EUROPEAN CENTRAL BANK

EUROSYSTEM

FINANCING OBSTACLES AMONG EURO AREA FIRMS

WHO SUFFERS THE MOST?

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CONTENTS

Abstract

In this study we investigate the determinants of financing obstacles using survey data on a sample of around 5000 firms from the euro area countries. This completely new survey – started at the end of 2009 - gives us the opportunity to test whether firm characteristics such as size, age, economic branch, financial autonomy and ownership are valid predictors of financing obstacles also during the recent financial crisis. Our results show that only age and ownership are robust explanatory variables for firms' perceived financing obstacles while mixed results are found for size and economic branches.

Non-Technical summary

This paper investigates the role of certain firm characteristics with respect to the experience of financing obstacles during the recent financial crisis, drawing on new survey data for a sample of more than 5000 firms in the euro area.

Since access to finance is widely perceived to be a crucial factor for firms, the existence of financing obstacles should cause major problems for firms as well as economies in general as they pose a considerable threat to productivity. To address such challenges, the nature of such obstacles as well as their determinants need to be identified. This seems to be of even more relevance today when, due to the recent financial crisis, traditional sources of firm financing seem to have disappeared and the availability of financing instruments is continuously deteriorating.

This paper evaluates whether firm characteristics such as size, age, economic branch, financial autonomy and ownership are valid predictors of financing obstacles across euro area countries. For this purpose we utilize data obtained in the second wave of the ECB- European Commission Survey on the 'Access to Finance of small and medium-sized Enterprises' (SAFE), which provides most recent evidence on the financial situation, financing needs and the access to financing of small and medium-sized enterprises as well as of a comparable sample of large firms in the euro area during the second half of 2009.

We measure financing obstacles through firms' self-assessment on whether access to finance constitutes their most pressing problem and conduct multiple regression analysis to identify important determinants of such perceptions.

Our findings show that age and ownership structure are important explanatory variables for firms' perceived financing obstacles across countries, while mixed results are revealed regarding the effect of firm size and economic branches. These results remain robust to various different specifications, including individual estimations at the country level for the four largest member states (France, Germany, Italy and Spain) as well as separate analyses for the main sectors of business activity (Construction, Industry, Services and Trade).

Finally, we extend the analysis to firms' choice about how to finance their day to day business, investigating the existence of underlying firm characteristics that drive such decision. We find that the use of external financing sources seems closely related to the existence of financing obstacles although we do not imply any causality between the two. Interestingly, controlling for this strong relationship leaves the revealed effects of the main determinants of financing obstacles untouched.

1. Introduction

Access to finance is widely perceived to be a crucial factor for firms - especially for small and medium-sized enterprises (SMEs) - in order to maintain their day-to-day business as well as to achieve long term goals. Hence, the experience of major financing obstacles or constraints should present considerable challenges to enterprises and economies in general as they pose a major threat to productivity. Indeed, the ever growing literature on firm growth recently drew increased attention to the effects of financing obstacles, clearly identifying a negative impact on growth (e.g. Ayyagari et al. 2008, Beck et al. 2006). This seems to be of even more relevance today when, due to the recent financial crisis, sources of firm financing seem to have disappeared and the availability of financing instruments is continuously deteriorating[4]. Hence, addressing these challenges posed by increased financing obstacles should be a primary goal. Nevertheless, achieving this goal necessitates investigating the nature of such obstacles as well as to identify which firms are affected the most.

Following Fazzari et al (1988) many studies investigated the existence and determinants of financing constraints for firms. One main body of this literature refers to empirical investigations using *balance sheet information.* In a nutshell, this literature implies the need of a priori classifications between financially constrained and unconstrained firms (using proxies such as the size or the age of the firm) in order to check whether the sensitivity of investment/growth to cash flow is higher for constrained than for unconstrained firms.[5] Furthermore the literature has identified additional determinants related to country characteristics and in particular to the various degrees of financial development (see for instance Demirgüç-Kunt and Maksimovic 1998).

