing Council decided in March 2016 on a set of policy measures in pursuit of its objective of price stability, including: (i) a further reduction in key ECB interest rates (the deposit facility rate was cut by 10 basis points from -0.3% to -0.4%); (ii) a new series of four targeted longer-term refinancing operations (TLTROs) starting in June 2016, each one with a maturity of four years; (iii) an increase in the monthly net asset purchases under the APP from €60 billion to €80 billion; and (iv) the CSPP. This comprehensive package was aimed at exploiting the synergies between the different instruments. It was calibrated to further ease financing conditions, stimulate new credit provision and thereby reinforce the economic recovery and accelerate the return of inflation to levels below, but close to, 2%.

At its meeting on 26 October 2017, at which the APP measures were re-calibrated, the Governing Council confirmed that purchases under the APP are intended to run until the end of September 2018, or beyond, if necessary, and in any case until the Governing Council sees a sustained adjustment in the path of inflation consistent

with a return to price stability. In addition, the Governing Council announced that the Eurosystem anticipates that the purchase volumes under the three private sector purchase programmes (the ABSPP, the CBPP and the CSPP) will remain sizeable. Currently, the book value of the Eurosystem's CSPP holdings stands at around €150 billion, which constitutes about 6% of the total APP.

A broad range of corporate bonds are eligible for purchase under the CSPP, including issues of smaller size. The Eurosystem purchases securities issued by non-bank corporations in both the primary and the secondary market. To be eligible for purchase, securities must at least be eligible as collateral for Eurosystem refinancing operations. This means that they must meet the minimum requirement of a credit assessment of credit quality step 3 on the Eurosystem's harmonised rating scale (which is equivalent to a minimum first-best long-term credit rating from an external credit assessment institution of BBB-, i.e. investment grade). In addition to being eligible as ECB collateral, the securities purchasable under the CSPP must also be denominated in euro,[56] the remaining maturity of the securities must range from a minimum of 6 months to a maximum of 31 years at the time of purchase, and the securities must be issued by a non-bank corporation established in the euro area. Securities issued by credit institutions are not eligible. The absence of a minimum issuance volume for debt instruments to be eligible under the CSPP ensures that even bonds issued by small firms, which often issue small volumes of debt securities, can also be purchased. Purchases of eligible debt instruments with a negative yield to maturity are also permissible, as long as the yield to maturity is above the deposit facility rate at the time of purchase. The Eurosystem applies an issue share limit of 70% per security.[57]

This article assesses the impact of the CSPP on the financing conditions for euro area NFCs and its implications for corporate bond market functioning and liquidity conditions. Section 2 analyses the impact of the CSPP on corporate finance in the euro area by analysing the effects of the CSPP on (i) corporate bond spreads, (ii) primary bond market issuance, (iii) the capital structure of euro area NFCs and (iv) wider NFC financing conditions. Section 3 investigates the implications of the CSPP for the functioning of the euro area corporate bond market. Section 4 concludes.

56 Foreign currency-denominated debt instruments are also accepted as eligible collateral on a temporary basis.

57 Lower issue share limits apply in specific cases, for example for securities issued by public undertakings, which are dealt with in a manner consistent with their treatment under the public sector purchase programme (PSPP). In relation to public undertakings, the Eurosystem is bound by the monetary financing prohibition in Article 123 of the Treaty on the Functioning of the European Union (TFEU).

2 Impact on corporate financing

2.1 Impact on the cost of financing for euro area NFCs

Developments in the spreads between corporate bond yields and risk-free rates provide useful information on the impact of the CSPP. The analysis of corporate bond spreads enables us to assess the effects of the CSPP on NFC bond market-based financing costs in isolation, whereas the other non-standard monetary policy measures announced by the ECB in March 2016 are likely to have contributed to lowering corporate bond yields by reducing the level of risk-free rates.

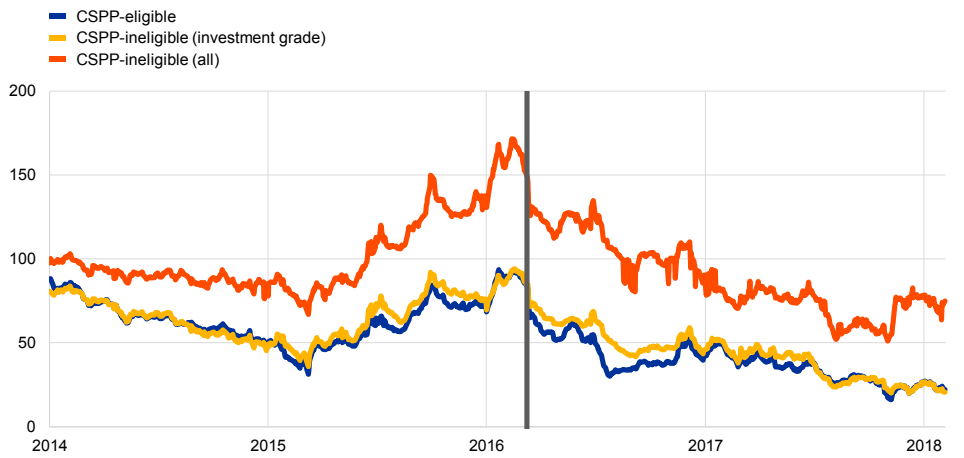
Corporate bond spreads have steadily tightened since the announcement of the CSPP in March 2016 (see Chart 1).[58] In the year leading up to the announcement, spreads had widened distinctly. The subsequent narrowing is an initial indication that financing conditions for NFCs have improved as a result of the March 2016 monetary policy measures. Moreover, spreads have narrowed not only for CSPP-eligible bonds, but also for corporate bonds that are not eligible for purchase under the CSPP (e.g. bonds issued by banks, high-yield bonds and bonds with an ineligible coupon structure[59]) owing to spillovers from the CSPP and – more broadly – the APP and other monetary policy measures. As yields and spreads of bonds purchased by the Eurosystem decline, investors have an incentive to rebalance their portfolios towards assets with similar risk characteristics that are expected to provide better returns.

58 The corporate bond spread is measured by the Z-spread, which is the spread over the euro interbank offered rate (EURIBOR) curve required to discount a pre-determined cash flow. Z-spreads are primarily driven by the credit quality of the issuer and are economically comparable to bond yield-to-maturity spreads.

59 Bonds with a coupon structure that is contingent on the issuer's discretion are not eligible. Purchases under the CSPP are restricted to coupon structures that are not subject to the issuer's discretion throughout the lifetime of the asset, based on both a forward-looking and a backward-looking perspective.

Chart 1

Corporate bond spreads – eligible versus ineligible



Sources: Bloomberg and ECB calculations.
Notes: The indices include only senior unsecured bonds. The vertical line marks the announcement of the CSPP on 10 March 2016. Corporate bond spreads are measured by the Z-spread. The latest observations are for 5 February 2018.

