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SMEs' Access to Finance in the Euro Area: What Helps or Hampers?

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Access to Finance by SMEs in the Euro Area—What Helps or Hampers?

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Abstract

The monetary transmission mechanism in the euro area has been adversely affected by the recent crises. Using survey data on thousands of euro area firms, we study factors that affect the access to finance of SMEs. We find that changes in bank funding costs and borrower leverage matter for firms' access to finance. Increases in bank funding costs and borrowers' debt-to-asset ratios are significantly and negatively associated with firms' access to finance. The use of subsidies significantly improve access to finance of SMEs. Finally, access to finance is found to be positively related to firm size and firm age.

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I. INTRODUCTION

Monetary transmission mechanism in the euro area has been adversely affected by the recent financial and sovereign debt crises. This can be inferred from the limited transmission of changes in the monetary policy stance to the real economy via bank lending rates and persistently restrained credit to the non-financial private sector, especially in countries under financial stress. For non-financial corporations, the focus of this paper, access to credit seems to vary not only by country but also by firm size.[1] In fact, there is ample anecdotal and survey evidence that Small and Medium Sized Enterprises (SMEs) have been suffering the most from the recent financial malaise. According to a recent survey by the European Central Bank (2013), a larger percentage of SMEs ranked "access to finance" as their major concern when compared to their larger counterparts, with significant heterogeneity across countries.

Limited transmission of changes in the monetary policy rate to lending rates and the supply of credit might stem from the inability and/or the unwillingness of banks to grant credit. These might reflect weaknesses in banks' and/or borrowers' balance sheets through the so-called "bank-lending" and "non-financial borrower balance sheet" channels, respectively (Bernanke, 1989; Bernanke and Gertler, 1989, 1995). Next to supply factors, credit growth might also be constrained by demand factors, and the relative importance of demand and supply effects are likely to differ across countries (GFSR, 2013). Understanding which factors are responsible for the impaired transmission of monetary policy in the euro area is essential to identify whether and what policy actions can help repair it. Given their importance in employment and value added creation, we focus on SMEs and the factors that have helped or hindered their access to finance since the onset of the financial crisis.[2]

The main research question in this paper is whether the riskiness of banks' and/or borrowers' balance sheets significantly affects firms' access to finance. Using firm-level data we are also able to analyze whether subsidies, put in place to improve access to finance, can help alleviate credit constraints. Throughout the analysis, we control for firm-specific characteristics such as firm size, firm age, the branch of economic activity, and demand for credit.

To perform the analysis we use a unique firm-level panel dataset from the Survey on the Access to Finance of SMEs in the Euro Area (SAFE). The survey is conducted jointly by the European Central Bank (ECB) and the European Commission (EC). First undertaken in 2009 and conducted bi-annually since then, it covers micro, small, medium and large firms, and includes questions on the demand for and the availability of credit for firms along with invaluable additional firm-specific information. The analyzed dependent variable, "bank access", corresponds to the answer to a survey question regarding the change in the availability of bank loans for firms during the six months preceding the survey waves. A distinct advantage of using SAFE data over other datasets is less sample selection bias, since in addition to firms that applied for bank loans, it allows us to include in the analysis those

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[1] In this paper, "access to credit", "access to finance" and "access to bank loans" are used interchangeably, unless mentioned otherwise.

[2] SMEs account for 67 per cent of employment and 58 per cent of value added in the EU as of 2012 (EC, 2013).

credit constrained firms that did not apply for a bank loan due to a fear of possible rejection. This way, we capture the experiences of firms that were discouraged from applying for a loan and were at the same time credit constrained. Equally importantly, with the help of a SAFE question on the change in firms' demand for bank loans during the six months preceding the survey waves, we can account for demand effects.

We proxy bank funding costs with country level bank CDS premiums, which are assumed to reflect the health of banks' balance sheets indirectly. To capture the borrower balance sheet channel, we control for the strength of borrowers' balance sheets with the survey question tracking the change in firms' debt-to-assets ratios over time. The analysis is run first for the whole sample. Later, we control for the heterogeneity of the transmission mechanism by splitting the sample into stressed economies and the rest of the euro area, and running the analysis for these two groups of countries separately.[3] The nature of our dependent variable requires that we use qualitative response models, such as ordered logit. Ordered logit treats our dependent variable as an ordinal ordered variable and therefore frees us from caveats usually involved with employing qualitative data.

We find that an increase in bank funding costs is negatively associated with firms' access to finance, though only in stressed economies. We also find that those firms that reported an increase in their debt to assets ratios are significantly more likely to report deterioration in their access to finance, regardless of firm size, the sector, and of whether they are located in the stressed economies or the rest. These findings confirm the existence of bank lending and non-financial borrower balance sheet channels in the euro area. Another interesting result concerns the use of subsidies, which, in the SAFE survey, refer to support to corporations in the form of state guarantees and directly subsidized bank loans. The results reveal that the use of subsidies is significantly and positively related to access to finance of all firms except for the large ones, which implies that subsidy programs that were put in place to help credit constrained SMEs could indeed help. Finally, firm size and age are significantly and positively associated with improved access to finance of firms, as expected. It is mainly micro firms that reported difficulties in obtaining bank loans.

The paper proceeds as follows. Section II motivates our research, provides stylized facts on firms' access to finance and a brief review of the literature. Section III describes data and presents our empirical strategy. Section IV discusses the results and presents the robustness checks. Section V concludes and discusses the policy implications.

II. THE MONETARY TRANSMISSION AND ACCESS TO FINANCE OF SMES

A. Stylized facts

The outbreak of the financial crisis has brought about a significant tightening in the growth of credit to non-financial corporations (NFCs), with pronounced heterogeneity across

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[3] Stressed economies refer to Greece, Ireland, Italy, Portugal and Spain; the economies with the highest average sovereign yields during the 2009-12 period (see Appendix IV). The rest of the euro area refers to Germany, the Netherlands, Finland, Austria, Belgium and France.

countries (Charts 1 and 2 in Figure 1). Similarly, the dispersion in bank lending rates for NFCs across the euro area, measured by the coefficient of variation, has increased sharply after 2008 (Chart 3). After stabilizing broadly between mid-2009 and mid-2011, the dispersion increased further, and as of December 2013, was nearly three times larger than what it used to be just before the crisis. The spreads between bank lending rates on small and large loans, i.e. loans up to and more than EUR 1 million, have also been increasing, reflecting fragmentation in funding costs for SMEs and larger firms (Chart 4). Remarkably, since early 2011, bank lending rates on large loans to corporates in the stressed economies have actually been higher than bank lending rates on small loans to corporates in the rest of the euro area, a clear result of less favorable economic conditions in the former group of countries.

