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ABSTRACT

We show that trade credit in production networks is important for the transmission of unconventional monetary policy. We find that firms with bonds eligible for purchase under the European Central Bank's Corporate Sector Purchase Program act as financial intermediaries and extend more trade credit to their customers. The increase in trade credit flows is more pronounced from core countries to periphery countries and towards financially constrained customers. Customers increase investment and employment in response to the additional financing, while suppliers with eligible bonds increase their customer base, potentially favoring upstream industry concentration. Our findings suggest that the trade credit channel of monetary policy produces heterogeneous effects on regions, industries, and firms.

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1. Introduction

Conventional monetary policy is typically thought to affect access to external finance more for small firms than for large firms. The informational frictions that add to the cost of external finance apply mainly to small firms such as young firms, firms with higher idiosyncratic risk, and firms with less collateral (Gertler and Gilchrist, 1994; Holmstrom and Tirole, 1997). In addition, small firms are more likely to be face liquidity constraints (Fazzari, Hubbard and Petersen, 1988) and rely more on financial intermediaries, while large firms have access to public markets (Gertler and Hubbard, 1988).

Unconventional monetary policy tools, which involve directly purchasing assets in public debt markets, can directly affect bond yields and issuance volumes of large firms, as these firms are much more likely to issue bonds. This has been the case for both episodes of quantitative easing in the United States focusing on short-and long-term Treasury bills (Foley-Fisher, Ramcharan and Yu, 2016), and for the European Central Bank's (ECB) Corporate Sector Purchase Program (CSPP) that involve the purchase of investment grade corporate bonds (Grosse-Rueschkamp, Steffen, and Streitz, 2019; Todorov, 2020). Quantitative easing can also indirectly benefit small firms in the economy through the bank lending channel (Acharya, Eisert, Eufinger, and Hirsch, 2018; Grosse-Rueschkamp, Steffen, and Streitz, 2019; Chakraborty, Goldstein, and Mackinlay, 2020).

This paper proposes and tests a new channel (*trade credit channel*) of transmission of unconventional monetary policy, which operates independently from the bank lending channel. Using the ECB's CSPP announced in March 2016 and implemented starting in June 2016 as a laboratory, we hypothesize that firms with access to bond markets (i.e., typically large firms) can act as financial intermediaries by providing trade credit to their customers who do not have access to bond markets. We examine whether this channel mitigates or exacerbates asymmetries in the transmission mechanism of monetary policy by studying which customers are supported by firms with eligible bonds under the CSPP. We also explore how the CSPP affects eligible firms' ability to acquire and retain customers and thus their competitive position in product markets.

The CSPP was designed with strict eligibility criteria in place, as only bonds issued by investment-grade non-financial firms from the euro area can be purchased by the ECB. The design of the CSPP allows us to implement a difference-in-differences analysis and to address concerns related to shocks concurrent to the implementation of the CSPP affecting eligible firms and their customers. We show that the CSPP resulted in a significant increase in the issuance of bonds in the core of the euro area (includes countries such as France and Germany), where more developed capital markets and stronger legal institutions allow firms to issue larger amount of bonds that are deemed to be safe.

This asymmetric reaction favoring large firms in more financially and economically developed countries and in countries with better economic conditions is a potentially unintended consequence of the CSPP. However, if targeted (large, unconstrained) firms pass on the additional funding liquidity to their customers through trade credit, unconventional monetary policy tools can also benefit small and financially constrained firms through production networks. In addition, even though firms located in core countries may experience a larger direct benefit from the CSPP, whether the increase in liquidity spill overs to other regions depends on the geography of production networks.

We investigate these unexplored questions using a new data set containing information on firm-level customer-supplier networks. We compare the amount of trade credit extended by eligible firms (i.e., firms with bonds that are eligible under the CSPP) to trade credit extended by non-eligible firms, before and after the CSPP announcement. We find that eligible firms increase the amount of trade credit they provide to customers (i.e., accounts receivable as a proportion of sales) more than non-eligible firms after the CSPP. As we would expect, at the same time, we find that the amount of trade credit received by customers of eligible firms (i.e., accounts payable as a proportion of sales) increases after the CSPP. The increase happens only after the program announcement, with no evidence of significant preexisting differential trends in trade credit.

We also show that the CSPP reduces financial constraints *indirectly* for firms in the production network of firms targeted by the CSPP. Eligible firms extend trade credit to customers that are

more financially constrained. In particular, smaller firms, non-investment grade firms, unrated firms, and firms with higher leverage and those with low tangible assets to pledge as collateral receive more trade credit from eligible suppliers.

We show that our results are not driven by preexisting differences between treatment and control groups. For instance, one important feature of the tests is that eligible (treated) firms are, by the nature of the program, larger than most non-eligible (control) firms. In order to account for the possibility of differential trends by size over time, we repeat our tests using matched samples of suppliers and customers. We also sort firms in fine size bins (splitting firms into 50 groups) and include size bin dummies interacted with year dummies in the regressions. We find similar estimates in these more stringent specifications, which indicates that asymmetric shocks affecting firms of different size are unlikely to drive our findings.

A program like the CSPP has the potential to produce redistributive effects across regions. While the design of the program by the ECB aimed to purchase investment grade bonds of firms in different euro area countries roughly in proportion of GDP, firms in core countries with more developed bond markets were able to issue many more investment grade bonds at lower yields after the announcement of the program. Arguably as a consequence of the asymmetric improvement in financial conditions, we only detect an increase in accounts receivable for suppliers located in core countries. There are proportionally fewer suppliers with eligible bonds under the CSPP in periphery countries such as Italy and Spain, and we do not find a significant increase in accounts receivable for suppliers located in periphery countries.

However, we find the exact opposite when we consider the *customers* of eligible firms. Customers located in core countries show small and insignificant increases in accounts payable, while customers in periphery countries show a significant increase in accounts payable as a proportion of sales. We also provide direct evidence that links between suppliers in core countries and customers in periphery countries drive the effects. These results are consistent with a substitution effect for trade credit particularly in periphery countries where banks were more affected by the 2010-2011 European sovereign debt crisis. We conclude that monetary policy

transmission through production networks mitigates the asymmetric effects that arise from the regional distribution of eligible firms and their ability to issue investment grade bonds, which benefit core countries.

Finally, we also show that the trade credit channel of monetary policy produces real effects. As a result of the increase in trade financing, the customers of eligible suppliers increase employment and investment and provide more trade credit to their own customers. While trade credit in production networks is an important channel of transmission for (unconventional) monetary policy to the real economy, there are also important effects on product market competition. Eligible suppliers that are able to extend more trade credit acquire new customers and thus enhance their competitive position in product markets, which may have long-lasting effects on real economic activity.

Our findings highlight mechanisms of tantamount importance in light of the expanded direct assets purchases announced by the Federal Reserve Board and the ECB in March 2020. Notably, both the unlimited quantitative easing program of the Federal Reserve Board and the Pandemic Emergency Purchase Program (PEPP) of the ECB involve direct interventions in corporate bond markets. We highlight a new channel through which quantitative easing affects the real economy that complement the stimulus arising from the effects of asset purchases on banks' balance sheets and lending. Trade credit can transmit the stimulus of unconventional monetary policy interventions to firms that are not directly targeted by the policy. However, monetary policy interventions that systematically benefit firms with better access to capital markets in core areas may favor concentration in upstream industries with long-run consequences on industrial structure. Hence, complementary measures that directly target small firms are an important complement to central bank asset purchases.

Our paper contributes to several strands of the literature. Our findings suggest that monetary policy can be transmitted through the supply chain. This complements existing studies showing that trade credit may provide an alternative source of liquidity that can mitigate the effects of bank liquidity shocks (Restrepo, Cardona-Sosa, and Strahan, 2019). Previous research provides mixed

evidence on whether trade credit attenuates the transmission of monetary policy and bank shocks to the real economy. While Gertler and Gilchrist (1993) find no substitution between bank loans and trade credit following monetary and credit contractions, Nilsen (2002) provides evidence that both small and large firms increase trade credit during monetary contractions.

This mixed evidence mirrors the findings of more recent papers exploring whether trade credit can substitute bank credit during credit crunches. Love, Preve, and Sarria-Allende (2007) find no evidence that firms in East Asia were able to do so during the late 1990s when one excludes the first phase of the crisis, while Garcia-Appendini and Montoriol-Garriga (2013) finds that cash-rich suppliers extended more trade credit during the 2007-2009 financial crisis. In this paper, by exploiting exogenous variation in suppliers' ability to access external finance, we show that supply chains enhance the transmission of monetary policy, and in particular of quantitative easing interventions. Thus, we contribute to the understanding of the transmission of unconventional monetary policies to the real economy.

Our paper also adds to the growing literature on the importance of customer-supplier networks in the transmission of economic shocks. A number of papers in this literature explore how negative shocks are transmitted through the supply chain and show that upstream negative liquidity shocks are transmitted to customers along the supply chain and are potentially amplified (Boissay and Gropp, 2013; Jacobson and von Schedvin, 2015; Barrot and Savagnat, 2016). A few recent papers consider the role of bank liquidity shocks (Alfaro, Garcia-Santana, and Moral-Benito, 2017; Costello, 2020; Huremovic, Jimenez, Moral-Benito, Peydro, and Vega-Redondo, 2020) and how banking structure is related to the propagation of shocks along the supply chain (Giannetti and Saidi, 2019). Using the stock market reaction to monetary policy shocks, Ozdagli and Weber (2019) show that input-output linkages through higher-order demand effects are an important transmission mechanism of macroeconomic shocks. To the best of our knowledge, we are the first to consider how monetary policy is transmitted through trade credit in production networks. Further, we examine the transmission of quantitative easing policies to the real economy (through trade credit), which has been largely unexplored in the literature.

2. Data and Methodology

This section describes the data, variables, and the empirical methodology.

2.1 Sample

Our initial sample consists of a panel of publicly listed and privately held firms in the period 2013-2017 drawn from the Bureau Van Dijk ORBIS - Global financials for industrial companies database.[1] We restrict the sample to firms based in the 19 member states that are part of the Economic and Monetary Union of the European Union (eurozone area). We exclude firms that are either classified as small companies by ORBIS or firms that have less than €1 million of total assets in the fiscal year of 2015 from our analysis.[2] We also exclude financial firms (SIC codes 6000-6999) and public administration entities (SIC codes 9000-9999). Finally, we require non-missing data on *Accounts Receivable*, *Accounts Payable*, *Assets*, *Cash*, *PPE*, *Net Margin*, and *Liabilities*. Table A.1 of the Appendix provides variable definitions. The final sample consists of 510,298 unique firms for a total of 2,248,514 firm-year observations. Panel A of Table IA.1 lists the number of observations in our sample by country. Table 1 reports summary statistics for the variables used in our analysis.

2.2 CSPP and Eligible firms

The ECB started a series of quantitative easing programs to ease monetary conditions in the euro area and achieve the inflation target in 2012. Initially the program was limited to asset backed securities and sovereign bonds. On March 10, 2016, the ECB announced the CSPP, which implied an expansion of its asset purchase program to include investment grade corporate bonds, as a tool to strengthen its accommodative monetary policy stance and to improve firms' financing conditions. Panel A of Figure 1 shows that the proportion of corporate bond purchases were

[1] To avoid double counting of financial reports and since the overwhelming majority of companies in ORBIS report unconsolidated accounts, we only include data from unconsolidated financial statements in our sample.
[2] Companies on ORBIS are considered to be small when they have less than €1 million in operating revenue, less than €2 million in total assets, and less than 15 employees.

designed to reflect the distribution of GDP in euro area countries. As a result, 70% of the universe of eligible bonds under the CSPP are issued by firms in eurozone area core countries. Countries in the core also represent about 66% of the gross domestic product (GDP) of the euro area.

The consequences of the policies in terms of the firms' ability to issue investment grade bonds, that is, the securities that benefitted most from the program in terms of lower yields appear to be more asymmetric. Panel B shows that the issuance of investment grade bonds (as a % of GDP) after the CSPP is much more pronounced in core countries, which have more developed bond markets and stronger creditor protection enhancing firms' ability to issue investment grade bonds. For example, from 2015 to 2016, in core countries, the new issuance of investment grade bonds (eligible bonds) increased by 2.74 percentage points (from 1.91% to 4.66% of GDP). In contrast, in periphery countries, the new issuance of investment grade bonds only increased by 0.58 percentage points (from 0.58% to 1.16% of GDP).

While differences in bond issuance could also depend on firms' differences in the demand for credit, Panel C indicates that new issuance of non-investment grade bonds (that were not targeted by the CSPP) was almost unchanged from 2015 to 2016 both in core and periphery countries, and if anything increased more in the periphery. This suggests that differences in the demand for credit are unlikely to play a role.