Econometric analysis attributes a significant part of the decline in spreads since March 2016 to the CSPP. Controlling for other determinants of corporate spreads, in particular the bond-specific credit risk, empirical evidence suggests that, relative to the pre-CSPP period between 1 April 2015 and 9 March 2016,[60] in the subsequent period between 10 March 2016 and the end of December 2017, the CSPP accounted for a decline in corporate bond spreads of, on average, 25 basis points for eligible bonds, 10 basis points for ineligible investment-grade bonds and 20 basis points for all ineligible bonds. For eligible bonds, the CSPP can be credited with almost the entire decline in spreads since the announcement of the programme (see Chart 2).[61] A controlled event study[62] which focused on the two weeks following the CSPP announcement provides further support for these findings. It suggests that the CSPP announcement accounted for a large share of the decline in corporate bond spreads over this period. In addition, the two-week decline in spreads was larger for eligible NFC bonds than for ineligible bank bonds. Similarly, ineligible high-yield bonds, despite showing a larger absolute decline in their spreads,[63] showed a smaller relative decline than eligible NFC bonds when compared with their levels before the announcement of the programme. Other studies concentrating on

60 Before 1 April 2015 the largest impact on asset prices came from the PSPP. Therefore, the econometric analysis focuses on the period after that date.

61 The results are based on a panel data analysis in which (the log of) corporate bond spreads of individual euro-denominated bonds issued in the European Union are disaggregated into their driving factors over the daily period from April 2015 to December 2017. Bond-specific credit risk and other term premia are estimated using bond-specific time-varying credit ratings, coupon rates, outstanding amounts and firm characteristics, such as distance to default. Aggregate demand factors are controlled for using country-specific time-fixed effects and sector-specific fixed effects.

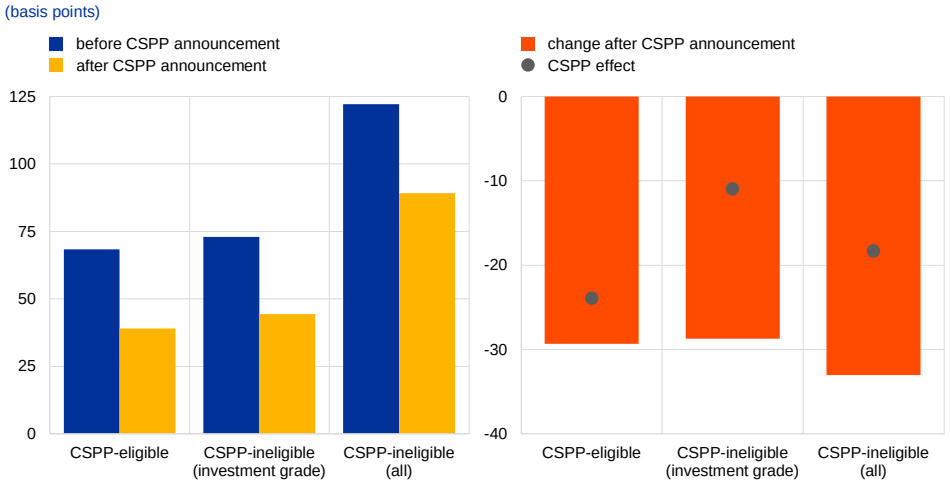
62 See the box entitled "The corporate bond market and the ECB's corporate sector purchase programme", *Economic Bulletin*, Issue 5, ECB, 2016.

63 See Abidi, N. and Miquel-Flores, I., "Who benefits from the corporate QE? A regression discontinuity design approach", *Working Paper Series*, No 2145, ECB, April 2018.

the primary bond market[64] and the credit default swap (CDS) market[65] come to similar conclusions.

Chart 2

Corporate bond spreads before and after the CSPP announcement



Sources: Bloomberg and ECB calculations.
Notes: The indices include only senior unsecured bonds. In the left panel, the blue bars denote average spreads between 1 April 2015 and 9 March 2016 and the yellow bars denote the average spreads between 10 March 2016 and 31 December 2017. Corporate bond spreads are measured by the Z-spread.

Owing to the narrowing of corporate bond spreads since March 2016, credit risk premia in the financial sector and in the NFC high-yield segment have diminished. By contrast, for the investment-grade NFC segment, which is covered by the CSPP, the "excess bond premium" (defined as the model-based deviation of corporate spreads from historical regularities, taking into account their risk characteristics)[66], although below its historical average, is significantly above its historical low recorded before the global financial crisis (see Chart 3).

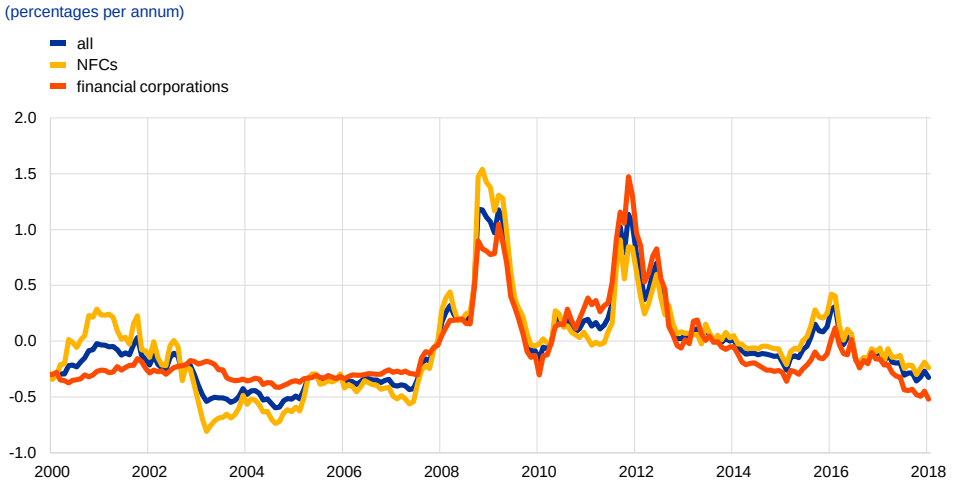
64 See Zaghini, A., "The CSPP at work: yield heterogeneity and the portfolio rebalancing channel", *Working Papers*, No 1157, Banca d'Italia, December 2017.

65 See Cecchetti, S., "A quantitative analysis of risk premia in the corporate bond market", *Working Papers*, No 1141, Banca d'Italia, October 2017.

66 See De Santis, R., "Credit spreads, economic activity and fragmentation", *Working Paper Series*, No 1930, ECB, July 2016.

Chart 3

Excess bond premia in the euro area by sector



Sources: Thomson Reuters, Merrill Lynch and ECB calculations.
Notes: The excess bond premium is the deviation of corporate bond spreads relative to the credit risk of the issuer. The latest observations are for 26 January 2018.