It is widely documented that SMEs generally have a harder time obtaining credit than larger firms, mainly due to their inherent lack of the ability to produce high quality collateral and the lack of transparency on their creditworthiness (Ayadi and Gadi, 2013). SMEs' inherent lack of transparency reinforces the asymmetric information problem that tends to be exacerbated during crisis times, which might lead to credit rationing and suboptimal lending to viable SMEs (Darvas, 2013; Kraemer-Eis et al, 2010). Besides, as roughly fifty per cent of SMEs survive only for five years or less (Schrör, 2009), many of them are unable to build lasting banking relationships or a credit track record. The SAFE data confirm that the availability of credit differed markedly by firm size and the country of origin since the start of the survey in 2009. For example, the percentage of firms reporting "access to finance" as the most pressing issue clearly decreases by firm size (Chart 5).[4]

The SAFE also includes a more specific question that requires firms to indicate whether the availability of "bank loans" has changed during the six months preceding the survey waves. With this information, we computed the net percentage of firms reporting an increase in the availability of bank loans, which we call the "index of access to bank loans".[5] As Chart 6 shows, except for the dip in 2009, the access to bank loans improved with firm size. Furthermore, firms located in the stressed economies reported a more restricted access to bank loans over the whole sample period than firms located in the rest of the euro area, with heterogeneity having increased evidently after 2009 and remained pronounced since then (Chart 7). Not surprisingly, the percentage of firms that applied for a bank loan but got rejected as well as those that did not apply due to a fear of possible rejection decreases by firm size (Chart 8).

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[4] "Access to finance" in this sentence refers to finance in the form of bank loans, trade credit, equity, debt securities and other external sources.

[5] Index of access to bank loans = (Percent of firms reporting their access has increased) – (percent of firms reporting their access has decreased). For more information on the question, please refer to Appendix I.

Figure 1. Fragmentation in access to finance in the euro area since 2009

Bank credit growth to NFCs in the euro area has decreased after the great recession…	*…but more in the stressed economies.**

1. Growth in credit to NFCs in the EA (Not stressed economies) (percent, y-o-y)

2. Growth in credit to NFCs in the EA (Stressed economies) (percent, y-o-y)

Cross country variation in bank lending rates to NFCs has increased…	*…as has the dispersion in bank lending rates for small and large loans.*

3. Coefficient of cross-country variation in bank lending rates to NFCs (percent, y-o-y)

4. Dispersion in bank lending rates by loan size (percent, y-o-y)

Access to finance is a common difficulty…	*…though it affects large firms less.*

5. Most Pressing Problems Firms Face (in percent of all answers)

6. Changes in access to finance according to SAFE (difference in % of firms with improved and worsened

Figure 1. Fragmentation in access to finance in the euro area since 2009 (continued)

Access to finance is worse in the stressed economies.	*Firm size affects loan approvals.*

7. Changes in access to finance (difference in % of firms with improved and worsened access)

Stressed economies
Rest of EA

2009 2010 2011 2012

8. Applied for a bank loan in previous 6 months (percent of firms in a category)

- Applied and got everything or most of it
- Applied and got only a limited part of it
- Applied but refused, cost too high
- Applied but was rejected
- DK/NA

Micro Small Medium Large

The use of subsidy increases by firm size.	*Subsidies are used more often in the stressed economies.*

9. Use of subsidies by firm size (percent of firms in a category)

Used

Micro Small Medium Large

10. Use of subsidies by region (percent of firms in a category)

Used

Rest of EA Stressed economies

Source: ECB, own calculations.
* The data for Spain do not include the transfer to the SAREB by end-2102 and in early 2013. This transfer implied a reduction in the exposure of banks to the corporate sector although not a fall in the availability of funding for NFCs. This should be taken into account by the reader when comparing Spain with other countries.

Confronted with these figures, many euro-area governments have sought to provide subsidies to support SMEs. The SAFE dataset allows us to analyze whether the use of a subsidy is positively associated with better access to finance. Subsidy is defined in the SAFE survey as grants and/or subsidised bank loans involving support from public sources in the form of guarantees, reduced interest rate loans, etc. Firms were asked whether they used subsidies over the past six months.As Chart 9 shows, the percentage of firms that reported having used a subsidy during the six months increases with firm size. Only 15 per cent of micro firms reported that they used a subsidy while this percentage was around double as high for large

firms.[6] In addition, the use of subsidy was higher in the stressed economies than in the rest of the euro area, and has been declining since 2010 (Chart 10).

B. A brief review of the literature

There is a vast amount of literature on the monetary transmission mechanism in the euro area, discussing its numerous channels.[7] The sharp drop in available credit since the onset of the crisis and its sluggish developments since then have exposed and highlighted once more the crucial role played by banks in transmitting monetary policy shocks to the real economy. The drop in credit growth might be driven by both demand and supply factors, and the relative size of these factors are likely to differ per country. Related to our research interest, in the remainder of this section, we focus on the "credit channel of monetary transmission", which comprises the bank lending channel and the non-financial borrower balance sheet channel.

The bank lending channel relates the supply of credit to the strength of banks' balance sheets. During tight market conditions and in the existence of financial frictions, the cost of funding, for example through the issue of bonds, will depend on banks' perceived riskiness, reflected in their capital and/or liquidity ratios. Banks that are perceived as riskier will find it more difficult and costly to obtain funding, especially in periods of financial stress. Faced with higher funding costs, they will pass these higher costs on to their customers and/or cut back on loan supply (Kashyap and Stein, 2000). Conversely, banks with healthier balance sheets will be able to obtain funding at more favorable conditions, allowing them to maintain their credit supply and the price they charge.

There is in fact expanding empirical evidence underlying the importance of the bank health for credit supply. Kishan and Opiela (2000) find that the ability of small and undercapitalized banks to maintain loan supply is negatively affected by a monetary policy tightening. Using bank level data for twelve euro area countries as well as the U.K. and the U.S., Gambacorta and Marques-Ibanez (2011) find that during the recent crisis, banks with weaker core capital positions and a greater reliance on market funding restricted their loan supply more strongly than banks with higher capital ratios. Similarly, using a large loan-level data from the syndicated loan market in 55 countries, Kapan and Minoiu (2013) find that banks with strong balance sheets were better able to sustain lending during the crisis. Especially banks that were more dependent on market funding and had a lower "structural" liquidity ratio (a novel measure accounting for the long-term liquidity requirements defined under Basel III) reduced the supply of credit relatively more (see also Cornett et al, 2011). The quantity and the quality of bank capitalization mitigate this effect. By using a unique dataset which contains information on virtually all business loan applications to all banks operating in Spain, Jimenez et al (2012) find that higher short-term interest rates or lower GDP growth reduce

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[6] Note that large firms reported having used a subsidy. Since EU Aid Rules mainly allow subsidies only for SMEs, this might indicate that in our sample there are also a number of partly state owned firms that are on the stock market - which are usually large. Our results remain if we drop large firms from our sample (see Column 4 in Table 2) or run the regressions for micro, small, and medium-sized firms separately (see first three columns in Table 5).

