Corporate Sector Purchase Programme: Game Changer for Corporate Bond Issuance Behaviour in the Euro Area

Roel Schrauwen
432383

ERASMUS UNIVERSITY ROTTERDAM
Erasmus School of Economics
Master Thesis Financial Economics

Supervisor	T. Eisert
Second Assessor	X
Date	June 2017

Abstract

On March 10, 2016 the ECB announced its Corporate Sector Purchase Programme (CSPP) in which it purchases investment grade non-bank corporate bonds of euro area issuers. This research examines the corporate reaction during the post-announcement period with respect to bond issuance behaviour. I make a distinction between eligible and non-eligible firms based on the eligibility list of the ECB and find that eligible firms tend to increase their bond issuance by 0.7% compared to their non-eligible counterparts in the post-announcement period. In different sub-samples based on company location, public status and leverage profile the results are persistent and highly significant. The programme succeeds in easing financing conditions and stimulating bond issuances for eligible companies, but fails to have a significant impact on firms based in GIIPS countries, where stimulus may be needed most.

Keywords: Corporate Sector Purchase Programme (CSPP), ECB, Corporate Financing Decisions, Monetary Policy, Corporate Bonds

Contents

1. Introduction

Following the Global Financial Crises and the Sovereign Debt Crises, the European Central Bank (ECB) has been lowering its three key interest rates – the rate for the deposit facility, the main refinancing operations and the marginal lending facility – to stimulate economic activity and fight disinflation. Since June 2014 the deposit facility rate has been negative, the rate for main refinancing is zero since March 2016 and the rate for marginal lending is close to zero (ECB, 2017a). These conventional measures alone did not succeed in stimulating the economy to satisfy the close to but lower than 2% target inflation rate. The turning point in the euro area occurred when Mario Draghi, president of the ECB, announced to do whatever it takes to preserve the euro on July 26, 2012. The Outright Monetary Transactions (OMT) programme restored financial stability in the euro area by giving sovereigns free unlimited support.

Almost four years after Draghi's speech, inflation levels are still not near the 2% threshold. In order to break the trend of low inflation, the ECB announced the extended asset purchase programme (APP) in which it will purchase bonds of governments, government related agencies and European supranational organisations in an amount of €60 billion a month. More than a year after the ECB announced the APP in January 2015, it has broadened the scope of its monetary policy by including corporate bond purchases and increasing combined monthly purchases to €80 billion. The corporate sector purchase programme (CSPP) is designed to stimulate economic growth, ease financing conditions for euro area corporates and increase inflation in the short- and medium-term. The programme was announced on March 10, 2016 and immediately led to a large compression of credit spreads and corporate bond yields and a jump in corporate bond issuance. The aim of this paper is to assess the effectiveness of the latter.

The ECB established seven conditions which any given bond should meet in order to be theoretically eligible under the CSPP. The bond has to be (i) denominated in euros, (ii) rated a minimum first-best credit assessment of BBB-, (iii) maturing in a minimum of 6 months and a maximum of 31 years, (iv) issued by a corporation established in the euro area, (v) issued by a non-credit institution or (vi) parent non-credit institution and (vii) issued by no asset management vehicle or divestment fund. Besides these criteria, the ECB maintains a list of all eligible assets that are allowed to be bought in the APP. For bonds, and therefore indirectly firms, to be eligible under the CSPP, they have to appear on the ECB eligibility list. A data sample is created where almost 75% of all euro area corporate bond issuers that fit the theoretical criteria are represented that have issued an even larger percentage of total amount outstanding in the investigated period. To assess the effectiveness of the programme, bond issuance behaviour between eligible and non-eligible companies will be investigated.

My empirical analysis covers four sections. In the first section, the entire sample is used to examine the overall effect of the CSPP announcement and start on eligible versus non-eligible corporate bond issuance behaviour. I find that the CSPP is significantly impacting new issuances of corporate bonds for eligible companies with an increase of 0.7% in issuance intensity compared to non-eligible firms. This indicates that the improvement of financing conditions following the CSPP announcement was indeed helping eligible firms to debt finance themselves through the bond market. I also find that the start of the CSPP did not have a significant impact on top of the already present announcement effect.

The second, third and fourth sections present the results from different subsamples based on company location, public status and leverage profile. Eligible GIIPS companies do not tend to change their issuance behaviour significantly after the announcement of the CSPP. This suggests that the CSPP fails to mitigate financing constraints in GIIPS countries. In non-GIIPS countries there is a significant increase in new debt issues by eligible firms. Eligible public and private companies tend to increase their issuance after the announcement by 0.5% and 1.7% respectively. However, the increase in issuance behaviour of eligible private firms needs to be interpreted with caution, as the effect is not highly significant. Although, the major increase at private firms may be explained by the ability of the ECB to buy up to 70% of a bond directly at issue. The CSPP is also effective in easing financing constraints of eligible low and medium levered firms, since they increase their issuance scaled by total assets with around 0.5%. Results are tested for robustness against common time trends and time invariant unobserved company heterogeneity, and other time varying firm-specific characteristics.

To the best of my knowledge this is the first paper to investigate corporate issuance behaviour while making use of different subsamples following the CSPP. My paper contributes to the vastly growing literature on unconventional monetary policy by addressing the corporate response to the CSPP announcement. It relates to previous studies[1] measuring the effect of unconventional monetary policy on asset prices. Previous unconventional monetary policy implementations include the Large-Scale Asset Purchases in the United States, the Comprehensive Monetary Easing programme in Japan, Quantitative Easing in the UK and the ECBs OMT and APP. These studies will be discussed in the Related Literature section.

The paper is set up as follows. Section 2 describes the theoretical framework including conventional and unconventional monetary policies and related literature. Section 3 explains the unconventional monetary measures implemented by the ECB. It covers

[1]See Doh (2010), Bank of Japan (2011), Gagnon et al. (2011), Hancock & Passmore (2011), Joyce et al. (2011), Krishnamurthy & Vissing-Jorgensen (2011), Lam (2011), Rosa (2012), Wright (2012), D'Amico & King (2013), Gilchrist & Zakrajsek (2013), Rogers et al. (2014), Ferrando et al. (2015), Szczerbowicz (2015), Altavilla & Giannone (2016), Altavilla et al. (2016) and Brózda (2016).

the CSPP in particular and already gives perspective on market and corporate reactions. The data gathering and descriptive statistics will be discussed in Section 4. Section 5 contains the methodology describing the research design and the different subsamples. The empirical results are presented in Section 6 after which Section 7 concludes.

2. Theoretical Framework

Central banks mainly have two ways in stimulating the domestic economy: (i) enacting conventional monetary measures, such as reducing its policy rates and (ii) implementing unconventional monetary measures, including asset purchases. This section will briefly discuss the conventional and unconventional monetary measures at hand.

2.1. Conventional Monetary Policy

Normally, central banks counteract market dysfunctions through the control of the short-term nominal interest rates. Over the short to medium term, central banks are also able to influence real interest rates, because inflation does not directly respond one for one to changes in nominal interest rates. Central banks can affect economic decisions based on the assumption that real interest rates influence asset prices. The amount of consumption or savings of individuals, the willingness of firms to invest and the eagerness of banks to increase or decrease their lending activity are all related to changes in asset prices and therefore to changes in real interest rates. As a result, a change in real interest rates potentially changes the level of output and employment (Lucas & Rapping, 1969; Fawley & Neely, 2013).

More specifically, central banks execute monetary policy by purchasing and selling short-term debt instruments to reach the desired short-term nominal interest rate. The purchases and sales affect both the monetary base the amount of money and bank reserves in the economy and the short-term interest rates (Ireland, 2010; Gambacorta et al., 2014). There are two ways a central bank can expand its monetary base. The first is by simply lending money and the second is by buying short term debt instruments in the open market. This way the amount of debt holdings in the market decreases and the amount of money and bank reserves in the market increases. This conventional monetary policy can potentially stimulate the economy through two types of transmission channels: asset price channels including interest rate channels and credit channels (Mishkin, 1996; Bean et al., 2002; Fawley & Neely, 2013).

Short-term nominal interest rates have an influence on real interest rates through the rigidity of prices on the short term. Short-term real interest rates on their turn have an influence on the long-term real interest rates, because these are an average of

expected future short-term interest rates (Mishkin, 1996). Investors take real interest rates into account to avoid losses through inflation. Hence, long term real interest rates have an effect on the cost of capital, resulting in a positive or negative effect on the consumption of households and corporate investment decisions, and therefore directly influencing aggregate supply and demand (Bean et al., 2002). Trough expanding the monetary base, by buying short term securities, and lowering short term real interest rates, central banks can influence a large selection of assets, of which exchange rates and stock prices. Higher stock prices can directly lead to more equity issuances and corporate investments on the one hand, and a lower exchange rate can increase the competitiveness of domestic versus foreign goods on the other hand. Hence, a lower interest rate can potentially lead to more consumption and investments (Fawley & Neely, 2013).

The main disadvantage of conventional monetary policy is that it is subject to a zero lower bound. Individuals will always have the ability to hold cash instead of depositing it in a bank. Therefore, short-term nominal interest rates cannot drop much lower than zero. When interest rates drop to or beneath zero, bonds and money become close substitutes, which prevents extra monetary stimulus from flowing into the real economy. This is called a liquidity trap (Werning, 2011). Once this zero bound is reached policy makers cannot ease policy by decreasing short-term nominal interest rates. Central banks will be forced to ease policy under the quantitative approach, that is buying eligible assets via open market operations or to provide funds through the discount window (Sellon, 2003; Wu & Xia, 2016).

2.2. Unconventional Monetary Policy

As previously discussed, a zero lower bound on interest rates means that the conventional measures in monetary policy are no longer efficient. In the aftermath of the Global Financial Crisis and the Sovereign Debt Crisis monetary policy changed its aim from conventional to unconventional measures and size of a central banks balance sheet became the focus. The central banks expand their balance sheets by buying assets, such as government bonds but also assets issued by the private sector (Hamilton & Wu, 2012). Asset purchases by the central bank are explicitly in quantities, contrasting decisions about a target for interest rates. The central bank expands its balance sheet by increasing its monetary liabilities – larger reserves held in the banking system – and buying debt instruments on the market, thereby shifting the portfolio of the private sector towards having more claims on the central bank (liabilities side) and less towards claims on the private sector that have shifted towards the asset side of the central bank (Curdia & Woodford, 2009; Smaghi, 2009; Joyce et al., 2012).

According to Joyce et al., (2012), these unconventional monetary policies are transmitted to the real economy through three main transmission channels: the portfolio balance

channel, the signalling channel and the liquidity channel. The merits of the portfolio balance channel are described by Tobin (1961, 1969) and Brunner & Meltzer (1973), and are being portrayed as an important transmission channel in more recent studies on unconventional monetary policy (Gagnon et al., 2011; Meaning & Zhu, 2011; Christensen & Rudebusch, 2012; Bauer & Rudebusch, 2013; Fratzcher et al., 2016). They emphasize that central banks can manipulate the path of yields on various securities due to imperfect asset substitutability by altering the relative supply and demand of debt instruments with different durations and liquidity. A segmented bond market is characterized by a demand for long and short maturities and these bonds are imperfect substitutes. This channel is also reliant on different investor preferences; along different segments of the yield curve you will find different investor types. This explains why pension funds and insurance companies are more likely to hold safe debt instruments in their portfolios, such as government bonds (Bauer & Rudebusch, 2013). If bond markets are efficient, unconventional monetary policy announcements such as quantitative easing should be priced in immediately by financial markets (Gagnon et al., 2011). The central bank purchases safe long-term debt assets in the market, which decreases the yield on such assets and creates liquidity on the investor side. Investors want to allocate their cash and are therefore more likely to buy assets with a higher expected return, thus embracing more risk. Therefore, unconventional monetary policy directly affects asset prices and as a results influences real investment decisions through the portfolio balance channel (Joyce et al, 2012; Arslanalp & Botman, 2015; Albertazzi et al., 2016).

The second transmission channel is the signalling channel (Krisnamurthy & Vissing-Jorgensen, 2011; Swanson, 2011; Christensen & Rudebusch, 2012; Bauer & Neely, 2013). It has become an increasingly important part of unconventional and conventional monetary policy over the last few decades. Central banks communication on unconventional monetary policy to the public concerns the objectives and strategy of the policy, the outlook on future policy decisions and economic developments resulting from policy implementation. The historical ability of a central bank to influence the economy plays a significant role in the ability to influence future market expectations. Nowadays, managing expectations has become a crucial part of executing monetary policy (Blinder et al., 2008; Cecioni et al., 2011). This is directly applicable to this paper as the announcement effect of the programme immediately leads to a strong reaction of both financial markets and corporates in the euro area.

2.3. Related Literature

Research on responses in financing decisions for corporates to unconventional monetary policy is still relatively thin. This paper adds to a vastly growing amount of literature on the impacts of unconventional monetary policy. It relates to several studies that quan-

tify the effect of asset purchases by central banks on asset prices and long-term interest rates. The Large-Scale Asset Purchases (LSAP) by the Federal Reserve led to reduction in long-term interest rates on a range of securities not only the ones included in the LSAP programme (Gagnon et al., 2011; Rosa, 2012). Purchases of mortgage backed securities reduced mortgage rates and risk premiums significantly (Hancock and Passmore, 2011). The LSAP also significantly lowered corporate bond yields (Krishnamurthy & Vissing-Jorgensen, 2011; Wright, 2012; D'Amico & King, 2013; Brózda, 2016) and caused a large decrease in corporate credit risk (Gilchrist & Zakrajsek, 2013). This drop in yields and credit risk is also estimated to be persistent for a minimum of one year (Altavilla & Giannone, 2016). Doh (2010) finds significantly lowering Treasury bond yields right after the LSAP announcement and Joyce et al. (2011) also find decreasing government bond yields in the UK after the announcement of Bank of England's quantitative easing policy.

The Bank of Japan (BOJ) has also conducted unconventional monetary measures when reaching the zero lower bound by purchasing assets on the open market. Just like the Federal Reserve and the Bank of England, the BOJ started purchasing government bonds in 2009 to ensure financial stability. Fairly soon after starting the Comprehensive Monetary Easing (CME) policy, the BOJ announced to add corporate bonds, commercial paper, exchange-traded funds (ETFs) and real estate investment trusts (REITs) to its portfolio of holdings. After the announcement, Lam (2011) finds a significant decrease in corporate bond yields of 15 to 22 basis points and an increase in equity prices of 2% to 3% due to the inclusion of ETFs and REITs. The Bank of Japan (2011) finds similar results following the announcement of including corporate bonds in the programme. Credit spreads tightened for corporate bonds that are eligible to be purchased under the CME, particularly investment grade bonds with a short remaining maturity. The effects of the CME seem to spill over to bonds with longer remaining maturities, since investors start selling the high priced shorter maturities and consequently buying lower priced longer maturity corporate bonds. With regards to bond issuance behaviour the BOJ finds that not only issuance amounts but also number of issuing firms quickly return to levels prior to the fall of Lehman Brothers in 2008 due to the favourable investor demand and scarcity created by the CME. CDS spreads also significantly decreased since the inclusion of corporate bonds despite having a weak stock market, resulting in an increasing gap in the performance of the Nikkei index and CDS spreads.

The CSPP follows a series of unconventional monetary policies implemented by the ECB. The launch of the Outright Monetary Transactions (OMT) programme following Mario Draghi's whatever it takes speech in 2012 caused an immediate decrease in covered and sovereign bond spreads and was most effective in lowering borrowing costs of banks and sovereigns exposed to high sovereign risk (Szczerbowicz, 2015). Altavilla et al. (2016) find a significant decrease on government bond yields in Italy and Spain and

thereby easing financing conditions for these sovereigns, while no significant change can be seen in the yields of similar bonds in France and Germany. Ferrando et al. (2015) discover that, after the announcement of the OMT, firms with a recovered outlook and credit history tend to have easier access to external funding, therefore the OMT mainly benefits corporates in non-GIIPS countries. Corporates in GIIPS countries tend to resort to more expensive sources of external finance. Rogers et al. (2014) examine the effects of unconventional monetary policy at the zero lower bound by the Federal Reserve, Bank of England, European Central Bank and Bank of Japan in their cross-country comparison study and find that all four programmes are effective in lowering yields and easing financing conditions for all parties included in the programmes.

3. Unconventional Monetary Policy by the ECB

Since the Global Financial crises of 2008 and the following European Sovereign debt crises from 2009-2012, the ECB has mainly reacted in two ways: (i) enacting conventional monetary measures by reducing its policy rates to (below) zero and (ii) implementing several unconventional monetary measures. This section will give a brief overview of the measures that preceded the CSPP, followed by a detailed description of the CSPP.

