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Whatever it takes: The Real Effects of Unconventional Monetary Policy*

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Abstract

On July 26, 2012 Mario Draghi announced to do whatever it takes to preserve the Euro. The resulting Outright Monetary Transactions (OMT) Program led to a significant reduction in the sovereign yields of periphery countries. Due to their significant holdings of GIIPS sovereign debt, the OMT announcement indirectly recapitalized periphery country banks by increasing the value of their sovereign bonds. This led to an increased supply of loans to private borrowers in Europe. We show that firms that receive new loans from periphery banks use the newly available funding to build up cash reserves, but there is no impact on real economic activity like employment or investment.

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1 Introduction

In the peak of the European Sovereign Debt Crisis in 2010, the European Central Bank (ECB) began introducing unconventional monetary policy measures to stabilize the Eurozone and restore trust in the periphery of Europe. Ultimately, these unconventional monetary policy measures were aiming at breaking the vicious circle between bank and sovereign health, which has led to a sharp decline in economic activity in the countries in the periphery of the Eurozone (Acharya, Eisert, Eufinger, and Hirsch (2015)). It was especially the ECB's Outright Monetary Transactions (OMT) program, which ECB's president Mario Draghi announced during his famous "whatever it takes" speech in the summer of 2012, that helped to restore trust in the viability of the Eurozone.

While, according to the ECB, the primary objective of the OMT program was "safeguarding an appropriate monetary policy transmission and the singleness of the monetary policy", the measure also potentially had an important impact on the stability of banks and their lending behavior. As the OMT program announcement led to a strong decrease in sovereign debt spreads of stressed countries in the periphery of the Eurozone, banks with significant holdings of these sovereign bonds potentially experienced substantial windfall gains due to the increased value of their bond holdings.

However, there is still no conclusive evidence as to whether and how the OMT program has impacted the real economy through the bank lending channel. Therefore, in this paper, we analyze whether (i) the ECB's OMT program led to a reduction in bank credit risk by increasing the value of the sovereign debt portfolio of banks, (ii) whether this reduction in bank credit risk entailed an increase in the availability of bank funding for borrowing firms, and (iii) whether this potential increase in loan supply led to real economic effects on the firm level.

This sets the structure for our analysis. Our empirical analysis is hence organized into three parts. We start by analyzing the impact of the OMT program announcement on bank health. The sample used in this paper builds on loan information data obtained from Thomson Reuters LPC's DealScan, which provides extensive coverage of bank-firm relationships throughout Europe, and firm-specific information from Bureau van Dijk's Amadeus database, which we hand-match to DealScan. The sample includes all private firms from all EU countries for which DealScan provides loan information. In particular, the sample includes firms from all European countries that were severely affected by the sovereign debt crisis (the GIIPS countries). In addition, we obtain information on bank and sovereign CDS spreads from Markit, bank equity and sovereign bond information from Datastream, bank level balance sheet data from SNL, and data on the sovereign debt holdings of banks from the EBA stress tests, transparency, and capital exercises. This allows us to determine the extent to which individual banks were affected by the announcement of the OMT program. Our sample period covers the years 2009 until 2013.

We first show that GIIPS banks benefited most from the OMT announcement due to their substantial amount of GIIPS sovereign debt holdings. These banks realized significant windfall gains on their sovereign debt holdings due to the decreasing sovereign yields, implying that the OMT program announcement has indirectly recapitalized especially those banks in Europe that contributed significantly to the severe loan supply disruptions during the sovereign debt crisis. Furthermore, we find that bank credit risk decreased significantly on the dates surrounding the OMT announcement dates, a result that is in line with findings in Acharya, Pierret, and Steffen (2015). We use regression analysis on the bank level to confirm that the reduction in bank credit risk is indeed largely driven by a bank's holding of GIIPS sovereign debt and its resulting windfall gains due to the OMT program.

Second, we document that this reduction in bank credit risk and the resulting improvement in bank health led to an increase in available loans to firms. Building on the methodology of Khwaja and Mian (2008), we find that banks with higher windfall gains on their sovereign debt holdings increased loan supply to the corporate sector by more in the quarters following the OMT announcement than banks with lower windfall gains. To analyze which type of borrowers benefited most from an increased lending volume in the period after the announcement of the OMT program, we divide our sample into low- and high-quality borrower based on the ability of firms to service existing debt. In particular, a low-quality borrower is defined as having a below country median interest coverage ratio, while borrowers are considered to be of high-quality if their interest coverage ratio is above the median. The results of our lending regressions show that especially low-quality borrower benefited from the increased loan volume in the period following the OMT program announcement. In contrast to this result, high-quality borrower did not benefit significantly from the OMT announcement as the loan volume extended to this subset of firms does not increase in response to the OMT announcement.

Next, we investigate whether the OMT program supported the economic recovery of the Eurozone due to the potential positive impact on firms' policies and real activity induced by the increased loan supply. To analyze how the OMT announcement has impacted corporate policies of firms through the bank lending channel, we closely follow the approach used in Acharya, Eisert, Eufinger, and Hirsch (2015). In particular, we use a diff-in-diff framework to evaluate the performance and policies of borrowing firms in the post-OMT period. To measure the impact of the OMT program announcement, we construct for each firm a variable that captures how much each firm indirectly benefited by the post-OMT increase in value of the sovereign debt holdings of the banks it is associated with. We provide evidence that borrowers with higher indirect OMT windfall gains (indirectly as they benefited through their banks) increased both their cash holdings and leverage by roughly the same amount, suggesting that they use the majority of cash inflow to build up cash reserves. However, we do not find any changes in real economic

activity; neither investment nor employment are significantly affected by a firms' indirect OMT windfall gains.

To shed more light on the motives behind this finding, we follow the approach of Almeida, Campello, and Weisbach (2004) and use the cash flow sensitivity of cash to analyze whether firms with relationships to banks that benefited from OMT remain financially constrained in the period following the OMT program announcement. Using this measure we, first, document that borrowers with a high exposure to banks that benefited from OMT were financially constrained in the pre-OMT announcement period, a finding which is consistent with prior studies (e.g., Acharya, Eisert, Eufinger, and Hirsch (2015)). Second, we find that, whether a firm that is borrowing from banks that benefited from OMT remains financially constrained or becomes financially unconstrained in the post-OMT period, depends on the quality of the borrower. Low-quality borrower became financially unconstrained, while high-quality borrower remain financially constrained in the period following the OMT announcement. This result is in line with the finding that mostly low-quality borrower obtained new loans.

In line with these results, we document that firms, which received new bank loans from banks that experienced large windfall gains on their sovereign debt holdings due to the OMT program, had a significantly higher propensity to save cash from the proceeds of new loans. One possible interpretation of this result is that low-quality firms used the proceeds from new loans to regain financial stability and build up a buffer after being cutoff from bank lending for a sustained period of time during the sovereign debt crisis.

A possible concern about our empirical methodology is that our results could be driven by the poor macroeconomic environment in GIIPS countries which prevented firms from investing and creating new jobs. We control for the macroeconomic environment in our main specification by including firm as well as interactions between industry, year and country fixed effects to absorb unobserved time-varying shocks to an industry in a given country in a given year. Furthermore, we include foreign bank country-year fixed effects to absorb any unobserved, time-varying heterogeneity that may arise because a firm's dependency on banks from a certain country might be influenced by whether this firm has business in the respective country. Consider as an example a German firm borrowing from a Spanish bank and a German bank. For this firm, we include a Spain-year fixed effect to capture the firm's potential exposure to the macroeconomic downturn in Spain during the European Sovereign Debt Crisis. Moreover, we control for unobserved, time-constant firm heterogeneity and observable time-varying firm characteristics that affect the firms' corporate policies, loan demand, and/or loan supply.

To further alleviate concerns that our results are driven by the poor economic environment, we show that all results continue to hold if we restrict our sample to non-GIIPS borrower without any subsidiaries in GIIPS countries or to GIIPS borrower that generate a considerable part of their revenues from non-GIIPS subsidiaries. For both of these

subsets of firms it is plausible to assume that they were relatively less affected by the economic conditions as, e.g., GIIPS firms operating solely in GIIPS countries.

2 Outright Monetary Transactions

In mid-2012 the anxiety about excessive national debt led to interest rates on Italian and Spanish government bonds that were considered unsustainable. From mid-2011 to mid-2012, the spreads of Italian and Spanish 10-year government bonds had increased by 200 basis points and 250 basis points, respectively relative to Germany. As a result, yields on 10-year Italian and Spanish government bonds were more than 4 percentage points higher than yields on German government bonds in July 2012.

This significant increase in bond spreads of countries in the periphery of the Eurozone became a matter of great concern for the ECB as it endangered the monetary union as a whole. In response to the mounting crisis, ECB President Mario Draghi stated on July 26, 2012, during a conference in London: “Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough.” On August 2, 2012, the ECB announced it would undertake outright monetary transactions in secondary, sovereign bond markets. The technical details of these operations were unveiled on September 6, 2012.

To activate the OMT program towards a specific country, that is, buy a theoretically unlimited amount of government bonds with one to three years maturity in secondary markets, four conditions have to be met. First, the country must have received financial support from the European Stability Mechanism (ESM). Second, the government must comply with the reform efforts required by the respective ESM program. Third, the OMT program can only start if the country has regained complete access to private lending markets. Fourth, the country’s government bond yields are higher than what can be justified by the fundamental economic data. In case the OMT program would be activated the ECB would reabsorb the liquidity pumped into the system by auctioning off an equal amount of one-week deposits at the ECB. By Summer 2015, the OMT program has still not been actually activated.

There is clear empirical evidence that the OMT announcement significantly lowered sovereign bond spreads. For example, Szczerbowicz et al. (2012) find that the OMT measure lowered covered bond spreads and periphery sovereign yields. Altavilla, Giannone, and Lenza (2014), Krishnamurthy, Nagel, and Vissing-Jorgensen (2014), and Ferrando, Popov, and Udell (2015) reach a similar conclusion by showing that the OMT announcements led to a relative strong decrease for Italian and Spanish government bond yields (roughly 2 pp), while bond yields of the same maturity in Germany and France seem unaffected.

Furthermore, Krishnamurthy, Nagel, and Vissing-Jorgensen (2014) investigate which channels led to the reduction in bond yields. The authors find that for Italy and Spain, a decrease in default and segmentation risks was the main factor in case of OMT, while there might have been a reduction in redenomination risk in the case of Spain and Portugal, but not for Italy. Finally, their paper shows that the announcement of the OMT measure led to large increases in stock prices in both distressed and core countries. Saka, Fuertes, and Kalotychou (2015) finds that the perceived commonality in default risk among peripheral and core Eurozone sovereigns increased after Draghi’s “whatever-it-takes” announcement.

By substantially reducing sovereign yields, the OMT program improved the asset side, capitalization, and ability to access financing for banks with large GIIPS sovereign debt holdings, and thereby the financial stability of these banks. First, the higher demand for GIIPS bonds and, in turn, higher bond prices implied that banks were able to sell government bonds with a profit and bonds in the banks’ trading book, which are marked to market, increased in value. Both improved the banks’ equity position. For example, Italian-based UBI Banca states in its annual report of 2012: “The effects of the narrowing of the BTP/Bund spread entailed an improvement in the market value of debt instruments with a relative positive net impact on the fair value reserve of Euro 855 million [...]” Consistent with this statement, Krishnamurthy, Nagel, and Vissing-Jorgensen (2014) and Acharya, Pierret, and Steffen (2015) document significantly positive effects on banks’ equity prices after the OMT announcement.

Second, due to the lower sovereign bond spreads and the resulting positive effect on the banks’ financial stability, investors regained faith in the banking sectors of the stressed countries. This improved the ability of banks from GIIPS countries to acquire funding from financial markets. For example, Spain-based BBVA noted in its annual report: “[...] as a result of new measures adopted by the ECB with the outright monetary transactions (OMT), the long-term funding markets have performed better, enabling top-level financial institutions like BBVA to resort to them on a recurring basis for the issue of both senior debt and covered bonds.” In line with this anecdotal evidence, Acharya, Pierret, and Steffen (2015) find that, after the ECB announced its OMT program, U.S. money market funds provided more unsecured funding to European banks. Furthermore, since banks regularly use sovereign bonds as collateral, their access to private repo markets and ECB financing improved as well due to higher bond ratings and the resulting lower haircuts.

In sum, the OMT program announcement has indirectly recapitalized financial institutions in Europe, especially in the periphery of Europe, by raising market prices of sovereign bonds that were under severe stress at the time of the announcement. By targeting GIIPS sovereign bonds in particular, predominantly those banks were recapitalized that contributed significantly to the severe loan supply disruptions during the sovereign debt crisis. By making the program (potentially) unlimited, the ECB provided liquidity insurance for otherwise illiquid banks. As a result, banks were able to re-enter capital

markets and raise capital from private investors.