A second main strand of the literature on financial constraints relies on *direct self-reporting by firms* on their perceptions of financing constraints rather than balance sheet information. In particular, several studies have made use of the firm-level World Business Environment Survey (WBES) database to derive a direct measure of financing obstacles.[6] Using the results of the WBES, Beck et al. (2006, 2008) find that age, size and ownership structure are valid predictors of financing obstacles while some country characteristics related to the developments of the financial market (in terms of financial intermediation and liquidity of the stock market) do have an additional impact on firms' likelihood to experience major obstacles. Drawing on the same data but focusing mainly on five major euro area countries (France, Germany, Italy, Portugal and Spain), Coluzzi et al. (2009) find firms that might be more opaque from the lender's perspective face higher financing constraints. At the same time, the authors reveal significant sectoral differences, indicating that firms in the manufacturing and in the construction sector face (or have

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[4]   See, for instance, section 2.6 of the quarterly issues of the ECB Monthly Bulletin (2009-2010).

[5]   For instance, small and young firms should face more binding financing obstacles due to the more severe information asymmetries their creditworthiness analysis involves (Devereux and Schiantarelli, 1990; Gilchrist and Himmelberg, 1995). Foreign owned firms and firms belonging to a group (Keiretsu in Hoshi et al, 1991) should suffer less from financing constraints, as they have alternative source of finance. An investment grade rating for corporate bonds also reduces financing constraints (Whited, 1992).

[6]   The WBES was run by the World Bank in 1999 and 2000 across 80 countries containing information from around 10,000 firms. The survey focused on obstacles to firm performance and growth, including information on firms' perception of being financially constrained.

the feeling of facing) more financing obstacles than those in the service sector. Additionally, a good economic performance is found to have a negative impact on the likelihood of suffering these restrictions. Angelini and Generale (2008) use survey information for Italian firms to directly measure the relationship between financing constraints and firm size distribution, concluding that although there is a significant negative link between financial constraints and firm size, this seems to be a real problem only for a small portion of their sample. More important seems to be the relationship between financial constraints and firm age. Related more specifically to the current financial crisis, Campello et al (2010) study the impact of financial constraints on corporate policies by surveying CFOs in the fall of 2008. They find that the crisis has systematically affected, for instance, real investment and growth but unequally across firms and countries. However in order to quantify these effects, it appears that traditional measures of financing constraints perform worse than measures derived using survey information.

In this paper we build upon this second line of research, investigating the underlying determinants of financing obstacles (measured through firms' self assessment of access to finance being the most pressing problem) among euro area firms and their implications for the use of external financing sources. As such, we make three important contributions to the literature.

First, we apply the empirical approach of Beck et al. (2006) to the results of a new firm-level survey which relates to a sample of non-financial corporations in Europe. This is the second wave of the ECB-European Commission Survey on the Access to Finance of small and medium-sized Enterprises (SAFE)[7], which provides evidence on the financial situation, financing needs and the access to financing of small and medium-sized enterprises as well as of a comparable sample of large firms in the euro area during the second half of 2009. The use of such recent survey data contains the unique possibility to test whether firm characteristics such as size, age, economic branch, financial autonomy and ownership are valid predictors of financing obstacles across countries also in a period of financial crisis. As mentioned above, these characteristics have been used in the literature as proxies for information asymmetries or agency costs to distinguish constrained from unconstrained firms. Drawing on the research of Beck et al. (2006), we expect that smaller and younger firms are more likely to perceive major financing obstacles. At the same time, listed companies are less opaque due to the listing requirements and therefore present smaller information asymmetries that determine financing obstacles. Also firms belonging to groups, as they make use of intra-group funds, are expected to face lower financing constraints than family-run firms or companies owned by a single person.

Due to a different wording of the question on access to finance as a major obstacle for firms in SAFE with respect to the WBES, we run probit regression analysis using firms' assessment of whether access to finance is their most pressing problem as dependent variable. In addition, we conduct multinomial logit regressions to further distinguish between different types of potential obstacles and problems captured in the survey. In this way we further investigate whether firm characteristics which are important for explaining financing obstacles are also relevant with respect to other problems reported by firms in the survey.

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[7] The survey started in the summer of 2009 and since then has been regularly run every six months. It is divided into two parts. The part of the survey relating to the shorter term is repeated by the ECB every six months to assess the developments in the financing conditions for firms in the euro area. The complete survey is conducted every two years in cooperation with the European Commission. It also includes information from other European countries not belonging to the euro area. For more information regarding the survey as well as the results of the individual waves see also http://www.ecb.europa.eu/stats/money/surveys/sme/html/index.en.html.