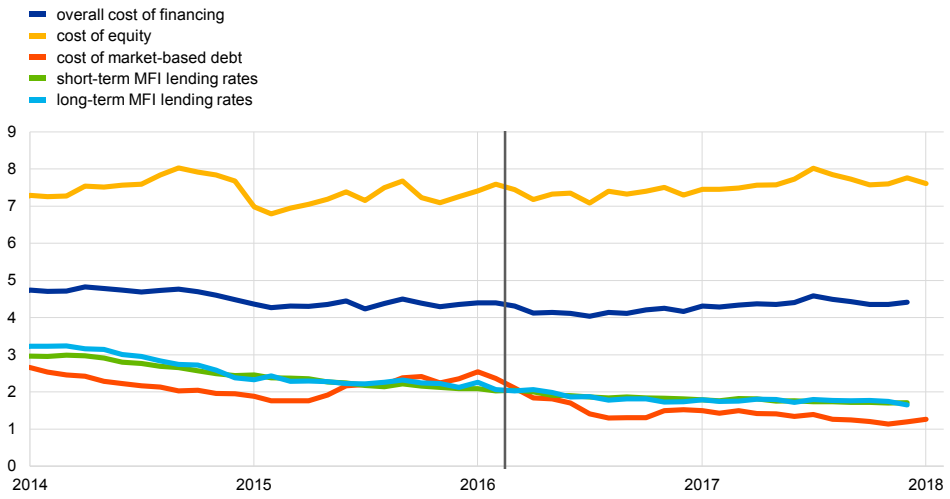
Over and beyond the intended impact on corporate bond spreads, the CSPP also appears to have had some wider effects on NFC financing conditions (see Chart 4). The estimated decline in corporate bond spreads that can be directly linked to the CSPP implies only a few basis points decline in the weighted average cost of financing for NFCs, as the debt securities market accounts for only 19.2% of NFCs' outstanding debt and 10.6% of their external financing volume. However, consideration should be given not only to the direct effect of the CSPP in lowering corporate bond spreads, but also to its indirect effects on other elements of NFCs' cost of financing. An indirect metric capturing the cost of financing for corporations is financial conditions indices (FCIs), which are aimed at summarising information about the future state of the economy contained in current financial variables. Empirical analysis suggests that FCIs are strongly influenced by changes in corporate bond spreads, even in cases where corporate bond spreads themselves do not form part of an FCI (see Chart 5).[67]

67 Two FCIs are considered. The Goldman Sachs FCI and an FCI constructed as a weighted average of the one-year overnight index swap (OIS), the ten-year OIS, the nominal effective exchange rate (NEER) of the euro vis-à-vis 38 trading partners and the Dow Jones EURO STOXX broad stock exchange index. The vector autoregression (VAR)-based weights are derived from the cumulative impulse response of HICP inflation to a shock in each of the four financial variables at a 12-month horizon gleaned from VARs which include one indicator at a time and a number of macroeconomic control variables.

Chart 4

Nominal cost of external financing for NFCs

(percentages per annum)

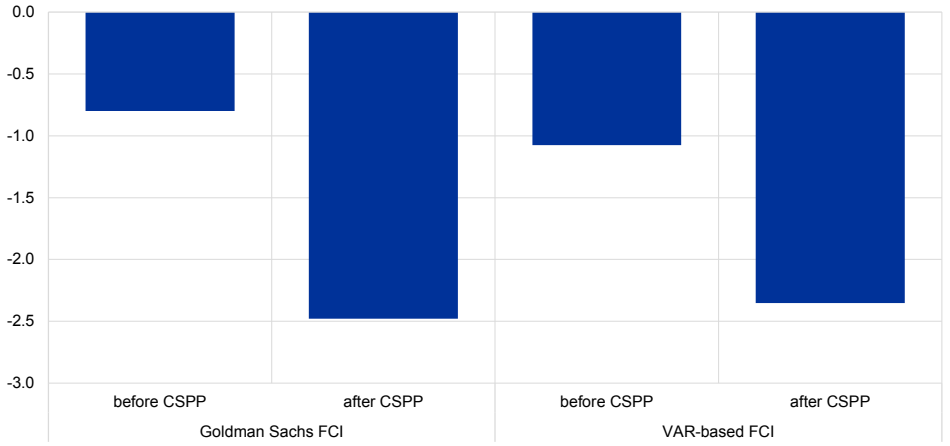


Sources: Thomson Reuters, Merrill Lynch and ECB calculations.
Notes: The vertical line marks the announcement of the CSPP on 10 March 2016. The latest observations are for November 2017 for MFI lending rates and December 2017 for cost of equity and cost of market-based debt.

Chart 5

Relationship between a 50 basis point decline in investment-grade NFC bond spreads and standardised financial conditions indices

(generalised impulse response functions, standard deviations)



Sources: Bloomberg, iBoxx, Thomson Reuters and ECB calculations.
Notes: The generalised impulse response functions (GIRFs) are obtained from a daily bivariate VAR with corporate spreads and two different financial conditions indices (FCIs). The GIRFs show the shock at impact generated from the corporate spreads. FCIs are standardised over the sub-sample periods. "Before CSPP" covers the period from 1 June 2014 to 9 March 2016. "After CSPP" covers the period from 10 March 2016 to 7 February 2018.

2.2 Impact of the CSPP on corporate bond issuance

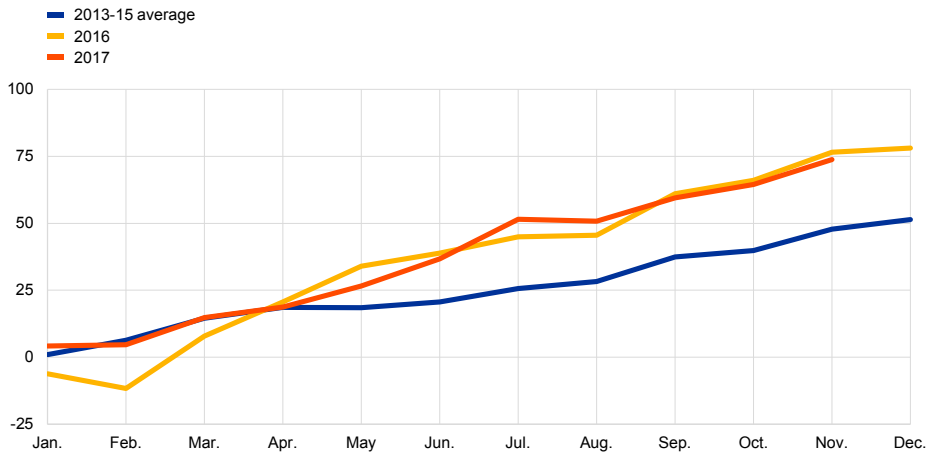
The CSPP appears to have contributed to improved supply conditions in primary corporate bond markets, particularly among eligible issuers. Net issuance by NFCs picked up immediately after the announcement of the CSPP in March 2016. Since then it has remained stronger than in previous years (see

Chart 6). This trend is particularly evident among NFCs based in France, the Netherlands and, to a lesser extent, Italy (see Chart 7). On a gross basis, issuance also remained concentrated in relatively few countries. Specifically, an increase in issuance by NFCs based in Germany, Spain, France, Italy and the Netherlands has been seen since the CSPP announcement.[68] By contrast, banks, whose bonds are not eligible for purchase under the CSPP and which, unlike NFCs, have access to TLTROs, have reduced their bond issuance funding activities.