[7] This section strives by no means to be a complete overview of the relevant literature.

the probability of a loan being granted. This effect is stronger for banks with lower capital or liquidity positions. Once rejected by a bank, firms cannot turn to other banks, especially firms with no or few existing bank relationships, most often SMEs (see also Iyer et al, 2013). Alternatively, the non-financial borrower balance sheet channel (henceforth, balance sheet channel) relates the supply of credit to the strength of borrowers' balance sheets. It is fair to assume that during times of financial stress if interest rates rise, the net worth of the potential borrower (the discounted net value of a firm), ceteris paribus, will deteriorate. In the presence of asymmetric information and "cost of credit intermediation" as in Bernanke (1989), which tends to be amplified during financial stress, those borrowers who see a decline in their net worth will also experience tighter credit conditions (Bernanke and Gertler, 1989). Since small firms tend to be more opaque and find it more difficult to provide the bank with high quality collaterals, their funding conditions will be more strained.

In a recent paper (as also in Maddaloni et al, 2012), Ciccarelli et al (2013) employ detailed data from the Euro Area Bank Lending Survey (BLS) in order to analyze the effects of conventional monetary policy on output growth and inflation during the crisis. They show how fragility of financial intermediaries as well as that of borrowers affected the monetary policy transmission in the euro area. The authors find that in 2008-2009, the bank lending channel played an important role in distressed economies, whereas borrower balance sheet channel played a crucial role during the whole period, with effects mainly operating from small banks to small firms. Based on these results, Ciccarelli et al conclude that problems remain in banks' perception of borrowers' creditworthiness.

Two recent empirical papers that use SAFE data to analyze SMEs' access to bank finance are Holton et al 2012 and 2013. Holton et al analyze in the first paper the impact of macroeconomic factors on access to finance of firms and identify three channels through which the recent crisis has affected firm credit. In the second paper, the authors analyze cross-country divergences in the availability of credit to SMEs. They investigate whether growth and private sector leverage can explain the extent of credit crunches that goes beyond the differences in firm quality and risk-free interest rate, and find that macroeconomic factors significantly affect SMEs' access to finance.

III. EMPIRICAL ANALYSIS

A. The SAFE data

Our firm-level data come from the EC/ECB Survey on the access to finance of SMEs (SAFE).[8] The survey is a source of invaluable information on the financial situation of firms as it contains questions that capture firms' demand for different financing sources (bank loans, bank overdrafts, trade credit, etc.), and the availability of these sources. It also contains questions on changes in firms' debt-to-asset ratios, turnover, labor costs, etc. The survey was held in 2009 for the first time and conducted bi-annually since then, providing us with eight

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[8] The SAFE is conducted by the ECB bi-annually for the euro area, and every two years by the EC for a larger number of countries.

survey waves in total.[9] It covers "micro" (less than 10 employees), "small" (less than 50 employees), "medium" (less than 250 employees) and "large" firms (250 employees or more). It also provides detailed information on firms' age, country of origin, financial autonomy, ownership structure, and branch of economic activity.[10] As many as 7510 firms were surveyed in the survey covering the period October 2012 through March 2013.

The bi-annual surveys conducted by the ECB cover the euro area countries, except for the six smallest (Cyprus, Estonia, Luxembourg, Malta, Slovakia and Slovenia). Since these six countries together make up only two per cent of euro area GDP and represent less than three per cent of the total number of employees in the euro area, we refer to "euro area" when we discuss our results.

The use of survey data in econometric analyses could potentially lead to biased results, if the subject of the survey in question systematically reports difficulties in access to finance that do not match actual difficulties faced by firms with identical characteristics. Ferrando and Mulier (2013) analyze the differences in perceived and actual financing constraints faced by firms, and find that systematic differences exist between the two. However, they do not observe both perceived and actual financing constraints for the same set of firms, and must rely on strong assumptions to match these two sets of financing constaints, thereby weakening the claim that self-reported financing constraints flowing from the SAFE dataset are not a reliable measure of actual financing constrains.[11,12]

B. Variables

Firm-level variables
The dependent variable, which we call "bank access", is qualitative and ordinal, and follows from the same question that we use to compute the index of access to bank loans; "would you say that the availability of bank loans has increased (coded "3"), remained unchanged (coded "2") or deteriorated (coded "1") for your firm over the past six months?".

Firms are also asked to indicate whether their need for bank loans has changed over the past six months. This information is important since it allows us to control for firms' demand for bank loans, and thus distinguish between demand and supply effects. Firms that experienced an increase in their demand for bank loans might have had a different perception of the availability of bank finance than those firms whose demand remained unchanged or even

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[9] The survey wave covering the period October 2012 through March 2013 is the last survey wave for which we have the micro data.

[10] " Industry" includes "manufacturing", "mining and quarrying", "electricity, gas and water supply"; "trade" includes "wholesale and retail trade"; "services" include "hotels and restaurants", "transport, storage and communication", "real estate, renting and business activities", "education", "health and social work", and "other community, social and personal service activities". "Construction" is simply "construction" (F).

[11] Ferrando and Mulier (2013) use a nonparametric nearest neighbor method to match firms in the SAFE dataset with firms in the AMADEUS dataset in order develop a relationship between reported and actual financing constraints.

[12] Furthermore, if the bias in self-reported data is not correlated with the explanatory variables that are used in our econometric analysis, then only inconsequential estimates of ordered logit cutoffs will be affected.

declined. Accordingly, three dummies are created: "demand up", "demand unchanged", and "demand down".

In order to capture the borrower balance sheet channel, we make use of the question that requires firms to indicate whether their debt-to-assets ratios have changed over the past six months. With this information we created the following three dummies; "leverage up", "leverage unchanged" and "leverage down". While this measure does not capture the overall level of debt to assets, it is interesting to see whether it is related to *changes* in the access to finance. Since the analyzed dependent variable measures changes in access to finance, and not the level of access to finance, the use of changes in debt-to-asset ratios is appropriate.[13] Detailed information on these and the rest of the variables can be found in Appendix I.

Country-level variables
Due to lack of bank-level data that could be matched with our firm-level data, we use (changes in) bank CDS premiums at the country level as a proxy for bank funding costs. [14] Although the wholesale funding does not constitute the largest share of European banks' liabilities, this is our preferred measure. Most importantly, since bank CDS premiums are the price buyers pay for the return they receive in a credit event, they serve as an indicator of banks' strength, thus credit risk. Further, although not directly related, we can assume deposit rates banks need to pay for retail funding to be indirectly related to CDS premiums. Since CDS premiums reflect banks' riskiness, deposit rates will most likely move in their direction since those banks that have a hard time attracting whole sale funding would need to pay higher deposit rates too (please refer to Figure 2 in Appendix II for a simple visual illustration of the relationship between CDS premiums and term deposits for Italy and Portugal 2009). Finally, CDS premiums are better comparable across banks than, for instance, bank bonds yields (BIS, 2011).

