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Unconventional monetary policy, funding expectations and firm decisions

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Abstract

We study the transmission of (unconventional) monetary policy to the real sector when firm decisions depend on both current and future credit market conditions. For a given level of current credit access, investment and employment increases more at firms expecting bank credit to improve in the future. Three separate unconventional policies by the ECB—the OMT, the introduction of negative rates, and the CSPP—improved expectations of future credit access for SMEs borrowing from banks that were expected to increase SME lending due to the policy. Our results enhance our understanding of the bank balance sheet channel of monetary policy.

JEL classification: D22, D84, E58, G21, H63.
Keywords: Unconventional monetary policy, funding expectations, corporate investment.

Non-technical summary

The "bank lending channel" hypothesis postulates that monetary policy is transmitted to the real economy through changes in the level and composition of bank credit. In this paper, we argue that firms' expectations about future credit availability play an important—and hitherto undocumented—role in the "bank lending channel" of unconventional monetary policy. By targeting a particular set of banks, monetary policy improves the expectations about future credit availability of firms borrowing from these banks. In turn, higher expectations about future credit conditions are reflected in firms' investment and employment decisions *before* an actual improvement in credit conditions takes place. The mechanism we uncover is important because while it can take a year before bank balance sheets adjust to a monetary policy shock, adjustments in expectations can be immediate. It is also novel: while shocks to inflation expectations have been studied extensively, to our knowledge we are the first to analyze the interplay among monetary policy, firms' funding expectations, and firms' real decisions. Because such decisions are central to many macroeconomic models, it is crucial to understand the precise mechanisms driving this interplay.

We examine the impact of three separate unconventional monetary policies enacted by the ECB in the wake of the twin financial and sovereign debt crisis in Europe on the variation in small firms' expectations of future credit availability. The three policies are the OMT Program, announced in the summer of 2012; the introduction of negative policy rates in the summer of 2014; and the announcement of corporate bond purchases in the spring of 2016. We investigate whether after the announcement of each policy, small firms experienced an improvement in their expectations of future credit availability, especially if their main creditor was plausibly expected to increase small business lending as a result of the policy. We also study how this improvement in expectations affected firms' real decision, such as investment and employment. We do so for a sample of around 7,000 SMEs in eight euro area countries, using a restricted access dataset containing rich balance sheet information for individual firms, information on expectations, and the identity of their main bank. As a source of identifying variation, we use the firm-bank match: while all firms are subject to the same policy announcement, some firms know they will benefit from the new policy because their creditor is going to be affected by it, and others know they will not.

We find that the announcement of the OMT Program resulted in a strong improvement (over

the next year) in expectations of future credit availability by firms borrowing from banks with substantial balance sheet exposures to impaired sovereign debt whose funding costs were expected to decline as a result of the announcement. Similarly, the introduction of negative policy rates improved credit expectations for firms borrowing from high-deposit banks, which were expected to increase risky lending because they would be reluctant to pass on the negative rates to their depositors. Finally, the announcement of the CSPP improved credit expectations for firms borrowing from banks focusing so far on large-firm lending, which were expected to have a spare lending capacity as a result of large firms finding it cheaper to sell bonds to the ECB than to borrow form banks. While the results are most consistently significant across model specifications in the case of the OMT Program, the evidence suggests that all of these three policies broadly work in the same direction. Our results point to the importance of funding expectations in the transmission of unconventional monetary policy through the bank lending channel.

We also find that controlling for current credit access, firms with higher expectations of future credit availability increase investment and employment. This is true both at all times, as well as during the period in question for firms affected by unconventional monetary policy shocks. This suggests that improvements in funding expectations can impact firms' real decision over and above firms' actual access to finance. Because changes in expectations often lead changes in credit access by 6 months to one year, the mechanism we identify not only complements, but also precedes the bank balance sheet adjustment channel of monetary policy. Our results thus imply that unorthodox monetary policy can have an impact on the real economy faster than previously believed. This has significant implications for the unconventional monetary policy initiatives being deployed to address the COVID-19 crisis— including, for example, programs such as the Primary Market Corporate Credit Facility and the Main Street Facilities deployed by the Federal Reserve, or the Pandemic Emergency Purchase Programme by the ECB. Our results suggest that policy makers and researchers should be aware that the efficacy of these programs could play out not only through the conventional balance sheet channel, but also the expectations channel we identify in this paper.

1 Introduction

The "bank lending channel" hypothesis postulates that monetary policy is transmitted to the real economy through changes in the level and composition of bank credit.[1] The same broadly applies to unconventional monetary policy. For example, the Large Scale Asset Purchases (LSAP) by the Federal Reserve Board increased the price and value of banks' asset holdings, thereby recapitalizing banks and stimulating lending (e.g., Rodnyanski and Darmouni, 2017; Chakraborty, Goldstein, and MacKinley, 2020). Analogously, the Corporate Sector Purchase Program (CSPP) of the European Central Bank (ECB) sought to reduce the cost of debt for firms relying on bond financing, thereby reducing their demand for credit and increasing banks' willingness to lend to SMEs.

In this paper, we argue that firms' expectations about future credit availability play an important—and hitherto undocumented—role in the "bank lending channel" of unconventional monetary policy. By targeting a particular set of banks, monetary policy improves the expectations about future credit availability of firms borrowing from these banks. In turn, higher expectations about future credit conditions are reflected in firms' investment and employment decisions *before* an actual improvement in credit conditions takes place. The mechanism we uncover is important because while it can take a year before bank balance sheets adjust to a monetary policy shock (e.g., Gertler and Karadi, 2015), adjustments in expectations can be immediate. It is also novel: while shocks to inflation expectations have been studied extensively (e.g., Cogley and Sargant, 2008; Orphanides and Williams, 2008; Guiliano and Spilimbergo, 2014), to our knowledge we are the first to analyze the interplay among monetary policy, firms' funding expectations, and firms' real decisions. Because such decisions are central to many macroeconomic models, it is crucial to understand the precise mechanisms driving this interplay.

We study three unconventional monetary policies adopted by the ECB in recent years. The first one is the Outright Monetary Transactions (OMT) Program announced in the summer of 2012. Under this program, the ECB committed itself—under strict conditionality—to purchasing eligible sovereign bonds issued by euro area governments. The announcement of the OMT program reduced yields on sovereign bonds issued by fiscally stressed countries immediately, sharply, and

[1] See Bernanke and Blinder (1988) and Bernanke and Gertler (1989) for theoretical contributions, and Kashyap and Stein (2000), Gambacorta (2005), and Jimenez, Ongena, Peydro, and Saurina (2012) for empirical evidence, among others.

permanently (Altavilla, Giannone, and Lenza, 2016). This in turn alleviated the pressure on euro area banks' with relatively large holdings of such bonds, allowing them to increase lending to both large firms (Acharya, Eisert, Eufinger, and Hirsch, 2019) and to SMEs (Ferrando, Popov, and Udell, 2019). The second one is the reduction of interest rates into negative territory in the summer of 2014. Because banks are reluctant to pass on negative rates to depositors, negative interest rates increased the funding cost of high-deposit banks, and reduced their net worth, relative to low-deposit banks. As a consequence, the introduction of negative policy rates by the ECB lead to more risk-taking by euro-area banks with a greater reliance on deposit funding (Heider, Saidi, and Schepens, 2019). The third one is the Corporate Sector Purchase Program (CSPP) announced in the spring of 2016. Under this program, the ECB announced that it would engage in large direct purchases of corporate bonds in the foreseeable future. This announcement reduced the bond yields of firms whose bonds were eligible for central bank purchases, leading them to substitute bond debt for bank term loans. This in turn pushed banks specializing in large-firm loans to increase lending to smaller firms (Grosse-Rueschkamp, Steffen, and Streitz, 2019).

The specific details of the three policies in question provides us with a clear identification strategy. Ex-ante, each policy is expected to affect relatively more banks with higher balance sheet exposures to impaired sovereign debt (the OMT), banks that rely relatively more on deposit funding (negative rates), and banks whose loan portfolio is tilted towards lending to large corporates (the CSPP). Our hypothesis is that SMEs borrowing from banks that were expected to benefit relatively more from a specific program adjusted their expectations of future funding relatively more, with clear implications for investment and employment decisions. We assume that firms know both the intended purpose of each ECB policy, as well as whether their creditor is part of the group of banks expected to be affected the program. To evaluate this hypothesis, we use a micro-level survey dataset containing information on credit expectations, banking relationships, investment, and employment for at most 17,000 SMEs.

Our main findings are twofold. First, firms with higher expectations of future credit availability in the previous period exhibit higher investment and employment growth in the current period. This effect is observed while controlling for realized credit conditions, suggesting that funding expectations can impact firms' real decision *over and above* firms' actual access to finance. Empirical tests that fail to control for the role of firm expectations can therefore overstate the impact of credit

access on firm growth.

Second, monetary policy has a significant effect on expectations of future credit availability. For each of the three separate unconventional monetary policy shocks we focus on, we find that immediately after the policy's announcement, expectations of future credit access improved relatively more for SMEs borrowing from banks that were expected to increase SME lending due to the policy. Our findings thus suggest that funding expectations play an important role in the bank lending channel of unconventional monetary policy. Importantly, this mechanism is typically activated before changes in actual credit conditions take place.

We subject the main findings in the paper to a battery of sensitivity tests aimed at strengthening the identification of the causal effects of unconventional monetary policy. First and foremost, our results can be driven by shocks to firms' credit demand, rather than by shocks to future credit supply. However, we show that the main results of the paper still obtain when we control for firm-specific factors, such as size, age, turnover, as well as changes in credit history, capital quality, and own outlook. The latter factors in particular crucially capture firm-specific shocks to the demand for external funds. We also repeat our main tests on the sub-sample of firms that are observed at least once before and at least once after each individual policy. This allows us to include firm fixed effects in the regressions, further alleviating concerns about omitted variable bias at the firm level related, for example, to unobservable investment opportunities.

We also employ country-time fixed effects in all regressions, thereby netting out the effect of shocks that are common to all firms in a country at the same point in time (e.g., the perception whether the euro itself will survive). Furthermore, we control for bank fixed effects, thereby soaking up the effect of shocks to all firms borrowing from the same bank at the same point in time which are driven by reasons unrelated to a particular unconventional monetary policy. Crucially, our results still obtain when controlling for current credit constraints.

We also subject our findings to a number of falsification tests. First, we show that the trend in beliefs about future credit availability do not predate the announcement of any of the three ECB policies we focus on. Second, our results disappear when we give the firms in our sample a placebo treatment, i.e., when we assign them to banks that are not expected to benefit from a particular policy. Our findings thus suggest that we have indeed identified an expectations channel of monetary policy that works through firms' beliefs about the availability of bank credit in the

future.

At the same time, we also show that the same transmission channel affected firm expectations of future availability of financing via a number of non-bank sources, too. In particular, the same set of firms whose expectations about future credit access improved were also more likely to expect funding via equity, trade credit, and bond securities to improve in the near future. This result is restricted to the announcement of the OMT Program, which is consistent with its overall large impact on both credit access and firm expectations. This finding is consistent with the idea that relaxing bank credit constraints improves the firm's fundamentals, which increases other investors' willingness to lend to the firm (Hertzberg, Liberti, and Paravisini, 2011; Giannetti and Saidi, 2019).

Our paper is related to a number of different literatures. First and foremost, the analysis directly relates to the literature on macroeconomic policy and expectations. Coibion and Gorodnichenko (2012), Coibion, Gorodnichenko, and Kamdar (2018), and Coibion, Gorodnichenko, and Kumar (2018) provide discussions of the importance of agent expectations in macroeconomic models and particularly the "workhorse" role of full-information rational expectations. In addition, these papers also address issues that arise from deviations from full-information rational expectations with a particular focus on the value of agent surveys such as the data that we use in our paper. Carroll (2003), Pfajfar and Santoro (2013), Das, Kuhnen, and Nagel (2017), Ehrmann, Pfajfar, and Santoro (2017), and Coibion, Georgarakos, Gorodnichenko, and Weber (2020) among others, study the determinants and evolution of inflation and macroeconomic expectations

This literature, however, has faced two main challenges. The first one is the endogeneity of agents' economic expectations and the absence of clear sources of identifying variation to make causal statements.[2] The second one is the lack of quantitative information on the macroeconomic expectations of firms, thereby restricting much of the literature to expectations of households.[3] To our knowledge, there are only two papers that overcome both challenges. Coibion, Gorodnichenko, and Kumar (2018) use an experimental design in a quantitative survey of firms in New Zealand to

[2] Notable exceptions are D'Acunto, Hoang, and Weber (2016), who exploit the rise in expected inflation associated with the anticipation of VAT changes in Germany as an exogenous source of variation in households' inflation expectations, and Coibion, Georgarakos, Gorodnichenko, and van Rooij (2019) who apply information treatments to a randomly selected subset of surveyed households in the Netherlands and study how the resulting exogenous variation in inflation expectations affects spending decisions.