While the existing literature provides clear evidence that the OMT program was effective in lowering bond spreads and thereby improving the health of banks with large GIIPS sovereign debt holdings, there is still no conclusive evidence about the impact of the ECB's OMT program on bank lending and the real economy. To our knowledge, our paper and a concurrent paper by Ferrando, Popov, and Udell (2015) are the only papers that investigate the effects of OMT on extension of credit to European borrowers. Using survey data, Ferrando, Popov, and Udell (2015) find that after the announcement of OMT, less firms report that they are credit rationed and discouraged from applying for loans. In particular, firms with improved outlook and credit history were more likely to benefit from easier credit access. Therefore, our paper is the first to conduct a comprehensive event-study to analyze the effect on OMT on banks' lending behavior and the resulting real effects for borrowing firms.

3 Data

We use a novel hand-matched dataset that contains bank-firm relationships in Europe, along with detailed firm and bank-specific information. Information about bank-firm relationships are taken from Thomson Reuters LPC's DealScan, which provides a comprehensive coverage of the European syndicated loan market. In contrast to the US, bank financing is the key funding source for firms in our sample since only very few bonds are issued in Europe (Standard&Poor's, 2010).

We collect information on syndicated loans to non-financial firms from all GIIPS countries. In addition, to be better able to disentangle the macro and bank lending supply shock, we include firms incorporated in other European (non-GIIPS) countries. Consistent with the literature (e.g., Sufi, 2007), all loans are aggregated to a bank's parent company. Our sample period spans the fiscal years 2009-2013. We augment the data on bank-firm relationships with firm-level accounting data taken from Bureau van Dijk's Amadeus database. This database contains information about 19 million public and private companies from 34 countries, including all EU countries. Since especially non-listed firms were affected by the lending contraction in the periphery due to their lack of alternative funding sources, we restrict our sample to private firms in Europe (see Acharya, Eisert, Eufinger, and Hirsch (2015)). This allow us to evaluate whether firms that were under severe stress during the peak of the sovereign debt crisis benefited from the OMT announcement.

Finally, we obtain information on bank as well as sovereign CDS spreads from Markit, bank equity and sovereign bond information from Datastream, bank level balance sheet data from SNL, and data on the sovereign debt holdings of banks from the EBA stress

tests, transparency, and capital exercises. For banks to be included in the sample, they must act as lead arranger in the syndicated loan market during our sample period. We identify the lead arranger according to definitions provided by Standard & Poor's, which for the European loan market are stated in Standard & Poor's Guide to the European loan market (2010). Therefore, we classify a bank as a lead arranger if its role is either "mandated lead arranger", "mandated arranger", or "bookrunner". Moreover, the bank needs to be included in EBA stress tests and must have data about the sovereign bond holdings available prior to the OMT announcement (June 2012).

4 Results

4.1 Bank Health

We begin our empirical analysis by investigating the effect of the OMT announcement on the financial health of large European banks. We conduct an event study using CDS spreads that we compile from Markit and use the OMT announcement dates reported in Krishnamurthy, Nagel, and Vissing-Jorgensen (2014), that is: July 26, 2012 ("whatever-it-takes" speech); August 2, 2012 (announcement of the OMT program; and September 6, 2012 (announcement of technical details).

In 2012, financial markets throughout Europe were characterized by tensions and high uncertainty. We account for these market conditions in our analysis by, first, using a 1-day event window in our event study.¹ By employing a narrow window around the OMT announcement dates we are able to separate the effect of the OMT announcement from other events that may potentially influence financial bank health.

Second, we follow the time-series event study approach of Krishnamurthy and Vissing-Jorgensen (2011), which compares the event announcement period (OMT in our case) to other periods of the same length without an event. The advantage of this approach is that it does account for the possibility that other events may arrive during the OMT announcement periods. In doing so the estimated standard errors are more conservative than standard errors from a more traditional cross sectional event study.

Results are presented in Table 1. Column (1) reports results for time-series regressions of CDS spreads on a set of dummy variables for the three OMT announcement dates. We run separate regressions for each subset of banks and report the mean of the sum over the three event dates. The CDS spread of the mean GIIPS bank decreased by -96bp over the three OMT announcement dates, while it decreased by -23bp for the average non-GIIPS bank.

To gauge the statistical significance, we conduct F-tests of the joint significance of

¹Results from a 2-day event window are qualitatively and quantitatively similar.

the dummy variables in our time-series regressions. The F-test is reported in parenthesis below the mean. In the case of GIIPS banks the F-test is -3.4 and for non-GIIPS banks it is -9.2, which indicates that the CDS spreads on days with OMT announcements are jointly significantly different from zero for both subsets of banks. To gauge the difference in the magnitude of the announcement effects for the two subsets, we use a t -test for the difference in means. The test shows that the default risk of GIIPS banks decreased by a larger margin than the default risk of non-GIIPS banks.

We draw two main conclusions from the results presented in Table 1. First, the OMT announcement led to an improvement of bank financial health for all European banks, that is, for GIIPS and non-GIIPS banks, as evidenced by a substantial decrease in CDS spreads. Second, the effect of the OMT announcement for GIIPS banks is about four times larger than the effect for non-GIIPS banks.

To analyze the large difference in the magnitude of the CDS return between non-GIIPS and GIIPS banks, we exploit information on GIIPS sovereign debt holdings of banks directly. In particular, we use changes in sovereign bond prices, as well as information on sovereign debt holdings, to estimate the impact of the OMT program announcement on the value of the banks' sovereign debt holdings. Since a large fraction of these holdings are held in the banks' trading books, and are hence marked to market, an increase in their value translates into an equity capital gain for the banks. We call this variable the *gain*.

To compute the *OMT windfall gain*, we first compile data on the sovereign debt holdings of all sample banks at the closest date before July 26 (the first OMT announcement date) from the EBA webpage.² From Datastream, we obtain information on GIIPS sovereign bonds prices, yields, and duration for various maturities. Second, we calculate the change in bond prices for all maturities around the three OMT announcement dates (July 26, August 2, and September 6) and sum these changes across the three announcement dates.³ Third, we multiply domestic sovereign debt holdings outstanding before July 26 and the sum of change in domestic sovereign bond prices for each maturity with valid bond price information in Datastream. Finally, the windfall gain is given by summing over all GIIPS sovereign bonds in the banks portfolio. We report this gain on sovereign debt holdings as a fraction of a bank's total equity throughout, that is, we define the windfall gains of bank b in country j as:

$$OMT \text{ windfall gain}_{bj} = \frac{\Delta \text{Value GIIPS Sov. Debt}_{bj}}{\text{Total Equity}_{bj}}. \quad (1)$$

Note that, similar to Krishnamurthy, Nagel, and Vissing-Jorgensen (2014), we are only

²Sovereign debt holdings are from June 2012.

³As a robustness check, we compute the change in bond prices by using the duration of a bond and the change in yield, where the change in yield is either computed from Datastream yields or taken from Krishnamurthy, Nagel, and Vissing-Jorgensen (2014). Results do not change.

able to use sovereign yields from three out of the five GIIPS countries (Spain, Italy, and Portugal), since for Greece and Ireland information on yields is partially or completely missing. Since the majority of sovereign debt holdings of GIIPS banks is domestic, we are not able to calculate the *OMT windfall gain* for Greek and Irish banks in our sample, since we cannot derive the gain in value of their sovereign debt holdings.

Table 1, Column (2) reports the results for the *OMT windfall gain*, split by GIIPS and non-GIIPS banks. Both subsets of banks experienced significant windfall gains from the appreciation of value of their sovereign debt portfolio through the announcement of the OMT program. However, when testing the difference between the two subgroups, perhaps not surprisingly, GIIPS banks experienced significantly larger windfall gains compared to non-GIIPS banks as is evidenced by a t -value of 5.21. This significant difference is due to the fact that banks' sovereign banks holdings are biased towards their own domestic sovereign (e.g., Acharya and Steffen (2014)).

Column (3) of Table 1 shows that the value of GIIPS sovereign bond holdings reported to the EBA right before the announcement of the OMT program as a fraction of total assets is roughly 10 times larger for GIIPS banks than for non-GIIPS banks (11.8% compared to 1%). Therefore, as mainly GIIPS sovereign debt appreciated in value in response to the OMT measure, GIIPS banks benefited much more from the OMT program than non-GIIPS banks. Consistent with this explanation, Figure 1 shows a clear negative relation between a bank's sovereign debt holdings and its CDS return around the OMT announcement. This relation is also present within the subsample of GIIPS banks, as shown by Figure 2.

Next, we provide detailed evidence on how much of the change in CDS spreads around the OMT announcements can be explained by banks' sovereign debt holdings and their resulting windfall gains. In particular, we regress the value of the GIIPS sovereign debt holdings of banks and the *OMT windfall gain* on a bank's CDS return. We compute the change in CDS spread for each bank by summing CDS spread changes over the three OMT announcement dates.

Results are presented in Table 2. Panel A reports results for the value of the GIIPS sovereign debt holdings of banks. In all specifications, this variable has a significantly negative effect on a bank's CDS return, suggesting that banks indeed benefited through the increase in the value of their sovereign debt holdings (which is in line with the finding of Acharya, Pierret, and Steffen (2015)). Panel B of Table 2 documents a similar pattern for the *OMT windfall gain* variable.

To summarize, we find evidence which is consistent with the OMT announcement increasing the financial health of large banks in Europe. The effect is larger for those banks that had reduced their lending volume to the real sector during the sovereign debt crisis. We show that an important channel of the mechanism works through GIIPS sovereign debt holdings of banks.

4.2 Bank Lending

We now turn to an investigation of whether the increased health of periphery country banks with high GIIPS sovereign debt holdings, resulting from (i) the increase in equity capital and (ii) the regained access to outside funding, led to an increase in loan supply in the quarters following the OMT announcement. We employ the methodology of Khwaja and Mian (2008) to control for loan demand and other observed and unobserved changes in borrowing firm characteristics. However, the fact that our sample consists of syndicated loans render it unfeasible to use the original setup of Khwaja and Mian (2008).

This is because of two stylized facts about the loans that are reported in Dealscan. First, Dealscan contains information only at the time of the origination of the loan, which does not allow us to observe changes over time for a particular loan (e.g., on credit line drawdowns). Second, the syndicated loans in our sample generally have long maturities. A large number of observations in our sample experience no significant quarter-to-quarter change in bank-firm lending relationships. This requires us to modify the Khwaja and Mian (2008) estimator and aggregate firms into clusters to generate enough time-series bank lending heterogeneity to meaningfully apply the estimator to our data. In particular, we track the evolution of the lending volume from a specific bank to a certain firm cluster.

To this end, we form firm clusters based on the following three criteria, which capture important drivers of loan demand, as well as the quality of firms in our sample: (1) the country of incorporation; (2) the industry; and (3) the firm rating. The main reason for aggregating firms based on the first two criteria is that firms in a particular industry in a particular country probably share a lot of firm characteristics and were thus likely affected in a similar way by macroeconomic developments during our sample period. Our motivation behind forming clusters based on credit quality follows from theoretical research in which credit quality is an important source of variation driving a firm's loan demand (e.g., Diamond (1991)).

Since we focus on private borrowers, firms in our sample generally do not have a credit rating. To aggregate firms into clusters, we assign ratings estimated from interest coverage ratio medians for firms by rating category provided by Standard & Poor's. This approach exploits the fact that our measure of credit quality which is based on accounting information is monotone across credit categories. We follow Standard & Poor's and assign ratings on the basis of the three-year median interest coverage ratio of each firm.

We start our empirical investigation by analyzing the supply of bank loans to private borrowers around the OMT announcement graphically. Figure 3 plots the log of the sum of all revolver and term loans provided by banks that strongly benefited (above median *OMT windfall gain*) and banks that benefited less (below median *OMT windfall gain*) from the OMT announcement in a given quarter. Note that we measure the change in loan volume relative to the quarter of the OMT announcement, that is, the y-axis is

normalized to zero at the time of the announcement in Q3 2012. Figure 3 documents a significant increase in loan supply by banks that strongly benefited from the OMT announcement to private borrowers after Q3 2012. In contrast, we do not see a similar increase in loan supply by banks that did not significantly benefit from the measure. Furthermore, the figure shows that, pre-OMT announcement, the bank loan supply by banks with a low *OMT windfall gain* is higher than that by banks with a high *OMT windfall gain*, a result confirmed by previous studies (e.g. Acharya, Eisert, Eufinger, and Hirsch (2015)).