To identify whether differences in access to capital markets and trade credit provision arise from demand shocks, our empirical methodology crucially relies on CSPP-eligible firms. We start from the list of marketable bonds accepted as collateral for Eurosystem credit operations that was published by the ECB the day before the CSPP announcement on March 9th, 2016. From this list, consistent with the CSPP eligibility criteria, we retain euro-denominated securities (denomination EUR, DEM, FRF) classified as bonds (type AT01) or medium term notes (type AT02) issued by corporations (issuer group IG3) and financial corporations other than credit institutions (issuer group IG9) resident in a country member of the euro area.[3]

[3] Data available at https://www.ecb.europa.eu/paym/coll/assets/html/list-MID.en.html.

To assign each bond to a unique firm, we first collect the issuer name of each bond in the list of bonds accepted as collateral by the ECB. Since several bonds are issued by financial subsidiaries and most are guaranteed by the core organization (e.g., bonds issued by "Volkswagen Intl Finance N.V." and by "Iberdrola Finanzas S.A.U." are guaranteed by "Volkswagen AG" and by "Iberdrola S.A.", respectively), we also collect the name of corporations and financial corporations other than credit institutions (guarantor groups GG3 and GG9) that guarantee eligible bonds provided that the guarantors are resident in a country member of the euro area. Next, we apply a fuzzy-string matching technique to identify in ORBIS the firm that has issued the CSPP eligible bonds. We are able to match 304 unique eligible firms to firms' financial statements in ORBIS. We next exclude financial firms (SIC codes 6000-6999) from the sample. As a result, our final sample includes 151 unique non-financial eligible firms, domiciled in the euro area, for which we have data on the variables of interest. Panel B of Table IA.1 of the Internet Appendix reports the number of eligible firms by country.

2.3 Customers of Eligible Firms

We match each eligible firm (supplier) to all disclosed customers reported in Factset Revere Supply Chain Relationship (Factset Revere). Using the Factset Revere database, we can track the effects on suppliers and on their customers.

Factset collects relationship information from primary public sources such as SEC 10-K annual filings, investor presentations, and press releases, and classifies them through normalized relationship types (e.g., disclosed customer, disclosed supplier, and competitor). Considering customer and supplier relationship type only, the Factset Revere data include over 25,000 global companies, which are the source of the supply chain relationship data and over 105,000 global target companies, which are disclosed by source companies.

We identify customers of eligible firms using direct and reverse relationships. A direct relationship is disclosed by the company that lists the target company as a material customer, and a reverse relationship is disclosed by another company listing the source company as a material

supplier. As a result, our data include a comprehensive network of supply-chain interconnections.[4]

To better understand our data, consider "Deutsche Telekom AG" as an example. Using direct relationships, the company discloses a list of 24 active material customers by the end of 2015. This list includes public entities such as "Government of Germany", "Government of Switzerland", and "European Commission", and corporations such as "Deutsche Post AG, "Daimler AG", "ABB Ltd", and "Netflix, Inc". Using reverse relationships, "Deutsche Telekom AG" is disclosed as a material supplier by an additional 11 unique companies. Customers that reported the firm as a supplier include corporations such as "Freenet AG", "Drillisch AG", and "KION Group AG". In total, considering both direct and reverse disclosures, "Deutsche Telekom AG" has a total of 35 unique customers identified using Factset Revere.

We then match the list of customers of eligible firms in Factset Revere to ORBIS using ISIN identifiers, when available, and a fuzzy-string matching algorithm using names for the remaining firm. We begin by filtering the Revere data only selecting suppliers that are CSPP-eligible firms. The initial sample consists of 802 supplier-customers pairs with 106 unique eligible firms and 463 unique customers domiciled in an euro area country. On average, eligible firms report 7.6 customers domiciled in the euro area by the end of 2015.[5]

Our final sample includes 318 unique non-financial customers of eligible firms, domiciled in the euro area, after matching with ORBIS to obtain firm fundamentals. Panel B of Table IA.1 of the Internet Appendix reports the number of customers of eligible firms by country. Table IA.2 of the Internet Appendix reports the interconnections between eligible suppliers and their customers.

2.4 Empirical Methodology

We perform difference-in-differences estimations by comparing changes in the outcome variables between treatment and control groups around the CSPP announcement. Specifically, we estimate the regression:

[4] We consider all business relationships that started on or before 2015 (the year before the introduction of the CSPP) and were still active on or after 2014 (we use one year lag, to include recent relationships).
[5] We can only find financial statements for 406 firms out of the 463 unique customers with descriptive information in Orbis.

$$Y_{i,t} = \beta_0 + \beta_1 Treated_i \times Post_t + \beta_2 \times X_{i,t-1} + \eta_i + \eta_{j,t} + \eta_{c,t} + \varepsilon_{i,t} \quad (1)$$

Our main outcome variables, $Y_{i,t}$, are the ratio of accounts receivable to sales and the ratio of accounts payable to sales. We also estimate additional specifications with outcome variables for investment in short-term assets, long-term assets and employment (*Assets Growth*, *CAPEX*, *Change in Inventories*, *Change in Receivable*, *Labor Growth*), operating activities (*Sales Growth*, *Profitability*), and financing decisions (*Change in Financial Debt*, *Change in Long-term Debt*, *Change in Short-term Loans*, *Change in Cash*).

The treatment variable, *Treated*, is alternatively: (1) *Eligible Supplier*, a dummy variable that takes the value of one if a firm has bonds eligible for purchase under the CSPP, and zero otherwise; (2) *Has Eligible Supplier*, a dummy variable that takes the value of one if a firm is a customer of a firm with eligible bonds, and zero otherwise; and (3) *Eligible Suppliers Share*, a variable that measures the firm's share of eligible suppliers relative to the firm's total number of suppliers.

Post is a dummy variable that takes the value of one in 2016, the year the CSPP is announced and implemented and thereafter, and zero otherwise. $X_{i,t-1}$ is a set of firm-specific control variables that includes: (1) *log(Assets)*, the logarithm of total assets; (2) *Cash*, the ratio of cash and cash equivalent to total assets; (3) *PPE*, the ratio of tangible fixed assets (property, plant and equipment) to total assets; (4) *Net Margin*, the ratio of net income to sales; and (5) *Liabilities*, the ratio of total liabilities to total assets. All control variables are lagged by one year. The regressions include firm fixed effects η_i, industry-year fixed effects $\eta_{j,t}$ (using the Fama-French 10-industry classification), and country-year fixed effects $\eta_{c,t}$. Standard errors are clustered at the firm level to correct for heteroscedasticity and within-firm residual correlation. In our baseline estimates, we use an unmatched sample but we also assess the robustness of our results by reporting estimates from a matched sample approach.

3. Main Empirical Results

In this section, we first establish whether the shock to eligible firms, following the purchases of eligible bonds by the ECB, is indeed transmitted through customer-supplier networks. We then check the robustness of our results using different empirical approaches.

3.1 Monetary Policy Transmission through the Supply Chain

There is evidence in the literature that the CSPP fostered the ability of eligible firms to tap public debt markets stimulating new issuance of bonds and reducing the bond yield spreads of eligible firms (Abidi and Miquel-Flores, 2018; Galema and Lugo, 2019; Grosse-Rueschkamp, Steffen, and Streitz, 2019; Zaghini, 2019; Todorov, 2020). In the Internet Appendix, we report evidence consistent with this literature. Table IA.3 of the Internet Appendix shows that eligible firms experience an increase in the change of financial debt scaled by lagged assets relative to non-eligible firms after the announcement of the CSPP, which is concentrated in core countries. Moreover, using a sample of publicly listed firms, with bond debt outstanding before the CSPP, drawn from Capital IQ/Compustat Global, Table IA.4 of the Internet Appendix shows that eligible firms experience a statistically significant increase in net bond debt issuance scaled by lagged assets relative to non-eligible firms, after the announcement of the CSPP. Bond issuance, however, is concentrated in the core countries.[6]

We hypothesize that thanks to the ability of issuing more bonds, CSPP-eligible firms are able to extend more trade credit to their customers. In turn, customers of eligible firms facing deteriorating credit market conditions may be able to fill their financing gap by resorting on the credit available through the supply-chain and thus delaying the payment of goods and services purchased from eligible suppliers.

We begin by testing whether CSPP eligible firms experience an increase in accounts receivable

[6] We also investigate the impact of the CSPP on eligible firm outcomes such as investment, turnover and profitability. Table IA.5 of the Internet Appendix reports the results. We find that eligible firms experience a statistically significant increase in the change of accounts receivable scaled by lagged assets. Consistent with Grosse-Rueschkamp, Steffen, and Streitz (2019), we also find that eligible firms experience a statistically significant increase in assets growth but other estimates are statistically insignificant.

following the announcement and implementation of the CSPP. The variable of interest is the interaction of the treatment dummy variable *Eligible Supplier* (that takes a value of one if a firm has bonds eligible for purchase by the ECB immediately before the announcement of the CSPP, and zero otherwise) with the *Post* dummy variable (that takes a value of one in the year the CSPP is announced and thereafter, and zero otherwise). The interaction term *Eligible Supplier* × *Post* measures the differential effect, on accounts receivable, between eligible firms and non-eligible firms around the CSPP.

Table 2 shows the results. The estimates in column (1) show that eligible firms (treatment group) experience a significant increase in the ratio of accounts receivable to sales of about 10 percentage points relative to non-eligible firms (control group) after the announcement of the CSPP (treatment). The effect is economically significant as a 10 percentage point increase in accounts receivable indicates that firms in the treatment group relative those in the control group increase days receivable by about 36 days ($36 = 0.1 \times 360$), which is about one third of the sample average. The results remain robust when we add firm-specific controls (column (3)) and country-year fixed effects (column (5)) to the specification in column (1), which already includes firm fixed effects and industry-year fixed effects. Importantly, columns (2), (4), and (6) show that both the treatment and control groups follow parallel trends in the pre-treatment period, which supports a causal interpretation of the results. In addition, Panel A of Figure IA.1 of the Internet Appendix shows no evidence of preexisting differential trends in accounts receivables between treatment and control groups.

As a placebo test, we estimate the change in the ratio of accounts receivable to sales of U.S. investment grade firms (the main criteria used by the ECB to determine eligible bonds), after the introduction of the CSPP. In this test, we use Compustat data, which only contains publicly listed firms as ORBIS offers a limited coverage of U.S. firms for most financial items. Columns (1) and (2) of Table IA.6 and Panel B of Figure IA.1 of the Internet Appendix report the results. We find no evidence that U.S. investment grade firms experience an increase in accounts receivable relative to control firms after the announcement of the CSPP. Columns (3)-(6) show the results of placebo

tests using a sample of investment grade firms domiciled in countries from the European Union that are not members of the euro area. We find a statistically significant increase of 1 percentage point in accounts receivable of non-euro European Union investment grade firms relative to control firms after the CSPP. The magnitude of the effect is much lower for non-euro European Union investment grade firms (1 percentage point) than that for eligible firms that are domiciled in euro area countries (10 percentage points).[7]

So far our results show that eligible firms increase trade financing to customers relative to non-eligible firms following the CSPP announcement. We also study firms in the downstream network of eligible firms. Specifically, we test whether customers of eligible firms are indeed the recipients of the increase in trade financing by eligible suppliers.

Table 3 shows the results. In Panel A, the explanatory variable of interest is the interaction of the treatment dummy variable *Has Eligible Supplier* (that takes a value of one if a firm is a customer of a firm with CSPP eligible bonds, and zero otherwise) with the *Post* dummy variable. The interaction term *Has Eligible Supplier* × *Post* measures the differential effect on accounts payable between firms with eligible suppliers and otherwise similar firms (without eligible suppliers) following the announcement of the CSPP.

In column (1), we find that customers of eligible suppliers (treatment group) experience an increase in the ratio of accounts payable to sales by about 5 percentage points relative to customers without a business relationship with eligible firms (control group) following the CSPP announcement (the treatment). The effect is statistically and economically significant as, on average, eligible firms relative to non-eligible firms benefit from an extension in payment terms of about 17 days ($17 = 0.048 \times 360$), which is about 20% of the sample mean. The results remain robust when we add firm-specific controls (column (3)) and country-year fixed effects (column

[7] The placebo using investment grade firms from non-euro European Union countries is not as clean as the placebo using U.S. investment grade firms as the Bank of England also announced a program to buy corporate bonds in August 2016. In addition, the CSPP also included a fraction of eligible bonds issued by legal entities established in the eurozone that were financing vehicles of firms resident in non-euro countries (representing about 7% of total CSPP eligible bonds).