3.1. Unconventional Measures preceding the CSPP

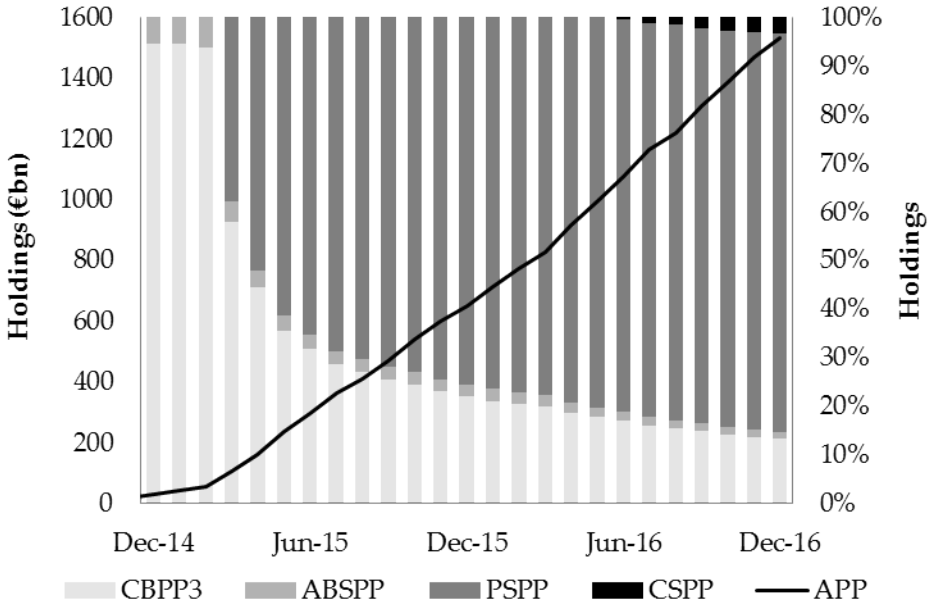
In the summer of 2009 the ECB started with the first covered bond purchase programme (CBPP1) with the aim to support a specific financial market segment that is important for the funding of banks and that had been particularly affected by the financial crises. In June 2010 the ECB announced that it had completed the €60 billion CBPP1 and intends to keep the covered bonds until maturity (ECB, 2009; 2010). Shortly before the end of CBPP1 the ECB implemented the securities markets programme (SMP) in May 2010. The assets that were being bought in the SMP were mostly sovereign bonds through the secondary market with the objective to stabilize prices in the medium term. The programme was completed in September 2012 and the value of holdings of the SMP peaked at €210 billion. The assets will also be held until maturity (ECB, 2012; 2013). In November 2011 the ECB started the second covered bond purchase programme (CBPP2) with the aim to contribute to easing funding conditions for credit institutions and enterprises and to encourage credit institutions to maintain and expand their lending to customers. The programme was intended to buy €40 billion on the primary and secondary market, but due to an increase in investor demand and a decline in the supply of euro area covered bonds the programme was completed in October 2012 with €16.5 billion of purchases (ECB, 2011; 2012).

On July 26, 2012, at the peak of the sovereign debt crisis, Mario Draghi announced the Outright Monetary Transactions (OMT) programme and that the ECB is ready to do whatever it takes to preserve the euro (Draghi, 2012). As a result of this announcement financial markets calmed down. With the start of the OMT programme the SMP was terminated. The OMT programme was designed to purchase sovereign bonds of Eurozone member-states in the secondary market (ECB, 2012). The ECB also enacted longer-term refinancing operations (LTROs) and targeted longer-term refinance operations (TLTROs) that provide attractive financing to credit institutions for periods up to four years. These (T)LTROs have the aim of easing the private sector conditions further and encouraging bank lending to the real economy (ECB, 2014). At a press conference in September 2014 the ECB announced the launch of the asset-backed securities purchase programme (ABSPP) together with the third covered bond asset purchase programme (CBPP3) (Draghi, 2014). The objective of the ABSPP is to help banks to diversify funding sources and stimulate the issuance of new securities, so that banks can provide credit to the real economy more easily (ECB, 2017c). However, the stability created in the banking sector is not fully transmitted into the real economy, as Mario Draghi mentioned in his keynote speech in November 2014 (Draghi, 2014).

The situation has shifted from economic turbulence towards a lengthy period of low inflation (Ciccarelli & Osbat, 2017). In January 2015, the ECB responds to this by announcing the expanded asset purchase programme (APP), commonly known as quantitative easing, or QE (ECB, 2015), with the aim of reviving the economy and maintaining price stability in the euro area. The ABSPP and the CBPP3 that have already been implemented will be part of the APP and the ECB adds the public sector purchase programme (PSPP) and later the corporate sector purchase programme (CSPP), which is my main focus. Combined monthly purchases started at €60 billion and would be carried out until September 2016, but the end date and purchasing value were changed during the programme to the end of 2017 and to €80 billion respectively. From April 2017 onwards the average monthly purchasing value will decrease to €60 billion again.

Figure 1 shows the evolution of holdings of the extended APP and the relative size of the different programmes included in the APP. The PSPP has since its start in March 2015 taken up about 80% of the total value of the APP and has by far the largest effect on the balance sheet of the ECB. It is expected that the percentage of the CSPP and the PSPP will further increase towards the end of the programme. The CSPP is still a rather small part of the APP, but has a significant impact on the corporate bond market. In December 2016 the APP amounted to €1,532 billion of assets in holdings, of which €51 billion is in corporate sector bonds.

Fig. 1. Breakdown of the Asset Purchase Programme (APP)



On the left vertical axis, the figure portrays the cumulative holdings of the APP. On the right vertical axis, the figure presents a breakdown of all cumulative holdings of all the different programmes within the extended asset purchase programme (APP): third covered bond purchase programme (CBPP3), asset-backed securities purchase programme (ABSPP), public sector purchase programme (PSPP) and the corporate sector purchase programme (CSPP).

3.2. Corporate Sector Purchase Programme

On March 10, 2016, the ECB announced it will add the corporate sector purchase programme to its current extended asset purchase programme with the purpose of further strengthening the pass-through of the Eurosystem's asset purchases to the financing conditions of the real economy. The CSPP aims to further enhance the transmission of monetary policy in combination with the other unconventional monetary measures in place. It will ease monetary and financing conditions of euro area non-financial corporations and households, and thereby stimulating aggregate consumption and investment spending to return inflation rates to levels close to but below 2% in the medium term while maintaining price stability (ECB, 2016; 2017b).

Furthermore, in April 2016 the ECB announced the details of the CSPP including the eligibility criteria. The programme will start on June 8, 2016, and will be coordinated by the ECB and carried out by six national central banks (Nationale Bank van België / Banque Nationale de Belgique, Deutsche Bundesbank, Banco de España, Banque de France, Banca d'Italia, and Suomen Pankki/Finlands Bank). Each national central bank will be responsible for purchases from issuers in a particular part of the euro area. Not only are the assigned national central banks able to buy corporate sector bonds in the secondary market, they are also allowed to buy corporate sector bonds of non-public corporations in the primary market, directly at issuance. The Eurosystem's collateral

framework – the rules that justify which assets can be held as collateral for monetary policy credit operations – will be leading in controlling the eligibility of corporate sector bonds to be acquired under the CSPP (ECB, 2016). In order to be eligible under the CSPP corporate sector bonds have to comply to certain parameters. Based on the requirements defined in the Guideline on the implementation of the Eurosystem monetary policy framework (ECB/2014/60), the debt instrument needs to be:

1. Denominated in euros.
2. Rated a minimum first-best credit assessment of at least credit quality step 3 (rating of BBB- or equivalent) obtained from an external credit assessment institution (Standard & Poor's, Moody's, FitchRatings and DBRS).
3. Left with a minimum remaining maturity of six months and a maximum remaining maturity of 30 years and 364 days at the time of purchase.
4. Issued by a corporation established in the euro area, defined as the location of incorporation of the issuer. Corporate debt instruments issued by corporations incorporated in the euro area whose ultimate parent is not based in the euro area are also eligible for purchase under the CSPP, provided they fulfil all the other eligibility criteria.
5. Issued by a non-credit institution.
6. Issued by a corporation that does not have any parent undertaking which is a credit institution.
7. Issued by a corporation that is not an asset management vehicle or a national asset management and divestment fund established to support financial sector restructuring and/or resolution.

Furthermore, the ECB applies the following rules per individual debt instrument:

1. The Eurosystem will apply an issue share limit of 70% per international securities identification number (ISIN) on the basis of the outstanding amount. However, in specific cases a lower issue share limit will apply, e.g. for securities issued by public undertakings, which will be dealt with in a manner consistent with their treatment under the PSPP.
2. A benchmark will be defined at issuer group level. The benchmark will be neutral in the sense that it will reflect proportionally all outstanding issues qualifying for the benchmark. This also implies that market capitalization provides a weighting for each of the jurisdictions of issuance within the benchmark. Issuer group limits will be based on the benchmark to ensure a diverse portfolio, while at the same time they will offer sufficient leeway to build up the portfolio.

The volume of the holdings under the CSPP is published on a weekly and monthly basis, together with a breakdown of debt instruments purchased on the primary market

Fig. 2. Cumulative holdings and monthly purchases of the CSPP

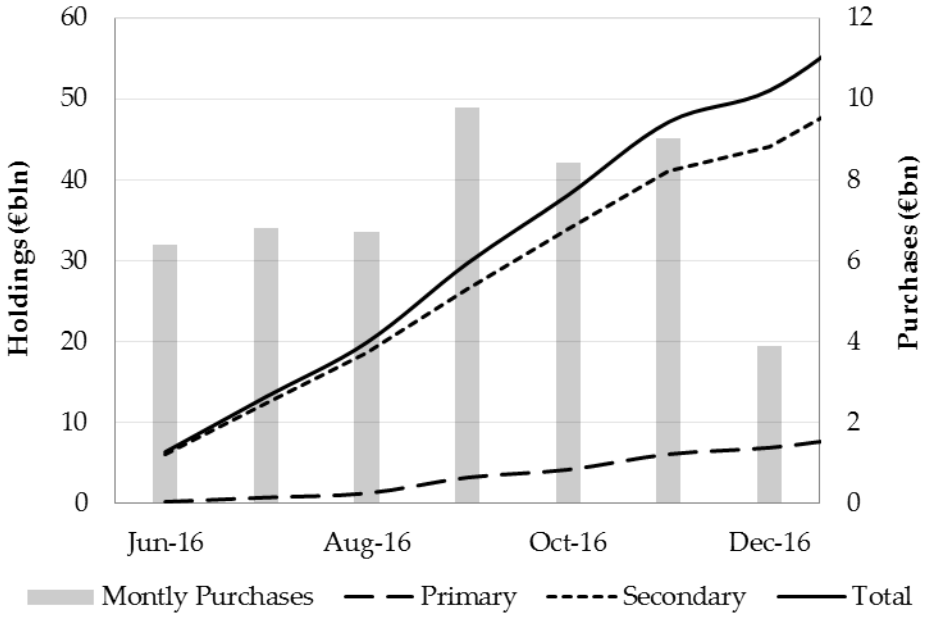


Figure 2 presents the cumulative holdings under the CSPP at the end of the month on the left hand axis and the monthly purchases on the right hand axis. Primary are the cumulative holdings of debt instruments purchased on the primary market and Secondary are the cumulative holdings of debt instruments purchased on the secondary market. Roughly €7 billion has been purchased on the primary market against €44 billion on the secondary market at the end of December 2016, which implies 14% against 86% of total holdings respectively.

and secondary market. The national central banks will also publish which debt instruments, identified by ISIN, they have bought under the CSPP on a weekly basis, however they will not disclose the amount purchased of each individual asset. Figure 2 presents the cumulative holdings under the CSPP and the amount of monthly purchases. Monthly purchases were between €6 and €7 billion in the first three months of the programme, thereafter the ECB picked up the pace and started buying between €8 to €10 billion each month. The slowdown in December is remarkable, but in line with a decline in the total expended APP purchases. At the end of December 2016 roughly 14% of total purchases were done on the primary market against 86% on the secondary market, amounting to €7 and €44 billion respectively.

Financial markets were taken by surprise and immediately reacted to the CSPP announcement and priced in the expected effect on the corporate bond markets. Figure 3 shows Markit iBoxx bond market indices for corporates, financial entities and non-financial corporates and Figure 4 shows the credit spreads of European corporates and financial entities. In the pre-announcement period there was a lot of market tumult because of the uncertainty of the Chinese economy and the low oil price. Between January 4 and 7, 2016, the Chinese stock market experienced a halt on trading and impacted all stock markets across the world (Campos, 2016; McCrum & Wildau, 2016). The announce-

ment of the CSPP coupled with the increase in monthly APP purchases was especially effective in decreasing credit spreads for both corporate and financial entities. However, the spread for financial entities quickly bounced back to higher levels while credit spreads for corporates remained at the lower level. The way the ECB has communicated its monetary policy measure was extremely effective, since the downward pressure on both yields and credit spreads persisted in times of economic uncertainty. The spread between yield on non-financial corporates and financial entities widened since the announcement of the CSPP resulting in easing financing conditions for euro area corporates. The real test for the CSPP was the Brexit referendum on June 26, just after the start of the CSPP programme. In the run up towards the Brexit vote credit spreads began to increase rapidly and yields increased slightly. Nevertheless, the ECB managed to decrease yields and credit spreads even further after the Brexit vote, implying a strong effectiveness of the programme.

A sign that the CSPP may be received with open arms by corporates in the euro area is the lacking bank lending to non-financial corporates in recent years. Figure 5 shows the year-on-year change of lending to non-financial corporates. Change in lending has been negative since the start of 2012 and has only stabilized around zero since mid-2015. This indicates that bank lending to non-financial corporates has not risen in more than five years. Banks are still in the in the process of recapitalising after the Sovereign Debt Crisis due to new regulatory requirements, it is for that reason unlikely that they will increase their bank lending significantly in the near future (Demertzis & Wolff, 2016). The CSPP is therefore a suitable alternative in providing credit to corporates by bypassing banks in the process. This way the ECB can take on the risk of lending to corporates that banks apparently are not capable or reluctant to do at the moment.

Corporate bond issuance behaviour can be seen as a reaction by corporates on the CSPP announcement. Figure 6 presents the total market value of non-financial corporate bonds outstanding in the euro area, since the moment of announcement the market started expanding rapidly from €840 billion to nearly €970 billion at the end of December 2016. This means a market expansion of over 15% in no more than nine months. Figure 7 and 8 show that non-eligible companies do not reach new records heights in comparison to their eligible counterparts. However, an increase is certainly noticeable in the month March and May. The figures suggest that eligible firms increase their issuance intensity tremendously following the announcement and it seems that they are the main drivers behind the vastly expanding bond market. When taking seasonality into account in Figure 8 and 9, it shows that the trend of high issuance is maintained after 2016Q1 and the CSPP is substantially impacting the corporate bond market in the quarters following the announcement. These presumed effects will be investigated further on this article.

Fig. 3. European Corporate Bond Yields

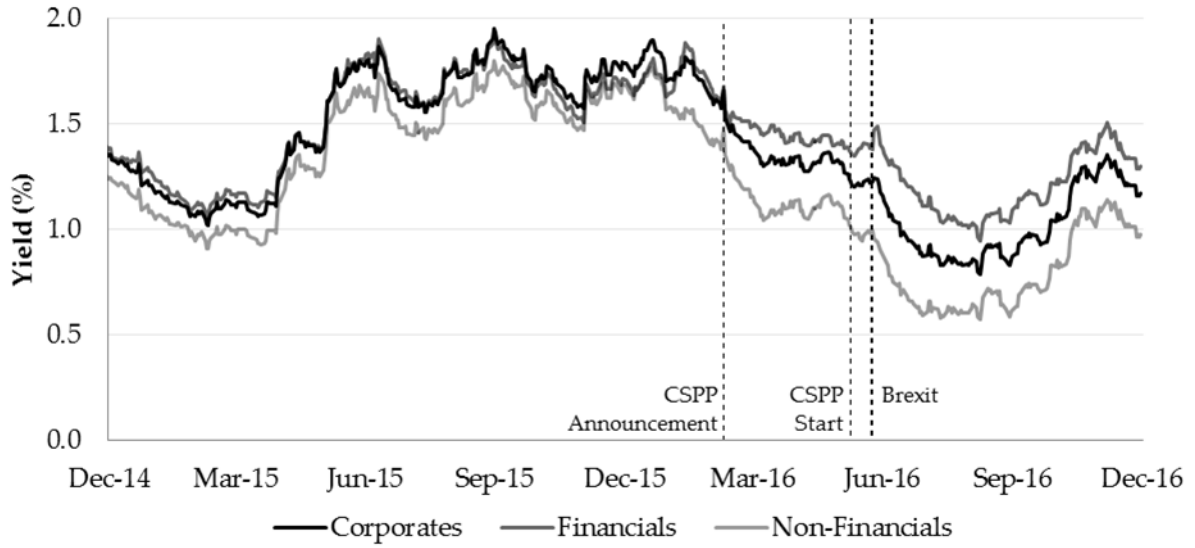


Figure 3 portrays the yield on the Markit iBoxx bond market indices of European corporates, financial institution and non-financial corporates. All indices comprise investment grade bond issues and are supported by Markit. The dotted lines represent macro-economic events, including the announcement and start of the CSPP and the Brexit referendum. Data is obtained from Markit through Datastream.