Our preferred specification to estimate the quarterly change in loan volume provided by bank b in country j to firm cluster m in quarter t is given by:

$$\begin{aligned} \Delta Volume_{bmt+1} &= \alpha + \beta_1 \cdot OMT\ windfall\ gain_{bj} * PostOMT \\ &+ \gamma \cdot X_{bjt} + Firm\ Cluster_m \cdot Quarter-Year_{t+1} \\ &+ Firm\ Cluster_m \cdot Bank_{bj} + u_{bmt+1}, \end{aligned} \tag{2}$$

where *OMT windfall gain* is as defined in Eq. (1).

We present the results of our empirical analysis in Table 3. Panel A reports results when we consider all loans provided to private borrowers, that is, revolver and term loans. As before, we use a bank's windfall gain on its sovereign debt portfolio from the OMT announcement to proxy how much the bank benefited from the OMT program. Therefore, our main variable of interest is *OMT windfall gain* interacted with a dummy variable *PostOMT*, which is equal to one when the quarter falls into the period after the OMT announcement.

The results in Table 3, Panel A show that banks with higher windfall gains from the OMT announcement significantly increased their supply of bank loans to private borrowers after the OMT announcement across all specifications, which control for different sets of fixed effects. When we include bank and quarter-year fixed effects in our regression, the coefficient on the interaction between *OMT windfall gain* and *PostOMT* is positive and significant, as shown in Column (1).

This result continues to hold if we interact firm-cluster and bank fixed effects. By doing this, we exploit the variation within the same firm-cluster-bank relationship over time. This controls for any unobserved characteristics that are shared by firms in the same cluster, bank heterogeneity, and for relationships between firms in a given cluster and the respective bank. The results of this specification are presented in Column (2). The interaction between *OMT windfall gain* and *PostOMT* remains positive and significant. Finally, in the results reported in Column (3), we add firm-cluster-time fixed effects, which allow us to additionally control for any time observed and unobserved time-varying characteristics that are shared by firms in the same cluster.

To further test the robustness of these results, we follow Peek and Rosengreen (2005)

and Giannetti and Simonov (2013) and employ the probability of a loan increase instead of the change in the loan amount as the dependent variable in our regression analysis. Results in Column (5) of Table 3 confirm that our result is invariant to using this alternative measure of lending supply expansion.

Finally, Column (6) of Table 3 estimates the regression when we restrict our sample to GIIPS banks. Recall that, in particular, GIIPS banks hold large GIIPS sovereign debt holdings, which implies that especially these banks benefited from the OMT program announcement. The significant coefficient in Column (6) shows that also within the subsample of GIIPS banks, those banks with higher windfall gains increased lending to private borrowers more than GIIPS banks with lower windfall gains.

We now turn to analyzing how the announcement of the OMT program has affected the composition of loans, that is, the composition of term loans and revolving credit facilities. Acharya, Almeida, Ippolito, and Perez (2014) study how firms that face a high liquidity risk manage their liquidity. They provide evidence that firms with high liquidity risk prefer to use cash rather than revolving credit lines because the cost of bank credit lines increases with liquidity risk due to the fact that banks may revoke access to liquidity in states where the firms need liquidity.

Along the lines of this argument, we hypothesize that, given the choice, high liquidity risk firms would prefer term loans over credit lines. The reason is that at the time of its announcement, it was unclear whether the OMT program would have lasting positive effects on the liquidity situation of banks which had incurred a substantial liquidity shock during the sovereign debt crisis. Therefore, high liquidity risk firms may fear to lose access to bank credit lines and choose term loans over revolving credit lines. Note that our sample consists of loans to private firms only. Previous studies have found that these firm faced a high liquidity risk during the sovereign debt crisis (e.g., Acharya, Eisert, Eufinger, and Hirsch (2015)).

Table 3, Panel B and C replicates the results for our loan regressions in Panel A, restricting the sample to term loans and revolver, respectively. The results in Table 3, Panel B confirm that banks with higher windfall gains from the OMT program announcement significantly increased the supply of term loans to private firms in the period following the OMT announcement. A different picture emerges for revolving credit lines, for which the results are shown in Panel C. While we find some evidence that the revolving credit amount extended to private firms increased, this result disappears if we control for loan demand factors by including the interaction of firm cluster and time fixed effects in our regression.⁴ Consistent with these findings, Figure 4 shows that banks with high windfall gains significantly increased the amount of term loans they are issuing, but that the

⁴Recall that the unit of observation in our loan regressions is a firm cluster quarter. Therefore, the interaction of firm cluster and quarter fixed effects is similar to employing an interaction of firm and quarter fixed effects in the original Khwaja and Mian (2008) setup.

amount of credit lines starts to only slightly increase in the last quarter of 2013 (almost one and a half years after the OMT announcement). Taken together, we find evidence that is consistent with the announcement of the OMT program leading to an increase in loan volume which is driven by the windfall gain of banks on their sovereign debt portfolio.

We now turn to analyzing which type of borrowers benefited most from an increased lending volume in the period after the announcement of the OMT program. We identify a low-quality (high-quality) borrower as a borrower with a below (above) country median 3-year interest coverage ratio, where we use the period 2009 to 2011 (i.e., the crisis years) to calculate the 3-year median. Results are presented in Table 4. We report results for the group of firms with below (above) country median interest coverage ratio in Panel A (B).

The general picture that emerges from Table 4 is that the increase in loan volume in the period after the OMT announcement is entirely driven by low-quality borrowers in our sample. For low-quality borrowers the interaction of a bank's *OMT windfall gain* and *PostOMT* is positive and statistically different from zero across all specifications, as shown in Table 4, Panel A. However the interaction is not different from zero for high-quality borrowers in the specifications presented in Table 4, Panel B.

An explanation for this result is that in many cases borrowers with a below country median interest coverage ratio are precisely those borrower that had close borrowing relationships with GIIPS banks in the past. Acharya, Eisert, Eufinger, and Hirsch (2015) show that, while not being less healthy before the outbreak of the European sovereign debt crisis, firms that were very dependent on GIIPS banks became financially constrained during the sovereign debt crisis because GIIPS banks were weakly capitalized and decreased lending to the private sector. Since bank-borrower relationships are sticky (Chodorow-Reich (2014) and Acharya, Eisert, Eufinger, and Hirsch (2015)), and private firms are less able to utilize alternative funding sources, these borrowers were stuck with weakly capitalized banks. This implies that they got under stress themselves and as a result their interest coverage ratios decreased (Figure 5).

4.3 Real and Financial outcomes

Given the evidence from the previous section that banks with higher windfall gains from the OMT announcement significantly increased their lending volume to the real sector, we now investigate how firms use this cash inflow from new loans. To analyze the real and financial outcomes of borrowing firms, we closely follow the approach in Acharya, Eisert, Eufinger, and Hirsch (2015). In particular, we now divide the financial information reported in Amadeus into the period before the OMT program announcement (i.e., fiscal years 2009 to 2011) and the period after the OMT program announcement (i.e., fiscal years 2012 and 2013). We construct a new indicator variable, *PostOMT*, which

is now equal to one if the financial information reported in Amadeus falls in the respective period.

To determine how much firms benefited from the OMT announcement through their banking relationships, we construct a variable that measures how much firms gained indirectly from the OMT announcement through the sovereign debt holdings of their banks. We denote this variable as *Indirect OMT windfall gain*.

To construct the variable, in a first step, we use the *OMT windfall gain* of each individual bank, as defined in Eq. (1), to compute the *Average OMT windfall gain* for all the banks that act as lead arranger in a given syndicate. Second, we calculate the indirect gains of a firm from the OMT program due to the windfall gains of the banks it has lending relationships with by using the fraction of syndicated loans a bank gets from a particular syndicate as weights. This yields the following measure for firm i in country j in industry h at time t :

$$\text{Indirect OMT windfall gains}_{ijht} = \frac{\sum_{l \in L_{ijht}} \text{Average OMT windfall gain}_{lijh} \cdot \text{Loan Amount}_{lijht}}{\text{Total Loan Amount}_{ijht}}, \quad (3)$$

where L_{ijht} are all of the firm's loans outstanding at time t . We measure the dependence on banks that benefited from the OMT announcement as the average dependence on these banks over the 2009-2011 period.⁵

Table 5 presents descriptive statistics for our sample firms in the pre-OMT period of 2009-2011, split into firms with high and low indirect gains on sovereign debt through their banks. Consistent with (Acharya, Eisert, Eufinger, and Hirsch (2015)), firms with a higher dependence on banks that benefited from the OMT announcement are larger and have a higher fraction of tangible assets. However, note that, while in the pre-crisis period of 2006-2008 firms in the two groups were comparable along all other observable dimensions, in the pre-OMT period of 2009-2011 firms with a higher dependence on banks that benefited from OMT (i.e., banks that were cutting lending significantly more during the peak of the crisis), have a lower interest coverage ratio, net worth and EBITDA/Assets ratio. This indicates that the quality of these firms deteriorated over the crisis period due to the fact that these firms could not access bank financing in this period.

We use four different proxies for the corporate policies of firms. In particular, we use changes in cash holdings ($(\text{cash}_{t+1} - \text{cash}_t) / \text{total assets}_t$) or leverage ($(\text{total liabilities}_{t+1} - \text{total liabilities}_t) / \text{total assets}_t$) to proxy for the change in financial policies of firms. To analyze non-financial firm policies, we consider employment growth ($\Delta \log \text{Employment}$) and investment ($\text{CAPX} / \text{Tangible Assets}$).

We begin by exploring the effect of the sovereign debt crisis on several firm outcomes

⁵Results are qualitatively similar when using the 2006-2008 average.

graphically.⁶ In Figures 6–9, we plot the time series of the cash holdings, leverage, employment growth rates, and investment levels, respectively, for firms with a high and low dependence on banks that strongly benefited from the OMT announcement, which is defined in Eq. (3). Note, that the x-axis in the graphs is divided into three segments. The first vertical line divides the pre and post sovereign debt crisis period. This partition is similar to the one used in Acharya, Eisert, Eufinger, and Hirsch (2015). We add a second vertical line that separates the pre and post OMT period. The graphs reconfirm the findings in (Acharya, Eisert, Eufinger, and Hirsch (2015)) that firms with a high and low dependence on banks that benefited from OMT (which are mostly GIIPS banks) were on similar trends prior to the beginning of the sovereign debt crisis.

Furthermore, the graphs clearly reveal that firms with lending relationships to banks that benefited from the OMT announcement show a significant increase in leverage and cash holdings, but no change in their investment level or employment growth rates. Moreover, cash and leverage increased by roughly the same share, suggesting that borrowing firms used the cash inflow from new loans primarily to build up cash reserves.

To formally investigate whether borrowing firms with significant business relationships to banks that benefited from the OMT announcement altered their corporate policies, we employ the following specification for firm i in country j , and industry h in year t :

$$\begin{aligned}
y_{ijht+1} &= \alpha + \beta_1 \cdot \text{Indirect OMT windfall gains}_{ijh} \\
&+ \beta_2 \cdot \text{Indirect OMT windfall gains}_{ijh} \cdot \text{PostOMT}_t \\
&+ \gamma \cdot X_{ijht} + \text{Firm}_{ijh} + \text{Industry}_h \cdot \text{Country}_j \cdot \text{Year}_{t+1} \\
&+ \text{ForeignBankCountry}_{k \neq j} \cdot \text{Year}_{t+1} + u_{ijht+1}.
\end{aligned} \tag{4}$$

Our baseline regression includes firm and year fixed effects, as well as firm-level control variables to capture other determinants of firms' corporate policies. These include firm size, leverage, net worth, the fraction of tangible assets, the interest coverage ratio, and the ratio of EBITDA to total assets. Additionally, we include interactions between industry, year, and country fixed effects to capture any unobserved time-varying shocks to an industry in a given country in a given year that may impact credit demand of borrowing firms as well as their real outcomes.

We observe a number of cross boarder firm-bank relationships in our sample. For example, a German firm borrowing from a Spanish bank. To capture possible effects that the German firm's exposure to the potentially changing macroeconomic environment in Spain after the OMT announcement that might be correlated with its dependence on a Spanish bank (e.g., because the German firm has a subsidiary in Spain), we include foreign bank country times year fixed effects. For the example of the German firm with a

⁶Note that we control for observable firm characteristics such as industry, country, and size in the figures.

Spanish subsidiary, besides the industry-country-year fixed effect, we additionally include a Spain-year fixed for this firm.

Results are presented in Table 6. The unit of observation is a firm-year. For ease of exposure, we only report the results for our key variable of interest, the interaction of *Indirect OMT windfall gains* with the *PostOMT* dummy. The results in Table 6 show distinct patterns for the behavior of financial and real variables after the OMT program announcement. For the financial variables, we find a significant increase in both cash and leverage. Note that the difference of the coefficients for the change in cash and change in leverage regressions is small and statistically insignificant (see Column (3)). This again suggests that both leverage and cash holdings increased by a similar amount, implying that firms used the liquidity inflow primarily to increase their cash reserves. This result is further confirmed by the fact that we do not find any significant effects for the real variables. Neither employment nor investment change significantly for firms with high *Indirect OMT windfall gains* in the period after the OMT announcement. Columns (6)–(10) show that results are robust to the exclusion of *ForeignBankCountry*Year* fixed effects. In the remainder we will stick to our preferred specification as described in Eq. (4).