Chart 6

Net issuance of euro-denominated long-term debt securities by NFCs in the euro area

(EUR billions; cumulative monthly flows)

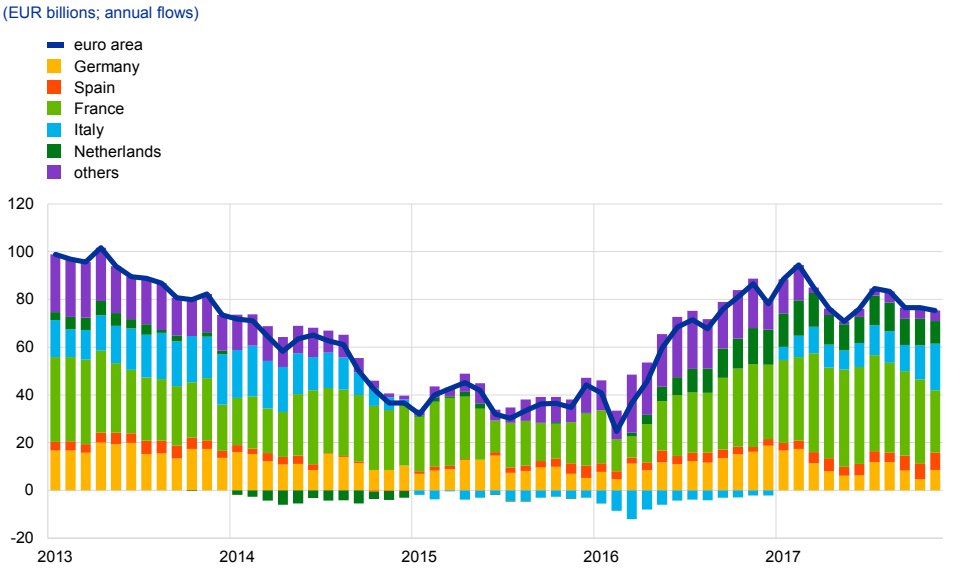


Source: ECB.
Note: The latest observations are for November 2017.

[68] It can be challenging to assess the country breakdown of issuance because companies may use subsidiaries in another euro area country to issue debt.

Chart 7

Net issuance of euro-denominated long-term debt securities by NFCs in selected euro area countries



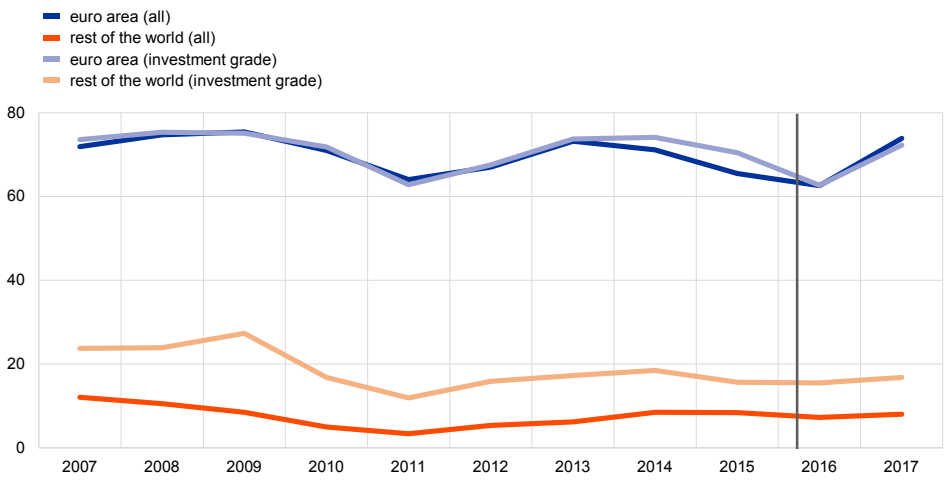
Source: ECB.
Notes: The breakdown is by residence of issuer. Net issuance includes both newly issued bonds and sales from past issues (i.e. tap issues). The latest observations are for November 2017.

At the same time, the maturity of newly issued, CSPP-eligible bonds has increased. Between March 2016 and October 2017, the average residual maturity of outstanding senior unsecured investment-grade bonds issued by NFCs increased from 8.9 years to 9.3 years, corresponding to a maturity lengthening of about 5 months. This change is larger than the maturity lengthening observed between June 2014 and the announcement of the CSPP, i.e. in a period when other major non-standard monetary policy measures were introduced by the Eurosystem. Whereas the residual maturities of outstanding bonds issued by NFCs have lengthened in all major euro area countries, outstanding bonds issued by banks – which are ineligible for purchase under the programme – have not shown any increase in residual maturities across countries.

Lastly, the CSPP seems to have shifted the preferences of NFCs back towards issuing euro-denominated bonds at levels recorded before 2015. Over the CSPP period, the share of eligible euro-denominated bond issuance by NFCs in total NFC bond issuance has risen. In 2017 it reached levels last seen in early 2015 (see Chart 8). Such a shift in favour of euro-denominated assets is not observable for ineligible bonds issued by NFCs in other jurisdictions or issued by the euro area banking sector, suggesting that at least part of the change in the currency denomination of bonds issued by euro area NFCs over the CSPP period is due to the programme.

Chart 8

Share of debt issued in euro by euro area NFCs and by NFCs in the rest of the world



Sources: Dealogic and ECB calculations.
Notes: The lines for "euro area" show new bond issuance denominated in euro as a share of total new bond issuance by NFCs based in the euro area. The lines for "rest of the world" show new bond issuance denominated in euro as a share of total new bond issuance by all NFCs based outside the euro area. The vertical line marks the announcement of the CSPP on 10 March 2016. The latest observations are for December 2017.

2.3 Impact of the CSPP on the capital structure of euro area NFCs and spillover to CSPP-ineligible borrowers

The rising NFC bond issuance suggests a shift by some firms from bank-based to market-based funding. Since the announcement of the CSPP, the net issuance of bonds by the NFC sector as a whole has risen relative to the net flow of loans to NFCs from monetary financial institutions (MFIs) (see Chart 9). NFCs whose bonds are eligible for purchase under the CSPP appear to have substituted bank financing with bond financing to some degree. In a sample of 534 euro area NFCs, the 113 NFCs with bonds that are eligible for the CSPP showed a rise in the share of bonds in their overall debt structure, with the average across firms growing from 64% at the end of 2015 to 66% by the second quarter of 2017 (see Chart 10, left panel). By contrast, the share of bank loans of longer maturity declined from an average of 24% to 21% over the same period. At the same time, the 421 NFCs with bonds that are ineligible for the CSPP did not change their debt structure (see Chart 10, right panel). Similar results are obtained by Grosse-Rueschkamp, Steffen and Streitz[69] and Arce, Gimeno and Mayordomo[70], who find that, in some countries, the CSPP has triggered a substitution of bank financing with bond financing in large CSPP-eligible companies.