Fig. 4. European CDS Spreads

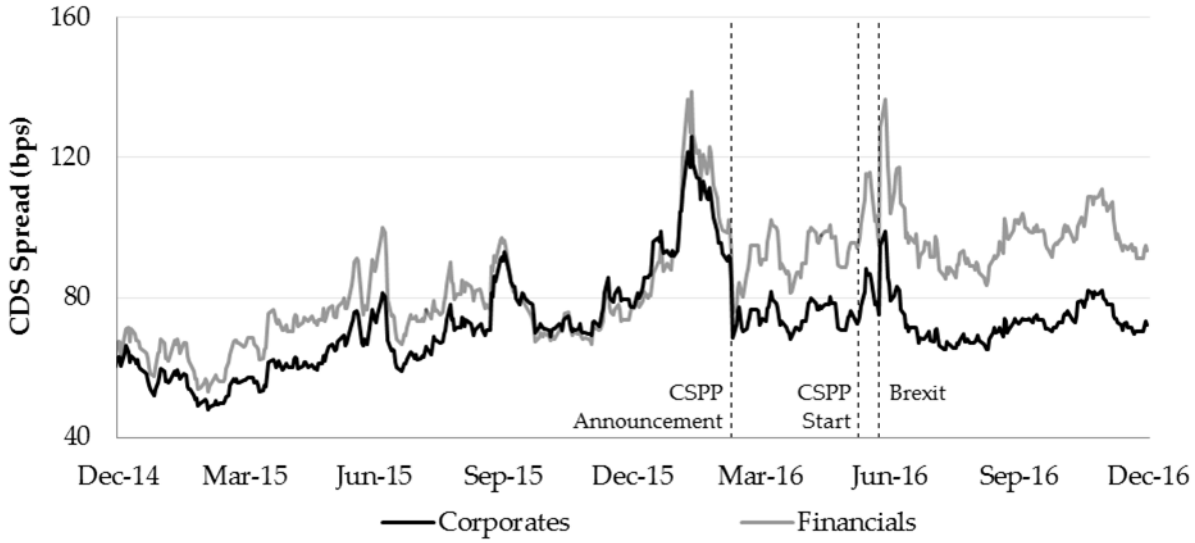


Figure 4 illustrates the credit default swap spreads of the Markit iTraxx Europe index and the Markit iTraxx Financials Senior index. The Markit iTraxx Europe index comprises 125 equally weighted credit default swaps on investment grade European corporate firms and the Markit iTraxx Financials Senior index comprises 25 equally weighted credit default swaps on investment grade European financial entities. The dotted lines represent macro-economic events, including the announcement and start of the CSPP and the Brexit referendum. Data is obtained from Markit through Datastream.

Fig. 5. Lending to Non-Financial Corporations

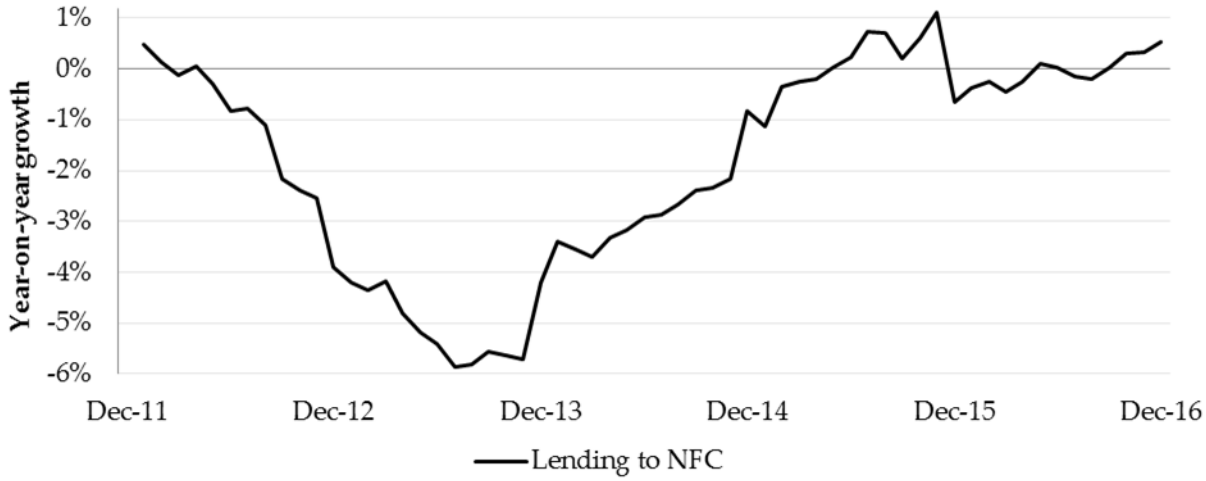
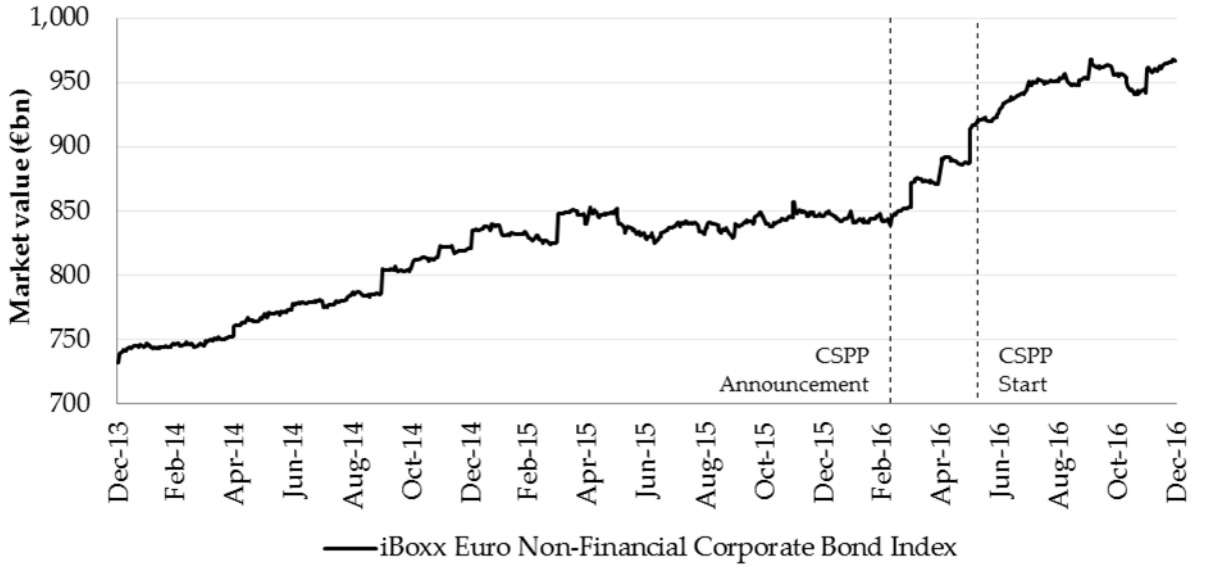


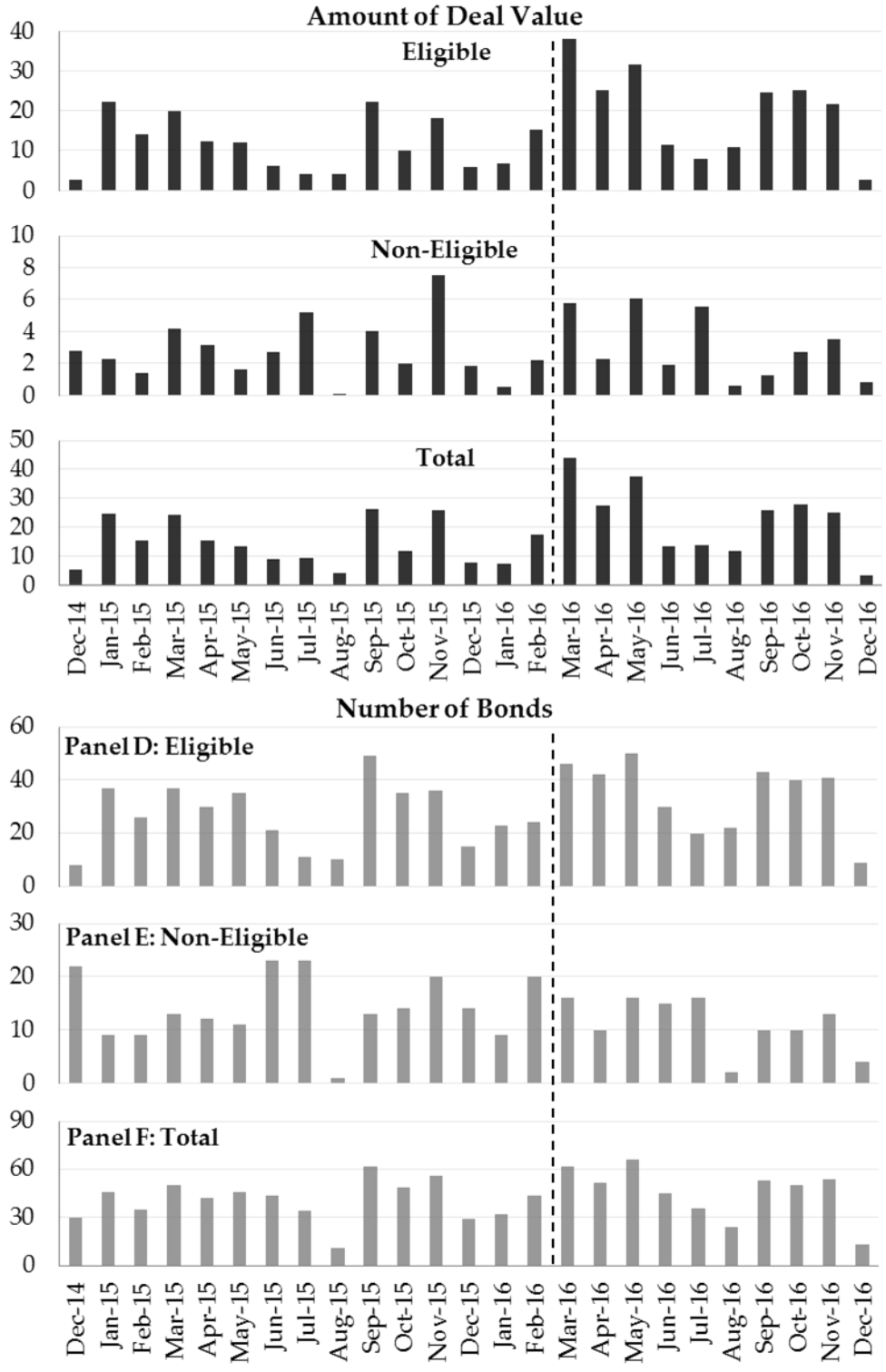
Figure 5 shows the year-on-year change of lending to non-financial corporates (NFC). Change in lending has been negative since the start of 2012 and has only stabilized around zero since mid-2015. This indicates that bank lending to non-financial corporates has not risen in more than five years. Data is obtained from the Statistical Data Warehouse of the European Central Bank.

Fig. 6. Total Market Value of Non-Financial Corporate Bonds Outstanding



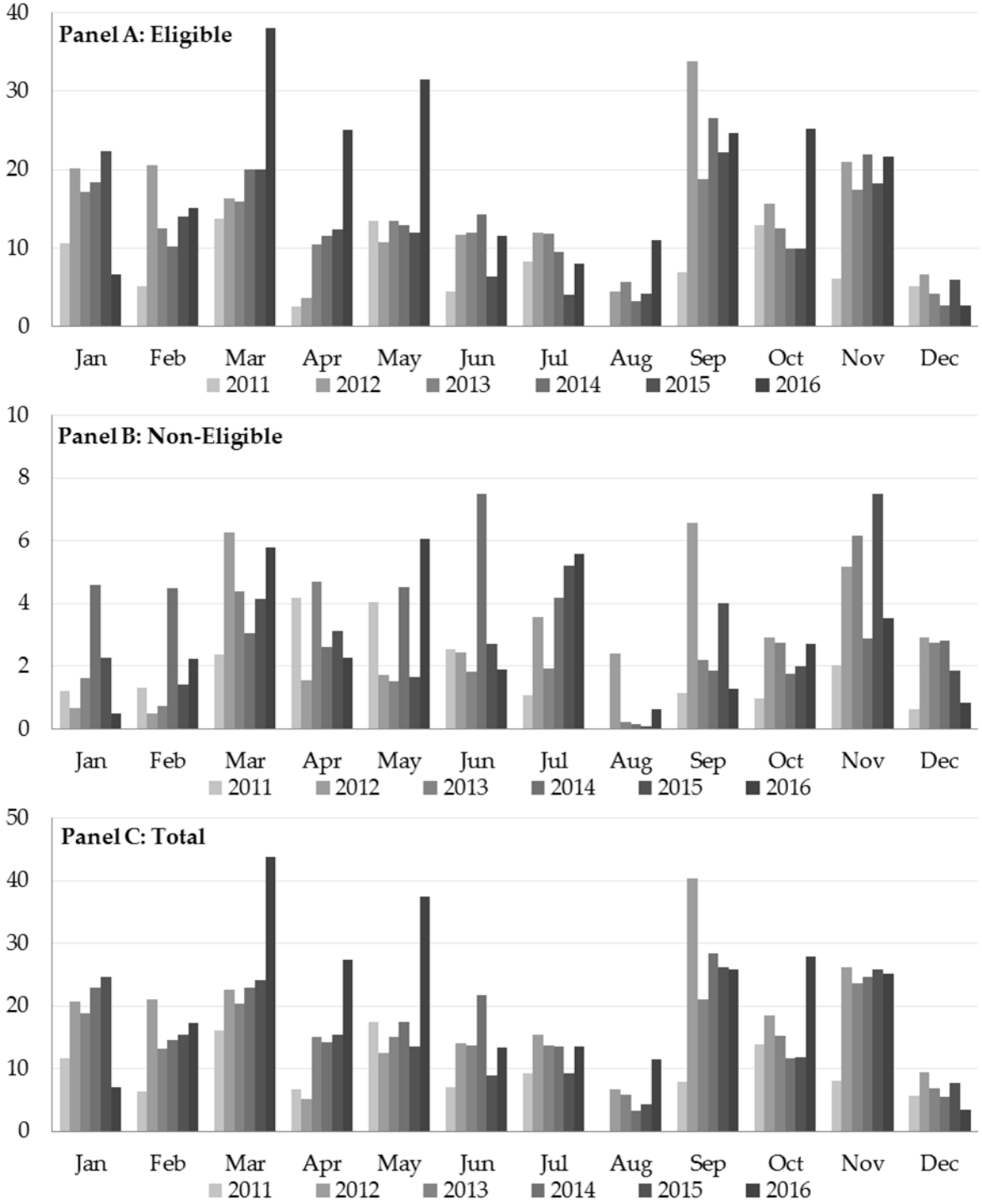
This figure presents the total market value of bonds outstanding of the Markit iBoxx Euro Non-Financial Corporate Bond Index. The index includes all investment grade non-financial corporate bond issues in the euro area. The total market grew from €850 billion to over €950 billion since the announcement of the CSPP. The dotted lines represent macro-economic events, including the announcement and start of the CSPP. Data is obtained from Markit through Datastream.