Second, we replicate our analysis on the country level for the 4 largest countries in the euro area (France, Germany, Italy and Spain) as well as separately for the main sectors of business activity (Construction, Industry, Services and Trade). This enables us to investigate more closely whether the effect of specific firm characteristics is equal across countries and sectors or rather depends on country or sector specific factors, respectively.

Finally, we extend the analysis to firms' choice about how to finance their day to day business, investigating the existence of underlying firm characteristics that drive such a decision. We thereby specifically take into account that the decision to use a specific kind of financing may be closely related to the existence of financing obstacles. While previous studies such as Beck et al. (2008) have to some degree addressed this issue by including the existence of financing obstacles as an explaining variable into the analysis of firms' financing patterns, we use a bivariate probit approach to control for the possibility of a strong relation between financing obstacles and firms' financing decisions without implying any causality between the two.[8] This approach not only enables us to investigate the role of certain firm characteristics with respect to the choice of specific financing instruments independently of the potential connection of such a choice to the existence of financing obstacles. It also provides the opportunity to test the robustness of the previous results regarding the determinants of financing obstacles when controlling for potential bias due to firms' financing patterns.

Our results show that only age and ownership are important explanatory variables for firms' perceived financing obstacles across countries, while mixed results are achieved for size and economic branches. Differently from previous studies where the sector of activity was found to present an important determinant of experiencing financing obstacles, our results seem to indicate that structural differences across firms in access to finance are not relevant. At this stage we are not able to infer whether this is attributable to the financial crisis- which could have been so widespread across sectors to possibly outweigh all sectoral differences- or to the different sample we use with respect to previous surveys. Our main results are confirmed also when probit estimations are conducted separately at country level as well as when additional explanatory variables such as bank loan applications or the interaction between stating financing obstacles and the use of external sources of finance are considered. In the latter case, the use of external funds is positively related to size as larger firms draw more heavily on external financing compared to smaller companies. On the other hand, as they become mature, firms rely more on internal funds to finance their day-to-day business.

The remainder of this paper is organized as follows. Section 2 gives a brief overview of the data, the relevant variables as well as of the bivariate relationships among them. Section 3 introduces the empirical model and presents the main results regarding the determinants of financing obstacles, whereas section 4 then specifically investigates potential differences among the four largest euro area countries as well as among different sectors. Finally, section 5 additionally focuses on firms' use of external financing, considering the role of certain firm characteristics as well as the potential connection between external financing and the existence of financing obstacles. The last section concludes.

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[8] Although Beck et al. (2008) include the existence of financing obstacles as explaining variable of firms' financing patterns, they note that causality could run either way. Firms that face financing obstacles may be unable to use certain financing instruments. At the same time, firms that rely more heavily on external funding should be more likely to encounter problems in the access to finance.

2.   Data characteristics

The present analysis on the relationship between firm characteristics and their likelihood to experience major financing problems draws on survey data obtained from the second wave of the SAFE, which was conducted during November and December of 2009.[9] The total euro area sample size amounted to 5,320 firms, of which 4,786 had less than 250 employees. These companies were randomly selected to form a sample stratified by firm size class (based on the number of employees), economic activity and country. The number of firms in each of these strata of the sample was then adjusted to increase the accuracy of the survey across activities and size classes. The survey contains firm-level information mainly related to major structural characteristics (size, sector, firm autonomy, turnover, firm age and ownership) as well as to firms' assessment of recent short term developments regarding their financing needs and access to finance. As reported in annex 2 the survey includes by construction a large number of SMEs (around 90%) which are mostly independent firms, not belonging to a group. More than 50% of the firms are more than 10 years old. Regarding ownership, very few firms are listed and the majority belongs to a family or to a group of entrepreneurs. Looking at the country breakdown, Germany stands out with the lowest percentage of listed companies and the highest one of firms belonging to a single owner.