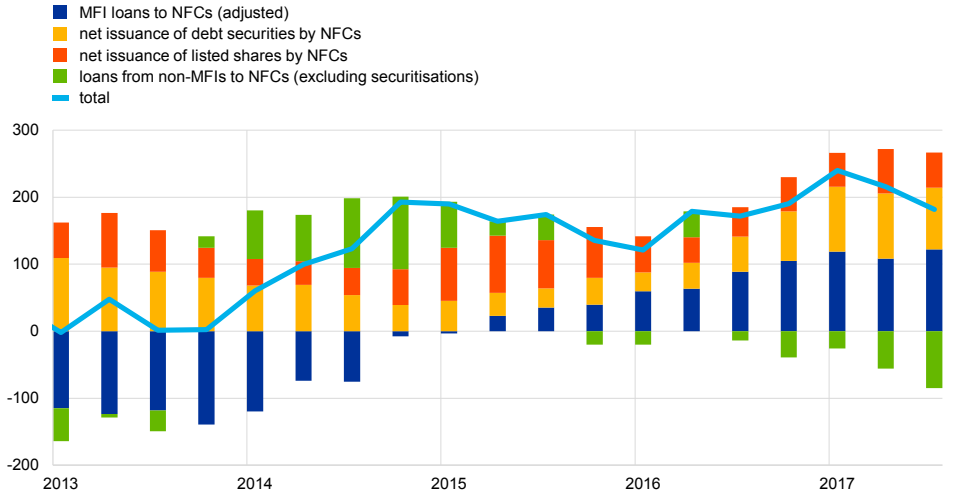
69 See Grosse-Rueschkamp, B., Steffen, S. and Streitz, D., "Cutting out the middleman – The ECB as corporate bond investor", SSRN, October 2017.

70 See Arce, Ó. Gimeno, R. and Mayordomo, S., "Making room for the needy: The credit-reallocation effects of the ECB's corporate QE", *Working Papers*, No 1743, Banco de España, 2017.

Chart 9

NFCs' flow of external financing

(EUR billions; quarterly flows, four-quarter sums)

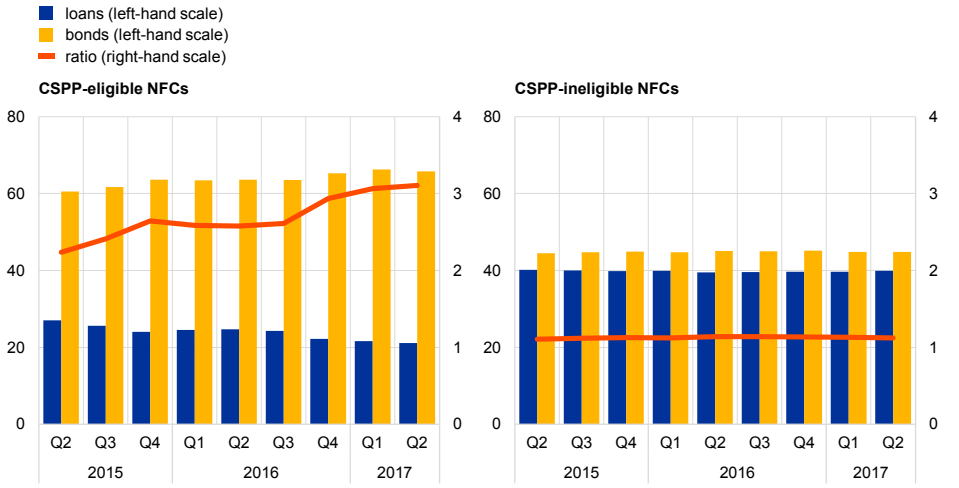


Sources: Eurostat, ECB and ECB calculations.
Notes: Non-MFI loans include loans from other financial intermediaries (OFIs) and insurance corporations and pension funds (ICPFs) to NFCs. The latest observations are for September 2017.

Chart 10

Debt structure of NFCs: eligible versus ineligible

(percentages)



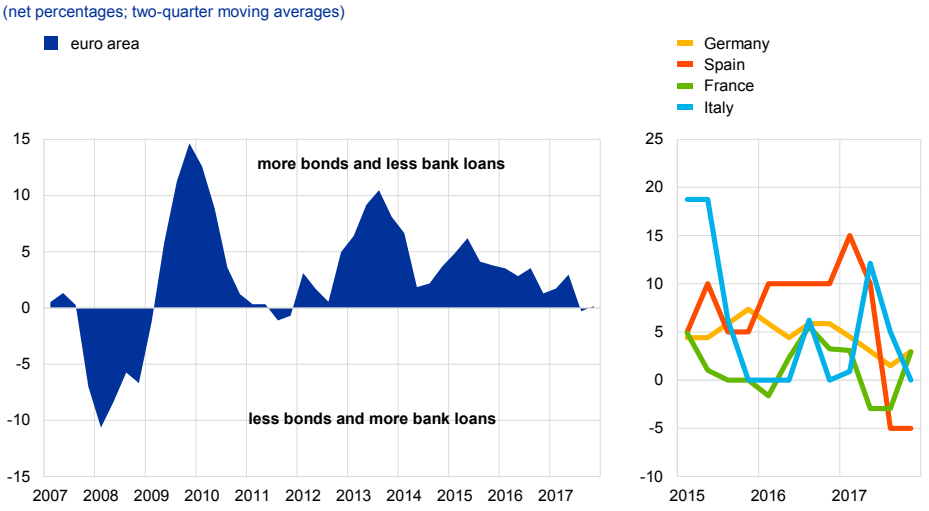
Sources: S&P Capital IQ and ECB calculations.
Note: The latest observations are for the second quarter of 2017.

Notwithstanding the rise in bond financing in some firms, on aggregate the flow of bank loans was not adversely affected. Rather, the net flow of MFI loans to the NFC sector has been positive and has even accelerated since the announcement of the CSPP (see Chart 9). Indeed, model-based evidence suggests that the flow of MFI loans to NFCs remained relatively tightly linked to its fundamental drivers in 2016, whereas the issuance of debt securities has been well

above the level implied by fundamental factors.[71] Results from the euro area bank lending survey (BLS) corroborate these findings. The CSPP has not reversed the decline in the perception among banks that NFCs are relying more on market-based financing than on bank-based financing to meet their financing needs (see Chart 11). The net percentage of banks reporting that NFCs would rather resort to market funding than to bank loans has fallen in the BLS round of the fourth quarter of 2017 tangibly below the level seen at the time of the CSPP announcement in March 2016, reaching its lowest point since the euro area sovereign debt crisis.

Chart 11

Market-based financing versus MFI loans to NFCs – BLS substitution financing indicator



Sources: Eurostat and ECB.
Notes: The indicator is constructed using question 7 of the BLS, which assesses whether "issuance/redemption of debt securities" is a factor affecting the demand for loans to enterprises. A positive (negative) net percentage indicates that banks see a decrease (increase) in bank loan demand due to an increase (decrease) in bond issuance. The latest observations are for December 2017.