[3] Notable exceptions are Dunkleberg and Scott (2009), who study the adjustment of firms' expectations following changes in the Fed funds rate; Gennaioli, Ma, and Shleifer (2015) who study CFOs' expectations of earnings growth; Boneva, Cloyne, Weale, and Wieladek (2016, who study firms' pricing expectations in the UK; and Frache and Lluberas (2017), who study the quantitative inflation expectations of firms in Uruguay.

assess how exogenous variation in inflation expectations of managers from an information treatment affects their subsequent choices over prices, wages, employment, and investment. Coibion, Gorodnichenko, and Ropele (2020) use a survey where a randomly chosen subset of firms is repeatedly treated with information about recent inflation, and find that higher inflation expectations on the part of firms leads them to raise their prices, increase demand for credit, and reduce their employment and capital. We contribute to this literature in two distinct ways. First and most important, we use firm-bank links as a source of exogenous variation to firms expectations. While all firms receive the same monetary policy signal, some firms know they will benefit more (less) because their creditor is going to be more (less) affected by the policy, and so they adjust their expectations relatively more (less). Second, we look at the response to an "unconventional" monetary policy shock. As we noted above, unconventional monetary policy initiatives are primarily directed at mitigating problems in bank sector to re-energize credit availability (Gertler and Karadi, 2011). As far as we are aware, no other paper has examined the impact of any unconventional monetary policy on firm expectations about future credit availability.

Our work also necessarily relates to research on monetary policy and the bank lending channel (e.g., Bernanke and Blinder, 1988; Kashyap and Stein, 1994). Thereby, our paper also relates to the general body of work on credit and conventional monetary policy (e.g., Gertler and Gilchrist, 1994; Jimenez, Ongena, Peydro, and Saurina, 2012; Massa and Zhang, 2013) and credit and unconventional monetary policy (e.g., Acharya, Eisert, Eufinger, and Hirsch, 2018; Andrade, Cahn, Fraisse, and Mesonnier, 2019; Carpinelli and Crosignani, 2018; Crosignani, Faria-e Castro, and Fonseca, 2020; Daetz, Subrahmanyam, Yongjun Tang, and Wang, 2016; Eser and Schwaab, 2016; Giannone, Lenza, Pill, and Reichlin, 2012; Gilchrist and Zakrajsek, 2013; Gilchrist, Lopez-Salido, and Zakrajsek, 2015; Foley-Fisher, Ramcharan, and Yu, 2016; Garcia-de-Andoain, Heider, Hoerova, and Manganelli, 2016; Heider, Saidi, and Schepens, 2019; Krishnamurthy and Vissing-Jorgensen, 2011; Krishnamurthy, Nagel, and Vissing-Jorgensen, 2018). Like the papers on the bank lending channel, and on credit and conventional and unconventional monetary policy, we are interested in the link between funding availability and monetary policy. However, our paper focuses on how monetary policy—and, specifically, unconventional monetary policy—affects expectations about future funding availability. So, our focus on expectations shares much with the broad literature on expectations and monetary policy mentioned above. However, our focus is not on expectations

about inflation, but rather on expectations about future access to credit.

2 Institutional design and theoretical underpinnings

2.1 The ECB's unconventional monetary policy

2.1.1 The Outright Monetary Transactions Program

The sovereign debt crisis which erupted in the euro area in 2010 sent ripples through the global banking system and prompted interventions by governments and central banks on a scale comparable to the programs implemented during the financial crisis of 2008–09. Over the course of 2010–2012, yields on sovereign bonds issued by the governments of Greece, Ireland, and Portugal reached levels which made their overall stock of debt unserviceable, with Italy and Spain facing record costs of issuing new debt, too. To tackle the crisis, the ECB implemented a series of non-standard monetary policy measures. In May 2010, the ECB instituted the Security Markets Program (SMP) whereby it began open market operations buying government and private debt securities in secondary markets, reaching about €220 billion in February 2012, and simultaneously absorbing the same amount of liquidity to prevent a rise in inflation (Eser and Schwaab, 2015). In December 2010, the ECB extended €489 billion in loans to more than 500 European banks at a fixed 1 percent interest rate. This was followed, in February 2012, by a second long-term refinancing operation, injecting an additional €530 billion into the banking system.

Concerned that the effect of all these interventions would be short-lived, on 2nd August 2012 the ECB announced that it would undertake outright transactions in secondary sovereign bond markets (OMT Program), aimed at safeguarding an appropriate monetary policy transmission and the singleness of the monetary policy. It set a number of conditions. The technical details of the program itself were announced on 6th September 2012. First, a country seeking access to the OMT must request financial assistance from the EFSF. Second, the EU must agree to provide financial assistance through the EFSF and lay out the terms of a macroeconomic adjustment program that the country must abide by. the involvement of the IMF shall also be sought for the design of the country specific conditionality. Third, the applicant country must agree to the terms of the program. At this point, the ECB can start purchasing sovereign bonds issued by the requesting

country, focusing on the shorter part of the yield curve (with maturity of 3 years or less). The ECB set no ex ante quantitative limits on the amount of government bonds that could be purchased through the OMT Program. However, in order to neutralize the potential impact on the money supply, all bond purchases would be offset by selling other securities of equal amount. Moreover, the ECB retains full discretion and acting in accordance with its monetary policy mandate. The Program would run until the country regained market access and could once again fund itself normally in bond markets.

Despite the fact that no OMT Programs were ready to start at the time of the announcement, the financial markets reacted immediately by pricing in a decline of both short term and long term interest rates in all European countries previously suffering from elevated interest levels. By the end of 2013, even though the ECB did not purchase a single bond through the OMT Program, capital had flown back into stressed countries such as Italy and Spain, and government bond yields had tumbled, returning to pre-crisis levels (Altavilla, Giannone, and Lenza, 2016). This in turn alleviated the pressure on euro area banks' with relatively large holdings of such bonds, allowing them to increase lending to the corporate sector (Acharya, Eisert, Eufinger, and Hirsch, 2019; Ferrando, Popov, and Udell, 2019).

2.1.2 Negative policy rates

In June 2014, the European Central Bank (ECB) cut its deposit facility rate (DFR) to negative territory (-0.10 percent), an unprecedented move given that no other major central bank had used negative rates before. The ECB's decision to introduce negative rates was part of a monetary stimulus package aimed at fending off deflationary risks in a situation in which policy rates had reached zero. Further rate cuts followed (September 2014, December 2015 and March 2016) bringing the rate on the ECB's deposit facility to -0.40 percent. This is consistent with a broader European trend towards reducing policy rates all the way to negative territory around the same time, in countries such as Denmark, Sweden, and Switzerland.

Lowering the policy rate to below zero is special because it affects the cost of deposit funding and the cost of market-based short-term debt funding differently. The standard description of how monetary policy affects the supply of bank credit does not assign a special role to deposit funding. A lower policy rate is typically seen to transmit both to lower rates on market-based

short-term debt and to lower deposit rates. However, Heider, Saidi, and Schepens (2019) show that the negative policy rate does not transmit to lower deposit rates because banks appear reluctant to charge negative rates to their depositors. The main explanation for this phenomenon is based on the zero nominal return on cash: if a bank charged a negative rate to its depositors, they would withdraw their deposits and hold cash as an alternative store of value and means of payment. Therefore, high-deposit banks experience a lower reduction of their cost of funding when the policy rate becomes negative and, thus, experience a negative shock to their net worth. The resulting reduction of insiders' "skin-in-the-game" leads to more risk taking by high-deposit banks (Heider, Saidi, and Schepens, 2019).

2.1.3 The Corporate Sector Purchase Program

On March 10, 2016, the ECB announced a novel program to increase inflation aimed directly at the corporate sector. The Corporate Sector Purchase Programme (CSPP) allows designated central banks in the Eurozone to purchase corporate bonds in the primary and secondary markets. Corporate debt instruments are eligible for the CSPP if they satisfy the following criteria: 1) denominated in euros; 2) have investment-grade credit rating (as determined by Standard & Poor's, Moody's, Fitch Ratings, or DBMS); 3) have remaining maturity longer than six months, but shorter than 31 years at the time of purchase; 4) satisfy eligible collateral requirements under the Eurosystem collateral framework for credit operations; 5) issued by a company incorporated in the euro area, but may have a parent company outside of the Eurozone; and 6) issued by a non-bank corporation, whereby both the issuer and its parents are not subject to banking supervision. The actual purchases of corporate bonds started on June 8, 2016.

The stated purpose of the CSPP is to facilitate financial intermediation for a group of borrowers by stimulating financial disintermediation for another group of borrowers. The ECB argued that the CSPP would increase the supply and liquidity of credit in the economy, reducing the cost of debt for eligible firms and allowing them to rely (more) on bond financing. As a result, banks with affected corporate borrowers would experience a reduction in demand for their loans from the corporate sector and smaller yields. The reduced demand by corporate customers could increase banks' willingness to lend to SMEs. As SMEs are typically a part of banks' commercial lending portfolio, they provide a natural substitute to large corporate loans. While banks could in theory

respond differently—by distributing dividends, investing in non-loan assets, or steering toward other types of loans, such as mortgages (Chakraborty, Goldstein, and MacKinlay, 2020)—recent evidence suggests that the CSPP has pushed banks to increase lending to smaller firms (Arce, Gimeno, and Mayordomo, 2021; Betz and De Santis, 2019; Ertan, Kleymenova, and Tuijn, 2019).

2.2 Unconventional monetary policy, credit access, and firm expectations

Theory has emphasized both the role of borrowers' balance sheets (e.g., Bernanke and Gertler, 1989; Kiyotaki and Moore, 1997; Bernanke, Gertler, and Gilchrist, 1996), whereby expansionary monetary policy can strengthen firms' balance sheets by increasing cash flow net of interest and by raising the value of collateralizable assets, as well as the role of lenders' balance sheets (e.g., Bernanke and Blinder, 1992; Kashyap, Stein, and Wilcox, 1993), whereby monetary policy regulates the pool of funds available to bank-dependent borrowers in the presence of reserve requirements on bank deposits.

Gertler and Karadi (2011) interpret unconventional monetary policy in terms of expanding central bank credit intermediation to offset a disruption of private financial intermediation. Their theoretical model incorporates financial intermediaries into a standard macroeconomic model and shows that the flow of credit is influenced by the condition of bank balance sheets, given an agency problem between intermediaries and depositors that drives an endogenous constraint on the intermediary's leverage ratio. In their model the Central Bank can intervene in a financial crisis using unconventional monetary policy because it does not face an agency problem-driven constraint on its leverage ratio. This type of framework is not only useful in thinking about how unconventional monetary policy can affect contemporaneous firm access to credit, but also how it can effect expectations about future firm access to finance.

In the case of the OMT Program, we expect the main effect to go through strengthening of the balance sheets of banks holding large amounts of sovereign debt. There are at least three mechanisms at play. First, as the OMT announcement reduces yields on previously impaired sovereign debt, investors now perceive banks with substantial balance sheet exposures to a risky sovereign as less risky and start lowering the rates they demand to keep funding them (Acharya, Pierret, and Steffen, 2015; Szczerbowicz, 2015). Second, the eligibility of sovereign bonds as collateral to secure wholesale funding increases as well (e.g., Drechsler, Drechsel, Marques-Ibanez, and Schnabl, 2016).

Finally, as yields on sovereign debt decline, the sovereign's ability to support the domestic banking sector increases, and this effect should be stronger for banks that were at a higher risk before the policy's announcement. Consequently, banks' funding costs after the OMT announcement should go down relatively more for banks with large balance sheet exposures to risky sovereign debt.

In the case of negative policy rates, we expect the main effect to go through lowering less the funding costs facing banks that rely relatively more on deposit funding. Because banks are reluctant to pass the negative policy rates to their depositors, high-deposit banks experience a negative shock to their net worth. The resulting reduction of insiders' "skin-in-the-game" leads to more risk taking by high-deposit banks. While Heider, Saidi, and Schepens (2019) only document this mechanism in the case of the syndicated loan market, it is reasonable to hypothesize that higher risk taking will also manifest itself in more lending to SMEs, due to their a priori higher riskiness (e.g., Berger and Udell, 1995).

Finally, in the case of the CSPP, we expect SME lending to be affected via the "capital structure channel" of monetary policy (Grosse-Rueschkamp, Steffen, and Streitz, 2019). In accordance with this channel, direct corporate bond purchases by central banks decrease corporate bond yields. If bond financing becomes more attractive relative to bank loans, firms shift from bank loans into longer-term bonds. Banks thus experience a decline in loan demand, which reduces their regulatory or economic constraints and allows them to increase lending to other firms. Central banks' purchases of corporate bonds thus strengthen the bank lending channel because it changes the financing incentives of large firms with access to public debt. Banks with a relative large share of such customer therefore experience spare lending capacity, which leads them to increase lending to smaller firms (Betz and De Santis, 2019; Ertan, Kleymenova, and Tuijn, 2019).