In our study the existence of major financing obstacles will be measured via the following question (Q0 in the questionnaire): "What is currently the most pressing problem your firm is facing?" Firms could choose among a set of potential problems ranging from finding customers and the presence of competition to increased costs of production of labour and the presence of regulation. Firms that choose the "Access to Finance" from the provided options are then considered as facing major financing obstacles. It is important to note that the wording of the question in SAFE is very different from the wording of the surveys used in the preceding literature (e.g. Beck et al., 2006). SAFE asks respondents to pick the most pressing problem from a set of seven different possibilities, whereas the other surveys typically ask firms to rank a given problem on a certain scale (e.g. 4, major obstacle to 1, no obstacle, see Beck et al. 2006). Consequently, in SAFE we do not observe the actual levels of financing obstacles within a firm as well as whether access to finance is the second most pressing problem or the third most pressing, etc (firms cannot signal more than one problem), whereas we consistently observe the degree of financing obstacles in the other surveys. In this way it could be that at in our sample we underestimate the existence of firms that consider access to finance as a pressing (although not the most pressing) problem. Nevertheless, our measurement has a bright side as we avoid the danger of bias caused by possible tendencies of some firms to give generally more negative (or positive) evaluations. In the SAFE, firms are forced to put the existence of financing obstacles in relation to other potential problems. Therefore, their answer is more likely to reflect a serious problem or obstacle that the respective firm is facing. However, as it will be explained in section 3, we need a different econometric tool to analyze this measure in order to differentiate between different types of potential obstacles and problems captured in the survey as well as to adequately test whether firm characteristics which are important for explaining financing obstacles are also relevant for other problems reported by firms.

Looking at firms' response regarding the most pressing problem they currently face, one can observe that a considerable fraction of enterprises experience major problems regarding finding customers, clearly a variable related to the subdued economic activity, but also regarding the access to finance (Figure 1). 17%

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[9]   The first wave of the survey, conducted in summer 2009, is not sufficient for this purpose as the relevant information of existing problems in the access to finance was not collected for the majority of firms, especially with respect to the four largest euro area countries.

of the responding firms state access to finance as their most pressing problem. Hence, it appears to be the second biggest issue among euro area firms. However, results are quite heterogeneous across countries. While access to finance seems to be the biggest problem for a large number of Spanish firms (34%), it is mentioned considerably less by German and Italian enterprises (18% and 20%, respectively) and appears to be much less of an issue in France, where besides finding customers competition, the costs of production and labour and the availability of skilled staff and experienced managers are also considered more troublesome. With respect to the rest of the euro area – treated as a whole due to the small number of observations in the individual countries – major financing obstacles are experienced by a smaller fraction of firms compared to Spain, Germany and Italy.

[Figure 1 around here]

When computing simple correlations between access to finance being the most pressing problem and other major firm characteristics (see table 1), it appears that only some demographic aspects are related to the experience of major financing obstacles.[10] For instance, only for micro firms a significant positive relationship with the experience of financing obstacles is revealed, while the correlation with other size classes remain insignificant.[11] Younger firms report more often the presence of problems related to access to finance while firms belonging to another firm or listed companies seems to be shielded from this problem. From the table it also appears that some of these variables are correlated among themselves. For instance, size in terms of employment seems to be closely related to annual turnover as micro firms are also firms with the lowest turnover while large ones rather report the highest turnover. Listed companies belong to the group of firms with the highest turnover while firms with a sole proprietor tend to have low turnover and to be small in terms of employment as well.

[Table 1 around here]

3.   Financing obstacles and the characteristics of the firm

As in previous studies we model the probability of firms facing financing obstacles as a linear function of the characteristics available from the survey data (see Beck et al., 2006, Coluzzi et al., 2009):

$$FinObst_{i,k} = \sum_k \theta_k country_k + \sum_j \phi_j (FirmCharacteristic_j)_{i,k} + \varepsilon_{i,k} \qquad (1)$$

where 'FinObst' is the response by firm i in country k that indicates access to finance as most pressing problem. 'FirmCharacteristics' is a vector of major firm attributes (e.g. firm size, sectoral dummies, firm

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[10]   A detailed description of these variables and their coding can be found in the annex.