Taken together, these observations indicate that the CSPP may have freed up bank balance sheet capacity to lend to CSPP-ineligible firms. With net MFI lending to the NFC sector accelerating overall and some CSPP-eligible companies shifting their funding away from bank loans, NFCs with little or no access to bond markets may have indirectly benefited from the CSPP, as banks have increased the supply of bank loans to them. Although it is difficult to attribute changes in bank-lending behaviour to the CSPP, some evidence supports the conclusion that the programme may have made a positive contribution to the provision of bank financing to CSPP-ineligible firms, particularly smaller firms. Specifically, the net percentage of small and medium-sized enterprises (SMEs) reporting improvements in the willingness of banks to provide credit in the Survey on the Access to Finance of Enterprises (SAFE) increased somewhat in the first half of 2016 (see Chart 12) at the time in which the CSPP was announced and became operational. This was

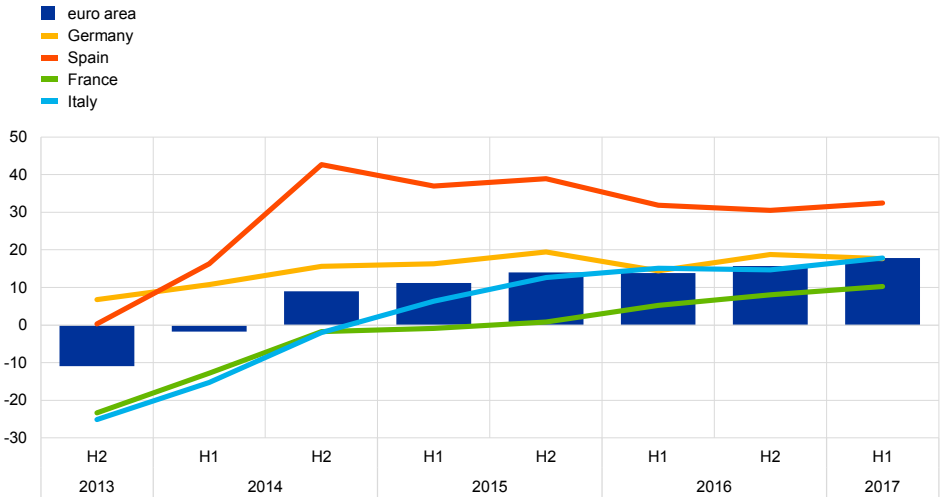
[71] In 2017, by contrast, the issuance of debt securities fell below the level implied by fundamental factors, which may be partly explained by firms having covered their near-term financing needs through higher retained earnings, greater recourse to borrowing from banks, and the frontloading of bond issuance to 2016. Moreover, merger and acquisition activity continued to moderate, reducing the demand for external financing.

particularly evident in France, where companies have accounted for a large share of the higher bond issuance seen since the CSPP announcement (see Chart 12, green line). At the same time, Arce, Gimeno and Mayordomo[72] offer direct econometric evidence for a surge in lending to CSPP-ineligible firms in Spain around the time of the CSPP announcement, while Grosse-Rueschkamp, Steffen and Streitz[73] demonstrate a stronger rise in the lending volumes of banks with a large share of CSPP-eligible borrowers in their portfolios than in those of banks with a smaller share of such borrowers.

Chart 12

Change in willingness of banks to provide credit to SMEs in the euro area and selected euro area countries

(preceding six-month period; net percentages of respondents)



Sources: ECB and ECB calculations.
Note: Figures are from rounds ten (October 2013 to March 2014) to seventeen (April to September 2017) of the SAFE survey.

3 CSPP impact on secondary market functioning and liquidity conditions

The Eurosystem considers the impact on market functioning and liquidity when it calibrates the implementation of the CSPP. The CSPP is aimed at affecting general market conditions to support lending to the real economy, while seeking to avoid creating undue market distortions. The calibration of CSPP parameters – including the overall amounts purchased, the share of participation in primary and secondary markets, the distribution across countries, sectors or companies, and the overarching risk management framework – is designed and carried out to minimise the potential detrimental impact on corporate bond market functioning. This objective of "market neutrality" is pursued through flexibility and adaptability to market conditions.

72 Arce, Gimeno and Mayordomo, op. cit.

73 Grosse-Rueschkamp, Steffen and Streitz, op. cit.

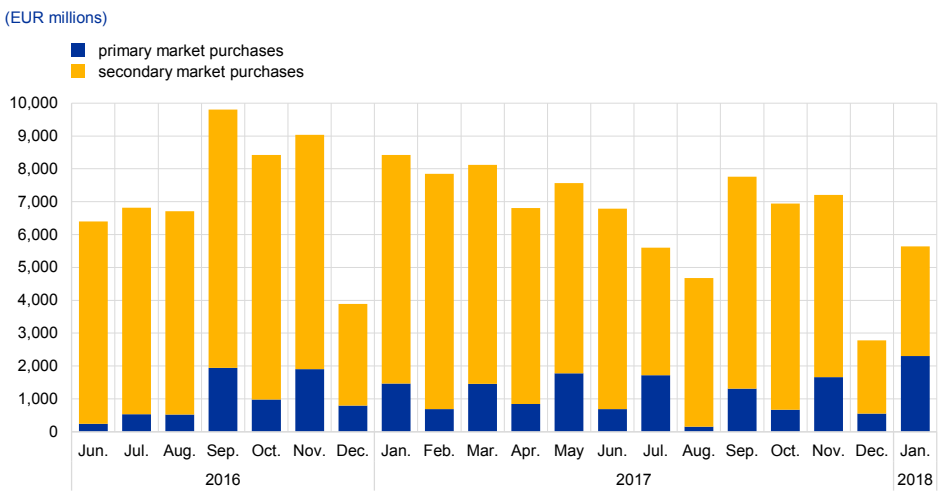
Several indicators can be used to assess whether the CSPP implementation is in line with the market neutrality principle of the APP. Market infrastructure, liquidity and functioning are dynamic in nature and are influenced by a multitude of factors which fall outside the scope of the monetary policy programmes. Therefore, not all changes in market functioning and liquidity can be attributed to the CSPP. For example, geopolitical developments, seasonal trends and individual issuer or sector-related events can have an effect on overall market conditions or on an individual issuer's bond yields.

3.1 Market functioning

The adaptability of CSPP monthly purchase volumes enables a flexible implementation of the programme in response to varying market conditions, including different issuance and secondary market activity. Primary market issuance and secondary market liquidity conditions follow a well-known pattern (i.e. usually strong at the start of the year and deteriorating in the summer and towards the end of the year). These patterns are used as an input when planning the CSPP monthly purchase amounts. If the conditions turn out to be substantially different from those anticipated, the CSPP can adapt by either increasing or decreasing purchases compared with the initial plan. Since its inception, monthly net CSPP purchases have fluctuated substantially, from around €3 billion in months of low market liquidity and low primary market activity to almost €10 billion in the most active months (see Chart 13).