GDP growth accounts for the general macroeconomic conditions. As firm level variables have bi-annual frequency, the frequency of country-level variables is matched with that of the SAFE, corresponding to the six month periods preceding the survey waves.

Table 1 presents the list of variables with expected signs, indicating whether we expect the variable to be positively or negatively associated with access to finance. Some of the signs (or the lack thereof) deserve explanation. Based on the theory behind the borrower balance sheet channel, we expect a negative coefficient for the "leverage up" dummy and a positive coefficient for the "leverage down" dummy. Similarly, based on the theory supporting the bank lending channel, we expect the coefficient of bank funding costs to be negative. The expected signs for "demand up" and "demand down" dummies are ambiguous due to self-

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[13] Besides, the SAFE dataset does not include information on the level of leverage.
[14] Since our dependent variable is by construction in changes, we cannot meaningfully account for the differences in capitalization ratio's between countries. If we also use the <u>change</u> in capital ratios among our explanatory variables, we would partly be capturing the deleveraging effect, instead of ex-ante healthiness of the banking sector, given that after the onset of the crisis banks increased their capital ratios considerably, undoubtedly partly through adjustments in their lending activities (deleveraging). Using <u>levels</u> of capital ratios instead we would inevitably be imposing on our model that for positive levels of capital ratios access to finance of firms improves indefinitely.

selection effects. That is, firms that are doing well might want to expand and therefore have higher demand for loans. These firms might also have better access to finance exactly because they are doing well. The opposite might also be true; firms that are doing poorly and struggle with meeting even with daily finances might need (emergency) loans from banks. These firms are also likely to face more stringent financing conditions. Among sectors, we can expect a negative coefficient for the "construction" dummy as this sector took a serious hit during the crisis. For "industry" and "trade" dummies, however, the expected sign is less clear and we let the data speak for itself.

Table 1. Variables and expected signs

Firm level			Country level	
Size (dummy)			ΔBank CDS*	-
	Size micro	-	GDP Growth	+
	Size small	-		
	Size medium	omitted		
	Size large	+		
Leverage (dummy)				
	Leverage up	-		
	Leverage unchanged	omitted		
	Leverage down	+		
Demand (dummy)				
	Demand up	ambigious		
	Demand unchanged	omitted		
	Demand down	ambigious		
Age (dummy)		+		
Sector (dummy)				
	Industry	?		
	Construction	-		
	Trade	?		
	Services	omitted		
Subsidy (dummy)		+		

C. Estimation method

Ordered qualitative response models

Since our dependent variable is qualitative and ordinal, we use an ordered logit model in our estimation. As mentioned earlier, firms report the availability of bank loans in the previous six months as having "increased", "remained unchanged", or "deteriorated", labeled respectively by 3, 2, and 1.[15] The probability that firm n reports at time t that its "bank access" was in the jth "bank access" class, is given by the following expression

$$\Pr\left(\text{access}_{n,t} = j \middle| x_{n,t}, \alpha, \beta\right) = F\left(\alpha_{j+1} - x'_{n,t}\beta + \upsilon_n\right) - F\left(\alpha_j - x'_{n,t}\beta + \upsilon_n\right),$$

$$j \in \{0,1,2\}, \quad \alpha_0 = -\infty, \alpha_j \le \alpha_{j+1}, \alpha_3 = \infty.$$

(1)

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[15] The labeling is strictly ordinal; any monotonic transformation of the labels is an equally valid labeling.

In the expression above, the vector of observed firm specific characteristics is given by $x_{n,t}$ and the unobserved random effect is given by v_n. Structural parameters are denoted by β; α is a vector of "cuts" that partition the real line into categories corresponding to different levels of "bank access", and probabilities are assigned to outcomes based on a cumulative distribution function F.[16]

In the general case, the unobserved random effects are drawn from a non-degenerate distribution. To evaluate the log-likelihood function in this case, the unobserved effects need to be integrated out, which requires assuming that they follow a known parametric functional form.[17] Consequently, maximum likelihood estimates of (α, β, γ) are obtained by maximizing the log-likelihood function, based on the solving the following optimization problem which is based upon equation (1).

The SAFE dataset has a complicated panel structure and the number of firms that were repeatedly surveyed in more than one survey wave is limited (see Osiewicz and Pérez-Duarte, 2011). Since the time dimension of our data is rather small and the sample size is fairly large, i.e. the "incidental parameters problem", we are not able to use fixed effects. Hence, we run our analysis with random effects.[18]

IV. RESULTS

A. Baseline analysis

Table 2 reports the results of the baseline analysis. The qualitative nature of our dataset and the chosen methodology do not allow us to draw quantitative conclusions that are standard in the literature of empirical economics (e.g. an increase in explanatory variable 1 by x basis points results in a decline in dependent variable 2 by y percent). Therefore, we will only discuss the signs and the significance of our estimated coefficients. Although the size of the coefficients cannot be directly interpreted, they can be compared with each other.

As Column (1) presents, an increase in bank CDS premiums, i.e. bank funding costs, is negatively and significantly related to the probability of a firm reporting improved access to finance. This suggests that the health of the banking sector in a given country has a distinct effect on the supply of credit to the real sector, and lends support to the bank-lending channel.[19] As mentioned earlier, bank-lending channel foresees that healthier banks, generally reflected by their capital and liquidity ratios, would be better able to shield their credit supply in the face of a shock. Empirical literature analyzing this relationship often makes a direct

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[16] The common choice for F is the logistic cdf (ordered logit).

[17] Typically it is assumed that they are normally distributed, with unknown variance γ.

[18] Incidental parameter problem in the case of fixed effects would arise because the number of fixed effects, that is parameters to be estimated, would grow as the number of firms in the sample.

[19] Bank CDS premiums might also reflect the distress faced by NFCs, leading both to lower access to finance for firms themselves and losses in the banking sector (through, for instance, non-performing loans). To account for this as a robustness check, we include in the regression changes in non-performing loans along with CDS premiums and find that the significance (and also the sign) of CDS premiums do appear to be robust.

link between the health of the banking sector before a shock, i.e. health ex-ante, and credit supply. Since we are limited by the availability of data and the structure of our dataset, we cannot study the relationship between banks' capital ratios and credit supply directly. Nevertheless, as discussed earlier, there is a mounting literature that finds a significant evidence for the ex-ante capital ratios of the banking sector in buffering the adverse effects of shocks to banks on credit supply. The distinction between ex-ante, transition period, and ex-post is essential. The theory of the bank lending channel rests on the distinction between those banks with better and worse capital ratios at the time of a shock. The ex-ante favorable capital positions give (healthier) banks the possibility of obtaining funding at more advantageous costs when compared to banks with worse capital positions. When banks want to increase their capital ratios after a shock due to, for instance, the need to deleverage, this might come at the cost of credit supply if this goal is realized by cutting back on assets. In other words, in the transition period from low to high capital ratios credit growth might temporarily decline. Once achieved, on the other hand, better capital positions ex-post would function as a desirable buffer in the face of a possible future shock.