(5)) to the specification in column (1) which already includes firm fixed effects and industry-year fixed effect. Importantly, columns (2), (4), and (6) show that both the treatment and control groups follow parallel trends in the pre-treatment period. In addition, Panel A of Figure IA.2 of the Internet Appendix shows no evidence of preexisting differential trends in accounts payables between treatment and control groups.

We also examine whether customers with a larger share of eligible suppliers benefit most from the increase in trade credit by eligible firms. Panel B of Table 3 shows the results. The explanatory variable of interest is the interaction of the treatment variable *Eligible Suppliers Share* (i.e., the firm's share of eligible suppliers relative to the firm's total number of suppliers) with the *Post* dummy variable. The interaction term *Eligible Suppliers Share* × *Post* measures the differential treatment intensities on accounts payable, following the announcement of the CSPP.

In column (1), we find that the *Eligible Suppliers Share* × *Post* coefficient is positive and statistically significant. The effect is also economically significant. A one-standard-deviation increase in the share of eligible suppliers (0.362, considering the sample of customers of eligible suppliers) leads to an increase of 2.5 percentage points (= 0.362 × 0.069) in accounts payable of customers of eligible suppliers (i.e., a delay in payment terms of about 9 days) and corresponds to 11% of the sample mean. The results are robust across specifications. In addition, there is no evidence of significant preexisting differential trends between treatment and control groups (see also Panel B of Figure IA.2 in the Internet Appendix).

3.2 Robustness

A possible concern with our baseline results is that somehow our firm-year panel regressions might be insufficient to cope with the heterogeneity of firms in the sample. To further establish the validity of our baseline results, we employ three additional empirical approaches: (1) a difference-in-differences estimation using a matched sample; (2) size-bins-by-year fixed effects regressions; (3) regressions excluding firms with less than €10 million in assets from the sample; and (4) regressions using the logarithm of the levels of the dependent variables.

First, we perform the difference-in-differences estimation around the CSPP announcement (March 2016) using a matched sample. We consider both the effect of the CSPP on eligible firms, and the effect of the CSPP on customers of eligible firms. We identify 144 eligible firms and 305 customers of eligible firms with non-missing information in ORBIS on 2015 and 2014. We select control firms that best match each firm in the treatment group using propensity score matching with replacement (the nearest neighbor) on multiple covariates in the two years preceding the event: *log(Assets)*, *Cash*, *PPE*, *Net Margin*, *Liabilities*, and industry fixed effects. The match assigns each treated firm to a control firm domiciled in the same region of the euro area, that is, firms either from core countries or periphery countries of the euro area. Panel A of Table 4 reports the tests of equality of pre-treatment means and medians between the treatment and control groups. In general, we cannot reject the hypothesis of equal means or medians between treatment and control groups in either the sample of eligible firms or the sample of customers of eligible firms.

Panel B of Table 4 presents the results of difference-in-differences estimators using the matched sample and firm and industry-year fixed effects specifications. The estimates are qualitatively and quantitatively similar to our baseline specifications. Column (1) shows a statistically significant 10 percentage-points increase in accounts receivable of eligible firms (treated group) after the announcement of the CSPP relative to non-eligible firms (control group). In column (3), we find a positive and statistically significant increase in the accounts payable of eligible firms' customers. The effect is also economically significant as the accounts payable of eligible firms' customers increase by 8 percentage points after the announcement of the CSPP relative to firms without eligible suppliers. Column (5) shows a positive and statistically significant coefficient of 0.08 on *Eligible Suppliers Share* × *Post*, which indicates a positive association between the share of eligible suppliers and the increase in accounts payable of customers of eligible firms.

Second, we estimate specifications with firm size-bins-by-year fixed effects to account for the possibility that the CSPP might have affected differently large and small companies. This adjustment controls for firm size heterogeneity in a given year between treatment and control

groups. We proceed, by ranking the firms in the sample according to their assets within each year of the sample and by assigning each firm to one of the 20 (50) size bins by year.

Panel A of Table 5 shows the results for the 20 size-bins-by-year fixed effects regressions. In columns (1)-(3), the accounts receivable of eligible firms experience a statistically significant increase of about 10 percentage points relative to non-eligible firms in the post-CSPP period. In columns (4)-(6), the accounts payable of eligible firms' customers experience a statistically significant increase of about 3-5 percentage points relative to firms without a material link to the downstream network of eligible firms in the post-CSPP period. The results remain virtually unchanged when we use 50 size-bins-by-year fixed effects regressions in Panel B of Table 5. Overall, these findings assuage any concerns that asymmetric shocks to firms of different sizes drive our findings.

Third, we assess the sensitivity of our baseline results to the exclusion of small firms from the sample. Specifically, we estimate our baseline specifications after excluding firms with less than €10 million in assets as of 2015 (the year before the announcement of the CSPP). The results in columns (1)-(3) of Table IA.7 of the Internet Appendix show that the accounts receivable of eligible firms increase by about 10 percentage points relative to non-eligible firms in the post-CSPP period. The results in columns (4)-(6) show that the accounts payable of eligible firms' customers increase by about 4 percentage points relative to those of non-eligible' firms customers in the post-CSPP period. The results are very similar to those reported in Tables 2 and 3 and confirm that our baseline results are not materially affected by size heterogeneity between treatment and control groups. We also assess the sensitivity of our results using a sample excluding firms domiciled in Germany. We do so because Germany is under-represented in the ORBIS database (see Panel A of Table IA.1 of the Internet Appendix). Table IA.8 of the Internet Appendix shows that our results are qualitatively unchanged.

Finally, we estimate our baseline specifications using either the logarithm of accounts receivable or the logarithm of accounts payable as dependent variables. Table IA.9 of the Internet Appendix shows that our estimates are qualitatively unaffected when we use this approach.

4. Heterogeneity

In this section, we investigate out how different customer characteristics such as financial constraints, ability to access public markets, tangibility and growth opportunities contribute to the magnitude of the monetary policy transmission mechanism through trade finance. We also examine the differential regional effects of the trade credit channel of monetary policy within the euro area.

4.1 Customer-Specific Financial Constraints

To better understand the distributional consequences of the trade credit channel of monetary policy, we explore the cross-section of customers. If the positive shock of monetary policy on the ability of eligible suppliers to tap credit markets is indeed benefiting their customers, we expect the effect to be stronger for customers that are more likely to be financially constrained. We consider several proxies for firm-specific financial constraints and partition the sample according to the median of these proxies. Table 6 presents the estimates of our baseline regression model for the subsamples of constrained and unconstrained firms.

Panel A, columns (1) and (2), show the estimates separately for the group of investment grade firms (i.e., firm with an investment grade long-term issuer credit rating, AAA to BBB-, by S&P before the CSPP announcement) vs. the group of non-investment grade firms. Columns (3) and (4) show thee estimates for the group of rated firms (i.e., firm with a long-term issuer credit rating by S&P before the CSPP announcement) vs. unrated firms. We find that only non-investment grade and unrated firms with eligible suppliers experience a statistically significant increase in accounts payable relative to control firms in the CSPP period. These results suggest that customers of eligible firms that are less able to tap public debt markets benefit from the increase in trade credit offered by eligible firms following the CSPP announcement.

Columns (5) and (6) show that only customers of eligible firms with a high liabilities to assets ratio experience a positive and statistically significant increase in accounts payable relative to control firms in the CSPP period. These results suggest that firms with higher external financial

dependence benefit from the increase in trade credit offered by eligible firms following the CSPP.

In columns (7) and (8), we find a positive and statistically significant increase in accounts payable both for customers of eligible firms with both high and a low PPE to assets ratio, relative to control firms in the post-CSPP period. However, the magnitude of the coefficient on the *Has Eligible Supplier* × *Post* variable in the group of low PPE firms (i.e., low tangibility firms) is almost the double that in the group of high PPE firms. These results suggest that customers of eligible firms with less tangible assets – which are less likely to be able to pledge collateral to obtain external finance – benefit more from the increase in trade credit offered by eligible firms following the CSPP.

Small firms are typically more financially constrained than large firms. We do not find a statistically significant increase in accounts payable of firms with eligible suppliers when we partition the sample by firm size as proxied by sales. However, Panel B, columns (1) and (2) show that the magnitude of the coefficient on the *Has Eligible Supplier* × *Post* variable in the group of small firms firms is much higher than that in the sample of large firms, suggestion that eligible firms' smaller customers benefit more from the increase in trade credit offered by eligible firms.

Columns (3)-(6) show that only customers of eligible firms with high rates of sales growth and assets growth experience a positive and statistically significant increase in accounts payable relative to control firms in the post-CSPP period. These results suggest that firms with greater growth opportunities benefit from the increase in trade credit offered by eligible suppliers.

Finally, columns (7) and (8) show a positive and statistically significant increase in accounts payable for customers of eligible firms with both a high and a low EBITDA to assets ratio (profitability), relative to control firms. However, the magnitude of the coefficient on the *Has Eligible Supplier* × *Post* variable in the sample of low profitability firms is almost five times higher than that in the sample of high profitability firms. Thus, customers of eligible firms with a lower ability to generate internal cash flows to finance operations benefit more from the increase in trade credit offered by eligible firms.

Overall, our results suggest that the trade channel of monetary policy is more pronounced for

financially constrained firms, low tangibility firms, firms with greater growth opportunities and external finance need and firms with lower ability to generate cash flow.

4.2 Publicly Listed vs. Private Firms

Privately held firms are often considered to be more financially constrained than public firms because they have no access to public equity markets. We thus investigate how access to public equity markets determines the decision of both eligible suppliers to extend more trade credit and of eligible firms' customers to rely more on trade credit. We do so by partitioning the sample in firms with shares publicly listed in the stock market and firms that are privately held.

Panel A of Table IA.10 of the Internet Appendix presents the results for the sample of public firms (i.e., firm is publicly listed in the year before the CSPP announcement date according to Orbis). Columns (1)-(3) show that publicly listed eligible firms experience a statistically significant increase in the ratio of accounts receivable to sales, relative to publicly listed non-eligible firms after the announcement of the CSPP. In contrast, columns (4)-(6) show no statistically significant increase in the ratio of accounts payable to sales for customers of eligible firms that are publicly listed. Customers with better access to financial markets are less likely to be financially constrained and rely on trade finance.

Panel B of Table IA.10 presents the results for the sample of private firms. In columns (1)-(3), we still find that private eligible firms experience a statistically significant increase in the ratio of accounts receivable to sales, relative to private non-eligible firms after the announcement of the CSPP. However, the magnitude of the effect is less pronounced for eligible firms that are privately held than to eligible firms that are publicly listed suggesting that the former may face stronger constraints in issuing bonds. Columns (4)-(6) show that customers of eligible firms that are private experience a statistically significant increase in the ratio of accounts payable to sales, relative to controls firms.

Table IA.10 suggests that firms without the ability to tap the stock market obtain more trade credit from eligible suppliers. In addition, publicly listed eligible firms are better able to benefit

from the CSPP and thus in a favorable position to extend trade credit to customers. Overall, these results support that trade credit is an important transmission mechanism of monetary policy as financially unconstrained suppliers provide trade credit to their financially constrained customers.

4.3 Regional Effects

In this section, we take a regional perspective and analyze how the CSPP impacts firms domiciled in countries of either the core or the periphery of the euro area. This is important as countries in the euro area periphery were more negatively affected by the sovereign debt crisis in 2011-2012. Firms in these countries are therefore more likely to face financial constraints as the sovereign debt crisis had severe repercussions on the banking system and led to a credit crunch.

We investigate whether there is propagation of the monetary policy shock from firms domiciled in core countries to firms domiciled in periphery countries. This is an important perspective of analysis (as shown in Figure 1) as eligible firms from core countries appear to benefit more than those from periphery countries in terms of the ability to tap the primary bond market following the CSPP announcement.

Panel A of Table 7 shows the estimates of our baseline regression model separately for the group of firms in core countries (Austria, Belgium, Finland, France, Germany, Luxembourg, and Netherlands) and periphery countries of the euro area. We find that only eligible firms from the core eurozone countries significantly increase accounts receivable relative to non-eligible firms following the CSPP. This finding suggests that only suppliers in the core countries, virtually unaffected by the sovereign debt crisis, were able to benefit from improved bond market conditions and expand the supply of trade credit. However, it is also possible that these suppliers faced different economic conditions because they had customers with stronger growth opportunities.

We also examine the effects of the CSPP on eligible firms' customers separately for the group of firms in core and periphery countries. Eligible firms' customers from the periphery benefit from a statistically significant increase in accounts payable relative to control firms in the post-CSPP period. This suggest that there was an increase in demand for external finance, and trade credit in

particular, from firms located in periphery countries. Suppliers in core countries were able to tap bond markets during the CSPP period and extended trade credit to their customers helping them to mitigate financial constraints in periphery countries.