One potential explanation for the results presented in Table 6 is that at the time of its announcement, it was unclear whether the OMT program would permanently improve the liquidity situation of banks. Therefore, firms may have prepared for a possible contraction in credit by hoarding more cash on their balance sheet. To shed more light on the reasons behind the significant increase in cash holdings of firms with higher *Indirect OMT windfall gains*, we follow the approach of Almeida, Campello, and Weisbach (2004), who show that firms that expect to be financially constrained in the future respond by saving more cash out of their cash flow today. In contrast, financially unconstrained firms show no significant association between cash flow and cash holdings. To test whether firms with high *Indirect OMT windfall gains* are indeed less financially constrained after the OMT announcement we employ the following specification:

$$\begin{aligned}
\Delta Cash_{ijht+1} &= \alpha + \beta_1 \cdot Indirect\ OMT\ windfall\ gains_{ijh} + \beta_2 \cdot Cash\ Flow_{ijht} \\
&+ \beta_3 \cdot Indirect\ OMT\ windfall\ gains_{ijh} \cdot PostOMT_t \\
&+ \beta_4 \cdot PostOMT_t \cdot Cash\ Flow_{ijht} \\
&+ \beta_5 \cdot Indirect\ OMT\ windfall\ gains_{ijh} \cdot Cash\ Flow_{ijht} \\
&+ \beta_6 \cdot Indirect\ OMT\ windfall\ gains_{ijh} \cdot PostOMT_t \cdot Cash\ Flow_{ijht} \\
&+ \gamma \cdot X_{ijht} + Firm_{ijh} + Industry_h \cdot Country_j \cdot Year_{t+1} \\
&+ ForeignBankCountry_{k \neq j} \cdot Year_{t+1} + u_{ijht+1}.
\end{aligned} \tag{5}$$

Table 7, Column (1) presents results for the degree to which firms save cash out of their cash flow. Several findings emerge from the table. First, the interaction of *Indirect*

OMT windfall gains with the *PostOMT* dummy is positive and statistically significant, hence confirming the results reported in Table 6, Column (1). Second, the interaction of cash flow with *Indirect OMT windfall gains* is significant and statistically different from zero, which implies that firms with higher *Indirect OMT windfall gains* tend to save more cash out of their cash flow prior to the OMT announcement. Therefore, these firms show the typical behavior of a financially constrained firm. These results provide evidence that these firms were more financially constrained during the sovereign debt crisis period, which precedes the OMT announcement period. However, this pattern partially reverses in the period after the OMT program announcement. The coefficient of the triple interaction of *Indirect OMT windfall gains*, *PostOMT*, and cash flow is negative and statistically significant at the 5% level.

To investigate whether firms with higher *Indirect OMT windfall gains* have a significantly higher propensity to save the proceeds from loans as cash for precautionary reasons after the OMT announcement, we estimate the following specification:

$$\begin{aligned}
\Delta Cash_{ijht+1} &= \alpha + \beta_1 \cdot Indirect\ OMT\ windfall\ gains_{ijh} + \beta_2 \cdot New\ Loan_{ijht} \\
&+ \beta_3 \cdot Indirect\ OMT\ windfall\ gains_{ijh} \cdot PostOMT_t \\
&+ \beta_4 \cdot PostOMT_t \cdot New\ Loan_{ijht} \\
&+ \beta_5 \cdot Indirect\ OMT\ windfall\ gains_{ijh} \cdot New\ Loan_{ijht} \\
&+ \beta_6 \cdot Indirect\ OMT\ windfall\ gains_{ijh} \cdot PostOMT_t \cdot New\ Loan_{ijht} \\
&+ \gamma \cdot X_{ijht} + Firm_{ijh} + Industry_h \cdot Country_j \cdot Year_{t+1} \\
&+ ForeignBankCountry_{k \neq j} \cdot Year_{t+1} + u_{ijht+1}.
\end{aligned} \tag{6}$$

Column (2) of Table 7 presents results for the extent to which firms save cash out of newly granted loans. The coefficient of the triple interaction of the variables *Indirect OMT windfall gains*, *PostOMT*, and the *New Loan* dummy (β_6 in Eq. (6)) is positive and statistically significant at the 5% level, implying that higher *Indirect OMT windfall gains* firms save more cash if they receive a new loan for precautionary reasons. Furthermore, firms borrowing from banks that did not significantly benefit from the OMT measure do not show a significant relation between receiving a new loan and the change in their cash holdings in the post OMT period, as can be seen from the insignificant coefficient on the interaction between *New Loan* and *PostOMT*. Finally, Column (3) of Table 7 estimates the models in Eq. (5) and (6) together. The results continue to hold if we include the variables used in the cash flow sensitivity of cash regression of Column (1) as additional controls.

Table 4 reports that primarily low-quality firms benefited from the expansion in loan volume induced by the increase in the value of the sovereign debt holdings in the period following the OMT program announcement. Next, we provide evidence on the association between real effects and the *Indirect OMT windfall gains* of these firms. Table 8 presents

the results for our baseline regressions for the four different corporate policies of firms (i.e., change in cash, change in debt, employment growth, and investment). Table 8, Panel A reports results for firms with a below and Panel B provides results for firms with an above country median average interest coverage ratio. The general picture that emerges from the table is that the financial effects reported in Table 6 for our entire sample of firms is driven mostly by the low interest coverage subset of firms while neither high- nor low-quality firms show a significant relation between *Indirect OMT windfall gains* of their banks and real economic activity like employment and investment.

Furthermore, Table 9 replicates the analysis presented in Table 7 for the subset of firms split by the country median of the average interest coverage ratio and reports results for the the degree to which firms save cash out of their new loans or cash flow. For low-quality firms, Column (1) of Panel A confirms that below average interest coverage firms were financially constrained in the pre-OMT announcement period as evidenced by a positive and significant coefficient of the interaction between *Indirect Gains on Sov. Debt* and cash flow. However, the coefficient of the triple interaction of the variables *Indirect OMT windfall gains*, *PostOMT*, and cash flow is negative and statistically significant, implying that the relation between cash holdings and cash flow partially reverts following the OMT program announcement. Hence, low-quality firms were less financially constrained in the period following the OMT program announcement.

We now analyze the question of how much low-quality borrower save cash out of the proceeds from newly obtained loans. Table 9, Column (2) presents the results. We find a positive and statistically significant (at the 5% level) coefficient of the triple interaction of the variables *Indirect OMT windfall gains*, *PostOMT*, and the *New Loan* dummy (β_5 in Eq. (5)), implying that higher *Indirect OMT windfall gains* save significantly more cash if they receive a new loan. Furthermore, Table 9, Column (3) reveals that this result continues to hold when we include further explanatory variables. Thus, low-quality borrower experiencing higher *Indirect OMT windfall gains* from their banking relationship save more cash out of newly obtained loans.

However, the result is different if we analyze the behavior of high-quality firms with respect to how these firms manage their cash holdings. Panel B of Table 9 reports the results. Column (1) reveals that also high-quality firms were financially constrained in the periods preceding the OMT announcement, although the coefficients are much smaller here in economical terms and the difference between the coefficient of *Indirect OMT windfall gains***Cash Flow* of high- and low-quality firms is statistically significantly different (t -statistic of 2.59 and 2.64), implying that overall high-quality firms were significantly less constrained during the crisis. However, they seem to have remained financially constrained in the period following the OMT program announcement.

An explanation for this finding is that high-quality firms did not benefit from the increased credit supply of banks following the OMT announcement, as indicated by the

results in Table 4. Instead they even experienced a small decrease in their outstanding loans (the loan volume as a fraction of total assets decline by roughly 2pp for these firms). This is in contrast to the subset of low-quality firms that benefited from the increase in loan volume and became financially unconstrained after the OMT announcement. Consistent with the evidence presented in Table 4 and Table 8, we do not find that high-quality borrower save more cash out of the proceeds from newly obtained loans.

Taken together, we find that low-quality borrower benefited from the expansion in credit supply and as a result of these new loans became financially unconstrained in the aftermath of the OMT announcement. However, our results indicate that low-quality firms use the proceeds from new loans to regain financial stability and create a financial buffer instead of making investments into new projects. High-quality firms, on the other hand, remain financially constrained in the period after the OMT announcement because they do not obtain new loans from banks.

4.4 Subsidiaries

In this section, we provide a further robustness check for the relation between the windfall gains incurred by banks through the OMT program announcement and the corporate policies of firms. Our robustness check is based on the information on subsidiaries provided in Amadeus and closely follows the approach in Acharya, Eisert, Eufinger, and Hirsch (2015). Recall that, because of the bias in sovereign debt holdings of banks, GIIPS banks benefited the most from the OMT program announcement. By focusing on non-GIIPS borrower without subsidiaries in GIIPS countries but with a GIIPS bank relationship, we can inform the debate about potential spillover effect of the OMT announcement to non-GIIPS countries.

Focusing on non-GIIPS borrower without subsidiaries also helps to alleviate the concern that our results are driven by the poor macroeconomic environment in GIIPS countries which prevents firms from investing and creating new jobs. Acharya, Eisert, Eufinger, and Hirsch (2015) report that the majority of the GIIPS bank non-GIIPS borrower relationships in the subsample of non-GIIPS firms without GIIPS subsidiary come from GIIPS banks inheriting relationships after the acquisition of a non-GIIPS bank (e.g., Unicredit acquiring Bayrische Vereinsbank).

Table 10, Panel A provides results for our baseline regressions for the four different corporate policy measures (i.e., change in cash, change in debt, employment growth, and investment) for the subsample of non-GIIPS firms that have no subsidiary in GIIPS countries. The results in Panel A confirm our previous finding that firms with higher *Indirect OMT windfall gains* through their banking relationships increase cash and debt but do not invest in new projects or hire more people.

As a robustness check, Panel B of Table 10 focuses on GIIPS firms that were less

exposed to the macroeconomic environment in the periphery countries, that is, GIIPS firms with foreign non-GIIPS subsidiaries (e.g., a Spanish firm that has a significant fraction of its revenues generated by a German subsidiary). The results show that also for these firms we observe a significant increase in leverage and cash holdings that can be attributed to their *Indirect OMT windfall gains* through their banking relationships, but no significant effects on employment and investment. In Table 11, we replicate the analysis regarding the effects of new loans presented in Table 7 for the subsample of non-GIIPS firms without GIIPS subsidiary (Panel A) and the subsample of GIIPS firms with an above median fraction of their revenue generated by non-GIIPS subsidiaries. Results are qualitatively similar to the prior analysis for these two subsamples.

Therefore, we find that even firms that were arguably least exposed to the macroeconomic environment in the periphery countries show no significant increase in real economic activity following the restored access to bank financing. Also for these firms it seems to be of first-order importance to improve their financial stability and build up cash reserves.

5 Conclusion

In this paper, we show that the announcement of the OMT program has significantly improved the health of banks in the periphery of Europe. By substantially reducing the yields on periphery sovereign debt, GIIPS banks could realize significant windfall gains on their large sovereign debt holdings. These gains significantly reduced bank risk and allowed banks to access market based financing again. The increase in bank health translated into an increased loan supply to the corporate sector, especially to low-quality borrowers. These firms use the cash inflow from new bank loans to build up cash reserves, but show no significant increase in real activity, that is, no increase in employment or investment.

This is also true for firms that are arguably least exposed to the macroeconomic environment in the periphery countries, i.e., non-GIIPS firms without GIIPS subsidiaries. This suggests that improving their financial situation seems to be of first-order importance for firms that regained access to bank financing. We are hence the first to provide cross-country evidence on the effect of the OMT announcement on bank lending behavior in the syndicated loan market and the real effects of the increased loan supply of periphery country banks for borrowing firms in Europe.