Fig. 7. Euro Area Corporate Bond Issuance



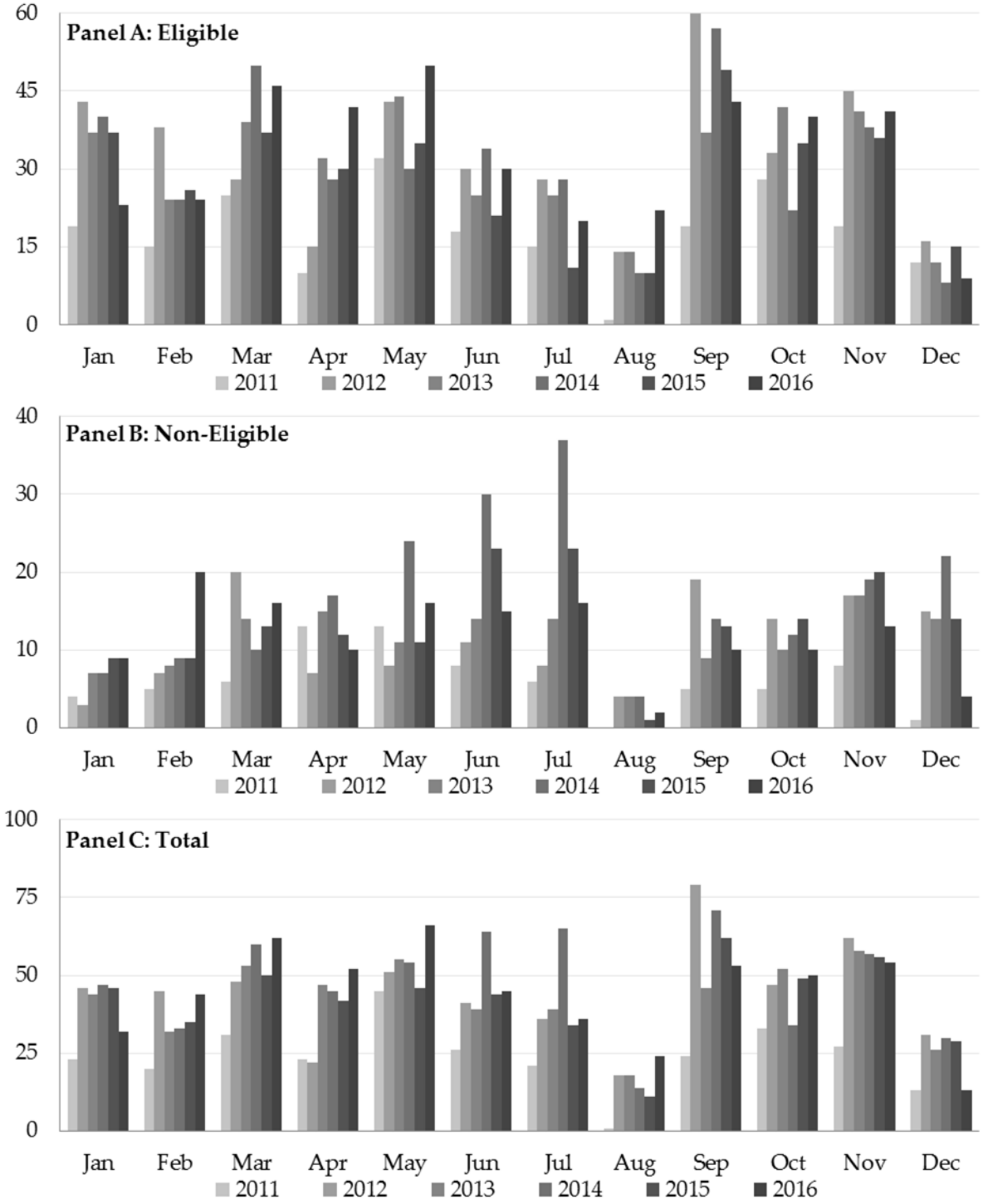
The figure shows the amount issued by the companies in the sample from December 2014 to December 2016. Panels A, B and C present the total value of bonds issued by eligible and non-eligible companies. Amounts in Panel A, B and C are expressed in €billions. Panel D, E and F show the number of bonds issued by eligible and non-eligible companies. The dotted line marks the CSPP announcement. Data is obtained from ThomsonOne.

Fig. 8. Euro Area Seasonal Corporate Bond Issuance: Value



The figure shows the total amount issued by companies in the sample from 2011 to 2016. The bond issues are clustered at the monthly level to see the seasonality in the issuance behaviour of companies. Panels A, B and C present eligible, non-eligible and total companies respectively. Amounts in Panel A, B and C are expressed in €billions. Data is obtained from ThomsonOne.

Fig. 9. Euro Area Seasonal Corporate Bond Issuance: Number of Deals



The figure shows the number of bonds issued by companies in the sample from 2011 to 2016. The bond issues are clustered at the monthly level to see the seasonality in the issuance behaviour of companies. Panels A, B and C present eligible, non-eligible and total companies respectively. Amounts in Panel A, B and C are expressed in absolute values. Data is obtained from ThomsonOne.

4. Data

The analysis in my article will focus on the difference between issuing behaviour of eligible, being on the ECB eligibility list, versus non-eligible, non-financial firms that fit the theoretical criteria under the CSPP but are not on the eligibility list. Therefore, the basis for the sample selection is the eligibility criteria given previously. I aim to construct a representative sample that consist as many corporates with corresponding bond issuance information as possible. To obtain a representative sample I include listed companies as well as private companies in the aggregated data sample. The sample period is from the first quarter in 2013 until the fourth quarter in 2016. Going further back would cause noise in the data due to abnormal corporate bond issuance behaviour as a results of bank lending tightening during the Sovereign Debt Crisis (Becker & Ivashina, 2014; Kaya & Wang, 2016). The aggregated data sample contains hand matched data from four different data sources.

Corporate bond information is obtained from ThomsonOne. It gives all publicly available information on the security level, such as Dates, ISINs, Amount Outstanding, Maturity to Redemption, Issuer and Coupon. I filter the bonds on the described issuance criteria set out in the CSPP: (i) euro denominated, (ii) minimum rating of BBB- or equivalent, (iii) maturity < 31 years, (iv) issued by a corporation established in the euro area, (v) issued by a non-credit institution, (vi) not issued by a corporation with a credit institution as parent undertaking and (vii) not issued by an investment management vehicle or divestment fund. All remaining bonds are matched with the ultimate parent company, which will be used to link bond information with company specific information. This results in a sample of 2,595 bond issuances with 691 corresponding issuers in the given timeframe.

For a complete picture I need to add company specific data to incorporate the effects of the corporate's financing conditions. Company specific data of listed companies was obtained from Compustat Global for all European listed entities and from Compustat North America for all American listed entities. Furthermore, for private companies all company specific information is assembled using a Bureau van Dijk database known as Amadeus. This includes information such as total assets, total debt, industry, country and other balance sheet or income statement figures. Almost all publicly listed firms report financial numbers on a quarterly basis, compared to the private firms who mostly report financial data semi-annually or annually. For those companies that do not report quarterly numbers, I use the identical value of the last available reported data and implement this in the following missing quarters. This way, I fully capture the size of the bond issuance scaled by total assets. However it is common practice to use the linear interpolation method, I recognize this may bias the results of my analysis. For example, Company X

reports its financial numbers on an annual bases at the end of the fourth quarter and it subsequently issues a relatively large bond in the fourth quarter of the following year. Linear interpolation would have already added around 75% of the value of this bond in total assets at the end of the third quarter, because the value of the bond would have been interpolated into the first, second and third quarter already. Due to the increase in total assets, this would lead to a significantly smaller amount issued over total assets in the fourth quarter. If there is no financial data available for a period longer than one year or if the company has gone bankrupt it is left out of the data sample. This results in an aggregated data sample consisting 502 unique companies that have issued 1722 bonds with a total value of over €740 billion during the period of 2013 to 2016.

Panel A of Table 1 shows that on average firms tend to issue around 5% of their total assets in newly issued bonds. The median is around 2%, which means that there are a lot of relatively small issues compared to the larger issues. This does not seem very strange when looking at the leverage ratio (long-term debt/total assets) of firms. The median firm levers around a quarter of the company with long-term debt to remain financially flexible. The largest relative issue is the 27 million euro bond issue of Solteq – a technology company from Finland – which at the time held an asset base of 22 million, so an issue of 111% of the asset base. Another remarkable issue is that of Anheuser-Busch Inbev that issued €13.25 billion in 2016, representing the largest issue in the data sample. Among the companies with the largest asset base are insurance companies NN Group and Allianz and American conglomerate General Electric, which issues bonds through its European funding company.

Panel B of Table 1 presents how the data sample is split between groups. In the entire sample almost 47% is eligible to be bought by the ECB resulting in a total of 212 companies on the ECB eligibility list. The other 290 companies are theoretically also eligible to be bought according to the CSPP criteria, but for some reason do not appear on the list. Exactly 32% of all the companies are already bought in the CSPP and represent the little over €50 billion in holdings of the ECB. The ECB has not disclosed the amount it holds on individual assets or whether it has been bought on the primary or secondary market. Another distinction is made between companies that are situated in Greece, Ireland, Italy, Portugal or Spain (GIIPS) and other euro area countries resulting in 63 companies labelled GIIPS versus 439 labelled non-GIIPS. The last dummy variable illustrates the activity of privately owned companies on the bond market and shows that public firms are more active with over 80% of all companies being publicly traded. This could be due to fact that public companies have easier access to public bond markets and their cost of debt is therefore lower. Literature acknowledges the phenomenon of a higher cost of debt for private companies and they seem to pay a private premium in the public bond market (Kovner & Wei, 2014; Badertscher et al., 2015).

Table 2 presents the change in company characteristics and issuance behaviour of eligible and non-eligible companies after the CSPP has been announced or has started. Panel A and Panel B do not distinguish significantly from each other, suggesting that corporate bond issuance already received a boost at the announcement of the programme and persisted during the programme. Also seen in Figure 6, 7 and 8 where bond issuance takes off right after the announcement of the CSPP. This would indicate a really strong signalling effect from the ECB towards the market. Prior to the CSPP announcement or start, eligible firms tend to have a larger asset base and issue larger bond sizes compared to non-eligible firms, whereas leverage ratios are very close to one another. My main dependent variable, amount issued over total assets, is on average noticeably lower at eligible companies compared to non-eligible companies. Eligible and non-eligible companies in the sample issue on average 3.2% and 9.6% of their total assets when they issue a new bond prior to the CSPP announcement respectively. Since both groups have almost the same leverage ratio, this could indicate that eligible firms issue more often and in smaller proportions of their total assets. Most interesting about Table 2 is the change in bond issuance behaviour after the CSPP announcement. Non-eligible companies tend to decrease their issue intensity and eligible firms tend to increase their issue intensity with -25% and +27% respectively. These results suggest that only firms that appear on the ECB eligibility list benefit from the ease in financing conditions after the CSPP announcement. It must be said that the averages of Issuance and Principal are calculated excluding the zero quarter observations. Therefore, it does not say anything about the total amount issued between the two groups, merely about the averages of all issues.

When diving deeper into the data by splitting it in several groups the issuance behaviour of different company classes becomes apparent. It can be noted that in Table A1 and A2 of the Appendix, where companies are compared on location and status, the non-eligible companies seem to decrease their issuance intensity following the CSPP announcement and eligible firms tend to increase their issuance intensity. When non-eligible firms issue a bond, their issue amount scaled by total assets is much higher than that of eligible firms in both the GIIPS/non-GIIPS and the private/public data samples. Overall eligible firms have a much larger asset base and can therefore issue higher bond values. Table A3 in the Appendix shows issuance behaviour of companies with low, medium and high leverage. The average issuance intensity tends to go up for eligible low and medium levered companies, whereas highly levered firms do not seem to benefit from the ease in financing constraints. Non-eligible firms all decrease their intensity or stay relatively stable. The results from Tables 2 and A1 to A3 of the Appendix need to be interpreted with caution, as they represent average values of the entire group. It is merely an indication for which direction the market went after the CSPP announcement and these changes in the market will be investigated on a firm level in the following sections.

Table 1: Descriptive Statistics

Panel A: Firm specific	Mean	Median	Std. Dev.	Min	Max	Total
Issuance*	0.051	0.023	0.089	0.0002	1.114	
Principal*	632	500	785	3	13,250	740,489
Total Assets	32,663	7,161	84,295	15	1,181,000	262,300,000
LTD	6,241	1,724	15,600	0	256,771	50,130,000
Leverage	0.272	0.251	0.156	0	0.886	
Panel B: Sample specific	Mean		Std. Dev.	Min	Max	Division
Eligible	0.466		0.499	0	1	212/290
Bought	0.319		0.466	0	1	160/342
GIIPS	0.125		0.331	0	1	63/439
Public	0.807		0.395	0	1	405/97

Panel A presents the firm specific descriptive statistics of the aggregated data sample. Firm specific data represents quarterly data consisting of Issuance (bond issuance scaled by total assets), Principal (the absolute amount issued), Total Assets, LTD (Long-term Debt) and Leverage (LTD scaled by Total Assets). Panel B presents the sample specific descriptive statistics on how the aggregated data sample is divided between firm classes. These are all dummy variables which split the data sample in eligible versus non-eligible, bought versus non-bought, GIIPS versus non-GIIPS and Public versus Private firms. Absolute amounts are expressed in €millions. Data is obtained from ThomsonOne, Compustat Global/North America and Amadeus. *Zero issuance quarters excluded.

Table 2: Issuance Behaviour as reaction to CSPP prior to announcement and start

Panel A:		Non-Eligible		Eligible	
Announcement		Mean	Std. Dev.	Mean	Std. Dev.
Before	Issuance	0.096	0.129	0.032	0.057
	Principal*	298	386	694	634
	Total Assets*	12,551	39,310	54,725	111,268
	Leverage	0.269	0.161	0.272	0.153
After	Issuance	0.072	0.066	0.041	0.084
	Principal*	328	584	957	1,281
	Total Assets*	12,882	39,539	58,233	113,155
	Leverage	0.282	0.155	0.271	0.149
		Abs.	%	Abs.	%
Change mean	Issuance	-0.024	-0.251	0.009	0.276
	Principal*	30	0.101	263	0.379
	Total Assets*	331	0.026	3,508	0.064
	Leverage	0.013	0.048	-0.001	-0.004
Panel B:		Non-Eligible		Eligible	
Start		Mean	Std. Dev.	Mean	Std. Dev.
Before	Issuance	0.093	0.125	0.033	0.062
	Principal*	296	381	753	863
	Total Assets*	12,587	39,316	55,216	111,522
	Leverage	0.271	0.160	0.272	0.152
After	Issuance	0.074	0.069	0.042	0.085
	Principal*	387	751	819	783
	Total Assets*	12,960	39,729	58,303	113,320
	Leverage	0.282	0.154	0.272	0.148
		Abs.	%	Abs.	%
Change mean	Issuance	-0.020	-0.211	0.009	0.266
	Principal*	91	0.309	66	0.087
	Total Assets*	373	0.030	3,087	0.056
	Leverage	0.011	0.041	0.000	0.000

Table 2 presents the company characteristics and issuance behaviour of eligible and non-eligible companies before the start and announcement of the CSPP compared to after the start and announcement of the CSPP. Panel A represents the average per quarter and per company from announcement, 2013q1 to 2015q4 (before) and 2016q1 to 2016q4 (after). Panel B represents the average per quarter and per company from the start, 2013q1 to 2016q2 (before) and 2016q3 to 2016q4 (after). In calculating the averages of Issuance and Principal zero issuance quarters are excluded. In both panels the growth rate and absolute change of the mean is given in the third section. *Expressed in €millions.

5. Methodology

I am going to compare companies that are technically eligible according to the CSPP criteria mentioned before, against companies that are on the ECB eligibility list. On December 31, 2016 there were 691 companies that had issued bonds that fulfilled to CSPP criteria of which 502 are currently in the data sample. Of this 502 companies, only 212 are on the ECB eligibility list against 290 non-eligible companies. It is currently unknown why these companies are excluded from the programme, as the ECB does not make any statements about individual firms or holdings. The goal of this research is to see the difference in issuance behaviour following the CSPP announcement on March 10, 2016 between these two groups.

5.1. Research design

To determine the eligibility of a firm the full database of all eligible assets is retrieved from the ECB. After filtering for all the requirements under the corporate sector purchase programme the full list of eligible companies is constructed. This list is again hand matched with the aggregated data sample. A dummy variable is created for firms that have one or multiple bonds outstanding that appear on the ECB eligibility list:

$$E_{i,t} = \begin{cases} 1 & \text{if } B_{i,t} \text{ is on the ECB list} \\ 0 & \text{otherwise} \end{cases} \tag{1}$$

where $B_{i,t}$ is a bond of firm i in quarter t and the assumption is made that if one bond of firm i appears on the eligibility list of the ECB the dummy variable $E_{i,t}$ equals 1. To measure the announcement effect of the CSPP a dummy variable is created that is switched on at the announcement. Since I am working with quarterly data it cannot be switched on exactly on March 10, 2016. The announcement is made at the end of the first quarter of 2010, and there already was a large jump in issuance right after the announcement in the first quarter. To capture the full extent of the announcement I therefore choose to turn the announcement variable on in the first quarter of 2016:

$$Announce_t = \begin{cases} 1 & \text{if } t \geq 2016\text{Q1} \\ 0 & \text{otherwise} \end{cases} \tag{2}$$

A similar variable can be made for the start of the CSPP, this dummy will have the following specification:

$$Start_t = \begin{cases} 1 & \text{if } t \geq 2016\text{Q3} \\ 0 & \text{otherwise} \end{cases} \tag{3}$$

To test whether the changes in issuance behaviour between eligible and non-eligible companies are statistically significant, I propose to use a linear model with panel data that measures the difference-in-difference estimation of my main independent variable, where the differential effect of a sharp change in the economic environment is tested for two groups, eligible and non-eligible firms, while controlling for firm and time specific variables. The sharp change in the economic environment is caused by the announcement of the corporate sector purchase programme.