So far our results suggest that firms from periphery countries experience an increase in trade credit obtained from eligible suppliers domiciled in core countries. Panel B of Table 7 provides a more direct test of inter-regional propagation of monetary policy through the trade credit channel, by decomposing the treatment dummy variable into the *Has Core Eligible Supplier* dummy variable (that takes the value of one if a firm has an eligible supplier domiciled in a country from the core, and zero otherwise) and the *Has Periphery Eligible Supplier* dummy variable (that takes the value of one if a firm has an eligible supplier domiciled in a country the periphery, and zero otherwise).

In column (1), customers of eligible suppliers located in core countries seem to increase their accounts payable to a larger extent than customers of eligible suppliers located in periphery countries. Column (2) shows that these effects do not seem to be driven by customers in core countries for which changes in accounts payable are not statistically distinguishable from those of the controls firms. In column (3), we find that customers located in periphery countries have more access to trade credit during the CSPP period. The coefficient on the *Has Core Eligible Supplier* dummy variable is double (but imprecisely estimated) than that of the *Has Periphery Eligible Supplier* dummy variable.

Overall, our results suggest suppliers from the less financially constrained countries extended more trade credit during the CSPP period to firms located in periphery countries that were part of their production network prior to the CSPP.

5. Real Effects of the CSPP

In this section, we investigate whether the trade credit channel of monetary policy has real effects in operating activities, investment policy and financial policy of customers of CSPP eligible firms, and affects the competitive position of eligible suppliers.

5.1 Effects on Customers

Our results show firms in the downstream network receive more trade finance from firms with easier access to the bond market due to unconventional monetary policy tools. In this section, we test whether the customers of eligible firms take advantage of potential investment opportunities due to the increase in trade credit. We also explore how the trade credit channel of monetary policy impacts the financing decisions of these firms.

Panel A of Table 8 shows that as the CSPP propagates to the clients of eligible firms through the trade credit channel, these firms experience a statistically significant increase in investment. Column (1) shows that firms in the treatment group experience an increase of 2.5% in total assets relative to the control group after the CSPP announcement. Next, we decompose this increase in assets growth into capital expenditures (CAPEX), change in inventories, and change in receivable (all variables scaled by lagged total assets). We find that customers of eligible firms experience an increase of 0.5 percentage points in CAPEX (column (2)), an increase of 0.4 percentage points in inventories (column (3)), and a 1.1 percentage points increase in accounts receivable (column (4)) relative to control firms in the post-CSPP period. In column (5), we also find a 3.4% increase in labor for treated firms relative to control firms following the CSPP implementation.

We also test whether customers of eligible firms experience changes in operating activities. Column (6) shows that customers of eligible firms experience a 2.4% increase in sales growth, even though this coefficient is imprecisely estimated. In column (7), we are unable to detect any short-term effects on the profitability of eligible firms' customers.

In sum, the customers of eligible firms are able to increase investment in fixed assets, human capital, and inventories, and to provide more trade credit to their own customers (accounts receivable) as a result of the CSPP.

Finally, we investigate how customers of eligible firms finance their assets growth. Panel B of Table 8 shows the effect on liabilities scaled by lagged total assets. Column (1) shows that firms with eligible suppliers experience a statistically significant increase of 0.9 percentage points on the change in accounts payable relative to control firms in the post-CSPP period. This increase in

accounts payable represents more than one third of the capital needs to fund the assets growth of treated firms relative to control firms.

We find that customers of eligible firms experience statistically insignificant increases in other sources of external finance (financial debt), including long-term debt and short-term loans, and internal financing (cash). This confirms that the real effects we uncover are to be ascribed to suppliers' trade finance and are not driven by an increase in access to bank credit.

5.2 Effects on Suppliers

This section sheds some light on the benefits to suppliers to extend more trade credit. Table IA.11 shows that the trade credit channel is largely driven by eligible suppliers in industries with lower competition and higher concentration. While we do not find any significant effects of the program on the profitability of the suppliers, this suggest that suppliers have incentives to fund customers in order to ensure business relationships with firms in better times.

This interpretation is consistent with evidence that CSPP-eligible firms benefit by retaining existing clients and establishing new relationships. To show this, we consider the number of customer relationships that a firm located in the eurozone is able to maintain and the number of new relationships that is able to initiate.

Panel A of Table 9 reports the results. All specifications include firm fixed effects so that we can test how the number of customers changes for eligible firms after the CSPP. In column (1), we find that eligible firms (treatment group) are able to maintain a larger number of client relationships relative to non-eligible firms (control group) after the announcement of the CSPP (treatment). The results remain robust when we add firm-specific controls (column (2)) and country-year fixed effects (column (3)) to the specification in column (1), which already includes firm fixed effects and industry-year fixed effects.

In column (4), we find that eligible firms experience a statistically significant increase of 3.3 new client relationships relative to non-eligible firms after the announcement of the CSPP. The effect is economically significant as the sample average of new client relationships is 2.3. The

results remain robust when we add firm-specific controls (column (5)) and country-year fixed effects (column (6)) to the specification in columns (4).

We also analyze whether eligible firms from core countries experienced differential effects in product market outcomes relative eligible firms from periphery countries, which did not increase the provision of trade credit after the start of the CSPP.

Panel B of Table 9 report the results for suppliers in core countries. We find that eligible firms from core countries experience a significant increase in both the number of client relationships maintained and the number of new client relationships relative to non-eligible firms after the CSPP. Panel C of Table 9 shows that eligible firms from periphery countries did not experience a similar increase. Importantly, Table IA.12, these results are robust when we consider the eurozone competitors (as identified by Factset Revere) of eligible firms as a control group.

Overall these findings provide further support for the importance of the trade credit channel of monetary policy, but also suggest that unconventional monetary policies interventions that facilitate access to credit for large firms with easier access to capital markets may affect firms' competitive positions and favor concentration in upstream markets.

6. Conclusion

In today's environment with nominal interest rates near zero in most developed economies, monetary authorities have resorted on unconventional monetary policies interventions to achieve their inflation targets. Direct asset purchases lowering the cost of public debt favor large firms that have access to public debt markets. The concerns about the asymmetric effects of these unconventional monetary policies are particularly relevant in economic areas, such as the euro area, where credit protection and access to bond markets exhibit geographical differences.

We show that supply chains can mitigate the asymmetric effects of direct asset purchases programs. Firms that benefit the most from an easier access to public debt market (i.e., higher issuance volumes and lower offer yields) expand the provision of trade credit to their clients. The expansion in trade credit benefits especially financially constrained customers and customers

located in periphery countries, in which the negative effects of the European sovereign debt crisis were more severe and bond markets are less developed.

We also provide evidence of real effects and product market effects of the CSPP. As a result of the increase in trade finance, firms with suppliers whose bonds are eligible for the CSPP increase employment and investment and provide more trade credit to their own customers. Eligible suppliers that are able to extend more trade credit acquire new customers and thus enhance their competitive position in product markets.

Our paper has important implications to the understanding of the transmission mechanisms of unconventional monetary policy interventions, a topic of tantamount importance given that direct asset purchases and intervention in corporate bond markets have been considerably expanded worldwide in light of the looming recession due to the Covid-19 pandemic.

We show that trade credit plays an important role in the transmission mechanism of monetary policy and that trade credit in production networks matter beyond demand effects. While economic and financial integration through supplier-customer networks can facilitate the transmission of monetary policy interventions to economically depressed regions and to firms with limited access to financial markets, we also highlight that firms benefiting from direct asset purchases are able to expand their customer base due to their ability to provide trade finance. This suggests that unconventional monetary policy may increase concentration in upstream industries with potentially long-lasting consequences on the spatial distribution of economic activity.

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Appendix

Table A.1
Variable Definitions

Variable	Definition
Accounts Receivable	Accounts receivable (Orbis item *DEBTORS*) divided by operating revenue (Orbis item *OPRE*).
Accounts Payable	Accounts payable (Orbis item *CREDITORS*) divided by operating revenue (Orbis item *OPRE*).
Assets	Total assets (Orbis item *TOAS*).
Sales	Operating revenue (Orbis item *OPRE*).
Cash	Cash and cash equivalent (Orbis item *CASH*) divided by total assets (Orbis item *TOAS*).
PPE	Tangible fixed assets (Orbis item *TFAS*) divided by total assets (Orbis item *TOAS*).
Net Margin	Net income (Orbis item *PL*) divided by operating revenue (Orbis item *OPRE*).
Liabilities	Current liabilities (Orbis item *CULI*) plus non-current liabilities (Orbis item *NCLI*) divided by total assets (Orbis item *TOAS*).
Financial Debt	Long term debt (Orbis item *LTDB*) plus loans (Orbis item *LOAN*) divided by total assets (Orbis item *TOAS*).
Eligible	Dummy variable that equals one if a firm has corporate bonds eligible for purchase under the CSPP rules before the CSPP announcement, and zero otherwise.
Has Eligible Supplier	Dummy variable that equals one if a firm is reported as a customer of eligible firms in Factset Revere Supply Chain Relationships database, and zero otherwise.
Eligible Suppliers Share	The firm's share of eligible suppliers relative to the firm's total number of suppliers.
Has Core Eligible Supplier	Dummy variable that equals one if a firm is a customer of an eligible firm with headquarters in core eurozone countries, and zero otherwise.
Has Periphery Eligible Supplier	Dummy variable that equals one if a firm is a customer of an eligible firms with headquarters in periphery eurozone countries, and zero otherwise.
Assets Growth	Change in total assets (Orbis item *TOAS*) divided by previous year total assets.
CAPEX	Change in tangible fixed assets (Orbis item *TFAS*) plus depreciation and amortization (Orbis item *DEPR*) divided by the previous year total assets (Orbis item *TOAS*).
Labor Growth	Change in number of employees (Orbis item *EMPL*) divided by the previous year number of employees.
Change in Inventories	Change in inventories (Orbis item *STOK*) divided by the previous year total assets (Orbis item *TOAS*).
Change in Receivable	Change in accounts receivable (Orbis item *DEBTORS*) divided by the previous year total assets (Orbis item *TOAS*).
Sales Growth	Change in operating revenue (Orbis item *OPRE*) divided by the previous year operating revenue.
Profitability	EBITDA (Orbis item *EBTA*) divided by the previous year total assets (Orbis item *TOAS*).
Change in Payable	Change in accounts payable (Orbis item *CREDITORS*) divided by the previous year total assets (Orbis item *TOAS*).
Change in Financial Debt	Change in financial debt (Orbis item *LTDB* plus Orbis item *LOAN*) divided by the previous year total assets (Orbis item *TOAS*).
Change in Long-term Debt	Change in long-term debt (Orbis item *LTDB*) divided by the previous year total assets (Orbis item *TOAS*).
Change in Short-term Loans	Change in current loans (Orbis item *LOAN*) divided by the previous year total assets (Orbis item *TOAS*).
Change in Cash Holdings	Change in cash (Orbis item *CASH*) divided by the previous year total assets (Orbis item *TOAS*).

Table 1
Summary Statistics
This table shows mean, median, standard deviation, minimum, maximum, and number of observations for each variable. Variable definitions are provided in Table A.1 in the Appendix. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. Variables are winsorized at the top and bottom 1%.