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Appendix

Figure 1

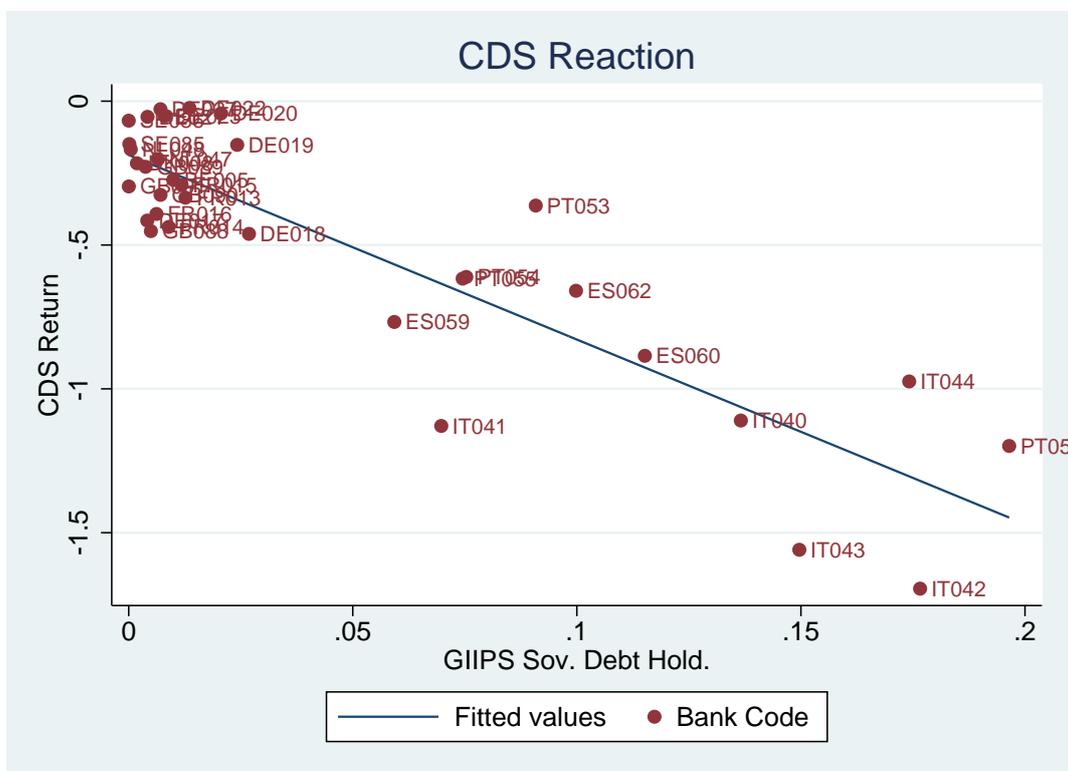


Figure 1 plots the relation between banks' CDS return on the OMT announcement dates and their GIIPS sovereign debt holdings for GIIPS and non-GIIPS banks. Banks included in the analysis must have information about their sovereign debt portfolio prior to the OMT announcement (June 2012) and must be active in the syndicated loan market during the sample period. GIIPS Banks include banks incorporated in Italy, Portugal, and Spain. Non-GIIPS banks consist of banks in all other European countries that are included in the European Banking Authority's stress tests and capital exercises.

Figure 2

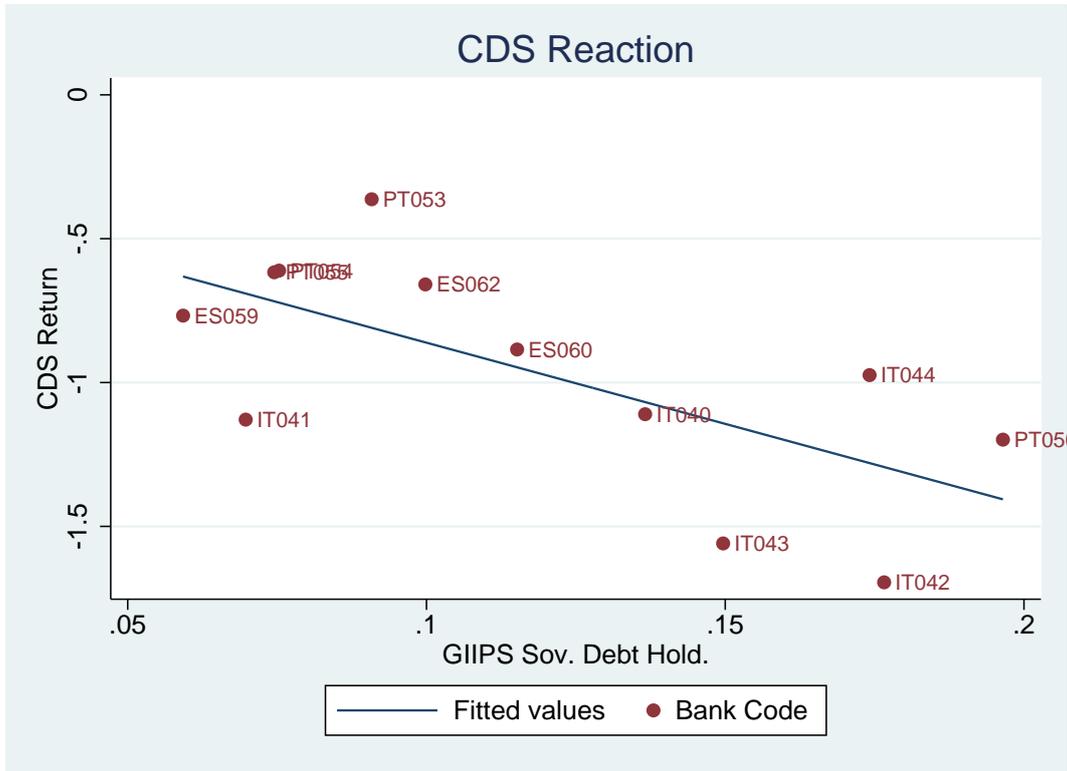


Figure 2 plots the relation between banks' CDS return on the OMT announcement dates and their GIIPS sovereign debt holdings for GIIPS banks only. Banks included in the analysis must have information about their sovereign debt portfolio prior to the OMT announcement (June 2012) and must be active in the syndicated loan market during the sample period. GIIPS Banks include banks incorporated in Italy, Portugal, and Spain.

Figure 3

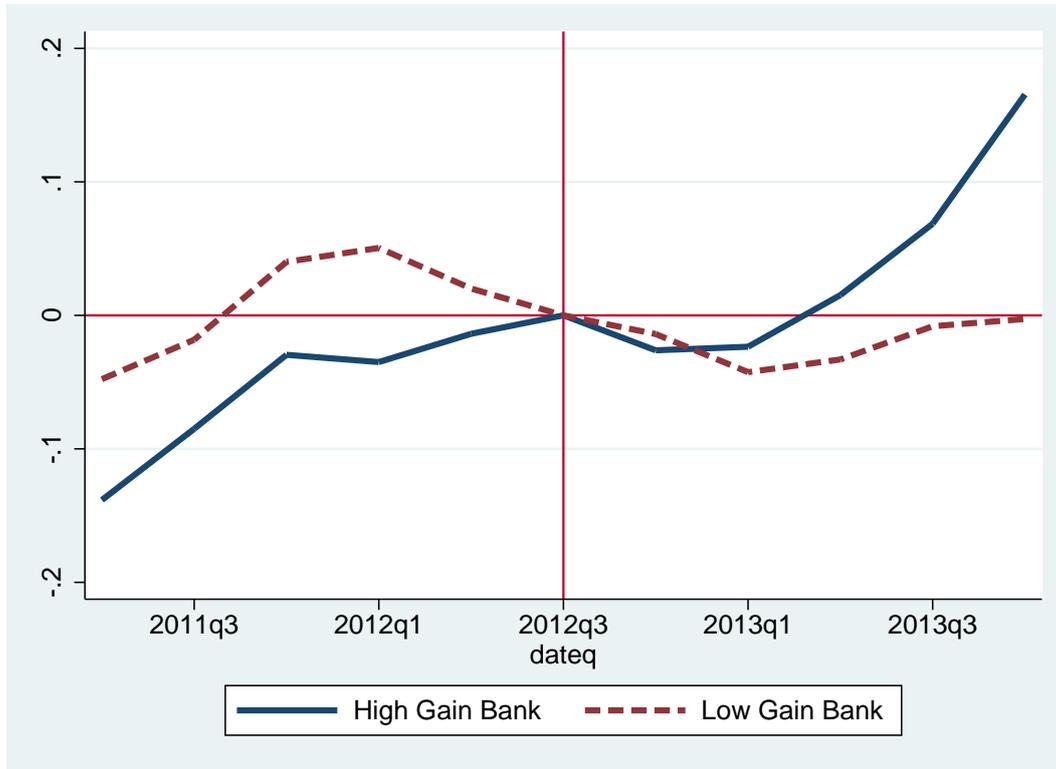


Figure 3 shows the log-ratio of total loans in a given quarter relative to the quarter of the OMT announcement, i.e., the y-axis is normalized to 0 at the time of the OMT announcement. For each quarter we aggregate all loans to private firms borrowing from GIIPS and non-GIIPS banks where GIIPS banks are banks headquartered in Italy, Portugal, or Spain. Non-GIIPS banks consist of banks in all other European countries that are covered by the European Banking Authority's stress tests and capital exercises. We consider all loans in Dealscan and restrict the sample to private firms with financial information available in Amadeus.

Figure 4

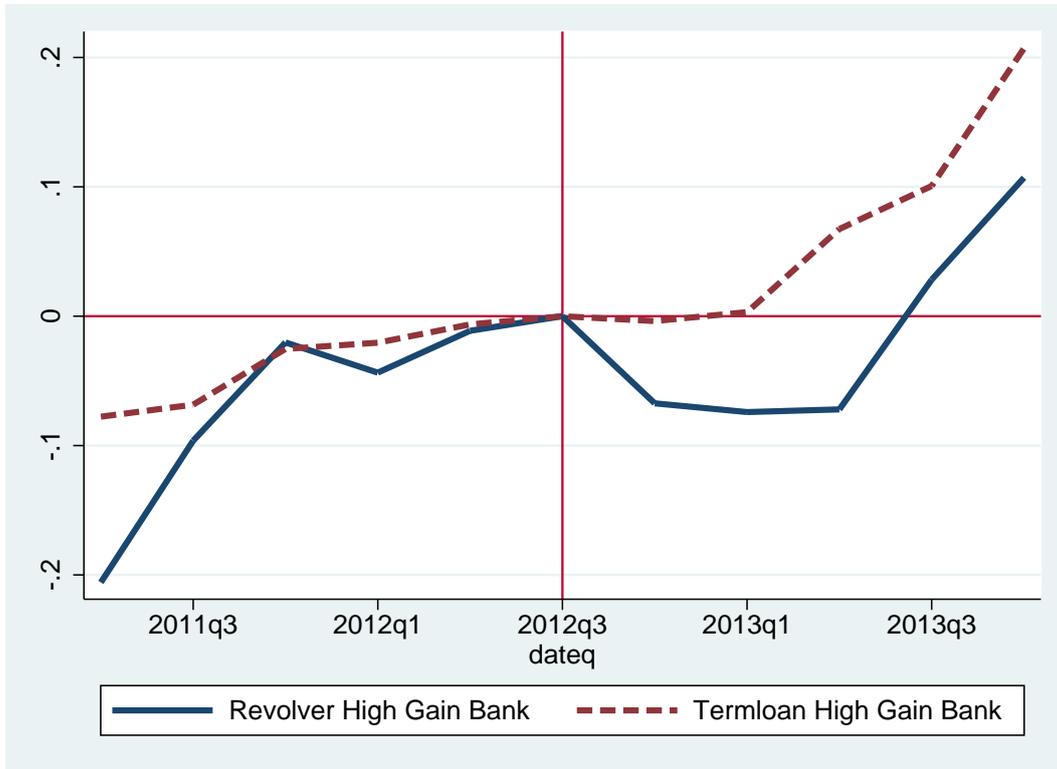


Figure 4 shows the log-ratio of total revolver or term loans in a given quarter relative to the quarter of the OMT announcement, i.e. the y-axis is normalized to 0 at the time of the OMT announcement. For each quarter we aggregate revolver and term loans to private firms borrowing from GIIPS banks where GIIPS banks are banks headquartered in Italy, Portugal, or Spain. Non-GIIPS banks consist of banks in all other European countries that are covered by the European Banking Authority's stress tests and capital exercises. We consider all loans in Dealscan and restrict the sample to private firms with financial information available in Amadeus.