[11]   A continuous variable based on the number of employees has a negative and statistically significant correlation with the financing obstacles variable indicating that the larger the firms the less they report having access to finance as the most pressing problems.

age and ownership structure). Country is a vector of country dummies to control for country-specific impacts on firms' responses. Given that the dependent variable is dichotomous, we use a probit model to estimate equation (1). We assume that the disturbance parameter, $\varepsilon_{i,k}$, has normal distribution and use standard maximum likelihood estimation. Since omitted country characteristics might cause error terms to be correlated for firms within countries, we allow for clustered error terms. Only observations with non-missing values on the relevant variables are considered, allowing the number of observations to be kept constant across estimations of the same type

Table 2 reports the results of a set of probit regressions using the experience of access to finance as most pressing problem as dependent variable. The four models present different combinations of firm characteristics. The first model includes firm size, age, sector as well as country dummies. In the second model, the autonomy of firms is added while in the third model firm ownership is additionally taken into account. The last model finally considers interaction terms between size and ownership. In all specifications firm age seems to be one of the most robust predictors of firms' likelihood to experience financing obstacles. In particular, younger firms are more likely to experience problems in the access to finance. Turning to size, its effect does not prove to be robust across different specifications. Looking at the first specification, size seems to matter showing larger firms to have a lower probability of experiencing financing problems. Yet, the coefficient is significant only in the case of large firms. This effect is vanishing almost completely when financial autonomy of firms (column 2) and ownership structure (column 3) are included. However, although firm size has been identified as an important predictor of financing constraints by several empirical studies over the last years, these results are not necessarily contradictory to the existing research. For instance, using WBES data Beck et al (2006) report that size matters for the overall sample of countries but becomes less important in developed countries. This is also confirmed for some euro area countries by Coluzzi et al. (2009) who show that size is not significant when a dummy on listed companies is included.

Turning to the results of the remaining covariates, financial autonomy does not seem to be of much importance. Although, firms that stand autonomous in their financial decisions are found to face a slightly higher probability of financing obstacles than firms which are part of groups either in the form of branches or subsidiaries (column 2), statistical significance remains very low and vanishes once ownership structure is controlled for (column 3). Rather more important, firms belonging to shareholders or to other firms suffer less than firms from the reference category, which groups together companies whose owners are a family, a group of entrepreneurs, venture capitalists, business angels or a natural person (one person only). However, this might be partially due to the fact that ownership structure is closely related to firm size as large firms are more likely to be listed on the stock market while smaller ones are in most cases owned by a family or a single person (we return to this below).

In all estimations, we further control for sectoral and country specific effects. Contrary to most previous studies, sectoral differences thereby do not prove statistically significant. However, at this stage we are not able to infer whether this is attributable to the recent financial crisis - which could have been so widespread across sectors to possibly outweigh important sectoral differences with respect to the access to finance - or to the fact that our sample is indeed considerably different from those used in previous

surveys.[12] In contrast, country specific effects are found to be significant pointing to some cross-country heterogeneity in firms' financing obstacles. In table 2 we present the estimated coefficients for Spain, France and Italy using Germany as reference category. The results indicate that Spanish, and to a lesser extent Italian firms, seem more affected by access to finance problems. With respect to French firms, instead, the coefficient is negative indicating that they are significantly less likely to report financing obstacles than German firms. In order to shed more light on the country (as well as sector) specific differences, we will present additional analyses in section 4.

Finally, including interaction terms between size and ownership into the model, we reveal a negative and significant effect that i) confirms the importance of the ownership structure and ii) partly explains the absence of significant effects for firm size in the previous specifications. Firms that are small or medium-sized in terms of employees and are owned by shareholders, other firms or business associates seem to possess a smaller likelihood of encountering financing obstacles than micro firms or firms of the same size classes but with different ownership. As expected, since most large firms in our sample are also public companies, there is no additional impact derived from the interaction terms when firms are large.

We additionally replicated all regressions to investigate the role of turnover using it as a proxy for firm size instead of employment and similar results to the ones reported here were obtained (results available upon request).[13]

[Table 2 around here]

So far, we only distinguished between firms that perceive access to finance as their most pressing problem and those that weigh other problems as more pressing. Indeed, in the survey, firms are forced to put the existence of financing obstacles in relation to other potential problems. Therefore, their answer is more likely to reflect a serious problem or obstacle that the respective firm is facing. Therefore, in order to further differentiate between different types of potential obstacles and problems captured in the survey (1 = finding customers, 2 = competition, 3 = access to finance, 4 = production or labour costs, 5 = availability of skilled staff, 6 = regulation and 7 = other non-specified problems), we conduct a multinomial logit regression using a categorical variable on the most pressing problem as dependent variable. Access to finance (3) is used as base category. Although we do not observe the actual levels of financing obstacles within a firm as well as whether access to finance is the second most pressing

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[12] Once further waves of the SAFE have been conducted, which allow comparison between crisis and non-crisis data on similar samples of euro area firms, this issue has to be further investigated.