	Mean	Median	Standard Deviation	Minimum	Maximum	Number of Observations
Accounts Receivable	0.3012	0.1849	0.5574	0.0000	4.6879	2,248,514
Account Payable	0.2284	0.1134	0.5555	0.0000	4.9558	2,248,514
Assets (million)	30.1234	3.2753	703.8566	0.0000	198,929	2,248,514
Sales (million)	22.5520	3.1251	367.4128	0.0000	107,970	2,248,514
Cash	0.1130	0.0480	0.1536	0.0000	0.8158	2,248,514
PPE	0.2358	0.1303	0.2600	0.0000	0.9767	2,248,514
Net Margin	-0.0528	0.0157	0.7375	-7.0694	1.7098	2,248,514
Liabilities	0.6402	0.6690	0.2958	0.0035	1.8202	2,248,514
Financial Debt	0.1938	0.1170	0.2218	0.0000	1.0345	2,105,609
Eligible	0.0003	0.0000	0.0177	0.0000	1.0000	2,248,514
Has Eligible Supplier	0.0007	0.0000	0.0257	0.0000	1.0000	2,248,514
Eligible Suppliers Share	0.0002	0.0000	0.0125	0.0000	1.0000	2,248,514
Has Core Eligible Supplier	0.0006	0.0000	0.0238	0.0000	1.0000	2,248,514
Has Periphery Eligible Supplier	0.0001	0.0000	0.0122	0.0000	1.0000	2,248,514
Assets Growth	0.0854	0.0226	0.3315	-0.4848	2.9298	2,248,512
CAPEX	0.0449	0.0149	0.0980	-0.1187	0.7761	2,116,731
Labor Growth	0.0643	0.0000	0.3237	-0.6154	2.0000	1,779,908
Change in Inventories	0.0095	0.0000	0.0754	-0.2499	0.4933	2,246,443
Change in Receivable	0.0177	0.0001	0.1404	-0.3881	0.7492	2,247,599
Sales Growth	0.1587	0.0301	0.8279	-0.8701	7.0343	2,248,514
Profitability	0.0922	0.0697	0.1213	-0.2832	0.7113	2,161,872
Change in Payable	0.0129	0.0000	0.1212	-0.3467	0.6517	2,238,452
Change in Financial Debt	0.0062	0.0000	0.1273	-0.4347	0.7314	2,081,233
Change in Long-term Debt	0.0027	0.0000	0.1106	-0.5351	0.8165	2,090,098
Change in Short-term Loans	0.0036	0.0000	0.0803	-0.3079	0.4568	2,236,327
Change in Cash Holdings	0.0152	0.0010	0.0983	-0.3164	0.6058	2,231,250

Table 2
Effect of CSPP on Accounts Receivable of Eligible Firms
This table presents difference-in-differences estimates of firm-level panel regressions of the ratio of accounts receivable to sales. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × Post	0.103***		0.102***		0.089***	
	(0.032)		(0.032)		(0.032)	
Eligible × 2014		-0.007		-0.007		-0.013
		(0.022)		(0.022)		(0.022)
Eligible × 2015		0.046		0.046		0.042
		(0.043)		(0.043)		(0.043)
Eligible × 2016		0.077**		0.077**		0.062*
		(0.038)		(0.038)		(0.038)
Eligible × 2017		0.156**		0.156**		0.139**
		(0.062)		(0.062)		(0.062)
log(Assets)			-0.013***	-0.013***	-0.014***	-0.014***
			(0.002)	(0.002)	(0.002)	(0.002)
Cash			-0.050***	-0.050***	-0.045***	-0.045***
			(0.005)	(0.005)	(0.005)	(0.005)
PPE			-0.086***	-0.086***	-0.087***	-0.087***
			(0.007)	(0.007)	(0.007)	(0.007)
Net Margin			-0.006***	-0.006***	-0.006***	-0.006***
			(0.002)	(0.002)	(0.002)	(0.002)
Liabilities			-0.010**	-0.010**	-0.007	-0.007
			(0.005)	(0.005)	(0.005)	(0.005)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	No	No	Yes	Yes
Number of observations	2,248,514	2,248,514	2,248,514	2,248,514	2,248,514	2,248,514
R-squared	0.74	0.74	0.74	0.74	0.74	0.74

Table 3
Effect of CSPP on Accounts Payable of Eligible Firms' Customers
This table presents difference-in-differences estimates of firm-level panel regressions of the ratio of accounts receivable to sales. *Has Eligible Supplier* is a dummy that takes the value of one if a firm had a supplier with CSPP-eligible bonds, and zero otherwise. *Eligible Suppliers Share* is the firm's share of eligible suppliers relative to the firm's total number of suppliers. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Dummy Variable

	(1)	(2)	(3)	(4)	(5)	(6)
Has Eligible Supplier × Post	0.048***		0.045***		0.032*	
	(0.017)		(0.017)		(0.017)	
Has Eligible Supplier × 2014		0.030		0.028		0.025
		(0.023)		(0.023)		(0.023)
Has Eligible Supplier × 2015		0.039		0.038		0.039
		(0.027)		(0.027)		(0.027)
Has Eligible Supplier × 2016		0.034**		0.031*		0.018
		(0.016)		(0.017)		(0.017)
Has Eligible Supplier × 2017		0.110***		0.107***		0.092***
		(0.034)		(0.034)		(0.034)
log(Assets)			-0.045***	-0.045***	-0.046***	-0.046***
			(0.002)	(0.002)	(0.002)	(0.002)
Cash			0.022***	0.022***	0.026***	0.026***
			(0.005)	(0.005)	(0.005)	(0.005)
PPE			-0.048***	-0.048***	-0.047***	-0.047***
			(0.008)	(0.008)	(0.008)	(0.008)
Net Margin			-0.019***	-0.019***	-0.019***	-0.019***
			(0.002)	(0.002)	(0.002)	(0.002)
Liabilities			0.066***	0.066***	0.069***	0.069***
			(0.006)	(0.006)	(0.006)	(0.006)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	No	No	Yes	Yes
Number of observations	2,248,514	2,248,514	2,248,514	2,248,514	2,248,514	2,248,514
R-squared	0.71	0.71	0.71	0.71	0.71	0.71

Table 3 (continued)

Panel B: Share of Eligible Suppliers

	(1)	(2)	(3)	(4)	(5)	(6)
Eligible Suppliers Share × Post	0.069**		0.067**		0.051*	
	(0.030)		(0.029)		(0.029)	
Eligible Suppliers Share × 2014		0.051		0.043		0.040
		(0.045)		(0.045)		(0.045)
Eligible Suppliers Share × 2015		0.039		0.035		0.036
		(0.041)		(0.040)		(0.040)
Eligible Suppliers Share × 2016		0.050**		0.042*		0.027
		(0.025)		(0.025)		(0.025)
Eligible Suppliers Share × 2017		0.159***		0.155**		0.138**
		(0.062)		(0.060)		(0.060)
log(Assets)			-0.045***	-0.045***	-0.046***	-0.046***
			(0.002)	(0.002)	(0.002)	(0.002)
Cash			0.022***	0.022***	0.026***	0.026***
			(0.005)	(0.005)	(0.005)	(0.005)
PPE			-0.048***	-0.048***	-0.047***	-0.047***
			(0.008)	(0.008)	(0.008)	(0.008)
Net Margin			-0.019***	-0.019***	-0.019***	-0.019***
			(0.002)	(0.002)	(0.002)	(0.002)
Liabilities			0.066***	0.066***	0.069***	0.069***
			(0.006)	(0.006)	(0.006)	(0.006)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	No	No	Yes	Yes
Number of observations	2,248,514	2,248,514	2,248,514	2,248,514	2,248,514	2,248,514
R-squared	0.71	0.71	0.71	0.71	0.71	0.71

Table 4

Difference-in-Differences around the CSPP: Matched Sample

This table presents difference-in-differences estimates of firm-level panel regressions of the ratio of accounts receivable to sales and accounts payable to sales. Panel A shows pre-treatment (CSPP announcement) means and medians of non-treated, treated, and control groups and tests of the difference in mean and median between treated and control groups. Treated firms consist of either 144 firms with eligible bonds or 305 firms with eligible suppliers. The samples includes only treated firms with non-missing information in Orbis on the two years preceding the treatment (2014 and 2015). Non-treated firms are all other firms. Control firms are firms that best match treated firms using propensity scores (nearest neighbor). Panel B shows estimates of the difference-in-differences regressions. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Has Eligible Supplier* is a dummy that takes the value of one if a firm had a supplier with CSPP-eligible bonds, and zero otherwise. *Eligible Suppliers Share* is the firm's share of eligible suppliers relative to the firm's total number of suppliers. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of a matched sample based on Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Summary Statistics (pre-treatment)

Eligible Firms								
	Mean				Median			
	Non-Treated	Treated	Control	*t*-test (*p*-value)	Non-Treated	Treated	Control	Pearson χ^2 (*p*-value)
log(Assets)	15.335	22.862	22.856	0.974	15.028	23.093	23.181	0.637
Cash	0.118	0.060	0.091	0.011	0.052	0.030	0.043	0.480
PPE	0.232	0.159	0.161	0.935	0.126	0.010	0.035	0.814
Net Margin	-0.051	0.284	0.083	0.204	0.018	0.183	0.078	0.000
Liabilities	0.637	0.624	0.631	0.813	0.662	0.614	0.710	0.059
Customers of Eligible Firms								
	Mean				Median			
	Non-Treated	Treated	Control	*t*-test (*p*-value)	Non-Treated	Treated	Control	Pearson χ^2 (*p*-value)
log(Assets)	15.334	21.164	21.094	0.716	15.027	21.410	21.172	0.224
Cash	0.118	0.088	0.098	0.347	0.052	0.042	0.023	0.019
PPE	0.232	0.105	0.094	0.450	0.126	0.017	0.010	0.124
Net Margin	-0.051	0.066	0.097	0.805	0.018	0.081	0.078	0.331
Liabilities	0.637	0.551	0.540	0.615	0.662	0.575	0.550	0.292

Table 4 (continued)

Panel B: Difference-in-Differences Estimates

	Accounts Receivable			Accounts Payable		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × Post	0.103**	0.109**				
	(0.047)	(0.050)				
Has Eligible Supplier × Post			0.079**	0.066**		
			(0.030)	(0.031)		
Eligible Suppliers Share × Post					0.083**	0.076*
					(0.039)	(0.043)
Controls	No	Yes	No	Yes	No	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,401	1,371	2,863	2,797	2,863	2,797
R-squared	0.81	0.81	0.62	0.64	0.62	0.64

Table 5
Size Bins-by-Year Fixed Effects Regressions

This table presents difference-in-differences estimates of firm-level panel regressions of the ratio of accounts receivable to sales and the ratio of accounts payable to sales. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Has Eligible Supplier* is a dummy that takes the value of one if a firm had a supplier with CSPP-eligible bonds, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The regressions in Panel A include 20 size bins-by-year fixed effects. The regressions in Panel B include 50 size bins-by-year fixed effects. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: 20 Size Bins

	Accounts Receivable			Accounts Payable		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	0.102***	0.100***	0.087***			
	(0.032)	(0.032)	(0.032)			
Has Eligible Supplier × *Post*				0.048***	0.045***	0.032*
				(0.017)	(0.016)	(0.017)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Size bins-by-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2,248,512	2,248,512	2,248,512	2,248,512	2,248,512	2,248,512
R-squared	0.74	0.74	0.74	0.71	0.71	0.71

Panel B: 50 Size Bins

	Accounts Receivable			Accounts Payable		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	0.102***	0.099***	0.087***			
	(0.032)	(0.032)	(0.032)			
Has Eligible Supplier × *Post*				0.048***	0.045***	0.032*
				(0.017)	(0.016)	(0.017)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Size bins-by-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2,248,512	2,248,512	2,248,512	2,248,512	2,248,512	2,248,512
R-squared	0.74	0.74	0.74	0.71	0.71	0.71

Table 6

Effect of CSPP on Accounts Payable of Eligible Firms' Customers: Role of Financial Constraints

This table presents difference-in-differences estimates of firm-level panel regressions of the ratio of accounts receivable to sales. *Has Eligible Supplier* is a dummy that takes the value of one if a firm had a supplier with CSPP-eligible bonds, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. In columns (1) and (2), Panel A, the sample is partitioned in firms with investment grade rating and firms with either a speculative grade rating or without a credit rating. In columns (3) and (4), Panel A, the sample is partitioned in firms that are rated and firms without a credit rating. In columns (5) and (6), Panel A, the low and high liabilities groups consist of those firms that are below or above the median of the distribution of the ratio of liabilities to assets. In columns (7) and (8), Panel A, the low and high PPE groups consist of those firms that are below or above the median of the distribution of the ratio of PPE to assets. In columns (1) and (2), Panel B, the low and high sales groups consist of those firms that are below or above the median of the distribution of sales. In columns (3) and (4), Panel B, the low and high sales growth groups consist of those firms that are below or above the median of the distribution of sales growth. In columns (5) and (6), Panel B, the low and high assets growth groups consist of those firms that are below or above the median of the distribution of assets growth. In columns (7) and (8), Panel B, the low and high profitability groups consist of those firms that are below or above the median of the distribution of EBITDA to assets ratio. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A

	Investment Grade	Non-Investment Grade	Rated	Unrated	Low Liabilities	High Liabilities	High PPE	Low PPE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Has Eligible Supplier × *Post*	-0.049	0.041**	-0.055	0.047**	0.023	0.082***	0.022**	0.039*
	(0.048)	(0.021)	(0.038)	(0.022)	(0.020)	(0.031)	(0.010)	(0.023)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	697	2,247,817	1,169	2,247,345	1,124,258	1,124,256	1,124,256	1,124,258
R-squared	0.77	0.71	0.68	0.71	0.71	0.72	0.72	0.72

Table 6 (continued)