In all three cases, and consistent with Gertler and Karadi (2011), firms quickly become aware of how unconventional monetary policy will affect their credit availability, and they rationally expect a larger improvement in future access to finance if their main creditor benefits more from unconventional monetary policy. The mechanism by which firm managers learn about the effect of these policy shocks is straightforward and flows through their loan officers. Specifically, loan officers are informed by senior bank managers about a respective policy's impact on lending supply; and then loan officers, in turn, convey this information about increased lending capacity to their customers. The incentive to convey this information is consistent with the academic literature in

banking that has long recognized that loan officers are typically compensated for generating loan volume as well as for performing due diligence (e.g., Acharya and Naqvi 2012; Cole, Kanz, and Klapper 2015; Gao, Kleiner, and Pacelli 2019).[4]

This general insight, combined with the specificities of the three ECB policies discussed above, allows us to formulate the following research hypothesis:

H1: The announcement of the OMT Program will improve firm expectations about future credit availability, more so for firms borrowing from banks with large holdings of impaired sovereign bonds whose value is directly affected by the program.

H2: The reduction of policy rates into negative territory will improve firm expectations about future credit availability, more so for firms borrowing from high-deposit banks.

H3: The announcement of the CSPP will improve firm expectations about future credit availability, more so for firms borrowing from banks for whom lending to large corporates is relatively more important.

3 Data

The main data source for our analysis is the firm-level "Survey on the Access to Finance of Enterprises" (SAFE) run jointly by the ECB and the European Commission. The SAFE has been conducted nineteen times since 2009. The survey started after the financial crisis initially hit the euro area. The survey waves include the period before the sovereign debt crisis (survey waves 1 and 2, from 1st January until 31st December, 2009); the period during which the sovereign debt crisis unfolded (wave 3, from 1st April until 30th September, 2010); the period of the sovereign debt crisis (waves 4, 5, 6, and 7, from 1st October 2010 until 30th September 2012); the period after the OMT Program announcement (waves 8, 9, 10, and 11, from 1st October 2012 to 30th September 2014); the period after policy rates dipped into negative territory (waves 12, 13, and 14, from 1st

[4] The Bureau of Labor Statistics states that most (loan officers) are paid a commission based on the number of loans they originate (Bureau of Labor Statistics 2008-2009). Given this compensation structure, loan officers are incentivized to expeditiously convey information to their customers about any positive shocks to the bank's lending capacity – such as the policy shocks we examine here. The implications of volume compensation in lending have been recently analyzed in other settings. Acharya and Naqvi (2012), for example, develop a theoretical model of bank risk-taking in which the optimal loan officer-bank contract involves compensation which is increasing in the volume of loans. Cole, Kanz, and Klapper (2015) have examined the impact of volume incentives in an experimental setting. Gao, Kleiner, and Pacelli (2019) discuss the role of volume and cross-sales incentives in the context of loan officer career outcomes. Other papers that examine volume incentives include Udell (1989) and Berg, Puri, and Rocholl (2019).

October 2014 to 31st March 2016); and the period after the announcement of the CSPP (waves 15 and on, from 1st April 2016). This firm-level SME survey contains information on each respondent firm's characteristics (size, age, sector of operation, turnover, and ownership structure) and on its assessment of recent short-term developments regarding its financing including information on its financing needs and its access to finance.[5] The sample contains only non-financial firms and excludes firms in agriculture, public administration, and financial services.[6]

Importantly, the dataset also contains information on firms' expectations about the evolution of the availability of future financing in the short-run. In particular, it includes questions about expectations related to the availability, in the next six months, of a wide range of funding sources: retained earnings, bank loans, bank credit lines, equity, trade credit, and debt securities. While a number of recent firm-level datasets include information on firm's *actual* access to finance and *existing mix* of funding sources, the SAFE is to our knowledge the first firm-level dataset that incorporates information on firms' expectations about *future* access to finance for the universe of funding sources. Because of the latter, the SAFE makes it possible to identify the impact of targeted policy shocks that are expected to affect firms through well-defined channels.

We next merge the SAFE with Bankscope, a bank-level dataset that contains information on banks' exposures to sovereign debt. To do so, we make use of a variable called "BANKER", made available through a merge with Bureau van Dijk's Amadeus dataset and originally acquired from the Kompass dataset. This variable displays the name of the banks with which the firm has a credit relationship. Following Kalemli-Ozcan, Laeven, and Moreno (2018), we use OpenRefine and Reconcile-CSV to match bank names to the BvD ID numbers of banks and we subsequently match these bank names with bank information from various sources. If a firm reports more than one bank, we use the bank reported first as the firm's main bank, rather than a weighted average of all banks that a firm is connected to. This is consistent with the literature on firm-bank lending relationships. It is also similar to studies that have relied on matched firm-bank information from Orbis and Kompass (e.g., Giannetti and Ongena, 2012; Kalemli-Ozcan, Laeven, and Moreno,

[5] The survey's main results are published in the ECB website every six months. For more information on the survey and its individual waves, see http://www.ecb.europa.eu/stats/money/surveys/sme/html/index.en.html.

[6] The SAFE data include an oversample of firms in smaller countries. For this reason, the survey providers also compute sampling weights that adjust the sample to be representative of the frame from which the sample was drawn. As a result, all empirical tests in the paper make use of sampling weights which restore the representativeness of each individual firm with respect to the average firm in the population of firms in the Eurozone.

2018). In all, we recover information on 126 banks from Bankscope in eight countries with which the firms in the dataset have a credit relationship: Austria, France, Germany, Greece, Ireland, the Netherlands, Portugal, and Spain.

For each unconventional monetary policy event that we analyze, we use the four waves around the announcement or inception of the policy. In the case of the announcement of the OMT Program, we use waves 6 and 7 (pre-OMT) and waves 8 and 9 (post-OMT). In the case of the introduction of negative policy rates, we use waves 10 and 11 (pre-negative rates) and 12 and 13 (post-negative rates). Finally, in the case of the CSPP, we use waves 13 and 14 (pre-CSPP) and 15 and 16 (post-CSPP). Most of the firms are interviewed only once in the survey but there is a small subsample of firms present in at least two waves. Once we focus on those firms that report the identity of a creditor that can be matched to Bankscope, this reduces the dataset to 7,191 firm-observations during the period of the three monetary policy events that we study. 242 firms are observed at least once before and once after the announcement of the OMT Program; 269 at least once before and once after the introduction of negative policy rates; and 184 at least once before and once after the announcement of the CSPP.

Panel A of Table 1 reports descriptive statistics on the main variables of interest, for the sample of firms with creditor information. All survey-based percentages are weighted statistics that restore the proportions of the economic weight (in terms of number of employees) of each size class, economic activity, and country. *Bank loan financing will improve*, our main dependent variable, is derived from the firm's answers to the question: "Could you please indicate whether the availability of bank loan financing to your firm (new or renewal; excluding overdraft or credit lines) will improve, deteriorate, or remain unchanged over the next 6 months?" We construct the variable *Bank loan financing will improve* as a dummy variable equal to 1 if the firm said "Will improve" in response to the above question, and to zero if it responded "Will remain unchanged" or "Will deteriorate". In robustness tests, we also allow this variable to vary across three categories ("Will improve", "Will remain unchanged", and "Will deteriorate"). Of the 7,191 firms that reported the identity of their creditor(s) and that gave a response to this question, 26.3 percent expect the availability of financing through banks to improve in the next six months.[7] Importantly, this is a

[7] Firms are interviewed at the end of each wave. Therefore, if a firm is included in, e.g., wave 8 (1st October 2012 – 31st March 2013) and it is asked about its credit experience in the past six months, this experience is limited to the period 1st October 2012 – 31st March 2013.

question about the firm's expectations of *its own* credit access, not of credit access in general.

Panel A of Table 1 further reports similar summary statistics on firms' expectations about the availability of financing through alternative channels. The data suggest that bank lending is the channel whereby most firms expect to be able to better finance their operations in the future. 22.1 percent of firms expect the availability of trade credit to increase in the next six months, and only 11.5 percent and 10.5 percent have such expectations about equity financing and financing through debt securities, respectively.

Panel B of Table 1 reports summary statistics on the three firm-bank variables used in the main analysis. We find that the average firm is borrowing from a bank which had on its balance sheet sovereign bond issued by Greece, Ireland, Italy, Portugal or Spain to the tune of 4.2% of its total assets, according to the EBA's 2012 EU Capital Exercise. Also, the average firm is borrowing from a bank which in end-June 2014 had a deposit-to-assets ratio of 0.50. Finally, the average firm is borrowing form a bank whose lending portfolio is such that around 10.3% of its customers are large firms.

In Panel C of Table 1, we report summary statistics on the rest of the firm-specific variables included in the survey and used in our tests. 94.9 percent of the firms are stand-alone, rather than subsidiaries of larger firms, and 58.7 percent are individuals- or family-owned. By default, the survey includes mostly SMEs, with 12.2 percent micro firms (less than 10 employees), 22.9 percent small firms (between 10 and 50 employees), and 24.2 percent medium firms (between 50 and 250 employees). Only 11.3 percent of the firms in the survey are younger than 10 years, which is representative of the European corporate landscape. In terms of turnover, around three-quarters of the firms have an annual turnover of less than EUR 10 million. At the same time, the firms in the sample are relatively mature, with only 10.5 percent of them younger than 10 years.

Turning to firms' credit quality and economic outlook, 37.4 percent of the companies in our sample report that their outlook, in terms of sales and profitability, improved during the past six months. 32.1 percent say the same about the quality of their capital, and 34 percent make a similar statement about the quality of their credit history.

Turning to actual credit access, we define a variable 'Credit unconstrained' as a dummy variable equal to 1 if the firm's application for a bank loan or credit line in the past 6 months was approved; and b) the firm received more than 75 percent of the loan amount it requested. On average during

the sample period, 74.9 percent of all firms with a strictly positive demand for bank credit report being credit unconstrained.

In Panel D of Table 1, we report summary statistics on firms' real decisions. There are more observations than in the first three panels for two reasons. First, this time we do not require that the firms report the identity of their creditor. Second, we look at the entire sample period, that is, waves 1–19, or 1st January 2009 – 30th September 2018. In terms of real decisions, we report data on investment and employment growth. Both series are derived from a matching of the firms in the SAFE to the same firms in the Amadeus database. We measure both investment and employment growth as a year-on-year percentage change in total tangible assets and total employment, respectively. The summary statistics makes it clear that over the sample period, the average firms increased tangible capital at a rate of 6.8 percent, and employment at a rate of 1.6 percent per year.

Recent studies aiming at identifying the transmission of monetary policy through bank lending have typically relied on credit registers (e.g., Jimenez, Ongena, Peydro, and Saurina, 2012) or on syndicated loan data (e.g., Acharya, Eisert, Eufinger, and Hirsch., 2018). Relative to the former, the SAFE does not contain information on the universe of firms, but only on a small representative sample of firms, and relative to the latter, it does not have—for most firms—multiple firm-specific and bank-specific observations over time. Nevertheless, our dataset has two unique advantages when it comes to identifying the impact of unconventional monetary policy on firm expectations. First and foremost, it contains answers to questions on firms' expectations about the availability of financing in the short run. This makes it the first dataset of its kind with information on firm expectations for alternative sources of funding. Second, the survey contains questions about credit experience for both formally and informally constrained firms, making it possible to control for a theoretically correct proxy for credit access.

Figure 1 demonstrates the unique advantages of the SAFE by comparing the evolution of actual credit constraints and of expectations of future credit availability over time, for the firms in our sample. It plots for each wave the change over the previous period in the share of firms that are not credit constrained, and the change over the previous period in the share of firms that expect credit availability to improve in the future. The Figure illustrates two very important facts. First, after two of the three policy announcements, expectations about future credit access improved on

average. Second, both after the OMT announcement and after the introduction of negative rates, expectations of future credit access improved faster than actual credit access. In the case of the OMT, expectations of future credit availability became net positive a full year before actual credit access did.

4 Empirical methodology and identification

We investigate the impact of unconventional monetary policy on small firms' expectations about bank funding by comparing the evolution of said expectations around the time each of three separate ECB unconventional monetary policies were introduced. In doing so, we compare firms borrowing from banks that were expected to be affected more to firms borrowing from banks that were expected to benefit less from the policy. Because each policy aimed at stimulating lending through a different channel, the set of "affected" banks is different in each case.