On the borrower balance sheet channel, we can draw more solid results with our large, firm-level dataset. As expected, our "leverage up" and "leverage down" dummies are statistically significant ("leverage unchanged" is omitted) and have the correct sign. Those firms that reported an increase in their debt-to-asset ratios are found to be more likely to report deterioration in their access to finance compared to firms that reported no change or a decline in their leverage ratios. Similarly, the probability of reporting an improved access to finance is higher for firms that reported a decline in their debt-to-asset ratios in the previous six months. Our findings thus provide support to the existence of the borrower balance sheet channel in the euro area, at least since 2009.

Another interesting survey question concerns subsidies. With this question we assess whether subsidy policies helped alleviate firms' credit constraints. As expected, the coefficient of the subsidy dummy appears to be statistically highly significant and has a positive sign, suggesting that the use of subsidies significantly improves firms' perception of access to finance. Firm size is also significantly related to access to finance. In line with the stylized facts, micro and small sized firms have a harder time obtaining credit with respect to medium-sized firms. As of 2012, micro firms accounted for 92% of all firms in the EU and small-sized firms accounted for 7% of all firms. The shares were 21% and 18% for value added, respectively (EC, 2013). Although having the correct sign, the "size large" dummy turns out to be statistically insignificant. When firms are split into two groups as firms older and younger than 10 years old, we find that firm age is significantly and positively related to firms' access to finance. Finally, as shown in Column (4), in contrast to "industry" and "trade" dummies, "construction" dummy has a statistically significant and negative coefficient. This implies that firms operating in the construction sector have a harder time obtaining credit. This is not surprising given the large hit the construction sector had to take in several euro area countries in the recent years. Note that the sample with sector dummies does not include large firms as sector information is not available for these firms to protect their anonymity.

Table 2. Main estimation results

Dependent variable: Bankaccess		(1)	(2)	(3)	(4)
		Full sample	*Stressed economies*	*Rest of EA*	*Only SMEs*
Country level	Bank CDS	-0.000708***	-0.000807***	0.000529	-0.000747***
		(0.000120)	(0.000121)	(0.000395)	(0.000126)
	Growth	0.366***	0.380***	0.208***	0.356***
		(0.0240)	(0.0365)	(0.0396)	(0.0254)
Firm level	Size micro	-0.386***	-0.299***	-0.511***	-0.354***
		(0.0431)	(0.0564)	(0.0701)	(0.0449)
	Size small	-0.142***	-0.131**	-0.186***	-0.119***
		(0.0397)	(0.0538)	(0.0619)	(0.0405)
	Sizelarge	-0.0203	0.0217	-0.0393	
		(0.0612)	(0.0861)	(0.0904)	
	Age	0.0984**	0.0579	0.130**	0.0930**
		(0.0389)	(0.0522)	(0.0625)	(0.0403)
	Subsidy	0.301***	0.333***	0.279***	0.327***
		(0.0369)	(0.0479)	(0.0598)	(0.0392)
	Demand up	-0.465***	-0.578***	-0.349***	-0.510***
		(0.0407)	(0.0531)	(0.0661)	(0.0433)
	Demand down	0.137***	-0.0731	0.285***	0.139***
		(0.0440)	(0.0652)	(0.0647)	(0.0469)
	Leverage up	-0.407***	-0.427***	-0.355***	-0.422***
		(0.0395)	(0.0499)	(0.0664)	(0.0415)
	Leverage down	0.141***	0.146***	0.137**	0.116***
		(0.0362)	(0.0521)	(0.0542)	(0.0385)
	Industry				0.185***
					(0.0436)
	Construction				-0.184***
					(0.0565)
	Trade				0.105**
					(0.0424)
	Constant 1	-1.383***	-1.263***	-1.590***	-1.345***
		(0.0520)	(0.0682)	(0.0854)	(0.0578)
	Constant 2	2.209***	1.957***	2.385***	2.298***
		(0.0572)	(0.0748)	(0.0921)	(0.0645)
	Sigma 2	1.323***	0.840***	1.760***	1.357***
		(0.102)	(0.117)	(0.175)	(0.110)
	Observations	25679	12129	11849	23313

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

B. Stressed economies versus the rest

As a next step, we split the sample and run the analysis for the stressed economies and the rest of the euro area separately as stylized facts point at a substantial degree of heterogeneity

among these groups when it comes to firms' access to finance. Columns (2) and (3) of Table 2 present the results.

Bank CDS premiums preserve significance and the negative sign only in the stressed economies while it becomes insignificant in the rest of the euro area. The borrower balance-sheet channel appears to be significantly relevant in both country groups (though more so in the stressed economies), underlying the wide-ranging importance of the health of borrowers' balance sheets. Firm size continues to be statistically significant and is of the expected sign, and therefore appears to be conducive for firms' access to finance regardless of where they are located. The same can also be said for the "subsidy" dummy. In addition, firm age ceases to be a relevant factor for firms in the stressed economies.

C. Results for the four largest countries

Finally, we are also interested in the results for individual countries. In addition to the representativeness of the sample at the euro area level, the sample is representative for the four largest euro area economies at the country level. Therefore we are able to run the country-specific analysis for Germany, Spain, France, and Italy. Since our variable capturing bank lending costs is a country-level variable (CDS premiums), it is inevitably excluded from this exercise.

Results presented in Table 3 reveal that it is mainly micro firms that reported difficulties in access to finance in the largest four economies. In addition–and in line with earlier results–subsidy is found to be significantly and positively related to better access to finance. Also, increased leverage is significantly and negatively related to better access to finance in Italy, Spain and France, and turned out to have no clear effect on firms located in Germany.

Table 3. Results by country

Dependent variable: Bankaccess	(1)	(2)	(3)	(4)
	Italy	*Spain*	*Germany*	*France*
Sizemicro	-0.321***	-0.295***	-0.577***	-0.528***
	(0.0898)	(0.0905)	(0.134)	(0.111)
Sizesmall	-0.135	-0.104	-0.144	-0.200**
	(0.0867)	(0.0855)	(0.116)	(0.0959)
Sizelarge	-0.147	0.0734	0.103	-0.137
	(0.145)	(0.130)	(0.155)	(0.151)
Age	0.135	0.185**	0.287**	-0.00199
	(0.0826)	(0.0855)	(0.127)	(0.0973)
Subsidy	0.425***	0.241***	0.242**	0.254***
	(0.0793)	(0.0773)	(0.104)	(0.0979)
Demandhigh	-0.538***	-0.458***	-0.455***	-0.208**
	(0.0854)	(0.0888)	(0.126)	(0.0978)
Demandlow	0.121	-0.226**	0.390***	-0.0360
	(0.118)	(0.0944)	(0.114)	(0.111)
Leveragehigh	-0.504***	-0.544***	-0.185	-0.520***
	(0.0784)	(0.0824)	(0.133)	(0.0970)
Leveragelow	0.237***	0.158**	0.0710	0.0853
	(0.0915)	(0.0793)	(0.0988)	(0.0852)
Constant 1	-1.429***	-0.901***	-1.860***	-1.875***
	(0.108)	(0.108)	(0.172)	(0.133)
Constant 1	2.089***	2.150***	2.529***	2.217***
	(0.117)	(0.124)	(0.185)	(0.136)
Sigma 2	0.810***	0.895***	2.233***	1.816***
	(0.167)	(0.198)	(0.437)	(0.246)
Observations	4810	4704	3741	5124

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Robust standard errors in parentheses.