In this section I consider a linear model for data in which the dependent variable is linearly dependent on a set of predictor variables. Companies are the individuals ($i = 1, \ldots, n$) and are measured at multiple points in time ($t = 1, \ldots, T$). A Pooled OLS model is used as a starting point:

$$y_{i,t} = \mu + \beta X'_{i,t} + \epsilon_{i,t} \tag{4}$$

where $y_{i,t}$ is the dependent variable, μ is the intercept, the vector $X'_{i,t}$ represents the predictor variables in the model, β are vectors of coefficients and $\epsilon_{i,t}$ is the error term. This model specifies constant coefficients and the regressors have to be uncorrelated with the error term. The pooled OLS output treats each of the T quarters as independent pieces of information, but this may lead to an overstatement of the estimator precision (Cameron & Trivedi, 2005). It ignores the time dimension in panel data and a fixed or random effects model should be used:

$$\begin{aligned} y_{i,t} &= \mu_t + \beta X'_{i,t} + \alpha z'_i + \epsilon_{i,t} \\ &= \mu_t + \beta X'_{i,t} + c_i + \epsilon_{i,t} \end{aligned} \tag{5}$$

where z'_i is a vector of company specific variables that are unknown and α are vectors of coefficients. A part of z'_i can be known and measured, but there will always be unknown elements. The second notation is more commonly used by authors, including Chamberlain (1984) and Wooldridge (2010), and c_i will be treated as the random or fixed effect. The key consideration in choosing a random or fixed effects model is whether c_i and $X'_{i,t}$ are correlated. Hausman (1978) suggested a test that calculates the differences between the fixed effects and the random effects parameter estimates. A fixed effects model is consistent when c_i and $X'_{i,t}$ are correlated and a random effects model otherwise, so a statically significant difference results as proof against the random effects assumption. Table A4 in the Appendix shows that the difference is statistically significant and therefore I use a fixed effects model.

To elaborate on that, if the dependent variable is affected by multiple variables that have not or cannot be measured, a fixed effects model makes it possible to control for

these influences. Each company in the data sample is used as its own control. I want to know whether the announcement of the CSPP has an influence on eligible and non-eligible companies, therefore I have to compare their issuance behaviour pre- and post-announcement. When I assume that nothing else changes, the difference in the issuance behaviour of a company in those two periods is an estimate for the announcement effect of the CSPP. The model than averages all those differences of every company in the sample and the overall average of the announcement effect is estimated. The fixed effect controls for all firm specific characteristics that do not vary over time. It does not control for firm specific variables that do change over time, like income statement or balance sheet items, these are controlled for by putting them in the model as control variables.

To distinguish whether I also need to control for time-specific fixed effects I apply a Wald test to the post estimation results of the time variable's covariates fit in my model (Royston et al., 2009). In panel data, a Wald test provides a method of testing a hypothesis about β without assuming homoscedasticity or serial independence of errors (Wooldridge, 2010). It is a joint test to assess the hypothesis that the dummies for all quarters in my data sample are equal to zero. If the hypothesis is confirmed no time-specific fixed effects are needed, and if it is rejected otherwise. Table A5 in the Appendix shows that I successfully reject the hypothesis that the coefficients are jointly equal to zero, therefore time-specific fixed effects are needed in the model. I also test for the presence of heteroskedasticity by applying a Wald test and autocorrelation by applying Wooldridge's test described by Baum (2001) and Drukker (2003) respectively. The results can be found in Table A5 in the Appendix, it presents that both heteroskedasticity and autocorrelation are present in the data sample. Therefore, this is controlled for in the regressions.

My main independent variable measures the *treatment effect* of the announcement of the CSPP, where eligible companies are the treatment group and non-eligible companies the control group. Cameron and Trivedi (2005) describe the treatment effect as the marginal effect of a single binary regressor that equals one if the treatment occurs and equals zero if treatment does not occur. In my case this could be referred to as the announcement effect of the CSPP:

$$D_{i,t} = E_{i,t} \cdot Announce_t \tag{6}$$

where $D_{i,t}$ is an interaction term between $E_{i,t}$ and $Announce_t$. I add time-specific fixed effects and the difference-in-differences estimator to the fixed effects model. The formula for $y_{i,t}$ changes as follows:

$$y_{i,t} = \mu_t + \phi D_{i,t} + \beta X'_{i,t} + c_i + \delta_t + \epsilon_{i,t} \tag{7}$$

where $y_{i,t}$ is the dependent variable, μ_t is the intercept, ϕ is the treatment effect caused by the CSPP announcement, $D_{i,t}$ is the difference-in-differences variable, β are vectors of coefficients, $X'_{i,t}$ represents the control variables, c_i are firm-specific fixed effects, δ_t are time-specific fixed effects and $\epsilon_{i,t}$ is the error term. There are mutliple pre and post periods in the data sample, therefore the seperate variables which construct the announcement effect, $E_{i,t}$ and $Announce_t$, are also added to the regression. Rewriting this formula with the variables used in my data sample leads to the following specification of the regression model:

$$\Delta B_{i,t} \,/\, TA_{i,t-1} = \mu_t + \phi E_{i,t} \cdot Announce_t + \beta_1 E_{i,t} + \beta_2 Announce_t + \beta X'_{i,t} + c_i + \delta_t + \epsilon_{i,t} \quad (8)$$

where $\Delta B_{i,t} \,/\, TA_{i,t-1}$ defines the seasonaly adjusted bond issuance of firm i in quarter t, scaled by the total assets of firm i in quarter $t-1$ (lagged), where $\Delta B_{i,t} = B_{i,t} - B_{i,t-4}$. $E_{i,t}$ is the eligibility dummy variable, $Announce_t$ is the dummy variable for the announcement of the CSPP and $X'_{i,t}$ are the control variables leverage, calculated as long-term debt ratio (long-term debt over total assets ($LTDR_{i,t-1}$)), and the natural logarithm of total assets ($ln(TA_{i,t-1})$). Seasonally adjusted bond issuance is used as the dependent regressor since corporate credit demand shows a seasonal pattern (Murfin & Petersen, 2016), also illustrated in Figure 8 and 9. Not a lot of variables are used, but the simplicity of the regression enhances the transparency of the regression output.

5.2. Subsamples

Different groups in the sample will be investigated, therefore the data will be split on company location (GIIPS/non-GIIPS), public status (Public/Private) and leverage profile (Low/Medium/High). While investigating these different groups, the same regression model is used.

5.2.1. Company Location

GIIPS countries, consisting of Greece, Ireland, Italy, Portugal and Spain, are severely hit during the sovereign debt crisis and the capital markets in these countries have tightened. Acharya et al. (2016) find that during the sovereign debt crisis GIIPS banks significantly decreased their lending volume to the corporate sector and, thereby, were an important driver of the negative real effects experienced by their borrowing firms. Research on the fragmentation in the European corporate bond market is recently been done. Horny et al. (2016) investigate the yield difference between corporate bonds of Italian and Spanish companies and the German Bund of similar maturity, credit and duration risk and Zaghini (2016, 2017) looks at the fragmentation of corporate bond

yields between different euro area countries. They find that fragmentation was somewhat limited during the Global Financial Crisis, however during the sovereign crisis spreads reached peak heights in the Euro area. Corporate bonds issued in GIIPS countries carry higher yields than comparable bonds in France and Germany. It was only after the announcement of the OMT programme of the ECB that spreads started to drop, but remained around 50 basis point at the end of June 2015. During this period the cost of borrowing for these companies increased and are likely to have a disadvantage against similar companies in non-GIIPS countries. The goal of the CSPP is to ease financing constraints for all European corporates. Almost 60% of all GIIPS companies in the data sample are eligible to be bought under the CSPP, so I would expect that the issuance behaviour of GIIPS eligible companies is significantly affected by the announcement of the programme.

5.2.2. Public Status

A company is perceived public when it has a listing on a stock exchange. The literature on private borrowing costs is still limited. There are a few studies that look into the interaction of capital markets and public versus private companies. Pagano et al. (1998) examine Italian firms that go public and find that the borrowing costs of the firms decline significantly after the initial public offering. Kovner and Wei (2014) are the first to empirically find a private premium in public bonds. They do not have necessarily lower liquidity or higher CDS spreads, but bond investors tend to discount the equity of private companies resulting in increasing bond spreads. Lastly, Saunders and Steffen (2011) find that private firms face significantly higher borrowing costs in the syndicated loan market due to a higher cost of information production, lower bargaining power and different ownership structures.

The CSPP criteria includes one major difference between private and public firms; the ECB can purchase corporate bonds of private companies directly at issuance on the primary market. Public companies do not have the advantage of selling directly to the ECB. Since the ECB has the ability to buy up to 70% of a bond, eligible private companies have a very large capital provider entering the primary market. Given that current literature describes higher borrowing costs for private firms and the advantage eligible private companies have in the CSPP, I would expect eligible companies to increase their bond issuance to a larger extent than eligible public companies will do. Public firms tend to benefit from better access to capital markets, lower cost of equity (Amihud et al., 2015) and lower cost of debt (Saunders & Steffen, 2011). The access to capital markets is therefore more diversified for public firms (Badertscher et al., 2015). I expect the announcement effect to be significantly positive for eligible public firms, nonetheless to a lesser extent than the difference between eligible and non-eligible private companies.

5.2.3. Leverage Profile

The data sample is split into three different leverage groups. When looking at leverage, the companies that belong to the lowest quartile are the least levered, the companies that belong to the highest quartile are highly levered and the companies between the 25th and the 75th percentile belong to the medium levered group. The effects of being eligible in the CSPP between groups with different financial flexibility and marginal cost of borrowing can be examined in this manner. Eased financing constraints will be applicable to all eligible firms in the CSPP. Financial flexibility is a firm's capacity to deploy its financial resources to act on uncertain future investment opportunities. The higher a firm's leverage the less financial flexibility a firm has and the more financially constraint it is. If capital markets are perfect there is no need for financial flexibility (Byoun, 2011). Whited (1992) shows that a firm's investment opportunities are strongly impacted by the difficulties in obtaining debt finance. Meaning that highly levered firms could see investment opportunities arising, but do not have the opportunity to finance these investment because of the difficulties it faces to obtain debt finance. They do not find the same relation for unconstrained firms. This could indicate that the CSPP is going to have a significant impact especially on financially constraint firms.

Abudy and Raviv (2016) are able to establish a link between a corporate's leverage and the illiquidity spread of a corporate bond. They find that the illiquidity spread of a bond increases with the amount of leverage of a company. The size of the illiquidity spread of a corporate bond is largely dependent on the leverage of a firm and the relation is exponential. The liquidity of a bond is priced in corporate yields spreads (Chen & Lesmond, 2007). Higher illiquidity leads to a higher yield spread, which makes the cost of borrowing for corporates higher. The other way around one would expect that an unexpected ease in financing constraints (lower yields), such as the announcement of the CSPP, would make it more attractive for highly levered eligible firms to issue new bonds. For the least levered and medium levered eligible firms I would also expect an increase in the issuance intensity, but to a lesser extent compared the highly levered firms. Current leverage should not play a significant role in the issuance behaviour of low leverage companies, as the companies are not financially constraint and the marginal cost of attracting additional debt is still relatively low (Withed, 1992). The announcement effect will be especially large when even low levered firms see a substantial decrease in their cost of borrowing.

5.2.4. Robustness

It is common exercise in empirical research to do a robustness check, where the researcher examines in what way modifications in the regression specifications will change the empirical results. If the coefficients do not change significantly, this can be inter-

preted as evidence of structural validity (Lu & White, 2014). I conduct the following robustness checks; (i) compare actually bought companies with eligible companies and the whole sample and (ii) place the actually bought variable in the model on top of the announcement effect to see whether it remains positively significant.

To perform the first robustness check the lists of the national central banks' purchases are obtained from the ECB. This way I can compare the reaction of firms that are actually bought with other eligible and non-eligible firms. The national central banks only report the ISINs of all bonds currently in holdings. A similar dummy to the eligible variable is created with the following specification:

$$H_{i,t} = \begin{cases} 1 & \text{if } B_{i,t} \text{ is in holdings at time } t \\ 0 & \text{otherwise} \end{cases} \tag{9}$$

if the ECB has bought a bond of company i during the CSPP the $H_{i,t}$ becomes 1 and 0 otherwise. Consequently, the main independent variable in the regression changes to $D_{i,t} = H_{i,t} \cdot Start_t$, since a company only knows it is bought from the start of the CSPP. This will measure the increase in issuance intensity after being bought. A subsample is created by only keeping eligible companies in the subsample. This way the comparison between bought companies and eligible companies can be made. Next, I use the whole sample and compare bought companies with the control group, non-bought companies.

Subsequently, in the second robustness check, I place the bought effect on top of the announcement effect to see whether firms that have been bought actually issued more when they knew they were being bought on top of being eligible. This will give some biased results, because all bought companies are also eligible. It will provide evidence on how much of the announcement effect is caused by companies that have actually been bought.

6. Empirical Results

In this section, I will report the main results of my empirical research. The question is whether the corporate sector purchase programme of the ECB affected the bond issuance behaviour of eligible companies compared to non-eligible companies. To the best of my knowledge I am the first to examine the effects of the CSPP on corporate issuance behaviour within different company groups. First, I will show the regression estimates of the overall effect of the CSPP announcement and start. Then, I will give an insight whether the CSPP start has an extra effect on top of the announcement effect. Thereafter, I divide my sample into different subsamples based on the location, public status and leverage profile of the issuer. This is followed by a discussion of the robustness checks.

6.1. Main Findings

The main results of the full sample regressions are presented in Table 3 showing differences between the announcement and start effect. The dependent variable in all regressions is the seasonally adjusted quarterly amount issued by company i scaled by total assets. Panel A shows the effect from the announcement of the CSPP. Column (1) and (2) present the simplest OLS specification. Column (1) shows results without controlling for any firm-specific and time-specific fixed effects or other time varying firm-specific characteristics. There is a significant increase in the bond issuance behaviour of eligible companies compared to non-eligible companies since the announcement of the CSPP. Eligible companies increase their issuance by 0.8% of total assets compared to non-eligible firms. These results do need to be interpreted with caution, as there are no controls in the regression.

In Column (2), time varying firm-specific effects are added, including the natural log of total assets and the long-term debt ratio. The natural log of total assets is included to control for firm size and the long-term debt ratio is included to control for the firms leverage profile. What can be noted from Column (2) is the fact that the significance of $E_{i,t}$ disappears. This indicates that there is a common trend in the pre-announcement period and that I am indeed comparing apples-with-apples. The announcement effect is also highly significant in this specification. Both size and leverage have its effect on the bond issuance behaviour of a company. The larger the size the smaller the relative issuance, so a €50 billion company is less likely to issue a bond of €5 billion then a €1 billion company is to issue a €10 million bond. With regards to leverage, the higher it gets the higher the cost of borrowing becomes, therefore the coefficient is negatively significant.

In Column (3), time-specific fixed effects are added and therefore the announcement variable is absorbed. This captures the common, time varying characteristics of a quarter that are not yet been captured by the time varying control variables. The effect on eligible companies' issuance behaviour remains unambiguously the same. In Column (4) firm-specific fixed effects are included that allows me to control for any time invariant unobserved company heterogeneity. The question this table answers is: Comparing companies of the same size that face the same leverage profile and demand conditions, is the company that happens to be on the CSPP eligibility list inclined to issue more corporate bonds after the announcement of March 2016? The answer to this question is unambiguous and highly significant. Eligible firms tend to increase their issuance intensity by 0.7% after the CSPP announcement. Column (5) shows the most demanding specification, presenting the estimates while controlling for firm-specific and time-specific fixed effects, thus common time trends, time invariant unobserved company heterogeneity, and other time varying firm-specific characteristics (size and leverage). The results do not change,

with eligible firms still increasing their issuance intensity by 0.7%. Size and leverage do have a persistent effect on the issuance behaviour. The bigger the company, the smaller its issuance intensity will be and the more leverage a firm takes on the less it is inclined to issue more bonds, which corresponds with previous literature.

Panel B of Table 3 presents the results when setting the start of the CSPP as the treatment date. The results are different than the outcome of Panel A. Eligible companies tend to increase their issuance intensity with 0.4% after the start of the CSPP. However, the start effect loses its significance in column (4) and (5) in which firm fixed effects are included. The eligible variable is also highly significant in column (2) and (3), this could be due to the fact that a portion of the announcement effect is part of the pre-start behaviour. Eligible firms' issuance behaviour is not significantly different than that of non-eligible companies in the pre-announcement period, it is however significantly different in the pre-start period. Hence, most eligible firms started issuing between announcement and start of the CSPP. Figure 8 also shows a large increase in seasonally adjusted issuance in the months March, April and May. The market has priced in the CSPP effects directly at announcement, which shows great confidence in the trustworthiness of the ECB. In Table 4 the assumption that the CSPP effect occurred between the announcement and CSPP start is tested. Both the announcement and start effects and dates are added. When the start effect has a significant impact on the issuance behaviour of eligible companies, the announcement was not properly priced in or the ECB did not fulfil its promise. If the effect does not have a significant impact, it means that the ECB made its promise at the announcement and holds that promise when starting the CSPP.