In the case of the OMT announcement, we use the following two sources of identifying variation: the time before and after the ECB's OMT announcement, and each firm's creditor's balance sheet exposure to impaired sovereign bonds at the time of the announcement. We estimate the following model:

$$\begin{aligned} Bank\ loan\ financing\ will\ improve_{icbt} = \quad & \beta_1 Post\ OMT_t \times \frac{Stressed\ sovereign\ bonds}{Assets}_b + \\ & \beta_2 X_{icbt} + \beta_3 \mu_{ct} + \beta_4 \eta_b + \varepsilon_{icbt} \end{aligned} \tag{1}$$

$Bank\ loan\ financing\ will\ improve_{icbt}$ is a dummy variable equal to 1 if the firm said "Will improve" in response to the question: "Could you please indicate whether the availability of bank loan financing to your firm (new or renewal; excluding overdraft or credit lines) will improve, deteriorate, or remain unchanged over the next 6 months?" It is equal to zero if the firm responded "Will remain unchanged" or "Will deteriorate". $Post\ OMT_t$ is a dummy variable that captures the ECB's OMT announcement and is equal to 0 between 1st October 2011 and 30th September 2012 (survey waves 6 and 7), and to 1 between 1st October 2012 and 30th September 2013 (survey waves 8 and 9). $\frac{Stressed\ sovereign\ bonds}{Assets}_b$ is the ratio of sovereign bond holdings to total assets—as of 2012—of bank b with whom firm i in country c has a credit relationship during the entire sample

period. Data on these exposures come from the EBA's 2012 EU Capital Exercise.

In the case of the reduction of the policy rate in negative territory, we use the following sources of identifying variation: the time before and after the policy rate cut, and each firm's creditor's reliance on deposit funding at the time of the announcement. The model then becomes:

$$\begin{aligned} Bank\ loan\ financing\ will\ improve_{icbt} = \quad & \beta_1 Post\ Negative\ Rates_t \times \frac{Deposits}{Assets}_b + \\ & \beta_2 X_{icbt} + \beta_3 \mu_{ct} + \beta_4 \eta_b + \varepsilon_{icbt} \end{aligned} \tag{2}$$

Here $Post\ Negative\ Rates_t$ is a dummy variable equal to 0 between 1st October 2013 and 30th September 2014 (survey waves 10 and11), and to 1 between 1st October 2014 and 30th September 2015 (survey waves 12 and 13). $\frac{Deposits}{Assets}_b$ is the ratio of total deposits to total assets—as of June 2014—of bank b with whom firm i in country c has a credit relationship during the entire sample period. Data on deposits and assets come from Bankscope.

Finally, in the case of the announcement of the CSPP program, we use the following sources of identifying variation: the time before and after the announcement of the program, and each firm's creditor's extent of lending to large firms at the time of the announcement. The model in this case is:

$$\begin{aligned} Bank\ loan\ financing\ will\ improve_{icbt} = \quad & \beta_1 Post\ CSPP_t \times \frac{\mathrm{Large\ firm\ lending}}{Total\ firm\ lending}_b + \\ & \beta_2 X_{icbt} + \beta_3 \mu_{ct} + \beta_4 \eta_b + \varepsilon_{icbt} \end{aligned} \tag{3}$$

Here $Post\ CSPP_t$ is a dummy variable equal to 0 between 1st April 2015 and 30th March 2016 (survey waves 13 and14), and to 1 between 1st April 2016 and 30th March 2017 (survey waves 15 and 16). $\frac{\mathrm{Large\ firm\ lending}}{Total\ firm\ lending}_b$ is the number of large firms in the loan portfolio divided by the total number of firms in its portfolio of bank b with whom firm i in country c has a credit relationship during the entire sample period. Data on the composition of lending by firm size come from the SAFE.

In all three cases, we also include a number of controls to account for shocks to firm expectations which are not related to the unconventional monetary policy in question. X_{icbt} is a vector of

time-varying firm-level control variables. Among those are size, age, turnover, and ownership structure. These capture shocks to firm i in country c during time t by capturing the independent impact of observable firm-level heterogeneity. Ample evidence points to a negative relation between profitability and the demand for external funds (Almeida and Campello, 2010). Therefore, we expect for example larger and older firms, whose projects have matured, to have a lower demand for external financing. To better control for credit demand, we also include self-reported changes in own outlook, in collateral quality, and in credit history. We thereby make sure that we separate shocks to the demand for external funds from shocks to the supply thereof. We also include a proxy for current credit access (i.e., whether the firms is currently credit constrained or not). Finally, in robustness tests we focus on the sub-set of firms that are observed at least once before and at least once after each policy in question. This allows us to include firm fixed effects, which further alleviates concerns that our results are contaminated by unobservable demand shocks.

μ_{ct} is an interaction of country and time (i.e., survey wave) fixed effects. These net out variation in firm expectations that is common to all firms in country c during time t (e.g., global demand for Spanish products, or a global repricing of risk). η_b is a bank fixed effect which is common to all firms borrowing from the same bank. It controls for all observable and unobservable characteristics of an individual bank, such as capitalization, business model, risk appetite, etc. The combination of firm-specific factors and various fixed effects addresses the concern that our estimates can be contaminated by shocks to credit demand unrelated to the supply of credit. For example, while agency cost problems may have become less severe and/or growth opportunities may have improved more for firms domiciled in particular countries, this should be accounted for by the firm-specific information and by the country-time fixed effects. ε_{icbt} is an i.i.d. error term. The dummies $Post\ OMT_t$, $Post\ Negative\ Rates_t$, and $Post\ CSPP_t$ are not included in the specification because their effect on firm expectations is subsumed in the matrix of country-sector-time fixed effects. Analogously, the variables $\frac{Stressed\ Sovereign\ bonds}{Assets}_b$, $\frac{Deposits}{Assets}_b$, and $\frac{Large\ firm\ lending}{Total\ firm\ lending}_b$ are not included in the specifications because their effect on firm expectations is subsumed in the bank fixed effects.

In each case, the coefficient of interest is β_1. This coefficient captures the change in expectations from the pre-treatment to the post-treatment period, for firms borrowing from banks that are more relative to banks that are less affected by the ECB policy. A positive coefficient would imply that all else equal, after the announcement/introduction of the respective policy, expectations about the

availability of bank financing improved more for firms borrowing from banks with large impaired sovereign exposures (in the case of the OMT), with higher reliance on deposit funding (in the case of the negative policy rates), and for whom lending to large companies was relatively more important (in the case of the CSPP).

Models (1)–(3) make clear how we use firm-bank links as a source of exogenous variation to firms expectations. A monetary policy signal—e.g., the announcement in the summer of 2012 that the ECB stands ready to purchase euro area sovereign bonds, under certain conditions—is common to all firms. Consequently, the policy affects all firms through a number of channels: general economic outlook improves, inflation expectations increase, and expectations of future funding improve. This effect is fully subsumed in μ_{ct}. Crucially, and in addition to that, some firms also know they will benefit relatively more, because their creditor is going to be affected by the policy relatively more. For example, again in the case of the announcement of the OMT Program, banks holding a large amount of impaired sovereign bonds on their balance sheets are expected to disproportionately benefit from the unconventional monetary policy. Firms borrowing from such banks adjust their expectations relatively more in comparison with firms that know that their credit is not going to be affected in a major way.

We estimate the parameters of Model (1) using OLS, in order to avoid the Incidental Parameters problem. In robustness tests, we employ other models, such as probit and ordered probit. We cluster the standard errors at the county level (Petersen, 2009), to account for the spatial correlation in the standard errors. Finally, the identification in Models (1)–(3) crucially relies on the assumption that firms are aware of the balance sheet conditions of their main creditor, and by extension know if it is going to be affected by a policy that targets a specific set of banks.

5 Empirical results

5.1 Firm expectations, credit constraints, and real decisions

We first set to motivate why it is important to study the determinants of firms' funding expectations. To that end, we evaluate the following model:

$$\begin{aligned} Y_{ict} = \; & \beta_1 Credit\ unconstrained_{ict-1} + \beta_2 Bank\ loan\ financing\ will\ improve_{ict-1} + \\ & \beta_3 X_{ict} + \beta_3 \mu_{ct} + \varepsilon_{icbt} \end{aligned} \tag{4}$$

Here, Y_{icbt} denotes the year-on-year growth in investment or employment by firm i in country c. $Credit\ unconstrained_{ict-1}$ is a dummy variable which captures if in the previous period, firm i in country c applied for a bank loan and was given at least 75% of the amount requested. $Bank\ loan\ financing\ will\ improve_{ict-1}$ is a dummy variable equal to one if in the previous period, firm i in country c declared that it expected the availability of bank loans to improve in the next six months. Finally, X_{icbt} is a set of firm-specific variables including firm size, age, turnover, ownership structure, as well as changes in its outlook, credit history, and capital quality.

This test combines annual data from Amadeus on investment and employment (Y_{ic}) with semi-annual data from the SAFE on credit access and expectations ($Credit\ unconstrained_{ic}$ and $Bank\ loan\ financing\ will\ improve_{ic}$). To make sure that the latter precede the former, we take lags of credit access and expectations. Specifically, for survey waves conducted between 1st April and 31st September in year X, we calculate firm-specific percentage changes in investment and employment between end-$X-1$ and end-X. For survey waves conducted between 1st October in year X and 31st March in year $X+1$, we calculate firm-specific percentage changes in investment and employment between end-X and end-$X+1$. We thus use only information on firms that are observed during two adjacent periods (rather than only once). In this way we make sure that credit access and expectations are realized before investment and employment decisions are made, and not simultaneously.

Table 2 reports the estimates of this model. For both investment and employment growth, we evaluate the impact of credit access and expectations first individually, and then jointly. Compared

to credit constrained firms, firms that need a loan and obtain it experience 4.2 percentage points higher investment growth (column (1)) and 2.6 percentage points higher employment growth (column (4)) over the following year. These magnitudes are meaningful, given that over the sample periods, investment grew on average by 6.8 percent and employment on average by 1.6 percent, year-on-year (see Table 1).

We also find that expectations of future credit availability have an independent effect on firms' real decisions. Compared to firms that expected their credit access to deteriorate or to stay unchanged, firms that expected their credit access to improve in the following months experience 2.1 percentage points higher investment growth (column (2)) and 1.1 percentage points higher employment growth (column (5)) over the following year. These magnitudes correspond to one-half of the effect of credit access, in the case of investment growth, and one-third of the effect of credit access, in the case of employment growth.

Crucially, expectations of future credit availability do not affect firms' real decisions simply by virtue of firms having higher expectations because they are credit unconstrained. As columns (3) and (6) demonstrate, the positive effect of credit expectations on investment and employment growth still obtains in specifications where we control for current credit access. This point is underscored by the fact that the simple correlation between $Credit\ unconstrained_{ic}$ and $Bank\ loan\ financing\ will\ improve_{ic}$ over the entire sample period is 0.05. This suggests that while unconstrained firms on average have higher expectations of future funding, the statistical association between the two is rather weak. Credit expectations are thus broadly independent from current credit conditions.

Finally, we note that these results are obtained controlling for firm-specific factors, as well as for country trends that are common to all firms in a country.

5.2 Unconventional monetary policy shocks and firm expectations: Headline results

In Table 3, we present the point estimates for Model (1)–(3) whereby we compare firms' expectations of future credit availability during the pre- period and during the post- period, for the OMT announcement (columns (1)–(2)), the introduction of negative rates (columns (3)–(4)), and the CSPP announcement (columns (5)–(6)). In each case, the treatment group, the control group,

and the sample period vary. In the case of the OMT, we compare firms in terms of the extent of balance sheet exposure of their creditor to impaired sovereign bonds, during 1st October 2011 – 30th September 2012 (survey waves 6 and 7) vs. 1st October 2012 – 30th September 2013 (survey waves 8 and 9). In the case of the introduction of negative rates, we compare firms in terms of their creditor's reliance on deposit funding, during 1st October 2013 – 30th September 2014 (survey waves 10 and 11) vs. 1st October 2014 – 30th September 2015 (survey waves 12 and 13). And, in the case of the CSPP announcement, we compare firms in terms of their creditor's propensity to lend to large firms, during 1st April 2015 – 30th March 2016 (survey waves 13 and 14) vs. 1st April 2016 – 30th March 2017 (survey waves 15 and 16). In each case, we are thus comparing the evolution of expectations over the short-to-medium-term, the one year after relative to the one year before the policy's announcement. We thus allow for the effect to build beyond an immediate short-term reaction, but we stop the sample period before it becomes contaminated by later developments in the business environment and in monetary policy.

In columns (1), (3), and (5) of Table 3, we test modifications of Models (1), (2), and (3), respectively, that include firm-specific covariates and country and bank fixed effects, but are stripped from country×wave fixed effects and from the interaction of the treatment with the *Post* dummy. The model thus controls for a host of observable and unobservable factors that can affect a firm's expectations of future credit availability in the absence of a monetary policy shock. At the same time, the exclusion of the wave effects makes it possible to estimate the direct effect of the monetary policy itself.