Chart 13

Primary and secondary market net purchases under the CSPP



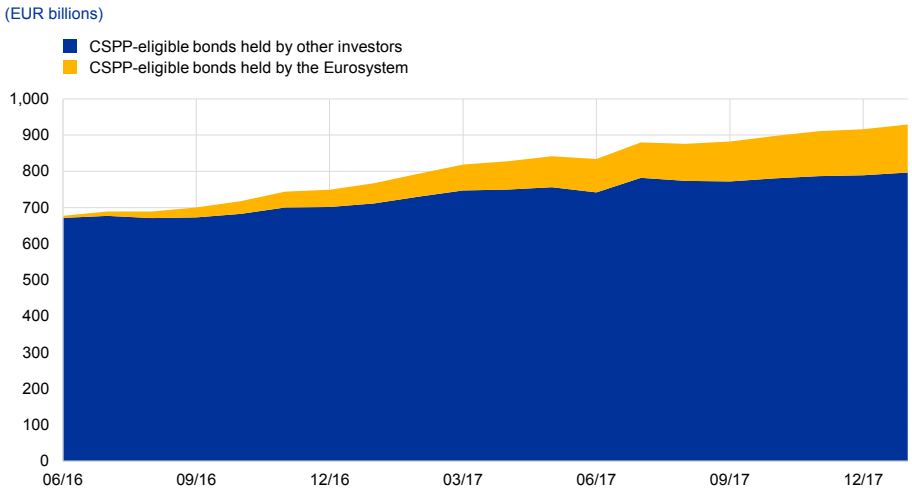
Source: ECB.
Note: The latest observations are for January 2018.

The flexibility of the split in the CSPP between primary and secondary market purchases provides another means of adapting to market conditions. The Eurosystem has no pre-set target for dividing overall purchase volumes between primary and secondary markets. This allows it to adapt to changing primary market issuance and secondary market liquidity conditions, which can be unpredictable.

This can be seen in the variability of the division between primary and secondary market purchases in Chart 13. Overall, when it participates in primary market issuances, the Eurosystem aims to balance the purchase volume objective of the programme with the need to ensure continued market functioning. Similarly, when making purchases in the secondary market, the Eurosystem considers, among other things, general market conditions and the scarcity of specific debt instruments.

The Eurosystem's CSPP holdings are moderate in relative terms, which reduces the risk of a large and negative impact on market functioning. After almost two years of programme implementation, cumulative CSPP holdings amount to around €150 billion (at amortised cost) and now account for 17% of the total CSPP-eligible universe. However, owing to the increase in issuance mentioned in the previous section, the volume of CSPP-eligible bonds held by other market participants has also risen in absolute terms (see Chart 14). Since the other market participants continued to play an important role, a negative impact on the price-setting and price discovery mechanism is minimised.

Chart 14
CSPP-eligible universe and share held by the Eurosystem



Sources: Eligible Assets Database (EADB) and ECB calculations.
Note: The latest observations are for January 2018.

3.2 Liquidity conditions

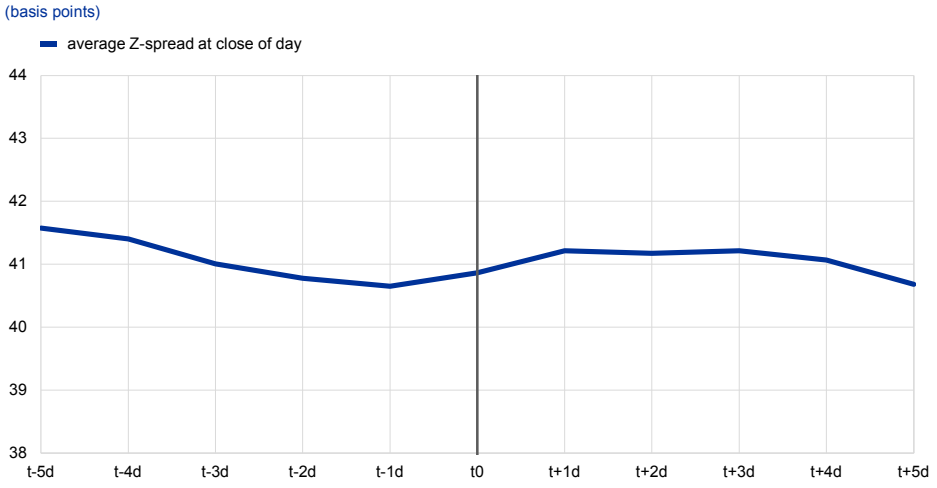
The evaluation of the impact of the CSPP on market liquidity is challenging, because market liquidity is difficult to quantify with a simple statistic. Markets are usually defined as liquid if a market participant is able to make a transaction without having a large impact on prices. Several quantitative indicators are needed to trace this comprehensively through time.

An evaluation of individual trades suggests that the short-term impact of CSPP trades on the market has been muted. To assess the impact, an event study was performed, focusing on the largest trades carried out within the CSPP. These were not found to have had a material impact on the pricing of the bonds in the market, as

spreads before and after the trades for the bonds concerned did not differ significantly (see Chart 15). Thus, while the CSPP may have contributed to overall spread compression in corporate bond markets, it seems that individual trades did not have a distortional impact on the pricing of particular bonds. Hence, it may be concluded that relative price formation is broadly unaffected.

Chart 15

Impact of large CSPP trades on spreads



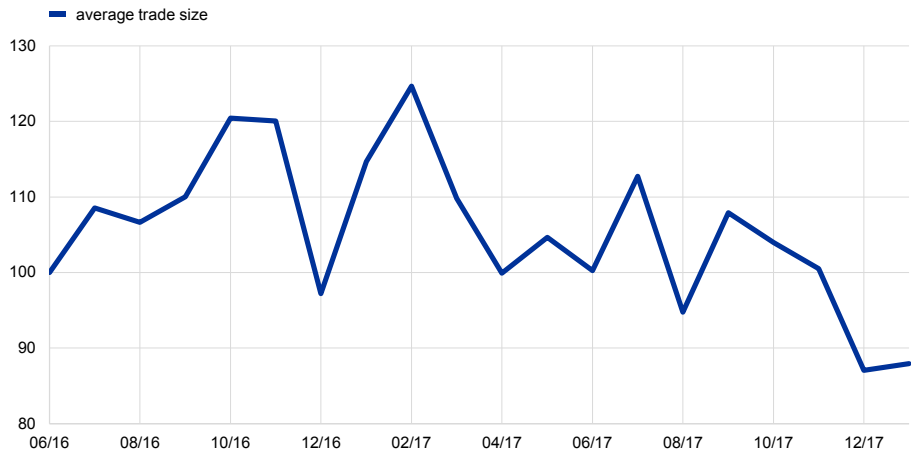
Sources: Bloomberg and ECB calculations.
Note: The chart is based on the 58 largest CSPP secondary market trades where there were no other CSPP trades on the 5 preceding or 5 succeeding days and where price information is available for all days.