Table 4 presents results of the combined announcement and start effects. The estimates answer the question: does the start of the CSPP has any additional effect on top of the announcement effect on the issuance behaviour of eligible companies? Column (1) and (2) have the most simple specification without controlling for any firm-specific or time-specific fixed effects. Column (3) and (4) control for time-specific and firm-specific fixed effects respectively. The estimate of the announcement effect remains highly significant after controlling for common, time varying characteristics and time invariant unobserved company heterogeneity. The question can be unambiguously answered: the estimate of the start effect does not have a significant impact on top of the announcement effect regarding the issuance behaviour of eligible companies in the CSPP. Even in the most demanding specification of Column (5), when controlling for common, time varying characteristics, time invariant unobserved company heterogeneity, size and leverage, the results remain unchanged. This shows that the market of companies and investors made a proper assessment of the impact of the programme and acted on the announcement of the ECB. Companies maintained their increased issuance intensity in all quarters after the announcement of the CSPP. This would indicate that the programme indeed lowered

Table 3: CSPP Effects on Corporate Bond Issuance Behaviour: Announcement and Start

$\Delta B_{i,t} \,/\, TA_{i,t-1}$	(1)	(2)	(3)	(4)	(5)
Panel A: Post-Announcement					
$E_{i,t} \cdot Announce_t$	0.00830***	0.00808***	0.00808***	0.00667***	0.00666***
	(3.382)	(3.360)	(3.358)	(3.067)	(3.055)
$E_{i,t}$	-0.00198**	0.000896	0.000912		
	(-2.426)	(1.132)	(1.162)		
$Announce_t$	-0.00548***	-0.00516***		-0.00185	
	(-3.081)	(-2.984)		(-1.105)	
$ln(TA_{i,t-1})$		-0.00133***	-0.00134***	-0.0223***	-0.0247***
		(-3.972)	(-3.969)	(-3.998)	(-3.988)
$LTDR_{i,t-1}$		-0.0138***	-0.0138***	-0.0996***	-0.0993***
		(-4.065)	(-4.052)	(-4.325)	(-4.322)
Firm Fixed Effects	NO	NO	NO	YES	YES
Time Fixed Effects	NO	NO	YES	NO	YES
Observations	8,024	8,024	8,024	8,024	8,024
Number of Firms	502	502	502	502	502
R^2	0.002	0.005	0.006	0.032	0.035
Panel B: Post-Start					
$E_{i,t} \cdot Start_t$	0.00448**	0.00428*	0.00428*	0.00299	0.00298
	(2.002)	(1.936)	(1.934)	(1.382)	(1.371)
$E_{i,t}$	-0.000463	0.00242***	0.00241***		
	(-0.851)	(3.380)	(3.366)		
$Start_t$	-0.00238	-0.00208		0.00107	
	(-1.361)	(-1.199)		(0.588)	
$ln(TA_{i,t-1})$		-0.00135***	-0.00134***	-0.0223***	-0.0247***
		(-3.983)	(-3.971)	(-4.119)	(-3.981)
$LTDR_{i,t-1}$		-0.0141***	-0.0140***	-0.101***	-0.101***
		(-4.073)	(-4.052)	(-4.341)	(-4.336)
Firm Fixed Effects	NO	NO	NO	YES	YES
Time Fixed Effects	NO	NO	YES	NO	YES
Observations	8,024	8,024	8,024	8,024	8,024
Number of Firms	502	502	502	502	502
R^2	0.000	0.003	0.005	0.031	0.034

Table 3 presents estimates from a linear regression analysis where the dependent variable is the seasonally adjusted amount of bonds issued scaled by total assets ($\Delta B_{i,t} \,/\, TA_{i,t-1}$). Independent variables are an interaction term of eligibility and announcement ($E_{i,t} \cdot Announce_t$) or an interaction term of eligibility and start ($E_{i,t} \cdot Start_t$), eligibility in the CSPP ($E_{i,t}$) and the announcement or start dummy of the CSPP ($Announce_t/Start_t$). Panel A follows the announcement as treatment date and Panel B takes the start as treatment date. Column (1) shows results without controlling for any firm-specific and time-specific fixed effects or other time varying firm-specific characteristics of which the latter are added in Column (2). Column (3) shows the estimates while controlling for time-specific fixed effects, whereas Column (4) controls for firm-specific fixed effects. Column (5) presents the estimates while controlling for firm-specific and time-specific fixed effects and other time varying firm-specific characteristics. Control variables include the log of total assets ($ln(TA_{i,t-1})$) and the long-term debt ratio ($LTDR_{i,t-1}$). Standard errors are adjusted for heteroskedasticity and clustered at the firm level. Robust t-statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table 4: CSPP Effects on Corporate Bond Issuance Behaviour: Combined Effect

$\Delta B_{i,t} \,/\, TA_{i,t-1}$	(1)	(2)	(3)	(4)	(5)
$E_{i,t} \cdot Announce_t$	0.0106***	0.0104***	0.0104***	0.00903***	0.00903***
	(2.993)	(2.969)	(2.967)	(2.760)	(2.754)
$E_{i,t} \cdot Start_t$	-0.00462	-0.00462	-0.00462	-0.00472	-0.00474
	(-1.321)	(-1.322)	(-1.321)	(-1.343)	(-1.345)
$E_{i,t}$	-0.00198**	0.000898	0.000912		
	(-2.425)	(1.135)	(1.163)		
$Announce_t$	-0.00750***	-0.00722***		-0.00414*	
	(-3.024)	(-2.961)		(-1.778)	
$Start_t$	0.00405	0.00410		0.00460*	
	(1.599)	(1.616)		(1.781)	
$ln(TA_{i,t-1})$		-0.00133***	-0.00134***	-0.0224***	-0.0248***
		(-3.973)	(-3.969)	(-4.007)	(-3.989)
$LTDR_{i,t-1}$		-0.0138***	-0.0138***	-0.0997***	-0.0993***
		(-4.066)	(-4.051)	(-4.330)	(-4.323)
Firm Fixed Effects	NO	NO	NO	YES	YES
Time Fixed Effects	NO	NO	YES	NO	YES
Observations	8,024	8,024	8,024	8,024	8,024
Number of Firms	502	502	502	502	502
R^2	0.002	0.005	0.007	0.032	0.035

Table 4 presents estimates from a linear regression analysis where the dependent variable is the seasonally adjusted amount of bonds issued scaled by total assets ($\Delta B_{i,t} \,/\, TA_{i,t-1}$). Independent variables are an interaction term of eligibility and announcement ($E_{i,t} \cdot Announce_t$), an interaction term of eligibility and start ($E_{i,t} \cdot Start_t$), eligibility in the CSPP ($E_{i,t}$) and the announcement and start dummy of the CSPP ($Announce_t/Start_t$). Column (1) shows results without controlling for any firm-specific and time-specific fixed effects or other time varying firm-specific characteristics of which the latter are added in Column (2). Column (3) shows the estimates while controlling for time-specific fixed effects, whereas Column (4) controls for firm-specific fixed effects. Column (5) presents the estimates while controlling for firm-specific and time-specific fixed effects and other time varying firm-specific characteristics. Control variables include the log of total assets ($ln(TA_{i,t-1})$) and the long-term debt ratio ($LTDR_{i,t-1}$). Standard errors are adjusted for heteroskedasticity and clustered at the firm level. Robust t-statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

the financing constraints of eligible euro area corporates and led to the increased issuance in bonds by these same companies. The announcement effect in Table 4 even increased to 0.9%, suggesting to even more issuance after including the start effect in the model. However, the coefficients in Table 3 are leading, as I believe the simplicity of the model enhances the transparency and by adding more insignificant variables the coefficients of other variables are inadvertently affected.

6.2. Company Location

Table 3 and 4 show the overall effectiveness of the programme on eligible versus non-eligible companies in the euro area. By splitting the sample into subsamples the effectiveness of the programme within groups of companies can be examined. It could be that within different company groups the issuance behaviour of eligible and non-eligible firms is affected in a different manner. This way it can be tested whether the programme is

effective in all different subsamples and find out more specifically which eligible companies make use of the effects of easing monetary policy. The first subsamples I create contain a split of the full sample in GIIPS and non-GIIPS countries. Research has shown GIIPS countries have tighter capital markets in the aftermath of the sovereign debt crisis than non-GIIPS countries (Acharya et al., 2016; Horny et al., 2016; Zaghini, 2016; 2017). Therefore, GIIPS companies face more financing constraints and since almost 60% of all GIIPS companies are eligible in the CSPP it is expected that these companies will increase their issuance intensity after the announcement of the CSPP.

The results of the GIIPS sample are presented in Panel A of Table 5 and the non-GIIPS results are shown in Panel B. All columns include time varying firm-specific controls, including size and leverage. The main result from Panel A is that there is no significant change in the issuance behaviour of eligible companies compared to non-eligible companies in GIIPS countries. In fact, when looking at the announcement dummy, there is no significant change in the issuance behaviour of any firm after the announcement of the programme. The CSPP fails to increase the issuance of corporate bonds in GIIPS countries, where they may need it most. A possible explanation for this phenomenon could be the overall economic conditions in GIIPS countries. The real effects of the sovereign debt crisis have hit the GIIPS countries hard, as investments, job creation and sales growth were depressed by decreasing bank lending and a slowing economy (Acharya et al., 2016). Companies may be reluctant to issue more debt, because currently there is not enough window for investments. When controlling for firm-specific and time-specific fixed effects in Column (4), it shows that GIIPS companies tend to let leverage play a significant role in their choice of bond issuance. This may indicate that firms in GIIPS countries are still more reluctant in issuing debt compared non-GIIPS companies. The average leverage of a GIIPS company is substantially higher compared to non-GIIPS firms as seen in Table A1 of the Appendix, implying a tighter capital market in GIIPS countries with firms facing higher financing constraints. These results correspond with the studies of Horney et al. (2016) and Zughini (2016; 2017), they both find higher yields on bonds of GIIPS corporates compared to similar non-GIIPS corporates.

Subsequently, Panel B illustrates the announcement effect in non-GIIPS countries. In contrast to the GIIPS sample, the non-GIIPS sample presents a highly significant announcement effect on bond issuance behaviour of eligible companies. The programme has effectively increased the bond issuance intensity of eligible companies in non-GIIPS countries. Corporates make use of the sudden decrease in yields and cheaper financing conditions. Throughout all four columns the announcement effect is highly significant. Both leverage and size also significantly impact the issuance behaviour of companies in non-GIIPS countries, which corresponds with previous finding in the entire sample. The eligibility variable is insignificant in the first two columns suggesting common issuance

Table 5: CSPP Effects on Corporate Bond Issuance Behaviour: Company Location

$\Delta B_{i,t} \,/\, TA_{i,t-1}$	(1)	(2)	(3)	(4)
Panel A: GIIPS Sample				
$E_{i,t} \cdot Announce_t$	0.0117	0.0117	0.00753	0.00758
	(1.430)	(1.422)	(0.847)	(0.846)
$E_{i,t}$	-0.00194	-0.00198		
	(-0.822)	(-0.846)		
$Announce_t$	-0.00878		-0.00544	
	(-1.141)		(-0.602)	
$ln(TA_{i,t-1})$	-0.00151**	-0.00149**	-0.0212	-0.0195
	(-2.426)	(-2.444)	(-1.260)	(-1.168)
$LTDR_{i,t-1}$	-0.0150*	-0.0153**	-0.127*	-0.129*
	(-1.994)	(-2.042)	(-1.887)	(-1.892)
Firm Fixed Effects	NO	NO	YES	YES
Time Fixed Effects	NO	YES	NO	YES
Observations	1,004	1,004	1,004	1,004
Number of Firms	66	66	66	66
R^2	0.008	0.032	0.037	0.061
Panel B: non-GIIPS Sample				
$E_{i,t} \cdot Announce_t$	0.00773***	0.00773***	0.00672***	0.00673***
	(2.967)	(2.963)	(2.871)	(2.864)
$E_{i,t}$	0.00122	0.00124		
	(1.410)	(1.448)		
$Announce_t$	-0.00481***		-0.00147	
	(-2.756)		(-0.908)	
$ln(TA_{i,t-1})$	-0.00131***	-0.00132***	-0.0226***	-0.0254***
	(-3.605)	(-3.605)	(-3.915)	(-3.929)
$LTDR_{i,t-1}$	-0.0138***	-0.0139***	-0.0961***	-0.0956***
	(-3.749)	(-3.733)	(-3.860)	(-3.856)
Firm Fixed Effects	NO	NO	YES	YES
Time Fixed Effects	NO	YES	NO	YES
Observations	7,022	7,022	7,022	7,022
Number of Firms	442	442	442	442
R^2	0.004	0.006	0.032	0.035

This table presents estimates from a linear regression analysis where the dependent variable is the seasonally adjusted amount of bonds issued scaled by total assets ($\Delta B_{i,t} \,/\, TA_{i,t-1}$). Independent variables are an interaction term of eligibility and announcement ($E_{i,t} \cdot Announce_t$), eligibility in the CSPP ($E_{i,t}$) and the announcement of the CSPP ($Announce_t$). Panel A only consist of companies that reside in GIIPS countries (Greece, Ireland, Italy, Portugal and Spain), whereas Panel B consist of companies that are situated in non-GIIPS countries. Column (1) shows results without controlling for any firm-specific and time-specific fixed effects or other time varying firm-specific characteristics. Column (2) shows the estimates while controlling for time-specific fixed effects, whereas Column (3) controls for firm-specific fixed effects. Column (4) presents the estimates while controlling for firm-specific and time-specific fixed effects and other time varying firm-specific characteristics. Control variables include the log of total assets ($ln(TA_{i,t-1})$) and the long-term debt ratio ($LTDR_{i,t-1}$). Standard errors are adjusted for heteroskedasticity and clustered at the firm level. Robust t-statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

behaviour between eligible and non-eligible firms in the pre-announcement period. Financing conditions, the corporate environment and investment opportunities in non-GIIPS countries were already ahead of GIIPS countries prior to the CSPP announcement (Horny et al., 2016, Zaghini, 2016; 2017). The results are similar to the full sample regressions, with the announcement effect increasing bond issuance around 0.7% in the non-GIIPS sample. It must be noted that companies in GIIPS countries seem to be less active on the corporate bond market in the euro area with only 73 companies in the sample. Non-GIIPS firms represent a large part of the full sample and it is therefore likely that the results of Panel B coincide with the results of the full sample regressions. These findings are highly relevant for European policy makers, as they strive towards a Europe Union with equal opportunities for all member states. The results from Table 5 indicate that the CSPP is mainly benefiting the core European countries, considering Germany, Netherlands and France are the biggest participants in the non-GIIPS sample. This could possibly lead to further diverging GIIPS and non-GIIPS economies.

6.3. Public Status

Next, I split the sample based on public status resulting in two subsamples, one including only publicly listed companies and the other only privately owned companies. The CSPP makes a distinction between public and private companies in the way national central banks are allowed to purchase corporate bonds. They are only allowed to buy corporate bonds of publicly listed entities in the secondary market, whereas with bonds of privately owned companies they are allowed to purchase them in the secondary market together with purchases directly at issue in the primary market. As seen in previous literature, financing conditions of public and private companies are different (Pagano et al., 1998; Saunders & Steffen, 2011; Kovner & Wei, 2014), the subsamples allow me to examine the intensity of the announcement effect on public and private eligible companies compared to the non-eligible companies that face the same financing conditions pre CSPP announcement. The results are presented in Panel A and B of Table 6 for public and private companies respectively.

Panel A presents unambiguous and highly significant estimates for the announcement effect of publicly listed eligible companies compared to the non-eligible companies. All columns show the same results with an increase in the issuance intensity of around 0.5% in the most demanding specification of Column (4). There is a common trend between eligible and non-eligible firms in the pre-announcement period, with the eligible variable being insignificant. Again, both the size and leverage have a highly significant negative effect on the issuance behaviour of a company, even after controlling for time invariant unobserved company heterogeneity or time fixed effects. The coefficients of the announcement effect in the public sample are lower compared to the full sample estimates. This

could possibly be explained by the fact that both eligible and non-eligible public firms have better access to capital markets and have more diversified ways of attracting capital.