We first note that the data strongly reject the hypothesis that the OMT had no effect on firms' expectations of future credit availability (column (1)). In particular, we find that in the year after the OMT announcement, firms were significantly more likely to expect that bank credit would improve in the next six months. The share of firms that expect bank loans to become more accessible in the future, during the 4 survey waves that we study in Model (1), is 0.18. The coefficient on the point estimate (0.102) is thus equal to 55% of the sample mean. This suggests that the OMT announcement generated an improvement in firm expectations of future credit availability across the board. We do not, however, observe an across-the-board effect on all firms in the sample, either after the introduction of negative policy rates (column (3)), or in the case of the CSPP announcement (column (5)). We note that a simple time dummy is likely to capture a number of

our global developments that have an independent effect on expectations. That caveat aside, our evidence suggests that in two out of three cases, an ECB policy announcement did not improve expectations for the whole population of firms.

In columns (2), (4), and (6), we evaluate the full versions of Models (1), (2), and (3) that include firm-specific covariates, bank fixed effects, and country×wave fixed effects. In these specifications, we can evaluate the differential impact of the ECB policy announcement, but not its level effect on the population of firms. Crucially, in all three cases, the estimate of β_1 is positive and significant at the 5-percent statistical level. This suggests that immediately after each policy announcement, firms borrowing from a bank that was expected to increase SME lending as a result of the policy experienced an improvement in their expectations of future credit availability.

In particular, after the OMT announcement, firms borrowing from banks with large impaired sovereign exposures were significantly more likely to expect credit conditions to improve (column (2)). The point estimate of 0.024 suggests that a two-standard-deviation increase in the firm's creditor's impaired sovereign exposures (1 st. dev. is equal to 0.38 during the four waves in question) is associated with an increase in credit expectations equal to $0.024 \times 0.76 = 0.018$, or 10 percent of the sample mean (which is 0.18 during the period in question). After the introduction of negative rates, firms borrowing from banks with large reliance on deposit funding were significantly more likely to expect credit conditions to improve (column (4)). The point estimate of 0.174 suggests that a two-standard-deviation increase in the firm's creditor's deposit-to-assets ratio is associated with an increase in credit expectations equal to 20 percent of the sample mean. And, after the CSPP announcement, firms borrowing from banks with lending portfolios skewed towards large firms were significantly more likely to expect credit conditions to improve (column (6)). The point estimate of 0.535 suggests that a two-standard-deviation increase in the firm's creditor's share of large customers is associated with an increase in credit expectations equal to 65 percent of the sample mean.[8]

[8] For brevity, we do not report the point estimates on the firm-specific controls listed in Panel C of Table 1. The only controls we exclude are 'Own outlook better' and 'Credit unconstrained'. We find that a number of these factors are correlated with firm expectations, in the statistical sense. For example, micro firms and individually or family owned firms have on average lower expectations about future credit availability. Conversely, older firms (more than five years of age) are more likely to expect future credit availability to improve, potentially because of their lower informational opacity (Berger and Udell, 1995; Cole 1998). Similarly, firms with improving capital and/or improving credit history (over the past 6 months) are more likely to be optimistic about future credit conditions than firms whose capital and/or credit history deteriorated or did not change.

We also note that in the most saturated versions of the models we estimate, the variables and fixed effects included in the regressions explain between 33 and 38 percent of the variation in credit expectations over the sample period, which is an excellent fit for a regression without firm fixed effects.

5.3 Unconventional monetary policy shocks and firm expectations: Falsification tests

5.3.1 Parallel trend assumption

The key identifying assumption of our approach is that in the absence of the policy-driven shock to a subset of banks, and by extension to the firms borrowing from them, all firms would be subject to the same trend in expectations of future credit availability.[9] This does not have to be the case, and the break in trends we report in Table 3 may have started already before the OMT announcement / introduction of negative rates / CSPP announcement, for reasons unrelated to unconventional monetary policy. While we condition our tests on observables, our empirical strategy would be compromised if the expectations of future credit availability for firms whose creditor was affected by a particular ECB policy were improving already before the program was put into place. This could have happened for a variety of reasons unobservable to the econometrician, such as better investment opportunities for firms matched to particular banks. If this were to be the case, we might incorrectly interpret pre-existing trends as evidence of the positive effect of unconventional monetary policy.

To address this concern, we take advantage of the fact that our original dataset is long enough to allow us to test our key identifying assumption explicitly. We now focus on the two survey waves that were conducted before the announcement of each program. In the case of the OMT announcement, these were survey waves 6–7 which were conducted over the period 1st October 2011 – 30th September 2012. In the case of the introduction of negative rates, these were survey waves 10–11 which were conducted over the period 1st October 2013 – 30th September 2014. And, in the case of the CSPP announcement, these were survey waves 13–14 which were conducted over the period 1st April 2013 – 30th March 2014. In all three cases, we can apply our strategy to test

[9] See Roberts and Whited (2011) for details.

for differences in credit access trends across firms within the pre-policy sample period.

Table 4 reports the estimates from these tests. In practice, in column (1), we compare expectations of future credit availability across firms with credit relationships to more versus less impaired-sovereign-debt-exposed banks, during the two waves prior to the OMT announcement. In column (2), we compare expectations of future credit availability across firms with credit relationships to more versus less deposit-reliant banks, during the two waves prior to the introduction of negative policy rates. And, in column (3), we compare expectations of future credit availability across firms with credit relationships to banks with more versus banks with less large customers, during the two waves prior to the CSPP announcement. The estimates from all three regressions suggest that there was no difference in expectations across firms borrowing from banks with different degrees of exposure to a particular policy, during the year before the respective policy announcement. While positive in two out of three cases, the point estimate on the interaction of interest is never significantly different from zero. This test thus confirms that the improvement in expectations we registered in Table 3 did not predate the unconventional monetary shock.[10]

5.3.2 Placebo treatment

One final concern is that firms adjust their expectations of future credit availability not because of their credit association, but because of changes in conditions unobservable to the econometrician. This would imply that in each case, the treatment and control group are arbitrarily chosen, and we would observe the same effect if we had split the firms across another criterion.

To address this concern, in Table 5 we first randomize the treatment. In particular, for each of the three policies, we created a treatment group and a control group of firms based on the criterion of the other two policies. For example, in the case of the OMT announcement, we split the firms according to whether at the time of the announcement, their creditor relied relatively more on deposit funding (column (1)) or had more or less large customers (column (2)). because the OMT's goal was to alleviate pressure on the balance sheet of banks with large impaired sovereign exposures,

[10] From the point of view of the theoretical mechanism we test in this paper—bank lending being affected by the price of a class of assets that bank hold on their portfolios—these results are not surprising. For example, in the year before the OMT, average sovereign bond yields hovered for a long time around higher levels, but were relatively flat: the average yield on a 10-year bond issued by the Italian, Irish, Spanish, or Portuguese government was 7.4 in the month of the OMT announcement, and 7.6 a year earlier. For comparison, that same number was 4.9 a year after the OMT announcement.

we do not expect to find an impact of the OMT announcement on firms' credit expectations via the other two channels.

The evidence indeed confirms that this is the case: the OMT announcement did not improve credit expectations for firms attached to banks that were not plausibly expected to benefit from it. Likewise, we find no effect of the introduction of negative policy rates (columns (3) and (4)) and of the CSPP announcement (columns (5) and (6)) when we split the firms based on a placebo criterion.

5.4 Unconventional monetary policy shocks and firm expectations: Robustness tests

5.4.1 Model robustness

In Table 6 we address a number of non-trivial concerns related to our choice of empirical model. To begin with, the dependent variable in Models (1)–(3) is a dummy, but we employ OLS to estimate the models. We do so because the approach we employ is predicated on an interaction term, non-linear model may suffer from an Incidental Parameters problem in samples with large N but small T (e.g., Ai and Norton, 2003). As a result, calculating and interpreting marginal effects in non-linear models is not straightforward. Yet, to make sure that our results are robust to estimating non-linear probability models, we re-run Probit versions of Models (1)–(3). Because we use marginal probit, it is easy to interpret the coefficients as percentage changes holding all other controls at their respective sample means. Columns (1)–(3) confirm that the impact of each of the three ECB policies under consideration on the respective treatment group is positive and significant at the 1-percent statistical level. The magnitudes of the effect are economically meaningful, too. For example, the point estimate of 0.383 in column (2) suggests that a two-standard-deviation increase in the firm's creditor's deposit-to-assets ratio is associated with an 12.2-percent increase in the probability that the firm will expect its credit availability to improve in the future.

We next note that the underlying question which we use to construct our main dependent variable ("Could you please indicate whether the availability of bank loan financing to your firm (new or renewal; excluding overdraft or credit lines) will improve, deteriorate, or remain unchanged over the next 6 months?") has three possible answers: "Will improve," "Will remain unchanged,"

and "Will deteriorate". In constructing our main dependent variable as a dummy, we have merged the latter two categories. However, this washes out the difference between steady expectations and expectations of deterioration. To address this issue, we create a variable that can take on one of three values, depending on the exact answer, and re-estimate Models (1)–(3) using ordered probit. The impact of the introduction of negative rates (column (5)) and of the announcement of the CSPP (columns (6)) remains positive and significant. The impact of the OMT announcement no longer is, however, suggesting that while the probability that firms borrowing from high-sovereign-exposure banks will expect credit conditions to improve—as opposed to deteriorate or stay the same—increases, those same firms are not more likely to expect that credit conditions will stay the same, as opposed to deteriorate.

Finally, in columns (7)–(9), we add interactions of all firm-specific variables with the respective *Post* dummies. This procedure aims at accounting for the possibility that the effect of various empirical proxies for net worth, such as age and size, is time-varying and our main explanatory variable may be picking up part of it. However, we find that association with a creditor that is expected to increase SME lending as a result of a particular ECB policy continues to explain a substantial portion of the variation in changes in credit expectations after the announcement of the policy.

5.4.2 Unobservable firm heterogeneity

We next address the possibility that the shift in expectations that we observe is driven by shocks to firms' demand for credit that are unrelated to shocks to credit supply. So far, we have attempted to identify an expectations shock driven by changes in unconventional monetary policy by comparing firms with credit relationships with banks that were expected to be prompted by the policy to increase SME lending, relative to banks that were not. This identification strategy also allows us to control for a range of firm-specific characteristics and for country×survey wave fixed effects, ensuring that our results are not contaminated by firm-specific factors such as size or age, or by general changes in country-specific conditions. However, it can still be the case that during the sample period in question, agency cost problems were less severe, and/or unobservable growth opportunities were better, for firms borrowing from affected banks after the policy.

We address this issue by isolating those firms that are observed at least once before and at

least once after the announcement of each of the three ECB policies. There are 242 firms with full balance sheet information which also disclosed their main creditor and which were present at least once before and at least once after during the OMT period, 269 firms during the negative rates period, and 184 firms during the CSPP period. We can therefore run our model on these limited sub-samples of firms while accounting for firm-specific factors that are fixed over time, thereby addressing lingering concerns about omitted variable bias related to time-invariant firm characteristics that can be correlated, for instance, with the demand for credit.

In practice, we test the following model:

$$\Delta \; Bank\ loan\ financing\ will\ improve_{icb} = \beta_1 Affected_b + \beta_2 X_{icb} + \beta_3 \mu_c + \beta_4 \eta_b + \varepsilon_{icb} \qquad (5)$$

Here, $\Delta Bank\ loan\ financing\ will\ improve_{icb}$ is the difference in credit expectations of firm i in country c borrowing from bank b between period t and $t-1$. We estimate three versions of Model (5) where $Affected_b$ is, in turn, the firm's main creditor's exposure to impaired sovereign bonds, the firm's main creditor's reliance on deposit funding, and the firm's main creditor's propensity to lend to large firms, all measured at time $t-1$. X_{icb} is a vector of firm-level control variables; μ_c is a vector of country dummies; η_b is a vector of bank fixed effect.

The point estimate from these modified versions of Models (1)–(3) is reported in Table 7. We continue finding a significant expectations effect of the relevant ECB policy on firms with credit relationship with banks exposed to impaired sovereign debt (column (1)), high-deposit banks (column (2)), and banks more likely to be lending to larger firms (column (3)). In all cases, the effect is significant at least at the 5-percent statistical level, and if anything, it is numerically larger than in the baseline specification reported in Table 3. This more restricted test confirms that variations in changes in expectations of future credit access after the ECB announces an unconventional monetary policy is strongly related to the expected reaction of banks in terms of small business lending, even in a specification which controls for unobservable firm quality.