D. Robustness checks

We run alternative specifications for robustness checks. We first extend our baseline analysis with country dummies on order to control for country-specific and time invariant factors. Later, we run the baseline analysis for different sub-samples, namely across sectors and firm sizes. Once again, since sector information is not available for large firms, the specification we use in the analysis for different sectors does not include the "size large" dummy. Naturally, the expected signs of the coefficients of our explanatory variables are not necessarily the same in different sectors or size groups. Tables 4, 5 and 6 in Appendix II present the results.

Table 4 shows the results of the baseline analysis with country dummies. All coefficients preserve their significance and sign. Columns (1), (2), (3) and (4) of Table 5 show the results for different sectors. As it appears, the coefficient for bank funding costs is significant and negative in all sectors. Similarly, the coefficients for subsidy and "leverage up" variables are significant in all sectors and have the expected signs. Age loses significance for the industry and construction sectors and appear significant in trade and services (though only at the 10 per cent level) with the expected sign. Finally, size appears to be not significantly related to access to finance for firms in the construction sector.

Columns (1), (2), (3) and (4) of Table 6 show the results for micro, small, medium and large firms. Results indicate that bank funding costs are significantly and negatively related to access to finance of micro, small and medium firms but not of large firms, in line with expectations. Similarly, subsidy is significantly and positively related to access to finance of micro, small and medium firms whereas no significant effect is found on large firms' access to finance. In contrast, an increase in firms' leverage is significantly and negatively related to firms' access to finance regardless of their size. In addition, age is significantly and positively related to access to finance of only small and medium sized firms.

Overall, our analysis with sub-samples implies that our results are robust.

V. CONCLUSIONS AND POLICY IMPLICATIONS

Using a unique firm-level dataset, we analyze whether the riskiness of banks' and borrowers' balance sheets significantly affect firms' access to finance. Further, we explore whether subsidies can help alleviate credit constraints of firms. We find that an increase in bank funding costs is negatively associated with access to finance of firms in the stressed economies. In the rest of the euro area, no clear affect of bank funding costs on access to finance of SMEs is found. We also find that an increase in firms' debt to assets ratios is significantly and negatively related to their access to finance. This is true for all firms regardless of their size and branch of economic activity. The use of subsidies is significantly and positively related to improved access to finance of all firms except for the large ones, which implies that subsidy programs that were put in place to help credit constrained SMEs were indeed useful. Firm size and age are significantly and positively associated with improved access to finance of firms.

Our results have the following policy implications. Strengthening bank balance sheets will make banks more resilient against a possible future shock, with more favorable prospects for credit growth after the shock. It should be acknowledged that our empirical analysis provides only indirect, thus suggestive, evidence in support of these policies. Further, as SMEs clearly struggle with bank financing constraints and as they have a considerable share in employment and value added creation in the euro area, additional policies should focus on ensuring credit availability to viable SMEs where deemed necessary. In this respect, authorities should commence or continue efforts to establish well-developed markets to create a more sustainable and diversified set of financing options that complement the traditional role played by banks. Targeted subsidies towards small firms could also help. According to our dataset, around 30 per cent of large firms reported having used a subsidy

during the six months preceding the survey waves in contrast to only around 15 per cent of micro firms. Yet, our results indicate that subsidies are significantly and positively related to access to finance of SMEs but not to that of large firms, justifying the case for reorienting subsidies towards smaller firms. This may also be done in a budget neutral way, which would be important in countries that try to reduce their fiscal imbalances. Further, awareness for subsidy programs should be promoted. There is anecdotal and survey evidence that SMEs lack awareness of the existence of subsidy programs in their countries. Targeted liquidity provisions for viable SMEs might also be comsidered. In this respect, the press release on July 18th (2013) of the ECB that the ECB would continue to investigate the possible acceptance of SME linked ABS guaranteed mezzanine tranches as Eurosystem collateral, in line with established guarantee policies, is worth mentioning.

References

Al-Eyd, A. and S.P. Berkmen, (2013), "Fragmentation and Monetary Policy in the Euro Area", IMF Working Paper, No. 13/208.

Ayadi, R. and S. Gadi, (2013), "Access by MSMEs to Finance in the Southern and Eastern Mediterranean: What role for credit guarantee schemes?", European Commission, MEDPRO Technical Report No. 35/2013.

Bernanke, B.S. (1987), "Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression", The American Economic Review, Vol. 73 (June), p. 257-76.

Bernanke, B. S. and M. Gertler (1989), "Agency Costs, Net Worth and Business Fluctuations", The American Economic Review, Vol. 79 (March) p. 14-31.
Bernanke, B. S. and M. Gertler (1995), "Inside the Black Box: The Credit Channel of Monetary Policy Transmission", Journal of Economic Perspectives, Vol. 9 (4), p. 27-48.

Bank for International Settlements (2011), "The Impact of Sovereign Credit Risk on Bank Funding Conditions", CGFS Papers, No.43.

Ciccarelli, M., A. Maddaloni and J-L. Peydró (2013), "Heterogeneous Transmission Mechanism Monetary Policy and Financial Fragility in the Euro Area", ECB Working Paper, No. 1527.

Cornett, M. M., McNutt, J. J., Strahan, P. E., and H. Tehranian, 2011, "Liquidity Risk Management and Credit Supply in the Financial Crisis", Journal of Financial Economics, 101(2), p. 297–312.

Darvas, Z. (2013), "Banking System Soundness is Key to SME Financing", Bruegel Policy Contribution, Issue 2013/10.

European Central Bank (2009), "Recent Developments in the Retail Bank Interest Rate Pass-through in the Euro Area", Monthly Bulletin, August 2009.

European Central Bank (2010), "Heterogeneity in Euro Area Financial Conditions and Policy Implications", Monthly Bulletin, May 2010.

European Central Bank, Survey on Access to Finance of Small and Medium-sized Enterprises in the Euro Area, April 2013.

European Comission (2012), "A Recovery on the Horizon? Annual Report for European SMEs 2012/2013", Brussels, 26 November 2013

Ferrando, A. and Mulier, K. (2013), "Firms' financing constraints: do perceptions match the actual situation?" Working Paper Series 1577, European Central Bank.

Gambacorta, L. and D. Marques-Ibanez (2011), "The Bank Lending Channel: Lessons From the Crisis", BIS Working Papers, No. 345.