[13] Further estimations were conducted additionally using information on whether firms applied for new bank loans or required a renewal of bank loans in the previous six months. Therefore we constructed a categorical variable, distinguishing between firms that applied and got everything (around 19% of the whole sample), applied but only got part of it (6%), applied but refused the bank's offer because they consider costs or terms of conditions unacceptable (less than 1%), firms whose application was rejected (around 5%), and firms that did not apply because of possible rejection (around 6%), because of sufficient internal funds (38%) or for other unspecified reasons (25%). We included this variable as an additional determinant of financing obstacles in our major specifications in order to assess the relationship between the experience of actual obstacles in the access to finance (with respect to bank financing) and firms' perception of facing severe financing problems. The results reveal that firms which applied and received less or refused the terms and conditions offered by banks indicate a significantly higher likelihood of facing financing obstacles than firms that received all required funding. On the other hand, those firms that did not apply are signalling significantly less constraints. All results for the remaining determinants remain robust to the introduction of this additional variable. Estimation results are available on request.

problem or the third most pressing, etc., the multinomial logit approach allows us to overcome the potential bias caused by possible tendencies of some firms to give generally more negative (or positive) evaluations.

Figure 2 reports the results for the main variables of interest.[14] The graphical interpretation of the econometric results gives us the possibility to exploit the multidimensional aspects of the analysis. The chart displays for each explaining variable the values of the odds ratios at the top as well as regression coefficients at the bottom.[15] If a problem category (expressed by numbers 1 to 7) is located to the right of another category, then increases in the respective independent variables (or the existence of the respective characteristic in case of dichotomous variables) make the category to the right more likely. The distance between a pair of categories illustrates the size of the effect. The existence of statistically significant differences (at 10% level of significance) between categories is present when there is no line drawn to connect these categories. A further interesting feature of the chart is that differences can be interpreted between all categories of the dependent variable, not only in comparison to the base category. It should be noted that only horizontal differences between the different types of problems are of importance, while vertical spacing is only added in order to make connecting lines between categories (illustrating the absence of significant differences) clearer and more visible.[16]

[Figure 2 around here]

Starting from the effects of firm size on potential obstacles, some strong effects are revealed, especially in the case of large firms as illustrated by the great distances between categories. Yet, only a few of these effects prove statistically significant. Overall, it can be noted that with increasing size, firms seem less likely to perceive severe problems in finding customers relative to any other problem. Compared to micro firms, being a medium-sized or large enterprise significantly reduces the odds of facing problems in finding customers instead of financing obstacles by factor 0.78 and 0.68, respectively. Consequently, when comparing these two problems, access to finance seems more of a problem to larger firms, while finding customers appears to be a rather pressing problem among a large number of micro firms. However, we still find other categories (especially competition or costs of production and labour) to the right of access to finance in the case of larger firms. Hence, the larger the firm the more likely it is to face these type of problems instead of financing obstacles. However, only when comparing competition and access to finance as most pressing problems for the case of large firms, a significant increase (by factor 1.64) in the odds of perceiving the former relative to the latter is found.

Despite the effect of firm size, being financially autonomous significantly increases the likelihood of experiencing financing obstacles rather than problems in finding customers, which seems to be the most pressing among the majority of firms which are only part of a profit-oriented enterprise either in the form

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[14] Detailed results of the multinomial logit analysis are available on request.

[15] The base category 'access to finance being the most pressing problem' is thereby given as reference category and therefore located at 0 on the coefficient and 1 on the odds ratio scale.