Figure 5

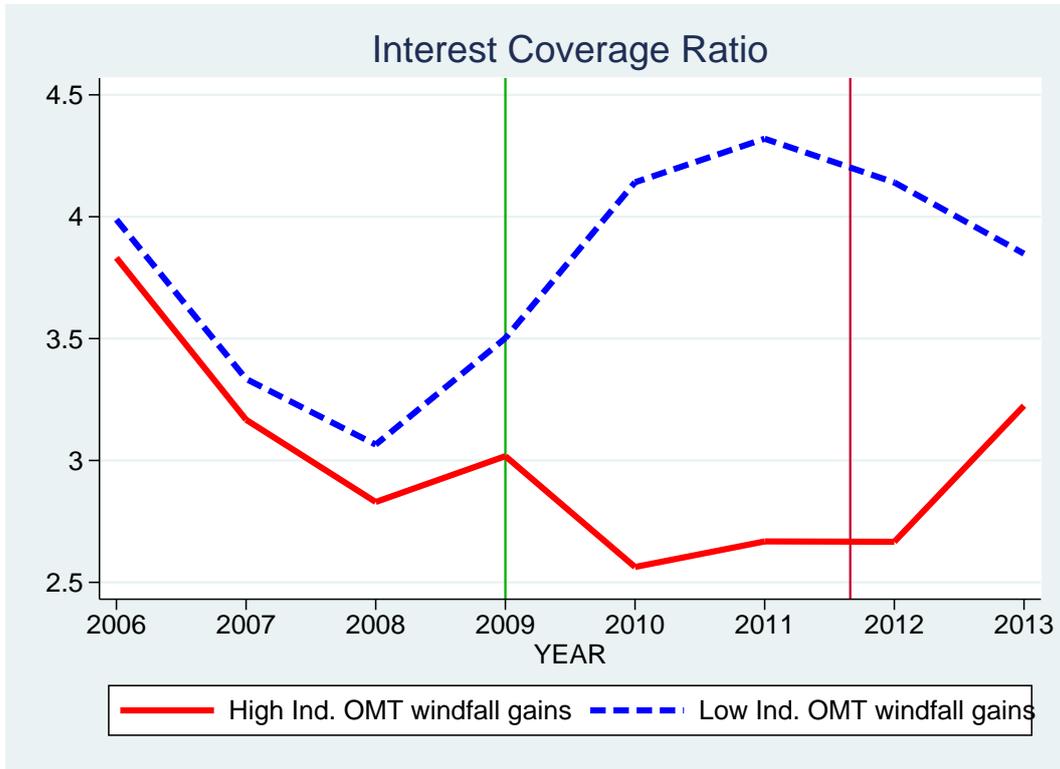


Figure 5 shows the evolution of interest coverage ratio for firms with high (red solid line) and low (blue dashed line) dependence on banks that benefited from the OMT announcement in the pre-OMT and post-OMT period. We consider all loans in DealScan to firms located in: Greece, Italy, Ireland, Portugal, Spain (GIIPS countries) and all other EU countries with an active syndicated loan market (non-GIIPS countries). We restrict the sample to private firms with financial information in Amadeus.

Figure 6



Figure 6 shows the evolution of cash holdings as a fraction of total assets for firms with high (red solid line) and low (blue dashed line) dependence on banks that benefited from the OMT announcement in the pre-OMT and post-OMT period. We consider all loans in DealScan to firms located in: Greece, Italy, Ireland, Portugal, Spain (GIIPS countries) and all other EU countries with an active syndicated loan market (non-GIIPS countries). We restrict the sample to private firms with financial information in Amadeus.

Figure 7

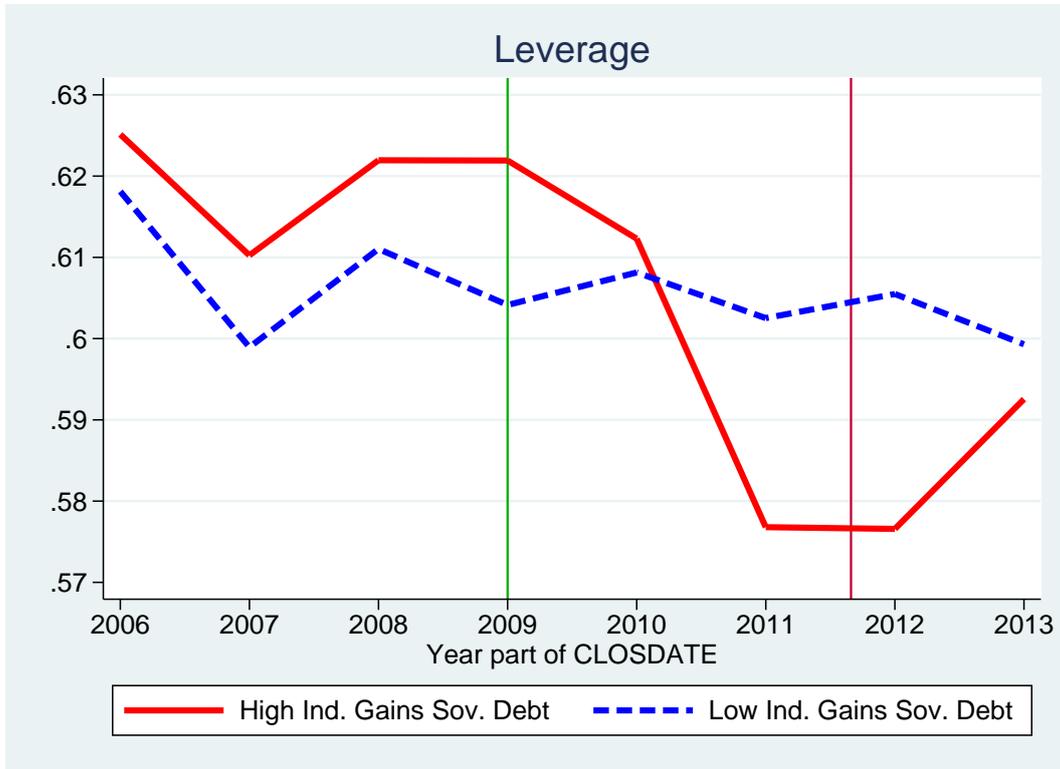


Figure 7 shows the evolution of leverage as a fraction of total assets for firms with high (red solid line) and low (blue dashed line) dependence on banks that benefited from the OMT announcement in the pre-OMT and post-OMT period. We consider all loans in DealScan to firms located in: Greece, Italy, Ireland, Portugal, Spain (GIIPS countries) and all other EU countries with an active syndicated loan market (non-GIIPS countries). We restrict the sample to private firms with financial information in Amadeus.

Figure 8

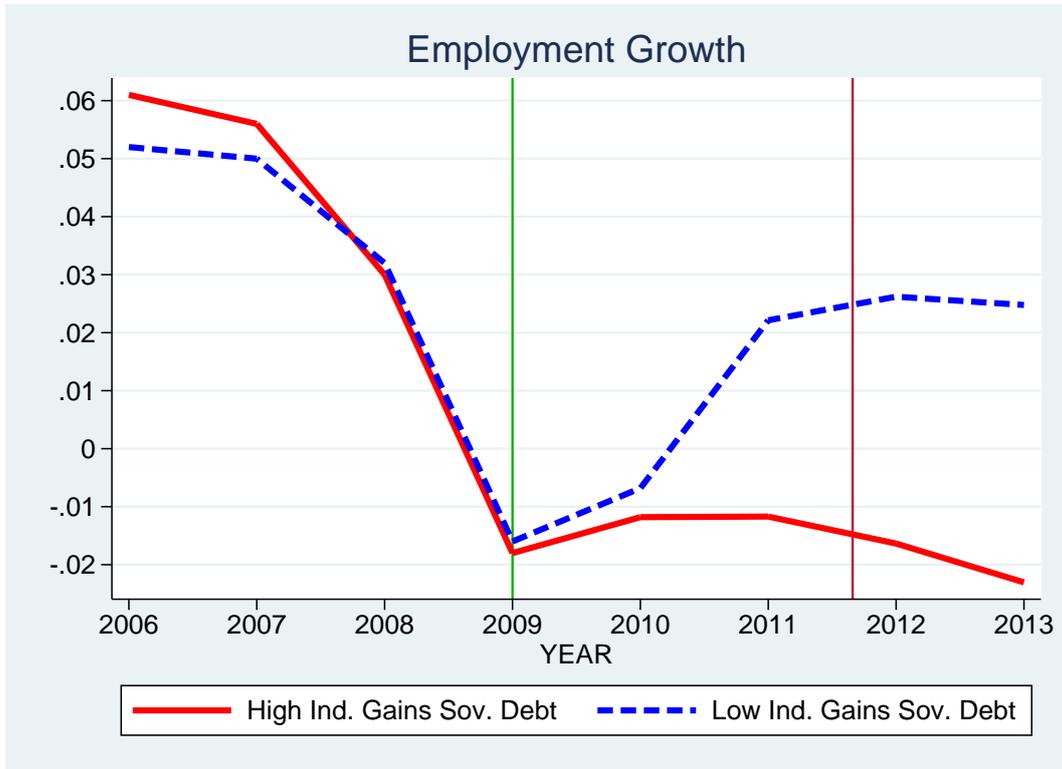


Figure 8 shows the evolution of employment growth rates for firms with high (red solid line) and low (blue dashed line) dependence on banks that benefited from the OMT announcement in the pre-OMT and post-OMT period. We consider all loans in DealScan to firms located in: Greece, Italy, Ireland, Portugal, Spain (GIIPS countries) and all other EU countries with an active syndicated loan market (non-GIIPS countries). We restrict the sample to private firms with financial information in Amadeus.

Figure 9

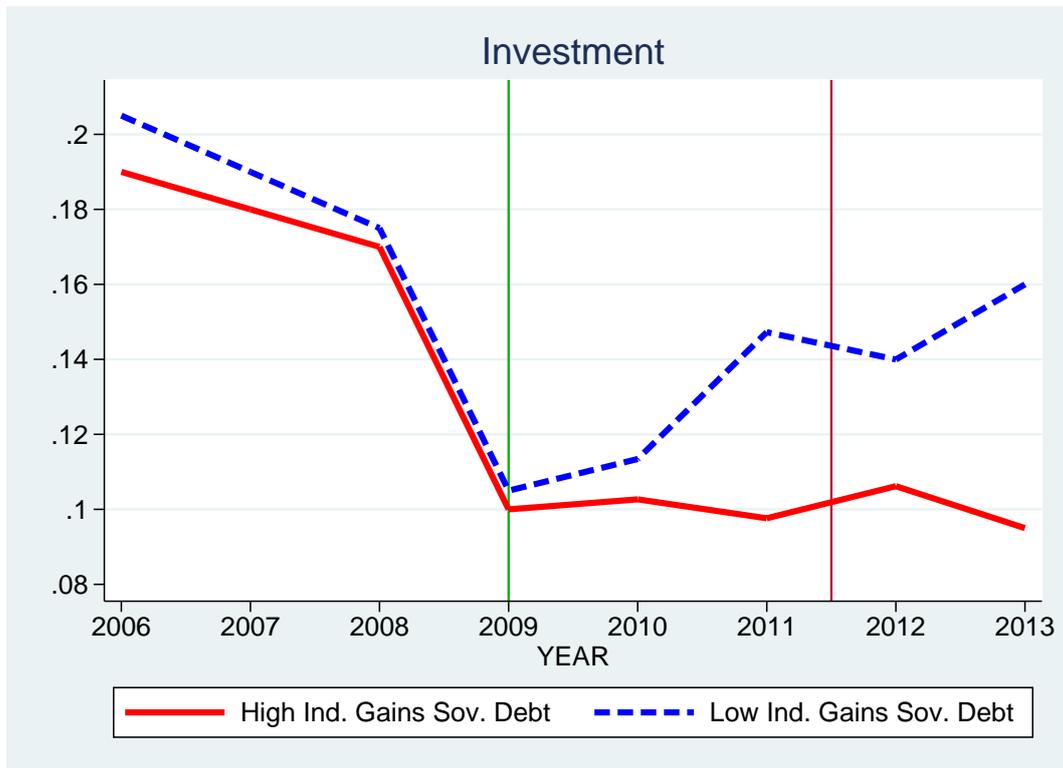


Figure 9 shows the evolution of capital expenditures as a fraction of tangible assets for firms with high (red solid line) and low (blue dashed line) dependence on banks that benefited from the OMT announcement in the pre-OMT and post-OMT period. We consider all loans in DealScan to firms located in: Greece, Italy, Ireland, Portugal, Spain (GIIPS countries) and all other EU countries with an active syndicated loan market (non-GIIPS countries). We restrict the sample to private firms with financial information in Amadeus.