Consequently, the effect of the CSPP on eligible privately owned companies is portrayed in Panel B of Table 6. Column (1) and (2) shows there is a common trend in issuance behaviour between eligible and non-eligible firms in the pre-announcement period. The announcement effect is somewhat ambiguous as it is only significant at a 90% confidence level and loses significance in Column (2) after controlling for time fixed effects. Nonetheless, the coefficient is remarkably high and indicates that eligible firms increase their issuance intensity by almost 1.7% after the CSPP announcement. The control variables size and leverage play a significant role in all four specifications. As seen in Table A2 of the Appendix, private firms are on average more levered than public firms are. The leverage coefficient is therefore higher in the private sample compared to the public sample. The results of the announcement effect are not entirely persistent throughout all four specifications. Although, private firms face higher financing costs and are therefore more sensitive to external shocks in financing conditions. It is not clear whether the increase in the issuance intensity is mainly caused by the fact that the ECB is allowed to purchase bonds right at issuance, but it is a plausible explanation for such a sharp increase in issuance intensity. I need to be careful with making hard conclusions based on these results, but the CSPP seems to be effective in easing financing conditions and stimulating private corporates to attract more capital.

6.4. Leverage Profile

The third split in the data is based on the leverage profile of companies. Leverage is measured as long-term debt divided by total assets. Firms belonging to the lowest quartile have low leverage, companies belonging to the highest quartile are highly levered and companies belonging to the interquartile have medium leverage[2]. The announcement effect on eligible companies within different leverage profiles can be examined more thoroughly when using these subsamples. Highly levered firms get the chance to chase new investment opportunities with an ease in financing conditions. The difficulties in obtaining debt finance will decrease, resulting in more investment opportunities with a positive net present value. Medium and low levered firms may use the easing monetary policy to work towards their optimal capital structure. Firms may also use the opportunity to refinance their existing debt against more favourable conditions. From an ECB perspective, the latter would not be the desired outcome.

[2]Lowest quartile means a leverage ratio smaller than 15.7%, interquartile between 15.7% and 37.3% and highest quartile above 37.3%.

Table 6: CSPP Effects on Corporate Bond Issuance Behaviour: Public Status

$\Delta B_{i,t} \,/\, TA_{i,t-1}$	(1)	(2)	(3)	(4)
Panel A: Public Sample				
$E_{i,t} \cdot Announce_t$	0.00601***	0.00602***	0.00466**	0.00463**
	(2.948)	(2.947)	(2.437)	(2.423)
$E_{i,t}$	0.000503	0.000502		
	(0.702)	(0.700)		
$Announce_t$	-0.00382**		-0.00105	
	(-2.169)		(-0.607)	
$ln(TA_{i,t-1})$	-0.00102***	-0.00102***	-0.0186***	-0.0202***
	(-2.978)	(-2.937)	(-3.113)	(-3.021)
$LTDR_{i,t-1}$	-0.0115***	-0.0115***	-0.0837***	-0.0836***
	(-3.387)	(-3.385)	(-3.882)	(-3.913)
Firm Fixed Effects	NO	NO	YES	YES
Time Fixed Effects	NO	YES	NO	YES
Observations	6,478	6,478	6,478	6,478
Number of Firms	406	406	406	406
R^2	0.004	0.007	0.036	0.040
Panel B: Private Sample				
$E_{i,t} \cdot Announce_t$	0.0167*	0.0167	0.0166*	0.0168*
	(1.668)	(1.659)	(1.838)	(1.832)
$E_{i,t}$	0.00320	0.00331		
	(1.031)	(1.078)		
$Announce_t$	-0.0100**		-0.00517	
	(-2.109)		(-1.133)	
$ln(TA_{i,t-1})$	-0.00250**	-0.00253***	-0.0351**	-0.0397**
	(-2.611)	(-2.678)	(-2.438)	(-2.468)
$LTDR_{i,t-1}$	-0.0225**	-0.0228**	-0.130**	-0.131**
	(-2.450)	(-2.432)	(-2.325)	(-2.282)
Firm Fixed Effects	NO	NO	YES	YES
Time Fixed Effects	NO	YES	NO	YES
Observations	1,545	1,545	1,545	1,545
Number of Firms	97	97	97	97
R^2	0.007	0.020	0.031	0.046

This table presents estimates from a linear regression analysis where the dependent variable is the seasonally adjusted amount of bonds issued scaled by total assets ($\Delta B_{i,t} \,/\, TA_{i,t-1}$). Independent variables are an interaction term of eligibility and announcement ($E_{i,t} \cdot Announce_t$), eligibility in the CSPP ($E_{i,t}$) and the announcement dummy of the CSPP ($Announce_t$). Panel A only consist of companies that are publicly listed, whereas Panel B consist of companies that are privately held. Column (1) shows results without controlling for any firm-specific and time-specific fixed effects or other time varying firm-specific characteristics. Column (2) shows the estimates while controlling for time-specific fixed effects, whereas Column (3) controls for firm-specific fixed effects. Column (4) presents the estimates while controlling for firm-specific and time-specific fixed effects and other time varying firm-specific controls. Control variables include the log of total assets ($ln(TA_{i,t-1})$) and the long-term debt ratio ($LTDR_{i,t-1}$). Standard errors are adjusted for heteroskedasticity and clustered at the firm level. Robust t-statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table 7: CSPP Effects on Corporate Bond Issuance Behaviour: Leverage Profile

$\Delta B_{i,t} \,/\, TA_{i,t-1}$	(1)	(2)	(3)	(4)
Panel A: Low				
$E_{i,t} \cdot Announce_t$	0.00945***	0.00950***	0.00444**	0.00455**
	(3.828)	(3.802)	(2.116)	(2.158)
$E_{i,t}$	0.00273	0.00271		
	(1.281)	(1.280)		
$Announce_t$	-0.00540***		0.00122	
	(-2.690)		(0.747)	
$ln(TA_{i,t-1})$	-0.00287**	-0.00288**	-0.0161	-0.0205
	(-2.459)	(-2.439)	(-1.098)	(-1.323)
$LTDR_{i,t-1}$	-0.00574	-0.00567	-0.131**	-0.130**
	(-0.310)	(-0.319)	(-2.124)	(-2.231)
Observations	2,003	2,003	1,992	1,992
Number of Firms	206	206	195	195
R^2	0.016	0.022	0.159	0.166
Panel B: Medium				
$E_{i,t} \cdot Announce_t$	0.00713**	0.00711**	0.00492**	0.00493**
	(2.299)	(2.289)	(1.976)	(1.974)
$E_{i,t}$	0.00193	0.00193		
	(1.521)	(1.517)		
$Announce_t$	-0.00371*		-0.00208	
	(-1.702)		(-0.959)	
$ln(TA_{i,t-1})$	-0.00145**	-0.00144**	-0.0127***	-0.0130***
	(-2.214)	(-2.188)	(-3.345)	(-3.237)
$LTDR_{i,t-1}$	0.0133	0.0132	-0.0666***	-0.0670***
	(1.415)	(1.398)	(-2.670)	(-2.686)
Observations	3,990	3,990	3,977	3,977
Number of Firms	367	367	354	354
R^2	0.004	0.008	0.102	0.106
Panel C: High				
$E_{i,t} \cdot Announce_t$	0.00872*	0.00872*	0.00549	0.00534
	(1.681)	(1.668)	(1.061)	(1.019)
$E_{i,t}$	-0.00419	-0.00403		
	(-1.211)	(-1.175)		
$Announce_t$	-0.00781*		-0.00264	
	(-1.958)		(-0.582)	
$ln(TA_{i,t-1})$	0.00167	0.00161	-0.0268**	-0.0344***
	(1.583)	(1.549)	(-2.501)	(-2.804)
$LTDR_{i,t-1}$	0.00244	0.00277	-0.106***	-0.103***
	(0.277)	(0.320)	(-3.047)	(-2.982)
Observations	2,031	2,031	2,028	2,028
Number of Firms	183	183	180	180
R^2	0.003	0.008	0.063	0.072
Firm Fixed Effects	NO	NO	YES	YES
Time Fixed Effects	NO	YES	NO	YES

This table presents estimates from a linear regression analysis where the dependent variable is the seasonally adjusted amount of bonds issued scaled by total assets ($\Delta B_{i,t} \,/\, TA_{i,t-1}$). Independent variables are an interaction term of eligibility and announcement ($E_{i,t} \cdot Announce_t$), eligibility in the CSPP ($E_{i,t}$) and the announcement of the CSPP ($Announce_t$). Panel A only consists of companies that belong to the lowest quartile when looking at leverage (<15.7%), Panel B consists of firms belonging to the interquartile (>15.7% and <37.3%) and Panel C contains the highest quartile (>37.3%). Leverage is measured as long-term debt over total assets. Column (1) shows results without controlling for any firm- and time-specific fixed effects or other time varying firm-specific controls. Column (2) shows the estimates while controlling for time-specific fixed effects, whereas Column (3) controls for firm-specific fixed effects. Column (4) presents the estimates while controlling for firm-specific and time-specific fixed effects and other time varying firm-specific characteristics. Control variables include the log of total assets ($ln(TA_{i,t-1})$) and the long-term debt ratio ($LTDR_{i,t-1}$). Standard errors are adjusted for heteroskedasticity and clustered at the firm level. Robust t-statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Panel A of Table 7[3] portrays the estimates of the subsample for firms with a low leverage ratio. In the most simple specification of Column (1) and (2) the announcement of the CSPP has a significant effect on the issuance behaviour of eligible low levered firms. The most important regressions are presented in Column (3) and (4), where, amongst other controls, firm-specific fixed effects are added. The announcement effect is persistently significant in all four regressions, indicating that companies with low leverage grab the opportunity of improved financing conditions to attract more debt. The current leverage plays an ambiguous role in the issuance behaviour of low leverage companies, as it is only significant in column (3) and (4). These companies are not financially constraint and the marginal cost of attracting additional debt should still be relatively low. However, the leverage coefficient is rather high. A possible explanation could be the fact that these firms choose to have low leverage as part of their corporate strategy. In Column (4), the announcement caused a 0.5% increase in the issuance behaviour of eligible companies. With a corresponding R^2 of over 16% in the most demanding regression, the CSPP announcement, size and leverage seem to explain a significant amount of the variance in the change in issuance intensity.

Results of the estimates of medium levered firms are presented in Panel B. The CSPP significantly impacts the issuance behaviour of eligible firms in this sample. The announcement effect is persistently significant in all four specifications. In comparison with low levered firms, size becomes increasingly significant. The results for leverage are statistically significant in the most demanding regressions of Column (3) and (4). Eligible medium levered firms are making use of the ease in financing conditions similar to firms with low leverage. After the announcement they tend to increase their issuance intensity by 0.5% compared to non-eligible firms in the same sample.

The subsample containing highly levered firms is shown in Panel C. The announcement effect appears to be insignificant for eligible highly levered firms. They do not increase their issuance compared to non-eligible firms. Eligible and non-eligible firms show a similar pre-announcement trend and the announcement dummy is also insignificant. There is no evidence that the CSPP has decreased borrowing costs for highly levered firms, because they are still reluctant in issuing more debt. It could be the case that they have already reached their leverage ceiling and cannot bear any more interest payments. I would have expected that especially highly levered firms would use the CSPP to recapitalize against more favourable conditions. When looking at the tables in the Appendix it can be noted that in the GIIPS and Private sample the leverage is

[3]Throughout the different columns the number of firms and observations may deviate in Column (3) and (4). This is due to the fact that the fixed effects model drops all the singleton groups in the data sample. A fixed effects model looks within groups, one observation is therefore not enough. Leverage can change over time and as a result firms can have only one observation in a certain leverage category. The model drops singleton groups as they can overstate significance and lead to incorrect inference (Correia, 2015).

substantially higher compared to other subsamples. As suggested previously, a possible explanation could be that GIIPS firms have less viable investment opportunities at hand, because they operate in weaker overall economies. The effect on private firms was also ambiguous and in combination with GIIPS firms could lead to insignificant results for highly levered firms. Overall, highly levered companies are possibly already in bad shape and may not have a lot of viable investment opportunities to deploy the newly attracted capital.

6.5. Robustness

This section contains the robustness checks done to verify the methods used: (i) compare actually bought companies with eligible companies and the whole sample and (ii) place the actually bought variable in the model on top of the announcement effect variable to see whether the effect is still significant.

The first robustness check tests whether bought companies issue more than eligible companies since the start of the CSPP and then tests whether they issue more compared to the entire sample. Panel A of Table 8 shows the subsample consisting only eligible firms and states that actually bought companies do not issue significantly more than other eligible companies. The CSPP effect is the same for the entire eligible group. This is not strange since the ECB does not make any comments on holdings or individual assets. In Panel B bought companies are compared to the entire sample. Issuance intensity of bought companies tends to increase compared to non-bought companies. However, the coefficient is much lower compared to the estimates in Table 3. The other eligible firms are now also part of the non-bought group and reduce the significance and height of the coefficient. Panel B does not control for eligibility of a company during the post-announcement period and the third robustness check will show whether the bought effect is actually significantly increasing issuance intensity on top of the announcement effect.

Table 9 shows the regressions with the effect of being bought on top of the announcement effect. Expectedly, the bought effect seems to disappear after controlling for the announcement effect, while the announcement effect remains highly significant in all four specifications. Thus, firms that are eligible tend to increase their issuance behaviour in the post-announcement period, however they do not increase their issuance behaviour even more after being bought in the CSPP. The announcement effect seems to be strong for all eligible companies and not just the once that are being purchases by the ECB, increasing the effectiveness of the programme.

Table 8: Robustness for Being Bought

$\Delta B_{i,t} \,/\, TA_{i,t-1}$	(1)	(2)	(3)	(4)
Panel A: Eligible Sample				
$H_{i,t} \cdot Start_t$	0.00102	0.00319	0.00173	0.00393
	(0.425)	(1.200)	(0.733)	(1.511)
$H_{i,t}$	-0.00009	-0.000360		
	(-0.137)	(-0.522)		
$Announce_t$	0.00255		0.00332	
	(1.214)		(1.574)	
$ln(TA_{i,t-1})$	-0.00108***	-0.00110***	-0.0148***	-0.0187**
	(-3.693)	(-3.617)	(-2.700)	(-2.544)
$LTDR_{i,t-1}$	-0.0120***	-0.0121***	-0.147***	-0.146***
	(-3.541)	(-3.494)	(-3.869)	(-3.884)
Firm Fixed Effects	NO	NO	YES	YES
Time Fixed Effects	NO	YES	NO	YES
Observations	3,744	3,744	3,744	3,744
Number of Firms	234	234	234	234
R^2	0.003	0.006	0.029	0.033
Panel B: Full Sample				
$H_{i,t} \cdot Start_t$	0.00514**	0.00488**	0.00488**	0.00415*
	(2.477)	(2.125)	(2.432)	(1.880)
$H_{i,t}$	0.00119*	0.00123*		
	(1.918)	(1.920)		
$Announce_t$	-0.00224*		0.000493	
	(-1.661)		(0.350)	
$ln(TA_{i,t-1})$	-0.00109***	-0.00109***	-0.0223***	-0.0247***
	(-3.605)	(-3.602)	(-3.996)	(-3.978)
$LTDR_{i,t-1}$	-0.0132***	-0.0132***	-0.101***	-0.101***
	(-3.962)	(-3.949)	(-4.351)	(-4.348)
Firm Fixed Effects	NO	NO	YES	YES
Time Fixed Effects	NO	YES	NO	YES
Observations	8,024	8,024	8,024	8,024
Number of Firms	502	502	502	502
R^2	0.003	0.005	0.031	0.034

This table presents estimates from a linear regression analysis where the dependent variable is the seasonally adjusted amount of bonds issued scaled by total assets ($\Delta B_{i,t} \,/\, TA_{i,t-1}$). Independent variables are an interaction term of being bought in the CSPP and start ($H_{i,t} \cdot Start_t$), bought in the CSPP ($H_{i,t}$) and the start dummy of the CSPP ($Start_t$). Panel A only consist of companies that are on the eligibility list of the ECB, whereas Panel B represents the whole sample. Column (1) shows results without controlling for any firm-specific and time-specific fixed effects or other time varying firm-specific characteristics. Column (2) shows the estimates while controlling for time-specific fixed effects, whereas Column (3) controls for firm-specific fixed effects. Column (4) presents the estimates while controlling for firm-specific and time-specific fixed effects and other time varying firm-specific characteristics. Control variables include the log of total assets ($ln(TA_{i,t-1})$) and the long-term debt ratio ($LTDR_{i,t-1}$). Standard errors are adjusted for heteroskedasticity and clustered at the firm level. Robust t-statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table 9: Robustness for Bought and Announcement Effect