Panel B

	High Sales	Low Sales	Low Sales Growth	High Sales Growth	Low Assets Growth	High Assets Growth	High Profitability	Low Profitability
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Has Eligible Supplier × Post	0.019	0.191	0.027	0.044**	0.014	0.052**	0.014**	0.066***
	(0.015)	(0.371)	(0.032)	(0.019)	(0.029)	(0.026)	(0.006)	(0.023)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,124,256	1,124,258	1,081,305	1,081,303	1,090,815	1,090,812	1,082,737	1,082,737
R-squared	0.68	0.72	0.76	0.75	0.75	0.73	0.71	0.72

Table 7
Core vs. Periphery Eurozone Countries
This table presents difference-in-differences estimates of firm-level panel regressions of the ratio of accounts receivable to sales and the ratio of accounts payable to sales. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Has Eligible Supplier* is a dummy that takes the value of one if a firm had a supplier with CSPP-eligible bonds, and zero otherwise. *Eligible Suppliers Share* is the firm's share of eligible suppliers relative to the firm's total number of suppliers. *Has Core Eligible Supplier* is a dummy variable that takes the value of one if a firm is a customer of eligible firms headquartered in core eurozone countries, and zero otherwise. *Has Periphery Eligible Supplier* is a dummy variable that takes the value of one if a firm is a customer of eligible firms headquartered in periphery eurozone countries, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Core vs. Periphery Eurozone Countries

	Core Countries			Periphery Countries		
	Accounts Receivable	Accounts Payable	Accounts Payable	Accounts Receivable	Accounts Payable	Accounts Payable
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	0.126***			0.018		
	(0.045)			(0.025)		
Has Eligible Supplier × *Post*		0.017			0.072**	
		(0.019)			(0.032)	
Eligible Suppliers Share × *Post*			0.003			0.109**
			(0.031)			(0.048)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	650,691	650,691	650,691	1,597,823	1,597,823	1,597,823
R-squared	0.77	0.71	0.71	0.73	0.71	0.71

Panel B: Core vs. Periphery Eurozone Countries Eligible Suppliers

	Eurozone	Core Countries	Periphery Countries
	Accounts Payable	Accounts Payable	Accounts Payable
	(1)	(2)	(3)
Has Core Eligible Supplier × Post	0.044**	0.018	0.077
	(0.020)	(0.020)	(0.051)
Has Periphery Eligible Supplier × Post	0.024*	0.003	0.034*
	(0.013)	(0.023)	(0.018)
Controls	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes
Number of observations	2,248,514	650,691	1,597,823
R-squared	0.71	0.71	0.71

Table 8

Real Effects of CSPP: Investment, Operations, and Financing of Eligible Firms' Customers

This table presents difference-in-differences estimates of firm-level panel regressions of firm outcomes. Panel A shows regressions for variables that measure corporate investment (assets growth, CAPEX, change in inventories, change in receivable, and labor growth) and operating outcomes (sales growth, and profitability). Panel B shows regressions for variables that measure corporate external and internal financing decisions (change in payable, change in financial debt, change in long-term debt, change in short-term loans, change in cash holdings). *Has Eligible Supplier* is a dummy that takes the value of one if a firm had a supplier with CSPP-eligible bonds, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Investment and Operating Activities

	Investment in Fixed Assets, Working Capital and Human Capital					Operational Activity	
	Assets Growth	*CAPEX*	*Change in Inventories*	*Change in Receivable*	*Labor Growth*	*Sales Growth*	*Profitability*
	$\Delta Assets_t / Assets_{t-1}$	$(\Delta Fixed\ Assets_t + Depreciation_t) / Assets_{t-1}$	$\Delta Inventories_t / Assets_{t-1}$	$\Delta Receivable_t / Assets_{t-1}$	$\Delta Employees_t / Employees_{t-1}$	$\Delta Sales_t / Sales_{t-1}$	$EBITDA_t / Assets_{t-1}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Has Eligible Supplier × *Post*	0.025*	0.005*	0.004**	0.011**	0.034*	0.024	0.001
	(0.015)	(0.003)	(0.002)	(0.005)	-0.02	(0.048)	(0.003)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2,248,512	2,116,731	2,246,443	2,247,599	1,779,908	2,248,514	2,161,872
R-squared	0.55	0.48	0.32	0.29	0.28	0.39	0.73

Table 8 (continued)

Panel B: External and Internal Financing

	Change in Payable	*Change in Financial Debt*	*Change in Long-term Debt*	*Change in Short-term Loans*	*Change in Cash Holdings*
	$\Delta Payable_t$ / $Assets_{t-1}$	$\Delta Financial\ Debt_t$ / $Assets_{t-1}$	$\Delta Long\text{-}term\ Debt_t$ / $Assets_{t-1}$	$\Delta Short\text{-}term\ Loans_t$ / $Assets_{t-1}$	$\Delta Cash_t$ / $Assets_{t-1}$
	(1)	(2)	(3)	(4)	(5)
Has Eligible Supplier × Post	0.009***	0.008	0.005	0.004	-0.007
	(0.003)	(0.007)	(0.007)	(0.004)	(0.004)
Controls	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	2,238,452	2,081,233	2,090,098	2,236,327	2,231,250
R-squared	0.27	0.26	0.22	0.18	0.43

Table 9
Effect of CSPP on Client Relationships Maintained and New Client Relationships Obtained
This table presents difference-in-differences estimates of firm-level panel regressions of the number of client relationships maintained and number of new clients. The dependent variable in columns (1)-(3) is the number of client relationships maintained by a supplier relative to the existing relationships in the previous year. The dependent variable in columns (4)-(6) is the number of new client relationships initiated by a supplier relative to the existing relationships in the previous year. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Factset Revere Supply Chain Relationship nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Eurozone Countries

	Number of Clients Kept			Number of New Clients		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	9.514***	8.223***	7.624***	3.281***	2.767**	2.715**
	(1.935)	(2.073)	(2.043)	(1.234)	(1.231)	(1.219)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Number of observations	9,434	6,045	6,037	9,434	6,045	6,037
R-squared	0.84	0.84	0.84	0.58	0.57	0.57

Panel B: Core Eurozone Countries

	Number of Clients Kept			Number of New Clients		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	11.700***	9.968***	9.729***	4.247***	3.429**	3.612**
	(2.334)	(2.510)	(2.481)	(1.482)	(1.501)	(1.471)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Number of observations	6,558	3,883	3,883	6,558	3,883	3,883
R-squared	0.84	0.84	0.84	0.59	0.58	0.58

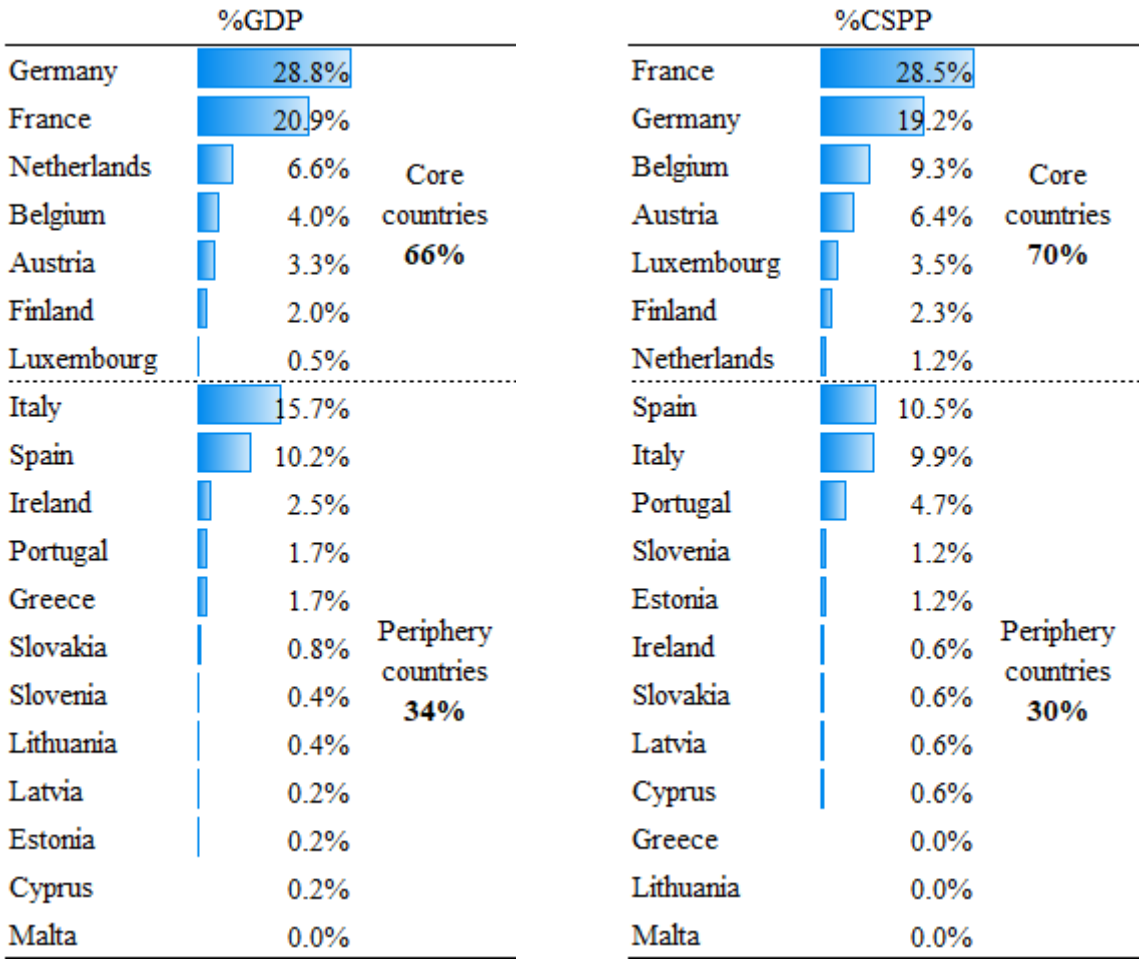
Table 9 (Continued)

Panel C: Periphery Countries

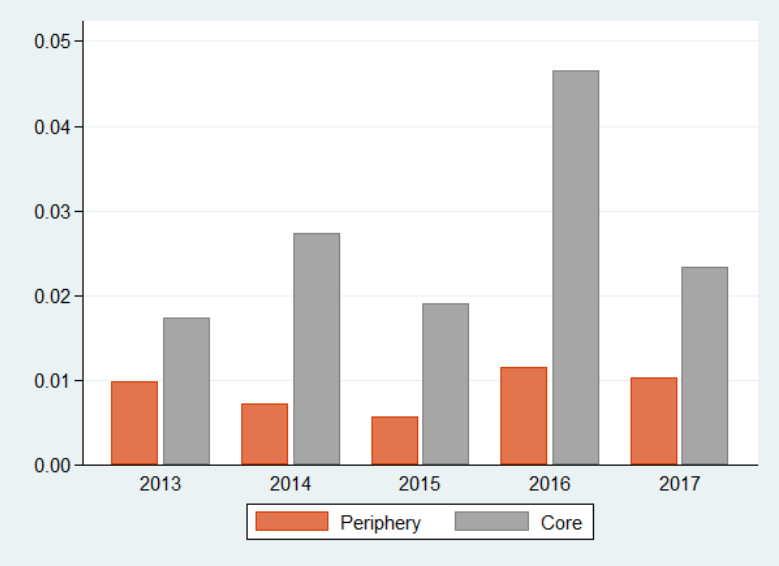
	Number of Clients Kept			Number of New Clients		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	0.624	-0.359	-0.580	-0.419	0.275	-0.648
	(1.318)	(1.445)	(1.548)	(1.152)	(1.058)	(1.248)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Number of observations	2,876	2,162	2,154	2,876	2,162	2,154
R-squared	0.85	0.85	0.85	0.51	0.5	0.52

Figure 1
New Issuance of Corporate Bonds around the CSPP: Core vs. Periphery Countries
Panel A shows the percentage of GDP as of 2015 by country and the percentage of nonfinancial eligible firms by country. The number of nonfinancial eligible firms is obtained before excluding observations with missing information in the variables used in the benchmark regressions. Panel B and C show the amount of capital (scaled by GDP) raised by core and periphery eurozone firms in the euro-denominated corporate bond market. Bond issuance data are obtained from SDC New Issues and includes bonds issued by nonfinancial firms domiciled in the eurozone over the 2013-2017 period. Panel B shows new issuance of investment grade bonds. Panel C shows new issuance of non-investment grade bonds.