5.5 Expectations about non-bank sources of finance

How do monetary policy shocks that are expected to improve credit conditions affect expectations of funding available via other sources? The answer to this question is ex-ante ambiguous. On the one hand, relaxing bank credit constraints improves the firm's fundamentals, which increases other investors' willingness to lend to the firm (Hertzberg, Liberti, and Paravisini, 2011; Giannetti and Saidi, 2019). On the other hand, the traditional "pecking order" of credit demand suggests that the demand for more expensive sources of finance, such as trade credit, declines when bank credit becomes cheaper (e.g., Nilsen, 2002). However, it could still be the case that investors' willingness to supply non-bank financing, such as trade credit, to the firm increases as its credit access and thus economic fundamentals improve. It is also plausible that firms are well aware of this, and so they adjust their expectations upwards.

We take these questions to the data. In Table 8, we report estimates from Models (1)–(3) whereby the dependent variables is the change in firm expectations of future availability of other funding sources: trade credit (columns (1)–(3)), equity (columns (4)–(6)), and debt securities (columns (7)–(9)).

We find that the announcement of the OMT program increased significantly firms' expectations of future funding via trade credit (column (1)), equity (column (4)), and debt securities (column (7)). The point estimates suggest that a two-standard-deviation increase in the firm's creditor's exposure to the shock is associated with an increase in expectations equal to 23 percent, 55 percent, and 78 percent of the sample mean during the period in question, respectively. In the case of the other two programs, we document on positive effect on expectations about future availability of non-credit sources of finance across treatment and control firms, after a policy announcement relative to before the announcement. In fact, we find that the announcement of the CSPP affected expectations of future availability of equity negatively (column (6)). A negative effect on equity could be associated with the special nature of external equity financing in the context of a privately-owned enterprise and the loss of cash flow and control rights that are not present in the other two external sources.

The evidence presented in Table 8 suggests that in the case of the announcement of the OMT Program, firms expecting to benefit from easier credit access also adjusted upwards their expecta-

tions of availability of other types of funding. This finding is consistent with the idea that relaxing bank credit constraints improves the firm's fundamentals, which increases other investors' willingness to lend to the firm (Hertzberg, Liberti, and Paravisini, 2011; Giannetti and Saidi, 2019). The same does not hold for the other two unconventional monetary policies we study. This suggests that policies which aim to activate the bank lending channel typically affect expectations of future bank funding, but not necessarily expectations of alternative forms of finance.

5.6 Unconventional monetary policy and real decisions

We have so far established two facts. First, in general, firm expectations of future credit availability have an effect on their real decisions over and above the extent of current credit access. Second, three separate unconventional policies by the ECB appear to have exerted a causal impact on firm expectations of future access to bank credit.

We now seek to link these two facts more tightly by asking, did these same three ECB policies affect firms' real decision, outside of their impact on current credit access? To that end, we evaluate the following three models:

$$\begin{aligned} Y_{icbt} = \quad & \beta_1 Credit\ unconstrained_{ict-1} + \beta_2 Post\ OMT_t \times \frac{Stressed\ sovereign\ bonds}{Assets}_b + \\ & \beta_3 X_{icbt} + \beta_4 \mu_{ct} + \beta_5 \eta_b + \varepsilon_{icbt} \end{aligned} \tag{6}$$

$$\begin{aligned} Y_{icbt} = \quad & \beta_1 Credit\ unconstrained_{ict-1} + \beta_2 Post\ Negative\ Rates_t \times \frac{Deposits}{Assets}_b + \\ & \beta_3 X_{icbt} + \beta_4 \mu_{ct} + \beta_5 \eta_b + \varepsilon_{icbt} \end{aligned} \tag{7}$$

$$\begin{aligned} Y_{icbt} = \quad & \beta_1 Credit\ unconstrained_{ict-1} + \beta_2 Post\ CSPP_t \times \frac{Large\ firm\ lending}{Total\ firm\ lending}_b + \\ & \beta_3 X_{icbt} + \beta_4 \mu_{ct} + \beta_5 \eta_b + \varepsilon_{icbt} \end{aligned} \tag{8}$$

As in Model (4), Y_{icbt} denotes the year-on-year growth in investment or employment by firm i in country c. The variable $Credit\ unconstrained_{ict-1}$ is defined as in Models (1)–(4). The three time dummies ($Post\ OMT_t$, $Post\ Negative\ Rates_t$, and $Post\ CSPP_t$), the three exposure variables ($\frac{Stressed\ sovereign\ bonds}{Assets}_b$, $\frac{Deposits}{Assets}_b$, and $\frac{Large\ firm\ lending}{Total\ firm\ lending}_b$), the vector of firm-specific controls X_{icbt}, and the fixed effects μ_{ct} and η_b are defined as in Models (1)–(3). The coefficient of interest is

β_2. Given that we formally control for credit access, it measures the impact of each of the three policies in question on firm investment and employment decisions through other channels, such as the channel of changes in firm expectations.

Table 9 reports the estimates of these models. The tests confirm that controlling for a host of firm-specific factors and unobservable common shocks, firms that are at present credit unconstrained are more likely to increase tangible investment and employment. In three of these cases (columns (2), (3) and (6)), this effect is not just positive, but also significant at least at the 10-percent statistical level.

Turning to the variables of interest, the point estimates of β_2 is positive in 5 out of 6 cases. This suggests that by and large, monetary policy shocks increase firms' willingness to invest and hire. Given that we are controlling for the channel of changes in current credit access, β_2 plausibly captures the channel of improved expectations of future funding that we identified in Tables 3–8.

Once again, we find that some unconventional policies are more powerful than others. On the one extreme, the announcement of the OMT Program increased both investment and employment by firms borrowing from banks that were expected to release credit funding as a result of the policy. On the other extreme, the announcement of the CSPP did not have an impact either on investment or on employment—over and above changes in current credit access—for firms borrowing from banks with a large lending exposure to large corporates. Finally, the introduction of negative rates had a positive effect on investment for firms borrowing from high-deposit banks, over and above the positive effect of current access to credit. However, it had no impact on employment.

The estimates presented in Table 9 strongly suggests that while current credit access is a major determinant of firm decisions, targeted unconventional monetary policy also spills into real activity through other channels. A prime candidate is its impact on firms' funding expectations which we identified in Tables 3–8.

6 Conclusion

In this paper, we examine the impact of three separate unconventional monetary policies enacted by the ECB in the wake of the twin financial and sovereign debt crisis in Europe on the variation in small firms' expectations of future credit availability. The three policies are the OMT Program,

announced in the summer of 2012; the introduction of negative policy rates in the summer of 2014; and the announcement of corporate bond purchases in the spring of 2016. We investigate whether after the announcement of each policy, small firms experienced an improvement in their expectations of future credit availability, especially if their main creditor was plausibly expected to increase small business lending as a result of the policy. We also study how this improvement in expectations affected firms' real decision, such as investment and employment. We do so for a sample of around 7,000 SMEs in eight euro area countries, using a restricted access dataset containing rich balance sheet information for individual firms, information on expectations, and the identity of their main bank. As a source of identifying variation, we use the firm-bank match: while all firms are subject to the same policy announcement, some firms know they will benefit from the new policy because their creditor is going to be affected by it, and others know they will not.

We find that the announcement of the OMT Program resulted in a strong improvement (over the next year) in expectations of future credit availability by firms borrowing from banks with substantial balance sheet exposures to impaired sovereign debt whose funding costs were expected to decline as a result of the announcement. Similarly, the introduction of negative policy rates improved credit expectations for firms borrowing from high-deposit banks, which were expected to increase risky lending because they would be reluctant to pass on the negative rates to their depositors. Finally, the announcement of the CSPP improved credit expectations for firms borrowing from banks focusing so far on large-firm lending, which were expected to have a spare lending capacity as a result of large firms finding it cheaper to sell bonds to the ECB than to borrow form banks. While the results are most consistently significant across model specifications in the case of the OMT Program, the evidence suggests that all of these three policies broadly work in the same direction. Our results point to the importance of funding expectations in the transmission of unconventional monetary policy through the bank lending channel.

We also find that controlling for current credit access, firms with higher expectations of future credit availability increase investment and employment. This is true at all times, as well as during the period in question for firms affected by unconventional monetary policy shocks. This suggests that improvements in funding expectations can impact firms' real decision over and above firms' actual access to finance. Because changes in expectations often lead changes in credit access by 6 months to one year, the mechanism we identify not only complements, but also precedes the bank

balance sheet adjustment channel of monetary policy. Our results thus imply that unorthodox monetary policy can have an impact on the real economy faster than previously believed. This has significant implications for the unconventional monetary policy initiatives being deployed to address the COVID-19 crisis— including, for example, programs such as the Primary Market Corporate Credit Facility and the Main Street Facilities deployed by the Federal Reserve, or the Pandemic Emergency Purchase Programme by the ECB. Our results suggest that policy makers and researchers should be aware that the efficacy of these programs could play out not only through the conventional balance sheet channel, but also the expectations channel we identify in this paper.

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Table 1. Summary statistics

Variable	# Obs.	Mean	St. dev.	Min	Max
Panel A. Firm expectations about future financing					
Bank loan financing will improve	7,191	0.263	0.440	0	1
Trade credit financing will improve	4,858	0.221	0.415	0	1
Equity financing will improve	1,538	0.115	0.319	0	1
Debt securities financing will improve	784	0.105	0.306	0	1
Panel B. Bank characteristics					
Main bank's stressed sovereign bonds / Assets	1,595	0.042	0.051	0	0.135
Main bank's deposits / Assets	4,742	0.503	0.161	0	0.904
Main bank's share large firm lending	4,830	0.103	0.163	0	0.875
Panel C. Firm characteristics					
Stand-alone firm	7,191	0.949	0.218	0	1
Individual- or family-owned	7,191	0.587	0.492	0	1
Micro	7,191	0.122	0.328	0	1
Small	7,191	0.229	0.420	0	1
Medium	7,191	0.242	0.429	0	1
Large	7,191	0.407	0.492	0	1
Age less than 2 years	7,191	0.003	0.058	0	1
Age between 2 and 5 years	7,191	0.015	0.120	0	1
Age between 5 and 10 years	7,191	0.088	0.283	0	1
Age more than 10 years	7,191	0.887	0.317	0	1
Turnover less than €2 mln.	7,191	0.069	0.253	0	1
Turnover between €2 and €5 mln.	7,191	0.224	0.417	0	1
Turnover between €5 and €10 mln.	7,191	0.289	0.453	0	1
Turnover more than €10 mln.	7,191	0.281	0.450	0	1
Own outlook better	7,104	0.375	0.484	0	1
Capital better	7,150	0.321	0.467	0	1
Credit history better	7,101	0.340	0.474	0	1
Credit unconstrained	3,746	0.749	0.434	0	1
Panel D. Firms' real decisions					
Investment growth	16,796	0.068	0.431	-0.833	2.891
Employment growth	12,101	0.016	0.202	-0.667	1.143

Note: This table presents weighted summary statistics for the variables used in the empirical tests. The weights restore the proportions of the economic weight (in terms of number of employees) of each size class, economic activity and country and are applied to the variables derived from the survey. 'Bank loan financing will improve' is a dummy variable equal to 1 if the firm believes that the availability of bank loans will improve in the next six months. 'Trade credit financing will improve' is a dummy variable equal to 1 if the firm believes that the availability of financing through trade credit will improve in the next six months. 'Equity financing will improve' is a dummy variable equal to 1 if the firm believes that the availability of financing through equity (including venture capital or business angels) will improve in the next six months. 'Debt securities financing will improve' is a dummy variable equal to 1 if the firm believes that the availability of financing through issued debt securities will improve in the

next six months. 'Main bank's stressed sovereign bonds / Assets' is the ratio of holdings of sovereign bonds issued by Greece, Ireland, Italy, Portugal, and Spain to total assets of the firm's main bank. 'Main bank's deposits / Assets' is the ratio of deposits to total assets of the firm's main bank. 'Main bank's share large firm lending' is the ratio of firms with more than 250 employees to all firms in the lending portfolio of the firm's main bank. 'Stand-alone firm' is a dummy variable equal to 1 if the firm is an autonomous profit-oriented enterprise. 'Individual- or family-owned' is a dummy variable equal to 1 if the firm's owner is an individual or a family. 'Micro' is a dummy variable equal to 1 if the firm has between 1 and 9 employees. 'Small' is a dummy variable equal to 1 if the firm has between 10 and 49 employees. 'Medium' is a dummy variable equal to 1 if the firm has between 50 and 249 employees. 'Large' is a dummy variable equal to 1 if the firm has more than 250 employees. 'Age less than 2 years' is a dummy variable equal to 1 if the firm is less than 2 years old. 'Age between 2 and 5 years' is a dummy variable equal to 1 if the firm is between 2 and 5 years old. 'Age between 5 and 10 years' is a dummy variable equal to 1 if the firm is between 5 and 10 years old. 'Age more than 10 years' is a dummy variable equal to 1 if the firm is 10+ years old. 'Turnover less than €2 mln.' is a dummy variable equal to 1 if the firm's annual turnover is less than €2 mln. 'Turnover between €2 and €5 mln.' is a dummy variable equal to 1 if the firm's annual turnover is between €2 mln. and €5 mln. 'Turnover between €5 and €10 mln.' is a dummy variable equal to 1 if the firm's annual turnover is between €5 mln. and €10 mln. 'Turnover more than €10 mln.' is a dummy variable equal to 1 if the firm's annual turnover is €10+ mln. 'Own outlook better' is a dummy variable equal to 1 if the firm's own outlook improved in the past 6 months. 'Capital better' is a dummy variable equal to 1 if the firm's capital improved in the past 6 months. 'Credit history better' is a dummy variable equal to 1 if the firm's credit history improved in the past 6 months. 'Credit unconstrained' is a dummy variable equal to 1 if the firm applied for a loan in the past 6 months, and it was granted more than 75% of the requested amount. 'Investment growth' denotes the percentage change in tangible assets over the past year. 'Employment growth' denotes the percentage change in the number of employees over the past year.