$\Delta B_{i,t} \,/\, TA_{i,t-1}$	(1)	(2)	(3)	(4)
$H_{i,t} \cdot Start_t$	-0.00063	-0.00063	-0.00033	-0.00033
	(-0.235)	(-0.235)	(-0.122)	(-0.125)
$E_{i,t} \cdot Announce_t$	0.00830***	0.00829***	0.00678***	0.00677***
	(3.005)	(3.003)	(2.664)	(2.653)
$H_{i,t}$	0.00008	0.00008		
	(0.109)	(0.110)		
$E_{i,t}$	0.000846	0.000859		
	(0.937)	(0.959)		
$Start_t$	0.00215		0.00251	
	(1.077)		(1.246)	
$Announce_t$	-0.00624***		-0.00309	
	(-2.807)		(-1.446)	
$ln(TA_{i,t-1})$	-0.00133***	-0.00134***	-0.0224***	-0.0247***
	(-3.967)	(-3.963)	(-4.005)	(-3.988)
$LTDR_{i,t-1}$	-0.0138***	-0.0138***	-0.0997***	-0.0993***
	(-4.064)	(-4.049)	(-4.332)	(-4.324)
Firm Fixed Effects	NO	NO	YES	YES
Time Fixed Effects	NO	YES	NO	YES
Observations	8,024	8,024	8,024	8,024
Number of Firms	502	502	502	502
R^2	0.005	0.006	0.032	0.035

This table presents estimates from a linear regression analysis where the dependent variable is the seasonally adjusted amount of bonds issued scaled by total assets ($\Delta B_{i,t} \,/\, TA_{i,t-1}$). Independent variables are an interaction term of being bought in the CSPP and the start of the CSPP ($H_{i,t} \cdot Start_t$), an interaction term of being eligible in the CSPP and the announcement of the CSPP ($E_{i,t} \cdot Announce_t$), dummy for being bought in the CSPP ($H_{i,t}$), dummy for being eligible in the CSPP ($E_{i,t}$), dummy for the start of the CSPP ($Start_t$) and a dummy for the announcement of the CSPP ($Announce_t$). Column (1) shows results without controlling for any firm-specific and time-specific fixed effects or other time varying firm-specific characteristics. Column (2) shows the estimates while controlling for time-specific fixed effects, whereas Column (3) controls for firm-specific fixed effects. Column (4) presents the estimates while controlling for firm-specific and time-specific fixed effects and other time varying firm-specific characteristics. Control variables include the log of total assets ($ln(TA_{i,t-1})$) and the long-term debt ratio ($LTDR_{i,t-1}$). Standard errors are adjusted for heteroskedasticity and clustered at the firm level. Robust t-statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

7. Conclusion

Almost eight years ago the ECB started fighting low inflation and growth rates with unconventional monetary policy. In these eight years several new measures were implemented including the corporate sector purchase programme. My analysis examines the effect of unconventional monetary policy on corporate bond issuance behaviour in the euro area. Financial markets immediately reacted to the ECB announcement of the CSPP with a large compression in credit spreads and declining bond yields. The effect of unconventional monetary policy on corporate financing decisions is still a relatively unexamined phenomenon in academic literature. My analysis shows how corporates tend to react to unconventional monetary policy. I base my analysis on a data sample of company specific bond and accounting data for all euro area countries. By not only including publicly listed entities, but also privately owned companies, I am able to provide unique insights in the change in financing decisions of corporates to the recently implemented unconventional monetary policy measure by the ECB.

The results suggests that the bond issuance behaviour for eligible companies is significantly affected by the announcement of the CSPP. These firms tend to exploit the easing financing conditions by increasing their issuance intensity. Firms that are technically eligible under the CSPP criteria, but are not on the ECB eligibility list, do not seem to benefit from the easing financing conditions as much as the eligible firms. The announcement of the programme was particularly successful as the announcement effect captures all the change in issuance behaviour compared to the actual start of the programme.

When looking to all different subsamples the results of the announcement effect remain persistently significant. The only exception to the rule is the effect in the GIIPS countries. There does not seem to be a significant impact on the issuance behaviour of eligible GIIPS companies, which is relevant for policy makers creating new measures to stimulate the European economy. The ECB strives to work towards a European Union where all countries share the burden equally without having large creditors and debtors. The CSPP seems to fail in encouraging GIIPS firms to attract new capital. A possible explanation is the lack of investment opportunities in the GIIPS countries. These countries were severely hit by the sovereign debt crisis and their economic recovery remains sluggish. Policy makers do need to find ways to stimulate corporate investments in these countries.

Eligible companies based in non-GIIPS countries seem to benefit from the improved financing conditions and significantly increase their bond issuance. Non-GIIPS economies are recovering must faster from the sovereign debt crisis compared to GIIPS countries, thus companies are better able to deploy their newly issued capital. When comparing eligible and non-eligible companies based on their public status, privately owned firms that are eligible increase their issuance intensity significantly against non-eligible private

companies. It must be noted that the effect is not highly significant, nonetheless seems to be persistent throughout different regressions. The fact that the ECB is allowed to purchase bonds of these firms directly at issue is a possible explanation for this large increase. The ECB does not only improve financing conditions for these firms, they are also a direct capital provider with the ability to buy up to 70% of the bond issue. At the subsample of publicly listed entities the announcement effect is also highly significant and in line with the entire sample, since 80% of all firms in the data sample are publicly listed. The effect on eligible public firms is lower compared to eligible private firms. A possible reason is that both eligible and non-eligible public firms have better access to capital markets and have more diversified ways of attracting capital.

Finally, the subsamples based on leverage profile show that the difference in issuance behaviour post-announcement is primarily evident in the low and medium leverage subsamples. These firms take advantage of the ease in financing conditions and increase their issuance intensity significantly. Companies that are highly levered face higher marginal borrowing costs and financing constraints. There is no evidence that eligible or non-eligible firms increase their issuance after the CSPP announcement. It appears that highly levered firms carry so much leverage for a reason and are more likely to be in a weak economic state. They cannot take on any more leverage even after the drop in yield spreads post-announcement and also show no sign of recapitalising against more favourable conditions.

All in all, the corporate sector purchase programme seems to be effective in easing financing conditions for euro area corporates, however it is not yet clear how the newly attracted capital will be deployed. If firms only use it to increase their cash holdings in these times of uncertainty or simply recapitalise against more favourable conditions, the effect on the real economy will be limited. Further research could include the high yield market to obtain a larger control group and to see whether there are positive spillovers towards the high yield market. The CSPP is likely to cause a search for yield and push investors towards more riskier assets. This way the CSPP could indirectly also benefit high yield markets, equity markets and non-European markets. Further research is necessary to examine the effects of the programme on corporate investment, investor holdings, market spillovers, bank loan substitutability as well as its impact on the real economy and inflation levels.

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Appendix

Table A1: Issuance Behaviour as reaction to CSPP: Company Location

Panel A:		Non-Eligible		Eligible	
GIIPS		Mean	Std. Dev.	Mean	Std. Dev.
Before	Issuance	0.131	0.121	0.028	0.038
	Principal*	265	229	542	464
	Total Assets*	2,807	2,193	55,829	110,578
	Leverage	0.322	0.158	0.294	0.148
After	Issuance	0.099	0.077	0.034	0.040
	Principal*	235	226	563	419
	Total Assets*	2,954	2,309	57,476	103,956
	Leverage	0.346	0.131	0.282	0.130
		Abs.	%	Abs.	%
Change mean	Issuance	-0.032	-0.242	0.006	0.224
	Principal*	-30	-0.115	21	0.039
	Total Assets*	147	0.052	1,647	0.030
	Leverage	0.024	0.075	-0.012	-0.041
Panel B:		Non-Eligible		Eligible	
non-GIIPS		Mean	Std. Dev.	Mean	Std. Dev.
Before	Issuance	0.093	0.130	0.033	0.061
	Principal*	301	396	731	663
	Total Assets*	13,510	41,068	54,503	111,428
	Leverage	0.264	0.160	0.268	0.153
After	Issuance	0.067	0.064	0.043	0.090
	Principal*	345	626	1,037	1,379
	Total Assets*	13,859	41,305	58,382	114,942
	Leverage	0.275	0.155	0.269	0.153
		Abs.	%	Abs.	%
Change mean	Issuance	-0.026	-0.279	0.009	0.279
	Principal*	44	0.144	306	0.419
	Total Assets*	349	0.026	3,879	0.071
	Leverage	0.011	0.042	0.001	0.004

Table 3 presents the company characteristics and issuance behaviour of eligible and non-eligible companies before and after the announcement of the CSPP. The sample is split based on company location, where Panel A represent the companies situated in GIIPS countries and Panel B shows the companies situated in non-GIIPS countries. Before announcement contains the averages between 2013q1 to 2015q4 and after contains the averages between 2016q1 to 2016q4. In calculating the averages of Issuance and Principal zero issuance quarters are excluded. In both panels the growth rate and absolute change of the mean is given in the third section. Data is obtained from ThomsonOne, Compustat Global/North America and Amadeus. *Expressed in €millions.

Table A2: CSPP Effects on Corporate Bond Issuance Behaviour: Public Status

Panel A:		Non-Eligible		Eligible	
Private		Mean	Std. Dev.	Mean	Std. Dev.
Before	Issuance	0.139	0.194	0.073	0.125
	Principal*	165	178	561	571
	Total Assets*	4,600	8,051	27,553	56,668
	Leverage	0.302	0.190	0.387	0.181
After	Issuance	0.071	0.064	0.092	0.196
	Principal*	192	251	556	451
	Total Assets*	4,805	9,054	31,960	69,417
	Leverage	0.319	0.188	0.387	0.178
		Abs.	%	Abs.	%
Change mean	Issuance	-0.068	-0.486	0.019	0.257
	Principal*	28	0.169	-4	-0.008
	Total Assets*	205	0.045	4407	0.160
	Leverage	0.017	0.056	0.000	0.000
Panel B:		Non-Eligible		Eligible	
Public		Mean	Std. Dev.	Mean	Std. Dev.
Before	Issuance	0.085	0.106	0.027	0.037
	Principal*	331	415	712	640
	Total Assets*	14,796	44,051	59,993	118,277
	Leverage	0.260	0.150	0.250	0.136
After	Issuance	0.072	0.068	0.032	0.034
	Principal*	359	634	1,028	1,365
	Total Assets*	15,125	44,183	63,327	119,166
	Leverage	0.271	0.142	0.249	0.132
		Abs.	%	Abs.	%
Change mean	Issuance	-0.013	-0.157	0.006	0.205
	Principal*	29	0.086	316	0.444
	Total Assets*	329	0.022	3,334	0.056
	Leverage	0.011	0.042	-0.001	-0.004

This table presents the company characteristics and issuance behaviour of eligible and non-eligible companies before and after the announcement of the CSPP. The sample is split based on public status, where Panel A represents privately owned companies and Panel B shows the listed corporates. Before announcement contains the averages between 2013q1 to 2015q4 and after contains the averages between 2016q1 to 2016q4. In calculating the averages of Issuance and Principal zero issuance quarters are excluded. In both panels the growth rate and absolute change of the mean is given in the third section. Data is obtained from ThomsonOne, Compustat Global/North America and Amadeus. *Expressed in €millions.

Table A3: CSPP Effects on Corporate Bond Issuance Behaviour: Leverage Profile

Panel A:		Non-Eligible		Eligible	
Low		Mean	Std. Dev.	Mean	Std. Dev.
Before	Issuance	0.123	0.179	0.021	0.029
	Principal*	303	451	800	619
	Total Assets*	22,526	65,397	93,711	155,553
	Leverage	0.097	0.064	0.096	0.051
After	Issuance	0.049	0.040	0.032	0.031
	Principal*	526	1,129	936	603
	Total Assets*	25,154	70,603	97,118	171,685
	Leverage	0.105	0.064	0.097	0.051
		Abs.	%	Abs.	%
Change mean	Issuance	-0.074	-0.601	0.011	0.524
	Principal*	223	0.737	137	0.171
	Total Assets*	2,628	0.117	3,407	0.036
	Leverage	0.008	0.080	0.001	0.011
Panel B:		Non-Eligible		Eligible	
Medium		Mean	Std. Dev.	Mean	Std. Dev.
Before	Issuance	0.079	0.101	0.026	0.035
	Principal*	360	410	706	684
	Total Assets*	11,167	23,640	49,464	97,123
	Leverage	0.256	0.070	0.256	0.069
After	Issuance	0.081	0.076	0.043	0.109
	Principal*	287	321	1,121	1,659
	Total Assets*	10,016	17,968	58,263	100,015
	Leverage	0.260	0.068	0.250	0.065
		Abs.	%	Abs.	%
Change mean	Issuance	0.002	0.028	0.017	0.665
	Principal*	-73	-0.203	416	0.589
	Total Assets*	-1,151	-0.103	8,799	0.178
	Leverage	0.004	0.016	-0.006	-0.023
Panel C:		Non-Eligible		Eligible	
High		Mean	Std. Dev.	Mean	Std. Dev.
Before	Issuance	0.104	0.116	0.054	0.092
	Principal*	162	166	588	521
	Total Assets*	4,419	16,939	28,145	69,813
	Leverage	0.480	0.109	0.473	0.100
After	Issuance	0.072	0.062	0.044	0.047
	Principal*	235	201	646	508
	Total Assets*	7,430	26,480	22,418	36,218
	Leverage	0.477	0.102	0.478	0.099
		Abs.	%	Abs.	%
Change mean	Issuance	-0.032	-0.311	-0.009	-0.175
	Principal*	73	0.449	58	0.098
	Total Assets*	3,011	0.681	-5,727	-0.203
	Leverage	-0.003	-0.006	0.005	0.011

This table shows the company characteristics and issuance behaviour of eligible and non-eligible companies before and after the announcement of the CSPP. The sample is split based on leverage profile, where Panel A only consists of companies that belong to the lowest quartile when looking at leverage (<15.7%), Panel B consists of firms belonging to the interquartile (>15.7% and <37.3%) and Panel C contains the highest quartile (>37.3%). Before announcement contains the averages between 2013q1 to 2015q4 and after contains the averages between 2016q1 to 2016q4. In calculating the averages of Issuance and Principal zero issuance quarters are excluded. In both panels the growth rate and absolute change of the mean is given in the third section. Data is obtained from ThomsonOne, Compustat Global/North America and Amadeus. *Expressed in €millions.

Table A4: Hausman Test

$\Delta B_{i,t} \,/\, TA_{i,t-1}$	(1)	(2)	(3)	(4)
	Fixed	Random	Difference	Cov. Diff.
$E_{i,t} \cdot Announce_t$	0.0067***	0.0087***	-0.0020	0.0011
	(3.067)	(4.111)		
$Announce_t$	-0.0019	-0.0055***	0.0036	0.0007
	(-1.105)	(-3.312)		
$ln(TA_{i,t-1})$	-0.0223***	-0.00122***	-0.0211	0.0034
	(-3.998)	(-3.969)		
$LTDR_{i,t-1}$	-0.0996***	-0.0135***	-0.0861	0.0107
	(-4.324)	(-4.018)		
χ^2	123.38			
$Prob > \chi^2$	0.0000			
Observations	8,024	8,024		
Number of Firms	502	502		
R^2	0.020	0.0065		

The Hausman test is used as part of my model selection. The null hypothesis (H_0) assumes that there is no correlation between the unique errors and the regressors in the model. The null hypothesis is rejected when the χ^2 is significantly different from zero. The test shows this is the case and the H_0 is therefore rejected and a fixed effects model is preferred. The dependent variable is the seasonally adjusted quarterly amount of bonds issued scaled by total assets ($ln(TA_{i,t-1})$). Independent variables are an interaction term of eligibility and announcement ($E_{i,t} \cdot Announce_t$) and the announcement dummy of the CSPP ($Announce_t$). Control variables include the log of total assets ($ln(TA_{i,t-1})$) and the long-term debt ratio ($LTDR_{i,t-1}$). t-statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table A5: A Wald test for Time-specific fixed effects, a Wald test for heteroskedasticity and a Wooldridge test for autocorrelation

Time-specific fixed effects	
H_0: *time dummies are jointly equal to zero*	
$F(14, 501)$	1.75
$Prob > F$	0.0429
Heteroskedasticity	
$H_0 : \sigma_i^2 = \sigma^2$ *for all* i	
$\chi^2(502)$	18,000,000
$Prob > \chi^2$	0.0000
Autocorrelation	
H_0: *No first-order autocorrelation*	
$F(1, 501)$	8.542
$Prob > F$	0.0036

In the first section of the table a Wald test was conducted to see whether time-specific fixed effects are present in the main regressions. The null hypothesis is rejected, so time-specific fixed effects should be included in the model. The second section shows the results of a modified Wald test for group wise heteroskedasticity in the fixed effect regression model. The null hypothesis is rejected, so heteroskedasticity is present in the sample and should be controlled for. The third section presents a Wooldridge test for autocorrelation in panel data. The null hypothesis is rejected and therefore autocorrelation is present in the sample and should be controlled for.