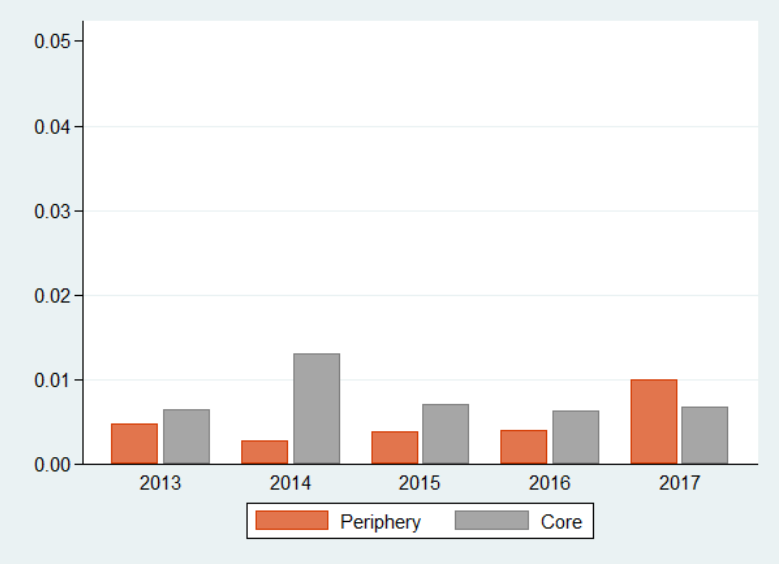
Panel A: Distribution of GDP and Eligible Bonds by Country



Panel B: New Issuance of Investment Grade Bonds (% of GDP)



Panel C: New Issuance of Non-Investment Grade Bonds (% of GDP)



Trade Credit and the Transmission of Unconventional Monetary Policy

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Table IA.1
Sample Description by Country
This table shows the frequency distribution of the sample by country using a sample of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. Panel A reports the number of observations by country. Panel B reports the distribution of eligible firms and customers of eligible firms by country.

Panel A: Frequency Distribution of the Sample by Country

	Baseline Sample		Sample (Assets > €10 million)	
	Number of Observations	%	Number of Observations	%
Austria	7,749	0.3	6,025	1.3
Belgium	76,449	3.4	31,812	6.7
Cyprus	1,783	0.1	721	0.2
Estonia	16,763	0.8	2,642	0.6
Finland	49,511	2.2	9,477	2.0
France	453,503	20.2	89,549	18.7
Germany	53,214	2.4	39,714	8.3
Greece	45,561	2.0	10,659	2.2
Ireland	9,787	0.4	5,547	1.2
Italy	831,072	37.0	149,283	31.2
Latvia	17,432	0.8	2,518	0.5
Lithuania	10,092	0.5	2,791	0.6
Luxembourg	5,657	0.3	3,591	0.8
Malta	1,616	0.1	684	0.1
Netherlands	4,608	0.2	3,503	0.7
Portugal	122,214	5.4	20,278	4.2
Slovakia	45,735	2.0	7,608	1.6
Slovenia	23,613	1.1	3,577	0.8
Spain	472,155	21.0	88,286	18.5
Total	2,248,514	100	478,265	100

Panel B: Distribution of Eligible Firms and Customers of Eligible Firms by Country

	Eligible Firms		Customers of Eligible Firms	
	Number of Firms	%	Number of Firms	%
Austria	8	5.3	6	1.9
Belgium	16	10.6	13	4.1
Cyprus	1	0.7	0	0.0
Estonia	2	1.3	2	0.6
Finland	4	2.6	15	4.7
France	44	29.1	89	28.0
Germany	28	18.5	80	25.2
Greece	0	0.0	6	1.9
Ireland	1	0.7	9	2.8
Italy	16	10.6	42	13.2
Latvia	1	0.7	0	0.0
Lithuania	0	0.0	0	0.0
Luxembourg	1	0.7	4	1.3
Malta	0	0.0	0	0.0
Netherlands	1	0.7	2	0.6
Portugal	8	5.3	8	2.5
Slovakia	1	0.7	1	0.3
Slovenia	2	1.3	0	0.0
Spain	17	11.3	41	12.9
Total	151	100	318	100

Table IA.2
Supply Chain Relationships: Distribution by country
This table shows the frequency distribution of the sample of supplier-customer pairs by country. The sample includes nonfinancial suppliers domiciled in the euro area as reported by Factset Revere before the CSPP announcement.

Supplier	Customer country																			
country	AT	BE	CY	DE	EE	ES	FI	FR	GR	IE	IT	LT	LU	LV	MT	NL	PT	SI	SK	Other	Total
AT	40	4	0	50	2	8	7	15	2	3	9	0	6	0	0	9	4	2	0	381	542
BE	1	32	0	35	1	4	2	49	4	3	6	0	2	0	0	22	0	0	0	408	569
CY	1	0	3	2	0	5	0	6	3	1	6	0	0	0	0	5	0	0	0	133	165
DE	64	37	3	1,348	3	45	38	215	21	31	78	2	34	1	1	117	7	1	1	3,208	5,255
EE	0	0	0	0	25	0	2	2	0	0	0	4	0	4	0	0	0	0	0	7	44
ES	4	10	0	54	2	209	6	64	8	9	33	0	7	3	0	26	17	1	0	860	1,313
FI	13	13	4	61	9	6	194	40	3	5	14	4	5	2	0	16	1	2	1	843	1,236
FR	15	73	2	316	8	78	35	1,158	13	28	113	0	41	1	1	170	13	4	6	3,514	5,589
GR	10	4	3	38	0	9	2	30	83	7	17	0	5	0	2	34	4	1	0	468	717
IE	0	10	1	17	0	2	1	23	1	24	9	0	2	1	0	19	2	0	0	616	728
IT	6	8	1	122	0	29	11	112	9	13	414	1	9	0	1	41	1	1	3	1,224	2,006
LT	0	1	0	3	1	0	2	0	0	0	0	12	0	3	1	0	1	0	0	26	50
LU	1	5	0	22	0	11	2	32	3	2	6	1	7	0	0	16	1	0	1	386	496
LV	0	0	0	0	0	0	0	0	0	1	0	3	0	1	0	1	0	0	0	8	14
MT	1	1	0	0	1	3	1	1	1	0	0	0	0	0	0	0	0	0	0	7	16
NL	8	15	3	159	3	27	10	76	9	19	32	0	6	1	1	130	7	0	0	1,374	1,880
PT	0	0	0	0	0	1	0	2	2	1	1	0	0	0	0	2	29	0	0	49	87
SI	1	0	0	3	0	0	1	1	0	0	0	0	1	0	0	1	0	3	0	15	26
SK	0	1	0	2	0	1	0	0	0	0	1	0	0	0	0	0	0	2	9	18	34
Total	165	214	20	2,232	55	438	314	1,826	162	147	739	27	125	17	7	609	87	17	21	13,545	20,767

Table IA.3
Effect of CSPP on Financial Debt of Eligible Firms

This table presents difference-in-differences estimates of firm-level panel regressions of the change in financial debt scaled by lagged assets. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Eurozone	Core Countries	Periphery Countries
	(1)	(2)	(3)
Eligible × *Post*	0.016	0.022*	-0.007
	(0.011)	(0.014)	(0.017)
Controls	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes
Number of observations	2,081,233	633,211	1,448,022
R-squared	0.26	0.25	0.26

Table IA.4

Effect of CSPP on Financial Debt, Bond Debt and Bank Debt Financing of Publicly Listed Eligible Firms

This table presents difference-in-differences estimates of firm-level panel regressions of firm outcomes. The dependent variable in columns (1), (4), and (7) is the change in total debt scaled by lagged assets. The dependent variable in columns (2), (5), and (8) is the change in bond debt scaled by lagged assets. The dependent variable in columns (3), (6), and (9) is the change in bank debt scaled by lagged assets. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Capital IQ/Compustat Global nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Eurozone			Core Countries			Periphery Countries		
	Change in Total Debt	*Change in Bond Debt*	*Change in Bank Debt*	*Change in Total Debt*	*Change in Bond Debt*	*Change in Bank Debt*	*Change in Total Debt*	*Change in Bond Debt*	*Change in Bank Debt*
	$\Delta Total\ Debt_t / Assets_{t-1}$	$\Delta Bond\ Debt_t / Assets_{t-1}$	$\Delta Bank\ Debt_t / Assets_{t-1}$	$\Delta Total\ Debt_t / Assets_{t-1}$	$\Delta Bond\ Debt_t / Assets_{t-1}$	$\Delta Bank\ Debt_t / Assets_{t-1}$	$\Delta Total\ Debt_t / Assets_{t-1}$	$\Delta Bond\ Debt_t / Assets_{t-1}$	$\Delta Bank\ Debt_t / Assets_{t-1}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Eligible × *Post*	0.007	0.016**	-0.008	0.005	0.013*	-0.003	0.006	0.016	-0.029
	(0.010)	(0.006)	(0.007)	(0.012)	(0.007)	(0.007)	(0.023)	(0.018)	(0.022)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	3,908	3,908	3,908	2,463	2,463	2,463	1,445	1,445	1,445
R-squared	0.39	0.29	0.26	0.39	0.31	0.29	0.4	0.29	0.23

Table IA.5

Real Effects of CSPP: Investment, Operations, and Financing of Eligible Firms

This table presents difference-in-differences estimates of firm-level panel regressions of corporate investment (assets growth, CAPEX, change in inventories, change in receivable, and labor growth) and operating outcomes (sales growth, and profitability). *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Investment in Fixed Assets, Working Capital and Human Capital					Operational Activity	
	Assets Growth	*CAPEX*	*Change in Inventories*	*Change in Receivable*	*Labor Growth*	*Sales Growth*	*Profitability*
	$\Delta Assets_t$ $/Assets_{t-1}$	$(\Delta Fixed\ Assets_t + Depreciation_t)$ $/ Assets_{t-1}$	$\Delta Inventories_t /$ $Assets_{t-1}$	$\Delta Receivable_t /$ $Assets_{t-1}$	$\Delta Employees_t /$ $Employees_{t-1}$	$\Delta Sales_t$ $/ Sales_{t-1}$	$EBITDA_t$ $/Assets_{t-1}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Eligible × *Post*	0.023*	0.002	0.005	0.009**	0.018	-0.018	0.003
	(0.014)	(0.005)	(0.004)	(0.004)	(0.024)	(0.076)	(0.004)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2,248,512	2,116,731	2,246,443	2,247,599	1,779,908	2,248,514	2,161,872
R-squared	0.55	0.48	0.32	0.29	0.28	0.39	0.73

Table IA.6
Effect of CSPP on Accounts Receivable of Eligible Firms: Placebo Test

This table presents difference-in-differences estimates of firm-level panel regressions of the ratio of accounts receivable to sales. *Investment Grade* is a dummy variable that takes the value of one if a firm had an investment grade credit rating (AAA to BBB-) before the CSPP announcement, and zero otherwise) *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. Columns (1) and (2) show the results for a sample of U.S. publicly listed firms drawn from Compustat. Columns (3) and (4) show the results for a sample of publicly listed firms domiciled in European Union countries that are not part of the eurozone. Columns (5) and (6) show the results for a sample of public and private firms domiciled in European Union countries that are not part of the eurozone. The sample in columns (3)-(6) consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	U.S. Public Firms (Compustat)		EU Non-Euro Public Firms (Orbis)		EU Non-Euro Firms (Orbis)	
	(1)	(2)	(3)	(4)	(5)	(6)
Investment Grade × Post	0.004		-0.014		0.013*	
	(0.005)		(0.013)		(0.007)	
Investment Grade × 2014		0.001		0.019		0.011**
		(0.004)		(0.015)		(0.005)
Investment Grade × 2015		0.005		-0.017		0.018**
		(0.006)		(0.018)		(0.008)
Investment Grade × 2016		0.004		-0.021		0.031***
		(0.007)		(0.020)		(0.009)
Investment Grade × 2017		0.007		-0.008		0.017
		(0.007)		(0.021)		(0.011)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	17,209	17,209	11,837	11,837	747,924	747,924
R-squared	0.65	0.65	0.74	0.74	0.76	0.76

Table IA.7
Sample Excluding Firms with less than €10 million in Assets

This table presents difference-in-differences estimates of firm-level panel regressions of the ratio of accounts receivable to sales and the ratio of accounts payable to sales. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Has Eligible Supplier* is a dummy that takes the value of one if a firm had a supplier with CSPP-eligible bonds, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. The sample excludes firms with less than €10 million in Assets as of 2015 (the year before the announcement of the CSPP). All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Accounts Receivable			Accounts Payable		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	0.098**	0.097**	0.088**			
	(0.041)	(0.041)	(0.041)			
Has Eligible Supplier × *Post*				0.043**	0.041**	0.037*
				(0.021)	(0.020)	(0.020)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Number of observations	478,265	478,265	478,265	478,265	478,265	478,265
R-squared	0.74	0.74	0.74	0.71	0.71	0.71