The evolution of the average CSPP trade size also suggests that liquidity conditions have remained adequate (see Chart 16). If liquidity conditions had deteriorated since the start of the CSPP, the Eurosystem would most likely have had to adapt by resorting to a significantly higher number of smaller trades. An analysis of the average size of all CSPP secondary market trades shows that there was only a slight drop in the average size after more than one year of CSPP implementation. However, the Eurosystem has adapted to market conditions and therefore occasionally has reduced its average trade size, particularly at times when liquidity is typically low owing to seasonal trends (e.g. in December).

Chart 16

Average size of CSPP secondary market trades

(index: June 2016 = 100; monthly data)



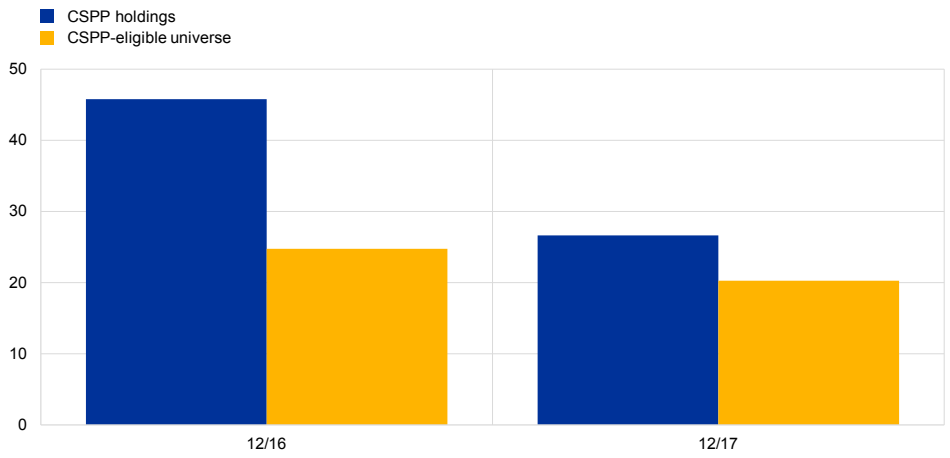
Source: ECB.
Note: The latest observations are for January 2018.

As a proportion of its overall holdings, the Eurosystem buys a higher share of recently issued bonds than their market weight, which reduces any potential negative impact on liquidity conditions. The CSPP operates under an overarching monetary policy and risk management framework which ensures due diversification across issuers, sectors and countries. Nevertheless, the holdings of each bond may vary from its weight in the CSPP-eligible universe, allowing the CSPP to adapt to the different liquidity conditions of eligible instruments. For instance, some bonds, in particular older, less liquid ones, are less available in the secondary market,[74] and the Eurosystem tends to receive more offers of newer, more liquid bonds. Chart 17 shows that the proportion of recently issued bonds (issued within the last year) in the Eurosystem's CSPP holdings is higher than in a market capitalisation benchmark. It also shows that this deviation decreased in 2017 compared with 2016. This is to be expected, since, as older and less liquid bonds mature, such deviations are gradually reduced and the composition of CSPP holdings converges to that of the market capitalisation-based benchmark.

[74] Recently issued or "on-the-run" securities are generally considered to be more liquid in the secondary market. As time passes, the liquidity of the security usually decreases. An older, less liquid security is called an "off-the-run" security.

Chart 17

Share of recently issued bonds in CSPP holdings and in the CSPP-eligible universe

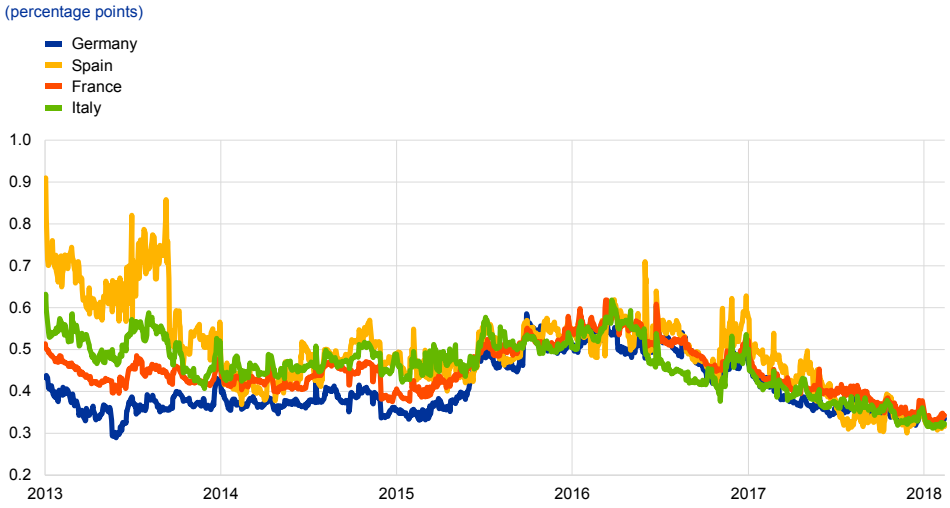


Sources: Bloomberg and ECB calculations.
Notes: The blue bars denote the share of CSPP-eligible bonds issued during the last year in the total CSPP holdings of the Eurosystem. The yellow bars denote the share of CSPP-eligible bonds issued during the last year in the total CSPP-eligible universe.

Finally, bid-ask spreads have tightened considerably since the start of the CSPP, suggesting that the programme has been supportive of liquidity conditions. A liquid market is usually characterised by low bid-ask spreads, i.e. a small difference between what a buyer is willing to pay and what a seller is willing to accept for an asset. Bid-ask spreads for investment-grade NFC bonds in a range of countries had been widening in 2015 (see Chart 18), but, since the CSPP announcement in March 2016, these spreads have shown a clear tightening tendency and are currently at historically low levels. This can be seen as an overall positive side effect of the regular presence of the CSPP in credit markets.

Chart 18

Bid-ask spreads of investment-grade NFC bonds in selected euro area countries



Sources: iBoxx and ECB calculations.
Notes: The country indices are computed as the weighted average of the spread between the ask and the bid price as a percentage of the mid-price of individual securities. The latest observations are for 13 February 2018.

4 Conclusions

Since the announcement of the CSPP on 10 March 2016, financing conditions for euro area NFCs have improved considerably. Corporate bond spreads have tightened and corporate bond issuance has increased. An ample set of analytical studies attributes a sizeable part of these developments directly to the effects of the programme. Indirectly, the CSPP has also had positive knock-on effects on the wider financing environment for firms in the euro area. Financing conditions outside of corporate bond markets improved, and there are indications that the CSPP has freed up the balance sheet capacity of banks to lend to companies that are not eligible under the programme. In fact, although the programme appears to have contributed to a shift from bank to bond funding among eligible NFCs, this has not resulted in a decline in bank lending to the NFC sector as a whole.

Reassuringly, evidence of adverse side effects on corporate financing and market functioning as a result of the CSPP is rather scarce. In particular, the smooth implementation of the programme, underpinned by the flexible pace of Eurosystem purchases and its adaptability to dynamics in the primary market, has safeguarded corporate bond market functioning and liquidity conditions. Overall, these findings back up the assessment of a successful implementation of the programme under changing market conditions without having a distortive market impact.