Table 1: BANK REACTION TO OMT

	(1)	(2)	(3)
	CDS return OMT	OMT windfall gain	GIIPS/Assets
Non-GIIPS Banks	-0.23	0.013	0.010 (-9.2)
GIIPS Banks	-0.96	0.098	0.118 (-3.4)
<i>t</i> -test for difference	7.8	5.21	12.7

Table 1 presents descriptive statistics about banks' CDS spread reaction to the OMT announcements, the *OMT windfall gain*, and the amount of sovereign debt holdings. Banks included in the analysis must have information about their sovereign debt portfolio prior to the OMT announcement (June 2012) and must be active in the syndicated loan market during the sample period. GIIPS Banks include banks incorporated in Italy, Portugal, and Spain. Non-GIIPS banks consist of banks in all other European countries that are covered by the European Banking Authority's stress tests and capital exercises. CDS return OMT represents the CDS return on the three OMT announcement dates (July 26, August 2, and September 6, 2012). *OMT windfall gain* represents the value gain on bank's sovereign debt holdings as a fraction of total equity. GIIPS/Assets represents banks' GIIPS sovereign debt holdings as a fraction of total assets. F-values are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table 2: BANK CDS REACTION TO OMT ANNOUNCEMENT

Panel A: GIIPS sovereign bond holdings scaled by total assets				
	(1)	(2)	(3)	(4)
	CDS Return OMT	CDS Return OMT	CDS Return OMT	CDS Return OMT
GIIPS/Assets	-6.414*** (-10.38)	-7.635*** (-13.05)	-7.734*** (-11.55)	-7.777*** (-10.77)
Log Assets		-0.134*** (-4.12)	-0.136*** (-4.05)	-0.133*** (-3.48)
Equity/Assets			0.679 (0.32)	0.294 (0.10)
RWA/Assets				0.031 (0.18)
R^2	0.771	0.852	0.853	0.853
N	34	34	34	34
Panel B: OMT windfall gain				
OMT windfall gain	-3.854*** (-4.53)	-4.321*** (-4.39)	-4.195*** (-4.77)	-4.067*** (-4.24)
Log Assets		-0.062 (-0.95)	-0.070 (-1.20)	-0.081 (-1.22)
Equity/Assets			-9.936*** (-2.99)	-8.336 (-1.51)
RWA/Assets				-0.112 (-0.37)
R^2	0.391	0.408	0.544	0.546
N	34	34	34	34

Table 2 presents estimates from a linear regression analysis of the determinants banks' CDS returns on the OMT announcement dates. Independent variables are each banks' GIIPS sovereign bond holdings scaled by total assets (GIIPS/Assets) measured before the OMT announcement or the OMT windfall gain which is defined as the gain on the sovereign debt holdings as a fraction of total equity. Control variables include the log of total assets, the ratio of equity to total assets, and the ratio of risk weighted assets to total assets, all measured in the period prior to the OMT announcement. t -statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table 3: LOAN VOLUME REGRESSIONS - ALL FIRMS

Panel A: All Loans						
	(1)	(2)	(3)	(4)	(5)	(6)
	Δ Loans	Δ Loans	Δ Loans	Δ Loans	Loan Inc.	Δ Loans
OMT windfall gain*PostOMT	0.208** (2.40)	0.225** (2.46)	0.105*** (2.97)	0.112*** (3.03)	0.159** (2.11)	0.119** (2.60)
Log Assets	-0.031 (-1.12)	-0.039 (-1.22)	0.008 (0.34)	0.014 (0.65)	0.035 (0.91)	0.034 (0.94)
Equity/Assets	-0.250 (-0.78)	-0.193 (-0.51)	-0.159 (-0.70)	-0.088 (-0.34)	0.096 (0.18)	-0.443 (-1.62)
Impaired Loans	0.041 (1.64)	0.053** (2.15)	-0.015 (-0.70)	-0.013 (-0.58)	0.035 (0.76)	-0.033 (-0.91)
Return on Avg. Assets	0.963 (1.42)	0.973 (1.37)	0.413 (0.91)	0.319 (0.67)	1.236 (1.45)	1.159 (1.64)
R^2	0.011	0.101	0.602	0.649	0.614	0.812
N	10576	10576	10576	10576	10576	4240
Panel B: Term Loans						
OMT windfall gain*PostOMT	0.110** (2.30)	0.123** (2.37)	0.074*** (2.81)	0.098*** (3.17)	0.158** (2.13)	0.120** (2.69)
Log Assets	0.040* (2.02)	0.032 (1.32)	0.064*** (2.91)	0.061** (2.63)	0.093** (2.30)	0.076* (2.03)
Equity/Assets	-0.135 (-0.39)	-0.100 (-0.25)	-0.039 (-0.16)	0.023 (0.08)	0.523 (1.14)	0.033 (0.07)
Impaired Loans	0.003 (0.20)	0.013 (0.67)	-0.031 (-1.59)	-0.026 (-1.23)	-0.001 (-0.01)	-0.016 (-0.44)
Return on Avg. Assets	1.273** (2.54)	1.317** (2.51)	0.476 (0.97)	0.372 (0.71)	0.163 (0.20)	1.446* (2.14)
R^2	0.012	0.112	0.550	0.607	0.601	0.767
N	8086	8086	8086	8086	8086	3636
Panel C: Revolver						
OMT windfall gain*PostOMT	0.348** (2.28)	0.336** (2.25)	0.090 (1.03)	0.047 (0.67)	-0.049 (-0.51)	0.186 (1.28)
Log Assets	-0.046 (-0.90)	-0.069 (-1.22)	-0.047 (-1.21)	-0.030 (-0.87)	-0.029 (-0.44)	-0.032 (-0.63)
Equity/Assets	0.008 (0.01)	-0.124 (-0.18)	-0.198 (-0.37)	-0.037 (-0.06)	0.368 (0.43)	-0.330 (-0.53)
Impaired Loans	0.063 (1.46)	0.056 (1.14)	-0.007 (-0.17)	-0.009 (-0.21)	0.016 (0.30)	0.050 (1.23)
Return on Avg. Assets	0.465 (0.43)	0.736 (0.63)	0.374 (0.36)	0.490 (0.45)	0.829 (0.82)	1.672** (2.43)
R^2	0.017	0.102	0.660	0.701	0.659	0.013
N	6818	6818	6818	6818	6818	2441
Bank Fixed Effects	YES	NO	YES	NO	NO	NO
Time Fixed Effects	YES	YES	NO	NO	NO	NO
FirmCluster-Bank Fixed Effects	NO	YES	NO	YES	YES	YES
FirmCluster-Time Fixed Effects	NO	NO	YES	YES	YES	YES

Table 3 presents the results of a modified version of the Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm cluster-bank-quarteryear. The dependent variable is the change in log loan volume (Panel A), the change in log term loan volume (Panel B) or the change in log revolver volume (Panel C) of a firm cluster-bank relation in a given quarter where firm clusters are formed based on a firm's country of incorporation, industry, and rating. The rating of each firm is estimated from EBIT interest coverage ratio medians for firms by rating category provided by Standard & Poor's. We assign ratings on the basis of the pre-crisis median interest coverage ratio of each firm. Data is restricted to: (i) the set of firm cluster-bank relations that existed prior to OMT announcement, and (ii) firm cluster-quarters where firms in a cluster borrow from at least one bank that benefited one bank that did not benefit from the OMT announcement. *PostOMT* is an indicator variable equal to one starting in quarter four of 2012, and zero before. Standard errors are clustered at the bank level. *t*-statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table 4: LOAN VOLUME REGRESSIONS - FIRM QUALITY

Panel A: Low Quality Firms						
	(1)	(2)	(3)	(4)	(5)	(6)
	Δ Loans	Δ Loans	Δ Loans	Δ Loans	Loan Inc.	Δ Loans
OMT windfall gain*PostOMT	0.229*** (3.14)	0.260*** (3.23)	0.171*** (3.57)	0.189*** (2.86)	0.213*** (2.74)	0.218** (2.76)
Log Assets	0.030 (1.24)	0.023 (0.78)	0.022 (0.92)	0.023 (0.99)	0.108** (2.18)	0.037 (0.82)
Equity/Assets	-0.296 (-1.58)	-0.255 (-1.09)	-0.184 (-0.63)	-0.075 (-0.23)	-0.029 (-0.06)	-0.215 (-0.55)
Impaired Loans	-0.000 (-0.03)	0.012 (0.69)	-0.034 (-1.17)	-0.034 (-1.15)	-0.002 (-0.04)	-0.023 (-0.46)
Return on Avg. Assets	0.285 (0.56)	0.265 (0.48)	0.539 (1.00)	0.426 (0.76)	1.562 (1.60)	1.496 (1.76)
R^2	0.011	0.100	0.559	0.608	0.578	0.780
N	6483	6483	6483	6483	6483	2671
Panel B: High Quality Firms						
OMT windfall gain*PostOMT	0.164 (1.52)	0.165 (1.34)	-0.006 (-0.10)	0.016 (0.25)	0.115 (0.77)	0.047 (0.61)
Log Assets	-0.125** (-2.04)	-0.133* (-1.88)	-0.014 (-0.30)	0.008 (0.15)	-0.072 (-1.13)	0.074 (0.76)
Equity/Assets	-0.155 (-0.17)	-0.083 (-0.08)	-0.096 (-0.16)	-0.007 (-0.01)	0.416 (0.46)	-0.846 (-1.60)
Impaired Loans	0.104** (2.08)	0.102* (1.76)	0.028 (0.97)	0.023 (0.59)	0.108* (1.72)	-0.083 (-1.39)
Return on Avg. Assets	2.464** (2.11)	2.486* (1.91)	0.660 (1.04)	0.417 (0.63)	0.840 (0.67)	0.349 (0.25)
R^2	0.026	0.114	0.644	0.687	0.680	0.825
N	4093	4093	4093	4093	4093	1569
Bank Fixed Effects	YES	NO	YES	NO	NO	NO
Time Fixed Effects	YES	YES	NO	NO	NO	NO
FirmCluster-Bank Fixed Effects	NO	YES	NO	YES	YES	YES
FirmCluster-Time Fixed Effects	NO	NO	YES	YES	YES	YES

Table 4 presents the results of a modified version of the Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm cluster-bank-quarteryear. The dependent variable is the change in log loan volume of a firm cluster-bank relation in a given quarter where firm clusters are formed based on a firm's country of incorporation, industry, and rating. High and low quality firms are split based on the country-specific 3-year median interest coverage ratio prior to OMT announcement. The rating of each firm is estimated from EBIT interest coverage ratio medians for firms by rating category provided by Standard & Poor's. We assign ratings on the basis of the pre-crisis median interest coverage ratio of each firm. Data are restricted to: (i) the set of firm cluster-bank relations that existed prior to OMT announcement, and (ii) firm cluster-quarters where firms in a cluster borrow from at least one bank that benefited one bank that did not benefit from the OMT announcement. *PostOMT* is an indicator variable equal to one starting in quarter four of 2012, and zero before. Standard errors are clustered at the bank level. *t*-statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table 5: DESCRIPTIVE STATISTICS (PRE-OMT PROGRAM ANNOUNCEMENT) - ALL FIRMS

		Total Assets (mn)	Tangibility	Int. Cov.	Net Worth	EBITDA/Assets
High Indirect OMT windfall gains	Mean	2850	0.614	2.70	0.210	0.076
	Median	486	0.658	1.25	0.190	0.069
	Std. Dev.	7520	0.260	9.25	0.196	0.062
Low Indirect OMT windfall gains	Mean	1810	0.536	4.98	0.230	0.090
	Median	330	0.553	1.41	0.220	0.075
	Std. Dev.	5590	0.290	2.540	0.216	0.077
	Diff. (<i>t</i> -Stat)	1040 (3.65)	0.078 (6.30)	-2.28 (-5.83)	-0.02 (-1.77)	-0.014 (-2.87)
	Normalized Diff.	0.289	0.149	-0.148	-0.074	-0.120

Table 5 presents descriptive statistics of firm-level control variables split into firms with a high and low dependence on banks that benefited from the OMT announcement in the pre-OMT period.