Table 2. Firm expectations about future bank financing, investment, and employment

	Investment growth			Employment growth		
	(1)	(2)	(3)	(4)	(5)	(6)
Credit unconstrained (1-period lagged)	0.042***		0.041***	0.026***		0.026***
	(0.009)		(0.009)	(0.006)		(0.006)
Bank loan financing will improve (1-period lagged)		0.021**	0.020**		0.011**	0.010**
		(0.011)	(0.011)		(0.005)	(0.005)
Firm-specific controls	Yes	Yes	Yes	Yes	Yes	Yes
Country × Time FEs	Yes	Yes	Yes	Yes	Yes	Yes
No. Observations	16,794	16,794	16,794	12,099	12,099	12,099
R-squared	0.02	0.02	0.02	0.04	0.04	0.04

Note: This table presents estimates of firms' investment growth over the past year (columns (1)–(3)) and employment growth over the past year (columns (4)–(6)) on current credit access and on beliefs about the availability of future credit access. The model is estimated using OLS. The estimation period is 1st January 2009 – 30th September 2018. 'Credit unconstrained (1-period lagged)' is a dummy variable equal to 1 if the firm applied for a loan in the past 6 to 12 months, and it was granted more than 75% of the requested amount. 'Bank loan financing will improve (1-period lagged)' is a dummy variable equal to 1 if in the past 6 to 12 months, the firm believed that the availability of bank loans would improve in the next six months. 'Firm-specific controls' include all variables from Panel C in Table 1. All regressions use sampling weights that adjust the sample to be representative of the population. All regressions include fixed effects as specified. Standard errors clustered at the country-wave level appear in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 3. Unconventional monetary policy and firm expectations about future bank financing: Main test

	Bank loan financing will improve					
	(1)	(2)	(3)	(4)	(5)	(6)
	OMT		Negative rates		CSPP	
Post	0.102***		0.004		-0.003	
	(0.021)		(0.017)		(0.019)	
Main bank's stressed sovereign bonds / Assets × Post OMT		0.024**				
		(0.010)				
Main bank's deposits / Assets × Post negative rates				0.174**		
				(0.091)		
Main bank's share large firm lending × Post CSPP						0.535**
						(0.233)
Firm-specific controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	Absorbed	Yes	Absorbed	Yes	Absorbed
Country × Time FEs	No	Yes	No	Yes	No	Yes
Bank FE	No	Yes	No	Yes	No	Yes
No. Observations	1,586	1,427	2,597	2,405	2,356	2,070
R-squared	0.09	0.33	0.14	0.36	0.10	0.38

Note: This table presents difference-in-differences estimates of firms' expectations of future credit access. 'Bank loan financing will improve' is a dummy variable equal to 1 if the firm believes that the availability of bank loans will improve in the next six months. The model is estimated using OLS. The estimation period is 1st October 2011 – 30th September 2013 (columns (1)–(2)), 1st October 2013 – 30th September 2015 (columns (3)–(4)), and 1st April 2015 – 31st March 2017 (columns (5)–(6)). 'Main bank's stressed bonds / Assets' is the ratio of holdings of sovereign bonds issued by Greece, Ireland, Italy, Portugal, and Spain to total assets of the firm's main bank. 'Main bank's deposits / Assets' is the ratio of deposits to total assets of the firm's main bank. 'Main bank's share large firm lending' is the ratio of firms with more than 250 employees to all firms in the lending portfolio of the firm's main bank. 'Post OMT' is a dummy variable equal to 1 during waves 8 and 9 (1st October 2012 – 30th September 2013). 'Post negative rates' is a dummy variable equal to 1 during waves 12 and 13 (1st October 2014 – 30th September 2015). 'Post CSPP' is a dummy variable equal to 1 during waves 15 and 6 (1st April 2016 – 31st March 2017). 'Firm-specific controls' include all variables from Panel C in Table 1. All regressions use sampling weights that adjust the sample to be representative of the population. All regressions include fixed effects as specified. Standard errors clustered at the country-wave level appear in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 4. Falsification test: Pre-trend

	Bank loan financing will improve: Pre-trend, two waves		
	(1)	(2)	(3)
Main bank's stressed bonds / Assets × Pre OMT	-0.341		
	(0.772)		
Main bank's deposits / Assets × Pre negative rates		0.289	
		(0.250)	
Main bank's share large firm lending × Pre CSPP			0.226
			(0.320)
Firm-specific controls	Yes	Yes	Yes
Country × Time FEs	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
No. Observations	352	1,378	1,089
R-squared	0.38	0.41	0.40

Note: This table presents difference-in-differences estimates of firms' expectations of future credit access. 'Bank loan financing will improve' is a dummy variable equal to 1 if the firm believes that the availability of bank loans will improve in the next six months. The model is estimated using OLS. The estimation period is 1st October 2011 – 30th September 2012 (column (1)), 1st October 2013 – 30th September 2014 (column (2)), and 1st April 2015 – 31st March 2016 (column (3)). 'Main bank's stressed bonds / Assets' is the ratio of holdings of sovereign bonds issued by Greece, Ireland, Italy, Portugal, and Spain to total assets of the firm's main bank. 'Main bank's deposits / Assets' is the ratio of deposits to total assets of the firm's main bank. 'Main bank's share large firm lending' is the ratio of firms with more than 250 employees to all firms in the lending portfolio of the firm's main bank. 'Pre OMT' is a dummy variable equal to 1 during wave 7 (1st April 2012 – 30th September 2012). 'Pre negative rates' is a dummy variable equal to 1 during wave 11 (1st April 2014 – 30th September 2014). 'Pre CSPP' is a dummy variable equal to 1 during wave 14 (1st October 2015 – 31st March 2016). 'Firm-specific controls' include all variables from Panel C in Table 1. All regressions use sampling weights that adjust the sample to be representative of the population. All regressions include fixed effects as specified. Standard errors clustered at the country-wave level appear in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 5. Falsification test: Placebo treatment

	Bank loan financing will improve					
	(1)	(2)	(3)	(4)	(5)	(6)
Main bank's deposits / Assets × Post OMT	-0.002					
	(0.001)					
Main bank's share large firm lending × Post OMT		0.007				
		(0.203)				
Main bank's stressed bonds / Assets × Post negative rates			-0.872			
			(1.001)			
Main bank's share large firm lending × Post negative rates				-0.201		
				(0.257)		
Main bank's stressed bonds / Assets × Post CSPP					-0.455	
					(0.980)	
Main bank's deposits / Assets × Post CSPP						-0.053
						(0.165)
Firm-specific controls	Yes	Yes	Yes	Yes	Yes	Yes
Country × Time FEs	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
No. Observations	1,531	2,676	1,551	3,777	780	1,283
R-squared	0.32	0.36	0.32	0.36	0.38	0.37

Note: This table presents difference-in-differences estimates of firms' expectations of future credit access. 'Bank loan financing will improve' is a dummy variable equal to 1 if the firm believes that the availability of bank loans will improve in the next six months. The model is estimated using OLS. The estimation period is 1st October 2011 – 30th September 2013 (columns (1)–(2)), 1st October 2013 – 30th September 2015 (columns (3)–(4)), and 1st April 2015 – 31st March 2017 (columns (5)–(6)). 'Main bank's deposits / Assets' is the ratio of deposits to total assets of the firm's main bank. 'Main bank's share large firm lending' is the ratio of firms with more than 250 employees to all firms in the lending portfolio of the firm's main bank. 'Main bank's stressed bonds / Assets' is the ratio of holdings of sovereign bonds issued by Greece, Ireland, Italy, Portugal, and Spain to total assets of the firm's main bank. 'Post OMT' is a dummy variable equal to 1 during waves 8 and 9 (1st October 2012 – 30th September 2013). 'Post negative rates' is a dummy variable equal to 1 during waves 12 and 13 (1st October 2014 – 30th September 2015). 'Post CSPP' is a dummy variable equal to 1 during waves 15 and 6 (1st April 2016 – 31st March 2017). 'Firm-specific controls' include all variables from Panel C in Table 1. All regressions use sampling weights that adjust the sample to be representative of the population. All regressions include fixed effects as specified. Standard errors clustered at the country-wave level appear in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 6. Unconventional monetary policy and firm expectations about future bank financing: Robust model

	Bank loan financing will improve								
	Probit			Ordered probit			Firm characteristics interactions		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Main bank's stressed bonds / Assets × Post OMT	0.023***			0.010			0.022**		
	(0.008)			(0.041)			(0.010)		
Main bank's deposits / Assets × Post negative rates		0.383***			0.952*			0.289*	
		(0.150)			(0.596)			(0.191)	
Main bank's share large firm lending × Post CSPP			0.908***			1.812**			1.883***
			(0.429)			(0.996)			(0.183)
Firm-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Balance sheet interactions	No	No	No	No	No	No	Yes	Yes	Yes
Country × Time FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Observations	1,157	1,931	1,467	1,438	1,931	2,363	1,457	2,022	1,898
R-squared	0.20	0.19	0.15	0.39	0.32	0.34	0.31	0.45	0.49

Note: Note: This table presents difference-in-differences estimates of firms' expectations of future credit access. In columns (1)–(3) and (7)–(9), 'Bank loan financing will improve' is a dummy variable equal to 1 if the firm believes that the availability of bank loans will improve in the next six months. In columns (4)–(6), 'Bank loan financing will improve' is equal to 1 if the firm believes that the availability of bank loans will deteriorate, to 2 if the firm believes it will remain unchanged, and to 3 if the firm believes it will improve, in the next six months. The model is estimated using Probit (columns (1)–(3)), ordered probit (columns (4)–(6)), and OLS (columns (7)–(9)). The estimation period is 1st October 2011 – 30th September 2013 (columns (1)–(2)), 1st October 2013 – 30th September 2015 (columns (3)–(4)), and 1st April 2015 – 31st March 2017 (columns (5)–(6)). 'Main bank's stressed bonds / Assets' is the ratio of holdings of sovereign bonds issued by Greece, Ireland, Italy, Portugal, and Spain to total assets of the firm's main bank. 'Main bank's deposits / Assets' is the ratio of deposits to total assets of the firm's main bank. 'Main bank's share large firm lending' is the ratio of firms with more than 250 employees to all firms in the lending portfolio of the firm's main bank. 'Post OMT' is a dummy variable equal to 1 during waves 8 and 9 (1st October 2012 – 30th September 2013). 'Post negative rates' is a dummy variable equal to 1 during waves 12 and 13 (1st October 2014 – 30th September 2015). 'Post CSPP' is a dummy variable equal to 1 during waves 15 and 6 (1st April 2016 – 31st March 2017). 'Firm-specific controls' include all variables from Panel C in Table 1. Columns (7)–(9)) include interactions of all variables from Panel C in Table 1 with the respective 'Post' dummy. All regressions use sampling weights that adjust the sample to be representative of the population. All regressions include fixed effects as specified. Standard errors clustered at the country-wave level appear in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 7. Unconventional monetary policy and firm expectations about future bank financing: Panel firms

	Δ Bank loan financing will improve		
	(1)	(2)	(3)
Main bank's stressed bonds / Assets	0.035***		
	(0.010)		
Main bank's deposits / Assets		0.394**	
		(0.162)	
Main bank's share large firm lending			0.841**
			(0.430)
Firm-specific controls	Yes	Yes	Yes
Country	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
No. Observations	242	269	184
R-squared	0.36	0.07	0.09