Institute for International Finance and Bain & Company (2013) "Restoring Financing and Growth to Europe's SMEs".

Holton, S., Lawless, M. and McCann F., (2013), "SME Financing Conditions in Europe: Credit Crunch or Fundamentals?," National Institute Economic Review, National Institute of Economic and Social Research, vol. 225(1), pages R52-R67, August.

Holton, S., Lawless, M. and McCann F., (2012), "Firm Credit in Europe: A Tale of Three Crises," Research Technical Papers 04/RT/12, Central Bank of Ireland. Forthcoming in Applied Economics

Iyer, R., S. Lopes, J-L. Peydro and A. Schoar (2013), "The Interbank Liquidity Crunch and the Firm Credit Crunch: Evidence From the 2007–09 Crisis", Economics Working Papers, Department of Economics and Business, Universitat Pompeu Fabra.

Jimenez, G., S. Ongena, J-L. Peydro and J. Saurina (2012), "Credit Supply: Identifying Balance-sheet Channels With Loan Applications and Granted Loans", American Economic Review, 102(5), p. 2301–2326.

Kapan, T. and C. Minoiu (2013), "Balance Sheet Strength and Bank Lending During the Global Financial Crisis", IMF Working Paper, No 13/102.

Kashyap, A. K. and J. C. Stein (2000), "What Do A Million Observations On Banks Say About the Transmission of Monetary Policy?" American Economic Review, Vol. 90(3), p. 407–428.

Kishan, R. P. and T. P. Opiela (2000), "Bank size, bank capital, and the bank lending channel", Journal of Money, Credit and Banking, Vol. 32(1), p. 121–141.

Kraemer-Eis, H., Schaber, M. and A. Tappi (2010) "SME Loan Securitisation. An important tool to support European SME lending", European Investment Fund Research & Market Analysis, Working Paper, No 2010/007.

Maddaloni, A., M. Ciccarelli and J-L. Peydro (2012), "Trusting the Bankers: A New Look at the Credit Channel of Monetary Policy", available at SSRN: http://dx.doi.org/10.2139/ssrn.1767969.

IMF, GFSR October (2013) "Chapter 2. Assessing Policies To Revive Credit Markets".

Osiewicz and Pérez-Duarte (2011), "Measuring the access to finance of small and medium-sized enterprises across the euro area through a flexible survey", presented at the ECB Workshop, 6 December 2011

Schrör, H. (2009), "Business Demography: Employment and Survival", Eurostat, 70/2009.

VI. APPENDIX I—DATA

Firm level variables

	Question	Code
Bank access	"Would you say that the availability of bank loans has improved, remained unchanged or deteriorated for your firm over the past 6 months?"	
	Improved	3
	Remained unchanged	2
	Deteriorated	1
	Not applicable to my firm	7
	[DK/NA]	9
	*The first three answer options were recoded as shown above in order to make our dependent variable easier to grasp intuitively. Answers coded with 7 and 9 were disregarded.	
Subsidy	"Could you please say whether you used a subsidy during the past 6 months, did not use them but have experience with them, or did not use them because this source of financing has never been relevant to your firm?"	
	Used in the past 6 months	1
	Did not use in the past 6 months, but have experience with this source of financing	2
	Did not use as this source of financing has never been relevant for my firm	3
	Not applicable to my firm	7
	[DK/NA]	9
	*Subsidy dummy takes the value of 1 for firms that reported having used a subsidy and 0 for answers coded with 2, 3 and 7. Answers coded with 9 were disregarded.	
Demand	"Please tell me if your needs for bank loans (new or renewal; excluding overdraft and credit lines) increased, remained unchanged or decreased over the past 6 months?"	
	Increased	1
	Remained unchanged	2
	Decreased	3
	Not applicable to my firm	7
	[DK/NA]	9

*"Demand up" dummy takes the value of 1 for firms reporting their needs has increased and 0 for answers coded with 2 and 3. "Demand unchanged" and "demand down" dummies are constructed in similar fashion. Answers coded with 7 and 9 were disregarded.

Leverage	"Would you say that the amount of debt compared to the assets of your company has decreased, remained unchanged or increased over the past 6 months?"	
	Increased	1
	Remained unchanged	2
	Decreased	3
	Not applicable to my firm / my firm has no debt	7
	[DK/NA]	9
	*"Leverage up" dummy takes the value of 1 for firms reporting their debt to asset ratios have increased and 0 for answers coded with 2, 3 and 7. "Leverage unchanged" and "Leverage down" dummies are constructed in similar fashion. Answers coded with 9 were disregarded.	
Age	"How long ago was your firm registered?"	
	10 years or more	1
	5 years or more but less than 10 years	2
	2 years or more but less than 5 years	3
	Less than 2 years	4
	[DK/NA]	9
	* Age dummy takes the value of 1 for firms older than 10 years old and 0 for firms younger than 10 years old as coded with 2, 3 and 4. Answers coded with 9 were disregarded.	
Sector	"What is the main activity of your company?"	
	Industry	1
	Construction	2
	Trade	3
	Services	4
	Set as missing	9
	*"Industry" dummy takes the value of 1 for firms that operate in industry and 0 firms in construction, trade or services. Other construction dummies are created in similar fashion. The code for the main activity is "set as missing" for confidentiality for all large firms. Answers coded with 9 were disregarded.	

*** Disregarded answers: The "DK"/"NA" are disregarded from the analysis, unless otherwise mentioned in the descriptions above. This does not distort the results as no obvious pattern was found across different firm-specific characteristics for firms that responded with a "DK"/"NA".

<u>Country level variables</u>

GDP growth	Data come from Eurostat.
Bank CDS premium	Average CDS premiums of 3 largest banks in a given country. Daily data. 5 days moving averages. Data come from Capital Market Analysis.

VII. APPENDIX II—ROBUSTNESS CHECKS

Table 4. Robustness checks with country dummies

Dependent variable: bankaccess		(1)	(2)
Country level	Bank CDS	-0.000708***	-0.000226*
		(0.000120)	(0.000130)
	Size micro	-0.386***	-0.368***
		(0.0431)	(0.0431)
Firm level	Size small	-0.142***	-0.127***
		(0.0397)	(0.0397)
	Size large	-0.0203	-0.0254
		(0.0612)	(0.0613)
	Age	0.0984**	0.124***
		(0.0389)	(0.0390)
	Subsidy	0.301***	0.312***
		(0.0369)	(0.0370)
	Growth	0.366***	0.296***
		(0.0240)	(0.0274)
	Demand up	-0.465***	-0.450***
		(0.0407)	(0.0406)
	Demand down	0.137***	0.149***
		(0.0440)	(0.0441)
	Leverage up	-0.407***	-0.412***
		(0.0395)	(0.0394)
	Leverage down	0.141***	0.149***
		(0.0362)	(0.0361)
Country dummies	DE		0.441***
PT omitted			(0.0852)
	NL		0.0990
			(0.103)
	IT		0.455***
			(0.0787)
	ES		0.00982
			(0.0799)
	FR		0.355***
			(0.0810)
	AT		0.230**
			(0.0962)
	IE		-0.796***
			(0.131)
	GR		-0.127
			(0.139)
	BE		0.481***
			(0.0963)
	Constant 1	-1.383***	-1.083***
		(0.0520)	(0.0869)
	Constant 2	2.209***	2.515***
		(0.0572)	(0.0924)
	Sigma 2	1.323***	1.283***
		(0.102)	(0.101)
	Observations	25679	25679