Table 6: FINANCIAL AND REAL EFFECTS- ALL FIRMS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Δ Cash	Δ Debt	Δ Debt- Δ Cash	Emp. Growth	CAPX	Δ Cash	Δ Debt	Δ Debt- Δ Cash	Emp. Growth	CAPX
Indirect OMT windfall gains*PostOMT	0.038*** (2.98)	0.044*** (2.86)	0.006 (0.29)	-0.009 (-0.39)	0.023 (0.69)	0.022** (2.12)	0.024** (2.16)	0.002 (0.14)	-0.025 (-0.65)	-0.047 (-1.02)
R^2	0.550	0.571		0.566	0.591	0.519	0.534		0.523	0.552
N	2055	2079		1691	2115	2055	2079		1691	2115
Firm Level Controls	YES	YES		YES	YES	YES	YES		YES	YES
Firm Fixed Effects	YES	YES		YES	YES	YES	YES		YES	YES
Industry-Country-Year Fixed Effects	YES	YES		YES	YES	YES	YES		YES	YES
Foreign Bank Country-Year Fixed Effects	YES	YES		YES	YES	NO	NO		NO	NO

Table 6 presents firm-level regression results. The dependent variables are the change in cash holdings, change in leverage, employment growth, and investments, respectively. The sample consists of all private firms in the intersection of DealScan and Amadeus that are located in the following countries: Greece, Italy, Ireland, Portugal, Spain (GIIPS countries) or other EU countries with active syndicated loan markets (non-GIIPS countries). *Indirect OMT windfall gains* measure the firms' indirect gains on sovereign debt holdings through their lenders, that is, for each firm, we measure the exposure it has to the value increase in the sovereign debt holdings of the banks from which it received loans. *PostOMT* is an indicator variable equal to one starting at the end of fiscal year 2012, and zero before. Firm control variables include the logarithm of total assets, tangibility, interest coverage ratio, EBITDA as a fraction of total assets, and net worth. All firm-level control variables are lagged by one period. All regressions include firm and industry-country-year fixed effects, as well as all firm-level controls. Columns (1)-(2), and (4)-(5) additionally include foreign bank country-year fixed effects. Standard errors are adjusted for heteroscedasticity and clustered at the firm-level. t -statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table 7: CASH HOLDINGS - ALL FIRMS

	(1)	(2)	(3)
	Δ Cash	Δ Cash	Δ Cash
Indirect OMT windfall gains*PostOMT	0.038*** (3.69)	0.022** (2.17)	0.029*** (2.76)
Cash Flow*Indirect OMT windfall gains	0.168*** (3.08)		0.173*** (3.07)
Cash Flow*PostOMT	0.001 (0.03)		-0.002 (-0.11)
Cash Flow*Indirect OMT windfall gains*PostOMT	-0.114*** (-2.64)		-0.101** (-2.31)
New Loan*PostOMT		-0.009 (-0.87)	-0.007 (-0.72)
New Loan*Indirect OMT windfall gains		-0.014 (-1.52)	-0.018 (-1.29)
New Loan*Indirect OMT windfall gains*PostOMT		0.109** (2.19)	0.114** (2.22)
R^2	0.558	0.556	0.564
N	2055	2055	2055

Table 7 presents firm-level regression results. The dependent variable is the change in cash holdings. The sample consists of all private firms in the intersection of DealScan and Amadeus that are located in the following countries: Greece, Italy, Ireland, Portugal, Spain (GIIPS countries) or other EU countries with active syndicated loan markets (non-GIIPS countries). *Indirect OMT windfall gains* measure the firms' indirect gains on sovereign debt holdings through their lenders, that is, for each firm, we measure the exposure it has to the value increase in the sovereign debt holdings of the banks from which it received loans. *PostOMT* is an indicator variable equal to one starting at the end of fiscal year 2012, and zero before. *New Loan* is an indicator variable equal to one if firm i received a new loan in year t . Firm control variables include the logarithm of total assets, tangibility, interest coverage ratio, EBITDA as a fraction of total assets, net worth, a firm's cash flow and capital expenditures. All firm-level control variables are lagged by one period. All regressions include firm, industry-country-year fixed effects, and foreign bank country-year fixed effects as well as all firm-level controls. t -statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table 8: FINANCIAL AND REAL EFFECTS - FIRM QUALITY

Panel A: Low-quality firms					
	(1)	(2)	(3)	(4)	(5)
	Δ Cash	Δ Debt	Δ Debt- Δ Cash	Emp. Growth	CAPX
Indirect OMT windfall gains*PostOMT	0.049**	0.066**	0.017	-0.085	0.069
	(2.56)	(1.97)	(0.45)	(-1.18)	(1.07)
R^2	0.768	0.812		0.758	0.745
N	938	948		765	974
Panel B: High-quality firms					
Indirect OMT windfall gains*PostOMT	0.016	0.032	0.016	-0.084	-0.007
	(0.95)	(1.53)	(0.59)	(-1.03)	(-0.11)
R^2	0.661	0.773		0.681	0.693
N	1117	1131		926	1141

Table 8 presents firm-level regression results for low (Panel A) and high quality firms (Panel B). High and low quality firm subsets are formed based on the country-specific 3-year median interest coverage ratio prior to the OMT announcement. The dependent variables are the change in cash holdings, change in leverage, employment growth, and investments, respectively. The sample consists of all private firms in the intersection of DealScan and Amadeus that are located in the following countries: Greece, Italy, Ireland, Portugal, Spain (GIIPS countries) or other EU countries with active syndicated loan markets (non-GIIPS countries). *Indirect OMT windfall gains* measure the firms' indirect gains on sovereign debt holdings through their lenders, that is, for each firm, we measure the exposure it has to the value increase in the sovereign debt holdings of the banks from which it received loans. *PostOMT* is an indicator variable equal to one starting at the end of fiscal year 2012, and zero before. Firm control variables include the logarithm of total assets, tangibility, interest coverage ratio, EBITDA as a fraction of total assets, and net worth. All regressions include firm, industry-country-year fixed effects, and foreign bank country-year fixed effects as well as all firm-level controls. Standard errors are adjusted for heteroscedasticity and clustered at the firm-level. t -statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table 9: CASH HOLDINGS - FIRM QUALITY

Panel A: Low-quality firms			
	(1)	(2)	(3)
	Δ Cash	Δ Cash	Δ Cash
Indirect OMT windfall gains*PostOMT	0.046*** (3.25)	0.031** (1.98)	0.041*** (2.80)
Cash Flow*Indirect OMT windfall gains	0.383*** (4.88)		0.386*** (5.00)
Cash Flow*PostOMT	-0.024 (-0.71)		-0.032 (-0.95)
Cash Flow*Indirect OMT windfall gains*PostOMT	-0.202* (-1.89)		-0.201* (-1.95)
New Loan*PostOMT		0.003 (0.17)	-0.006 (-0.37)
New Loan*Indirect OMT windfall gains		-0.010 (-0.79)	-0.010 (-0.80)
New Loan*Indirect OMT windfall gains*PostOMT		0.111** (2.32)	0.138*** (2.98)
R^2	0.767	0.748	0.771
N	938	938	938
Panel B: High-quality firms			
Indirect OMT windfall gains*PostOMT	0.013 (0.78)	0.014 (0.87)	0.017 (0.91)
Cash Flow*Indirect OMT windfall gains	0.131** (2.14)		0.123* (1.96)
Cash Flow*PostOMT	0.002 (0.09)		0.002 (0.09)
Cash Flow*Indirect OMT windfall gains*PostOMT	-0.069 (-0.40)		-0.072 (-0.42)
New Loan*PostOMT		-0.008 (-0.22)	-0.010 (-0.27)
New Loan*Indirect OMT windfall gains		0.003 (0.21)	-0.001 (-0.04)
New Loan*Indirect OMT windfall gains*PostOMT		-0.095 (-1.19)	-0.086 (-1.07)
R^2	0.666	0.665	0.669
N	1117	1117	1117
t -test for difference between high- and low-quality firms of <i>Cash Flow*Indirect Gains on Sov. Debt</i>	2.59		2.64

Table 9 presents firm-level regression results for low quality firms (Panel A) and high quality firms (Panel B). High and low quality firm subsets are formed based on the country-specific 3-year median interest coverage ratio prior to OMT announcement. The dependent variable is the change in cash holdings. The sample consists of all private firms in the intersection of DealScan and Amadeus that are located in the following countries: Greece, Italy, Ireland, Portugal, Spain (GIIPS countries) or other EU countries with active syndicated loan markets (non-GIIPS countries). *Indirect OMT windfall gains* measure the firms' indirect gains on sovereign debt holdings through their lenders, that is, for each firm, we measure the exposure it has to the value increase in the sovereign debt holdings of the banks from which it received loans. *PostOMT* is an indicator variable equal to one starting at the end of fiscal year 2012, and zero before. *New Loan* is an indicator variable equal to one if firm i received a new loan in year t . Firm control variables include the logarithm of total assets, tangibility, interest coverage ratio, EBITDA as a fraction of total assets, net worth, a firm's cash flow and capital expenditures. All firm-level control variables are lagged by one period. All regressions include firm, industry-country-year fixed effects, and foreign bank country-year fixed effects as well as all firm-level controls. t -statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table 10: FINANCIAL AND REAL EFFECTS - SUBSIDIARIES

Panel A: Non-GIIPS Firms without GIIPS subs					
	(1)	(2)	(3)	(4)	
	Δ Cash	Δ Debt	Δ Debt- Δ Cash	Emp. Growth	CAPX
Indirect OMT windfall gains*PostOMT	0.082***	0.087*	0.005	0.011	0.027
	(2.75)	(1.84)	(0.09)	(0.13)	(0.36)
R^2	0.443	0.403		0.502	0.495
N	776	800		596	804
Panel B: GIIPS Firms with non-GIIPS subs					
Indirect OMT windfall gains*PostOMT	0.035**	0.067**	0.032	-0.049	-0.001
	(2.16)	(2.26)	(1.00)	(-0.66)	(-0.02)
R^2	0.677	0.552		0.719	0.583
N	372	353		354	376

Table 10 presents firm-level regression results for Non-GIIPS firms without GIIPS subsidiaries (Panel A) and for GIIPS firms with non-GIIP subsidiaries (Panel B). The dependent variables are the change in cash holdings, change in leverage, employment growth, and investments, respectively. The sample consists of all private firms in the intersection of DealScan and Amadeus that are located in the following countries: Greece, Italy, Ireland, Portugal, Spain (GIIPS countries) or other EU countries with active syndicated loan markets (non-GIIPS countries). *Indirect OMT windfall gains* measure the firms' indirect gains on sovereign debt holdings through their lenders, that is, for each firm, we measure the exposure it has to the value increase in the sovereign debt holdings of the banks from which it received loans. *PostOMT* is an indicator variable equal to one starting at the end of fiscal year 2012, and zero before. Firm control variables include the logarithm of total assets, tangibility, interest coverage ratio, EBITDA as a fraction of total assets, and net worth. All firm-level control variables are lagged by one period. All regressions include firm, industry-country-year fixed effects, and foreign bank country-year fixed effects as well as all firm-level controls. Standard errors are adjusted for heteroscedasticity and clustered at the firm-level. t -statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).

Table 11: CASH HOLDINGS - SUBSIDIARIES

Panel A: Non-GIIPS Firms without GIIPS subs			
	(1)	(2)	(3)
	Δ Cash	Δ Cash	Δ Cash
Indirect OMT windfall gains*PostOMT	0.062***	0.056**	0.068***
	(2.94)	(2.37)	(3.32)
Cash Flow*Indirect OMT windfall gains	0.361**		0.382**
	(2.08)		(2.39)
Cash Flow*PostOMT	-0.005		0.001
	(-0.21)		(0.05)
Cash Flow*Indirect OMT windfall gains*PostOMT	-0.217*		-0.372***
	(-1.88)		(-3.29)
New Loan*PostOMT		0.012	0.012
		(1.03)	(1.00)
New Loan*Indirect OMT windfall gains		-0.052	-0.069
		(-1.29)	(-1.62)
New Loan*Indirect OMT windfall gains*PostOMT		0.222**	0.265***
		(2.27)	(2.77)
R^2	0.451	0.455	0.465
N	776	776	776
Panel B: GIIPS Firms with non-GIIPS subs			
Indirect OMT windfall gains*PostOMT	0.048***	0.029*	0.041**
	(2.67)	(1.81)	(2.08)
Cash Flow*Indirect OMT windfall gains	0.176*		0.180*
	(1.89)		(1.95)
Cash Flow*PostOMT	0.101		0.081
	(1.60)		(1.38)
Cash Flow*Indirect OMT windfall gains*PostOMT	-0.174*		-0.150*
	(-1.96)		(-1.78)
New Loan*PostOMT		-0.022	-0.026
		(-0.68)	(-0.86)
New Loan*Indirect OMT windfall gains		0.006	0.003
		(0.29)	(0.16)
New Loan*Indirect OMT windfall gains*PostOMT		0.173**	0.171**
		(2.07)	(2.00)
R^2	0.676	0.671	0.682
N	372	372	372

Table 11 presents firm-level regression results for Non-GIIPS firms without GIIPS subsidiaries (Panel A) and for GIIPS firms with non-GIIP subsidiaries (Panel B). The dependent variable is the change in cash holdings. The sample consists of all private firms in the intersection of DealScan and Amadeus that are located in the following countries: Greece, Italy, Ireland, Portugal, Spain (GIIPS countries) or other EU countries with active syndicated loan markets (non-GIIPS countries). *Indirect OMT windfall gains* measure the firms' indirect gains on sovereign debt holdings through their lenders, that is, for each firm, we measure the exposure it has to the value increase in the sovereign debt holdings of the banks from which it received loans. *PostOMT* is an indicator variable equal to one starting at the end of fiscal year 2012, and zero before. *New Loan* is an indicator variable equal to one if firm i received a new loan in year t . Firm control variables include the logarithm of total assets, tangibility, interest coverage ratio, EBITDA as a fraction of total assets, net worth, a firm's cash flow and capital expenditures. All firm-level control variables are lagged by one period. All regressions include firm, industry-country-year fixed effects, and foreign bank country-year fixed effects as well as all firm-level controls. t -statistics are reported in parentheses. Significance levels: * ($p < 0.10$), ** ($p < 0.05$), *** ($p < 0.01$).