Note: This table presents difference-in-differences estimates of firms' expectations of future credit access. 'Δ Bank loan financing will improve' is the difference in the firm's believes that the availability of bank loans will improve in the next six months, between the Post- and the Pre- period. The model is estimated using OLS. The estimation period is 1st October 2011 – 30th September 2013 (column (1)), 1st October 2013 – 30th September 2015 (column (2)), and 1st April 2015 – 31st March 2017 (column (3)). 'Main bank's stressed bonds / Assets' is the ratio of holdings of sovereign bonds issued by Greece, Ireland, Italy, Portugal, and Spain to total assets of the firm's main bank. 'Main bank's deposits / Assets' is the ratio of deposits to total assets of the firm's main bank. 'Main bank's share large firm lending' is the ratio of firms with more than 250 employees to all firms in the lending portfolio of the firm's main bank. 'Firm-specific controls' include all variables from Panel C in Table 1. Only firms with at least one observation during the Pre- and one observation during the Post- period are included in the regressions. All regressions use sampling weights that adjust the sample to be representative of the population. All regressions include fixed effects as specified. Standard errors clustered at the country-wave level appear in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 8. Unconventional monetary policy and firm expectations about other types of financing

	Trade credit financing will improve			Equity financing will improve			Debt securities financing will improve		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Main bank's stressed bonds / Assets × Post OMT	0.040**			0.051**			0.072**		
	(0.018)			(0.025)			(0.034)		
Main bank's deposits / Assets × Post negative rates		0.180			0.018			-0.428	
		(0.209)			(0.256)			(0.368)	
Main bank's share large firm lending × Post CSPP			-0.376			-2.788***			1.565
			(0.482)			(0.824)			(2.923)
Firm-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country × Time FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Observations	1,286	2,085	1,596	498	483	340	274	191	104
R-squared	0.29	0.36	0.40	0.36	0.33	0.54	0.56	0.42	0.47

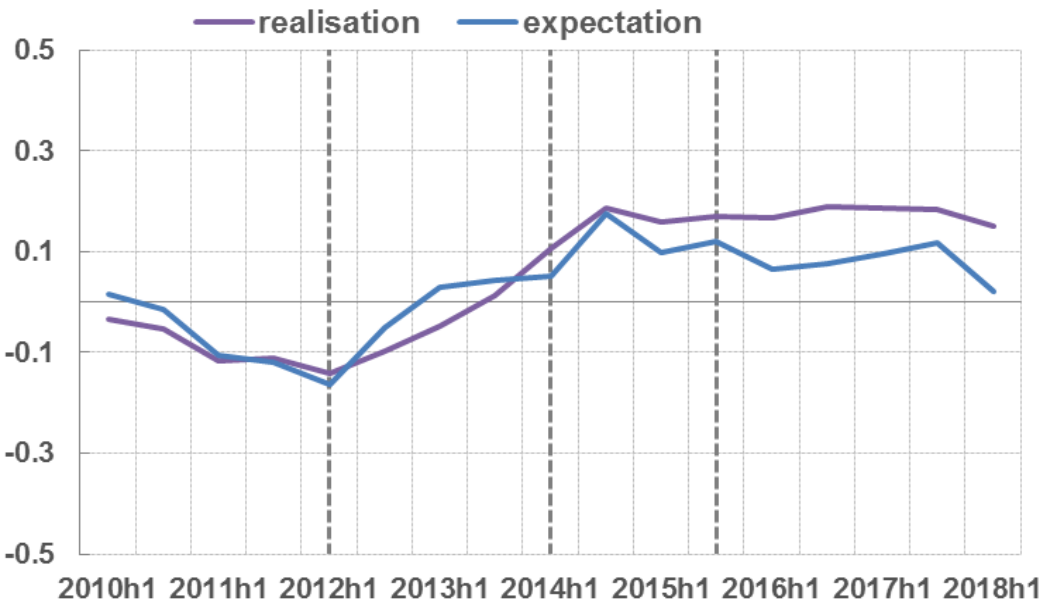
Note: This table presents difference-in-differences estimates of firms' expectations of future access to various types of financing. 'Trade credit financing will improve' is a dummy variable equal to 1 if the firm believes that the availability of financing through trade credit will improve in the next six months. 'Equity financing will improve' is a dummy variable equal to 1 if the firm believes that the availability of financing through equity (including venture capital or business angels) will improve in the next six months. 'Debt securities financing will improve' is a dummy variable equal to 1 if the firm believes that the availability of financing through issued debt securities will improve in the next six months. The model is estimated using OLS. The estimation period is 1st October 2011 – 30th September 2013 (columns (1), (4), and (7)), 1st October 2013 – 30th September 2015 (columns (2), (5), and (8)), and 1st April 2015 – 31st March 2017 (columns (3), (6), and (9)). 'Main bank's stressed bonds / Assets' is the ratio of holdings of sovereign bonds issued by Greece, Ireland, Italy, Portugal, and Spain to total assets of the firm's main bank. 'Main bank's deposits / Assets' is the ratio of deposits to total assets of the firm's main bank. 'Main bank's share large firm lending' is the ratio of firms with more than 250 employees to all firms in the lending portfolio of the firm's main bank. 'Post OMT' is a dummy variable equal to 1 during waves 8 and 9 (1st October 2012 – 30th September 2013). 'Post negative rates' is a dummy variable equal to 1 during waves 12 and 13 (1st October 2014 – 30th September 2015). 'Post CSPP' is a dummy variable equal to 1 during waves 15 and 6 (1st April 2016 – 31st March 2017). 'Firm-specific controls' include all variables from Panel C in Table 1. All regressions use sampling weights that adjust the sample to be representative of the population. All regressions include fixed effects as specified. Standard errors clustered at the country-wave level appear in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Table 9. Unconventional monetary policy and firm expectations about future bank financing: Investment and employment

	Investment growth			Employment growth		
	(1)	(2)	(3)	(4)	(5)	(6)
Credit unconstrained (1-period lagged)	0.011	0.029*	0.073*	0.009	0.023	0.021**
	(0.027)	(0.019)	(0.041)	(0.008)	(0.026)	(0.011)
Main bank's stressed bonds / Assets × Post OMT	5.319***			4.259***		
	(1.565)			(0.523)		
Main bank's deposits / Assets × Post negative rates		0.067			-0.176	
		(0.133)			(0.129)	
Main bank's share large firm lending × Post CSPP			0.493***			0.100
			(0.077)			(0.141)
Firm-specific controls	Yes	Yes	Yes	Yes	Yes	Yes
Country × Time FEs	Yes	Yes	Yes	Yes	Yes	Yes
No. Observations	2,209	1,244	1,252	1,423	1,036	1,039
R-squared	0.26	0.30	0.35	0.36	0.50	0.48

Note: This table presents estimates of firms' investment growth over the past year (columns (1)–(3)) and employment growth over the past year (columns (4)–(6)) on current credit access and on beliefs about the availability of future credit access. 'Credit unconstrained (1-period lagged)' is a dummy variable equal to 1 if the firm applied for a loan in the past 6 to 12 months, and it was granted more than 75% of the requested amount. The model is estimated using OLS. The estimation period is 1st October 2011 – 30th September 2013 (columns (1), (4), and (7)), 1st October 2013 – 30th September 2015 (columns (2), (5), and (8)), and 1st April 2015 – 31st March 2017 (columns (3), (6), and (9)). 'Main bank's stressed bonds / Assets' is the ratio of holdings of sovereign bonds issued by Greece, Ireland, Italy, Portugal, and Spain to total assets of the firm's main bank. 'Main bank's deposits / Assets' is the ratio of deposits to total assets of the firm's main bank. 'Main bank's share large firm lending' is the ratio of firms with more than 250 employees to all firms in the lending portfolio of the firm's main bank. 'Post OMT' is a dummy variable equal to 1 during waves 8 and 9 (1st October 2012 – 30th September 2013). 'Post negative rates' is a dummy variable equal to 1 during waves 12 and 13 (1st October 2014 – 30th September 2015). 'Post CSPP' is a dummy variable equal to 1 during waves 15 and 6 (1st April 2016 – 31st March 2017). 'Firm-specific controls' include all variables from Panel C in Table 1. All regressions use sampling weights that adjust the sample to be representative of the population. All regressions include fixed effects as specified. Standard errors clustered at the country-wave level appear in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Figure 1. Credit availability and expectations of future funding: Full sample



Note: The Figure plots percentage changes, from one survey wave to the next, in actual access to credit and in expectations of future funding, for all the firms in the sample. Data are weighted averages. The vertical lines indicates the timing of the announcement of the OMT Program, the introduction of negative rates, and the announcement of the CSPP. Source: SAFE.

Appendix Table 1. Unconventional monetary policy and firm expectations about future bank financing: Main test (full table)

	Bank loans will improve					
	(1)	(2)	(3)	(4)	(5)	(6)
	OMT		Negative rates		CSPP	
Post	0.102***		0.004		-0.003	
	(0.021)		(0.017)		(0.019)	
Main bank's stressed bonds / Assets × Post OMT		0.024**				
		(0.010)				
Main bank's deposits / Assets × Post negative rates				0.174**		
				(0.090)		
Main bank's share large firm lending × Post CSPP						0.535**
						(0.233)
Individual- or family-owned	-0.044	-0.025	-0.005	0.018	0.015	-0.010
	(0.039)	(0.057)	(0.018)	(0.014)	(0.015)	(0.028)
Micro	0.044	0.001	-0.071	-0.113	-0.035	-0.025
	(0.055)	(0.050)	(0.026)	(0.088)	(0.029)	(0.050)
Small	0.013	-0.035	0.004	0.005	-0.028	-0.016
	(0.038)	(0.045)	(0.021)	(0.033)	(0.020)	(0.033)
Age less than 2 years	-0.231*	-0.298**	-0.129**	-0.113	-0.144**	0.044
	(0.137)	(0.147)	(0.064)	(0.088)	(0.064)	(0.085)
Age between 2 and 5 years	-0.062	-0.102	0.140**	0.144***	-0.227	-0.202
	(0.140)	(0.150)	(0.071)	(0.056)	(0.109)	(0.198)
Age between 5 and 10 years	-0.093	-0.150	0.050**	0.053*	-0.022	0.068
	(0.120)	(0.128)	(0.025)	(0.032)	(0.045)	(0.058)
Turnover less than €2 mln.	-0.112**	-0.055	0.026	0.054*	___	___
	(0.052)	(0.071)	(0.026)	(0.033)		
Turnover between €2 and €5 mln.	-0.061*	-0.018	-0.030	-0.015	0.015	-0.011
	(0.035)	(0.029)	(0.020)	(0.037)	(0.022)	(0.037)
Turnover between €5 and €10 mln.	-0.034	0.022	-0.051	0.005	-0.017	0.033
	(0.068)	(0.086)	(0.041)	(0.056)	(0.033)	(0.053)
Capital better	-0.024	-0.063	0.045	0.054*	0.066***	0.081***
	(0.056)	(0.074)	(0.033)	(0.034)	(0.023)	(0.024)
Credit history better	0.171***	0.216***	0.180***	0.177***	0.135***	0.086***
	(0.045)	(0.050)	(0.019)	(0.020)	(0.020)	(0.022)
Own outlook better	0.078**	0.077*	0.144***	0.117***	0.040**	0.021
	(0.038)	(0.052)	(0.023)	(0.025)	(0.020)	(0.026)
Unconstrained	0.054	0.059	-0.037**	-0.032	0.001	0.007

	(0.042)	(0.046)	(0.018)	(0.042)	(0.022)	(0.025)
Country FEs	Yes	Absorbed	Yes	Absorbed	Yes	Absorbed
Country × Time FEs	No	Yes	No	Yes	No	Yes
Bank FE	No	Yes	No	Yes	No	Yes
No. Observations	1,586	1,427	2,597	2,405	2,356	2,070
R-squared	0.09	0.33	0.14	0.36	0.10	0.38

Note: This table presents difference-in-differences estimates of firms' expectations of future credit access. 'Bank loan financing will improve' is a dummy variable equal to 1 if the firm believes that the availability of bank loans will improve in the next six months. The model is estimated using OLS. The estimation period is 1st October 2011 – 30th September 2013 (columns (1)–(2)), 1st October 2013 – 30th September 2015 (columns (3)–(4)), and 1st April 2015 – 31st March 2017 (columns (5)–(6)). 'Main bank's stressed bonds / Assets' is the ratio of holdings of sovereign bonds issued by Greece, Ireland, Italy, Portugal, and Spain to total assets of the firm's main bank. 'Main bank's deposits / Assets' is the ratio of deposits to total assets of the firm's main bank. 'Main bank's share large firm lending' is the ratio of firms with more than 250 employees to all firms in the lending portfolio of the firm's main bank. 'Post OMT' is a dummy variable equal to 1 during waves 8 and 9 (1st October 2012 – 30th September 2013). 'Post negative rates' is a dummy variable equal to 1 during waves 12 and 13 (1st October 2014 – 30th September 2015). 'Post CSPP' is a dummy variable equal to 1 during waves 15 and 6 (1st April 2016 – 31st March 2017). For variable definitions, see Table 1, Panel C. All regressions use sampling weights that adjust the sample to be representative of the population. All regressions include fixed effects as specified. Standard errors clustered at the country-wave level appear in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

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