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5. Robustness checks with sector sub-samples

Dependent variable: Bankaccess		(1)	(2)	(3)	(4)
		Industry	*Construction*	*Trade*	*Services*
Country level	Bank CDS	-0.000760***	-0.00139***	-0.000769***	-0.000532**
		(0.000244)	(0.000404)	(0.000222)	(0.000226)
	Growth	0.282***	0.432***	0.455***	0.319***
		(0.0474)	(0.0816)	(0.0502)	(0.0435)
Firm level	Size micro	-0.455***	-0.231	-0.393***	-0.278***
		(0.0981)	(0.143)	(0.0895)	(0.0699)
	Size small	-0.178**	0.184	-0.177**	-0.0975
		(0.0690)	(0.134)	(0.0873)	(0.0677)
	Age	-0.0418	0.184	0.138*	0.109*
		(0.0875)	(0.130)	(0.0782)	(0.0609)
	Subsidy	0.357***	0.288**	0.319***	0.322***
		(0.0694)	(0.131)	(0.0798)	(0.0667)
	Demand up	-0.484***	-0.582***	-0.505***	-0.525***
		(0.0816)	(0.140)	(0.0859)	(0.0717)
	Demand down	0.250***	-0.0117	0.148	0.0912
		(0.0886)	(0.146)	(0.0921)	(0.0783)
	Leverage up	-0.429***	-0.615***	-0.403***	-0.388***
		(0.0801)	(0.130)	(0.0825)	(0.0687)
	Leverage down	0.0740	0.0379	0.121	0.181***
		(0.0715)	(0.129)	(0.0778)	(0.0635)
	Constant 1	-1.657***	-1.162***	-1.474***	-1.246***
		(0.107)	(0.173)	(0.116)	(0.0865)
	Constant 2	1.986***	2.840***	2.230***	2.270***
		(0.113)	(0.227)	(0.128)	(0.101)
	Sigma 2	1.416***	2.041***	1.362***	1.144***
		(0.220)	(0.510)	(0.244)	(0.198)
	Observations	6531	2624	6142	8016

*** p<0.01, ** p<0.05, * p<0.1

Robust standard errors in parentheses.

Table 6. Robustness checks with firm size sub-samples

Dependent variable: Bankaccess		(1)	(2)	(3)	(4)
		Micro	*Small*	*Medium*	*Large*
Country level	Bank CDS	-0.000990***	-0.000505**	-0.000811***	-0.000645
		(0.000225)	(0.000205)	(0.000230)	(0.000396)
	Growth	0.307***	0.398***	0.344***	0.457***
		(0.0485)	(0.0420)	(0.0426)	(0.0719)
Firm level	Age	0.0669	0.117*	0.173**	0.0121
		(0.0642)	(0.0677)	(0.0807)	(0.162)
	Subsidy	0.335***	0.326***	0.329***	0.0742
		(0.0819)	(0.0627)	(0.0624)	(0.104)
	Demand up	-0.718***	-0.466***	-0.389***	-0.0989
		(0.0826)	(0.0697)	(0.0742)	(0.118)
	Demand down	0.170*	0.0828	0.169**	0.158
		(0.0944)	(0.0758)	(0.0762)	(0.124)
	Leverage up	-0.546***	-0.432***	-0.301***	-0.270**
		(0.0759)	(0.0683)	(0.0726)	(0.127)
	Leverage down	0.106	0.0781	0.189***	0.294***
		(0.0754)	(0.0617)	(0.0640)	(0.108)
	Constant 1	-1.187***	-1.257***	-1.188***	-1.144***
		(0.0713)	(0.0742)	(0.0868)	(0.169)
	Constant 2	2.650***	2.364***	2.264***	2.002***
		(0.103)	(0.0910)	(0.0994)	(0.186)
	Sigma 2	1.714***	1.279***	1.066***	0.862***
		(0.260)	(0.191)	(0.164)	(0.259)
	Observations	7148	8615	7550	2366

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Robust standard errors in parentheses.

Figure 2. An illustrative relationship between CDS premiums and term deposits in Italy and Portugal since 2009
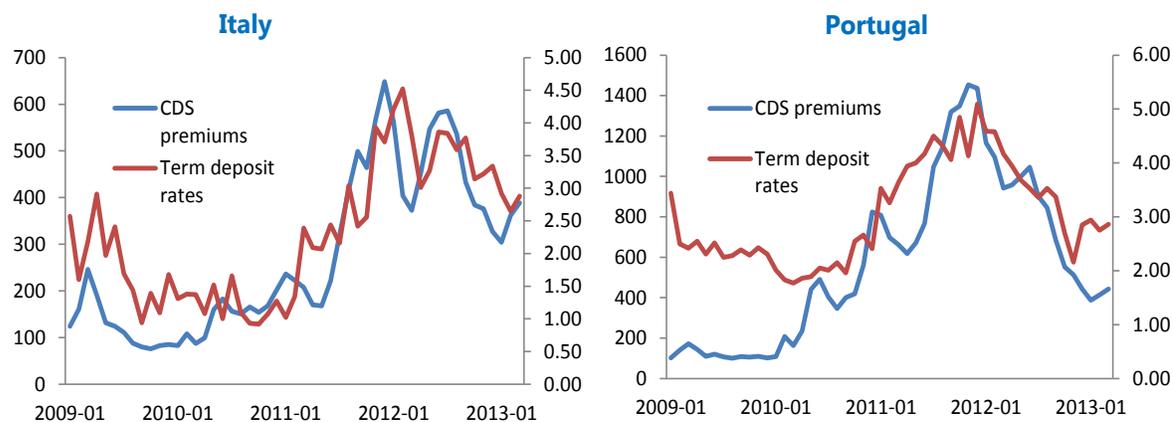
Source: ECB and Bloomberg

VIII.   APPENDIX III— IDENTIFYING STRESSED ECONOMIES

Table 7 shows the averages of secondary market yields of government bonds with a remaining maturity close to ten years. We define the economy as stressed, if its sovereign yield exceeds that of Germany by 2 percentage points or more.

Table 7. Average sovereign yields, 2009-12

Country	Average sovereign yield
DE	2.52
FI	2.91
NL	2.90
AT	3.21
FR	3.16
BE	3.65
IT	**4.82**
ES	**4.88**
IE	**6.68**
PT	**7.60**
GR	**13.13**

Source: ECB