Table IA.8
Sample Excluding Germany

This table presents difference-in-differences estimates of firm-level panel regressions of the ratio of accounts receivable to sales and the ratio of accounts payable to sales. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Has Eligible Supplier* is a dummy that takes the value of one if a firm had a supplier with CSPP-eligible bonds, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. The sample excludes firms domiciled in Germany. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Accounts Receivable			Accounts Payable		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	0.125***	0.124***	0.112***			
	(0.040)	(0.040)	(0.040)			
Has Eligible Supplier × *Post*				0.055**	0.053**	0.041*
				(0.022)	(0.022)	(0.022)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Number of observations	2,195,300	2,195,300	2,195,300	2,195,300	2,195,300	2,195,300
R-squared	0.74	0.74	0.74	0.71	0.71	0.71

Table IA.9
Logarithm of Accounts Receivable and Accounts Payable

This table presents difference-in-differences estimates of firm-level panel regressions of the logarithm of accounts receivable and the logarithm of accounts payable. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Has Eligible Supplier* is a dummy that takes the value of one if a firm had a supplier with CSPP-eligible bonds, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Log(Accounts Receivable)			Log(Accounts Payable)		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	0.239**	0.244***	0.222**			
	(0.094)	(0.094)	(0.094)			
Has Eligible Supplier × *Post*				0.080*	0.073*	0.060
				(0.043)	(0.043)	(0.043)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Number of observations	2,055,571	2,055,571	2,055,571	2,011,980	2,011,980	2,011,980
R-squared	0.92	0.92	0.92	0.92	0.92	0.92

Table IA.10
Sample of Public vs. Private Firms

This table presents difference-in-differences estimates of firm-level panel regressions of the ratio of accounts receivable to sales and the ratio of accounts payable to sales. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Has Eligible Supplier* is a dummy that takes the value of one if a firm had a supplier with CSPP-eligible bonds, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. Panel A shows regressions for the sample of publicly listed firms. Panel B shows regressions for the sample of privately held firms. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Public Firms

	Accounts Receivable			Accounts Payable		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	0.130**	0.131**	0.119**			
	(0.053)	(0.053)	(0.053)			
Has Eligible Supplier × *Post*				0.014	0.010	0.012
				(0.024)	(0.023)	(0.025)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Obs.	10,051	10,051	10,051	10,051	10,051	10,051
R-squared	0.67	0.67	0.68	0.69	0.69	0.69

Panel B: Private Firms

	Accounts Receivable			Accounts Payable		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	0.060*	0.059*	0.045			
	(0.034)	(0.034)	(0.034)			
Has Eligible Supplier × *Post*				0.076**	0.073**	0.065*
				(0.037)	(0.035)	(0.036)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Number of observations	2,238,463	2,238,463	2,238,463	2,238,463	2,238,463	2,238,463
R-squared	0.74	0.74	0.74	0.71	0.71	0.71

Table IA.11
The Role of Product Market Competition

This table presents difference-in-differences estimates of firm-level panel regressions of the ratio of accounts receivable to sales and the ratio of accounts payable to sales. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Has Eligible Supplier* is a dummy that takes the value of one if a firm had a supplier with CSPP-eligible bonds, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. In Panel A, the low and high Lerner index (EBITDA/Sales) groups consist of those firms that are below and above the yearly median at the two-digit SIC level. In Panel B, the low and high Herfindahl Index groups consist of those firms that are below and above the yearly median at the two-digit SIC level. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Lerner Index

	Low Lerner Index		High Lerner Index	
	Accounts Receivable	Accounts Payable	Accounts Receivable	Accounts Payable
	(1)	(2)	(3)	(4)
Eligible × Post	0.102		0.117***	
	(0.067)		(0.041)	
Has Eligible Supplier × Post		-0.007		0.041*
		(0.019)		(0.021)
Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Number of observations	1,161,440	1,161,440	1,087,074	1,087,074
R-squared	0.76	0.73	0.73	0.70

Panel B: Herfindahl Index

	Low Herfindahl Index		High Herfindahl Index	
	Accounts Receivable	Accounts Payable	Accounts Receivable	Accounts Payable
	(1)	(2)	(3)	(4)
Eligible × Post	0.109		0.086**	
	(0.073)		(0.037)	
Has Eligible Supplier × Post		-0.022		0.045**
		(0.043)		(0.018)
Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Number of observations	1,186,108	1,186,108	1,062,406	1,062,406
R-squared	0.74	0.71	0.77	0.73

Table IA.12
Client Relationships Maintained and New Client Relationships Initiated: Sample of Competitors as Control Group

This table presents difference-in-differences estimates of firm-level panel regressions of the number of client relationships maintained and number of new clients. The dependent variable in columns (1)-(3) is the number of client relationships maintained by a supplier relative to the existing relationships in the previous year. The dependent variable in columns (4)-(6) is the number of new client relationships initiated by a supplier relative to the existing relationships in the previous year. *Eligible* is a dummy variable that takes the value of one if a firm had corporate bonds eligible for purchase under the CSPP before the CSPP announcement date, and zero otherwise. *Post* is a dummy variable that takes the value of one in the years of 2016 and 2017, and zero otherwise. The sample consists of Factset Revere Supply Chain Relationship nonfinancial firms in the 2013-2017 period. The control group includes the competitors of eligible firms, domiciled in the Eurozone, as reported in Factset Revere. All explanatory variables are lagged by one year. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for firm-level clustering are reported in parentheses. ∗, ∗∗, and ∗∗∗ indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Eurozone Countries

	Number of Clients Kept			Number of New Clients		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	7.573***	6.377***	5.297**	2.972**	2.444*	2.278
	(2.233)	(2.412)	(2.451)	(1.412)	(1.462)	(1.478)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Number of observations	1,761	1,507	1,504	1,761	1,507	1,504
R-squared	0.84	0.85	0.85	0.56	0.56	0.58

Panel B: Core Eurozone Countries

	Number of Clients Kept			Number of New Clients		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	8.983***	7.520**	7.146**	3.981**	3.359*	3.417*
	(2.754)	(2.998)	(3.021)	(1.729)	(1.848)	(1.840)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Number of observations	1,282	1,078	1,078	1,282	1,078	1,078
R-squared	0.84	0.84	0.85	0.57	0.57	0.58

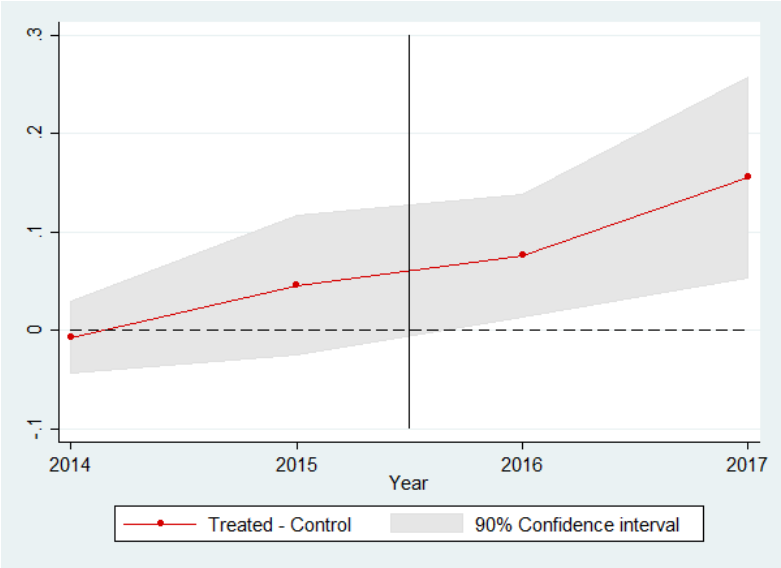
Table IA.12 (Continued)

Panel C: Periphery Countries

	Number of Clients Kept			Number of New Clients		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible × *Post*	-0.228	-1.147	-1.839	-1.329	-0.582	-1.303
	(1.896)	(2.015)	(2.172)	(1.544)	(1.470)	(1.514)
Controls	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-year fixed effects	No	No	Yes	No	No	Yes
Number of observations	479	426	421	479	426	421
R-squared	0.88	0.9	0.9	0.57	0.57	0.58

Figure IA.1
Accounts Receivable of Eligible Firms around the CSPP
This figure shows point estimates and 90% confidence interval of the differences in the ratio of accounts receivable to sales between treated firms (eligible firms) and control firms around the CSPP announcement. The results in Panel A are based on the estimates in column (4) of Table 2. The sample in Panel A consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. The results in Panel B are based on the estimates in column (2) of Table IA.6 of the Internet Appendix. The sample in Panel B consists of Compustat U.S. publicly listed firms.

Panel A: Effect of CSPP on Accounts Receivable of Eligible Firms



Panel B: Placebo Effect on Accounts Receivable of US Investment Grade Firms

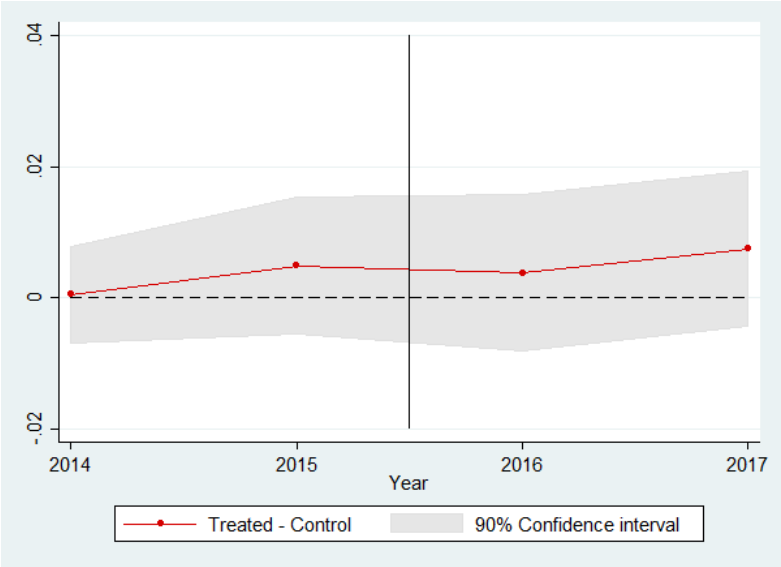
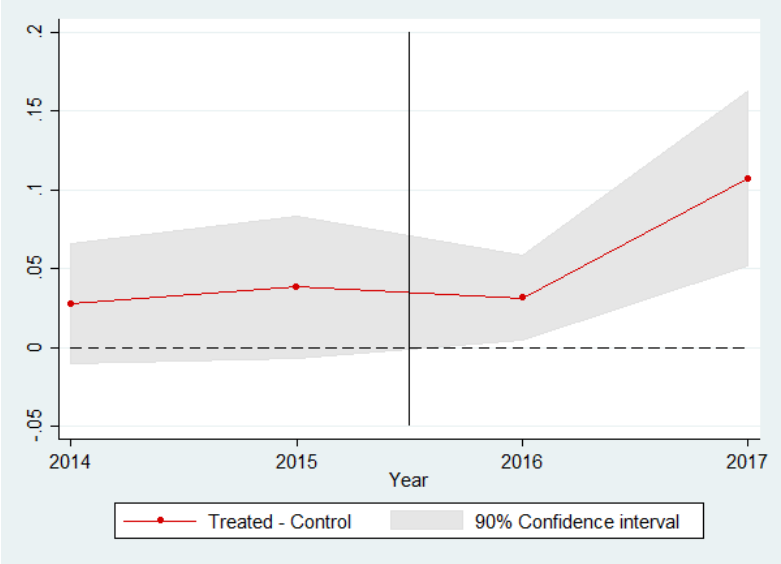


Figure IA.2
Accounts Payable of Eligible Firms' Customers around the CSPP
This figure shows point estimates and 90% confidence interval of the differences in the ratio of accounts payable to sales between treated firms (firms with a supplier with CSPP-eligible bonds) and control firms around the CSPP announcement using a sample of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period. The results in Panel A are based on the estimates in column (4) of Panel A of Table 3. The results in Panel B are based on the estimates in column (4) of Panel B of Table 3. The sample consists of Bureau Van Dijk Orbis nonfinancial firms in the 2013-2017 period.

Panel A: Effect of CSPP on Accounts Payable of Eligible Firms' Customers (Dummy)



Panel B: Effect of CSPP on Accounts Payable of Eligible Firms' Customers (Share of Suppliers)