[16] A detailed description of this kind of graphical illustration and its interpretation can be found in Long and Freese (2006).

of branches or subsidiaries. This result is not surprising as the latter do not make autonomous financial decisions, whereas financing plays a more important role in decision making of the former. Nevertheless, although all coefficients for the various types of problems remain negative when access to finance is used as base category (located to the left of access to finance in figure 2), no other significant differences than the one mentioned was found regarding the effect of financial autonomy on experiencing financing obstacles.

Similar to the probit regression results reported earlier, firm age and ownership again seem to play the most important role in determining firms' most pressing problems. When treating the experience of financing obstacles as base category, firm age is positively and significantly related to the experience of any other type problem, indicating that increasing age raises the odds of perceiving any problem as more pressing relative access to finance. Older firms thereby experience a significantly higher likelihood of facing problems related to finding customers or competition compared to any other problem.[17] Younger firms, on the other hand, are significantly related to higher odds of facing financing obstacles as most pressing problem (indicated by access to finance being located on the left of all other categories with no connection being displayed).

Turning to a company's ownership structure, similarly strong effects are revealed. Firms listed on the stock market or owned by other companies or business associates are significantly more likely to experience problems other than access to finance (especially with respect to regulation issues). The odds of perceiving regulation as most pressing problem relative to access to finance are thereby 1.71 times greater for companies listed on the stock market or owned by other firms or business associates than for firms owned by families, entrepreneurs or a natural person. The latter, on the other hand, experience significantly increased odds to regard access to finance the most pressing problem.

Overall, firm age and ownership appear to be the most robust predictors regarding the existence of financing obstacles. The importance of other factors such as firm size and economic branch, which are often assumed to play a crucial role in determining whether firms are facing financing obstacles, on the other hand, is not supported by the findings. Firm size, however, seems to have some effect, yet only in combination with ownership.

4. Are the determinants of financing obstacles different across countries and sectors in the euro area?

In the previous probit estimations country dummies were always significant, indicating important country differences with respect to the experience of financing obstacles. Consequently, a natural step is to split the sample according to country and to repeat the probit analysis including all major structural variables to investigate potential differences in the determinants of financing obstacles across countries. Although the survey sample contains non-financial corporations from all euro area countries, we investigate the

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[17]   A unit increase in the log of firm age increases the odds of facing problems related to finding customers or competition relative to access to finance by factor 1.37 in both cases.

major four countries (Germany, Spain, France and Italy) separately and additionally consider a pool of firms from the other euro area countries (as in Table 1). Again, only observations with no missing values on all relevant variables are considered. The results are shown in Table 3 below. Looking across countries, firm age again proves to be a robust predictor except in the case of Italy. The role of firm age in determining whether companies are facing pressing problems in the access to finance therefore shows to be more or less independent from country specific influences, at least when focusing on the biggest member states. The same appears to hold for ownership where across regions (with exception of France), the estimates indicate that firms whose owners are shareholders, other firms or business associates face a decreased likelihood of pressing financing problems compared to firms with different ownership structures.

Similar to the results from the aggregated sample, size is not statistically significant except in the case of Spanish medium and small firms which, according to the estimates, are suffering relatively more than micro firms from the access to finance as a pressing problem as well as in the case of small French firms for which the coefficient is negative. While the results for France at least provide some weak evidence for the expected negative relation between size and the likelihood of experiencing financing obstacles, the effect in Spain seems to be the opposite, indicating substantial country specific differences that determine the role of firm size for the existence of financing obstacles. Hence, a clear effect of size in terms of employment equal across different countries does not seem to hold, which may be responsible for the absence of a significant effect on the euro area level.

Tuning to the remaining covariates in the models, financially autonomous companies in France and Spain seem to possess higher probabilities of facing financing obstacles than those that are part of other firms or groups, most presumably because of the existence of internal channels of capital funds. Whereas almost no significant effects of sector were found at the euro area level, things are slightly different when considering the major countries individually. In the case of Spanish firms, those active in the construction sector are significantly more likely to experience financing obstacles than firms in the service sector. In France, a similar effect is found for firms active in manufacturing. Looking at the group of other euro area countries, firms in construction, manufacturing as well as in the trade sector all appear more likely to be affected by financing obstacles than firms in the service sector. In Germany, on the other hand, firms in the service sector seem be more affected by financing obstacles than firms in the remaining branches, yet not significantly so.

Overall, it must be noted that probit estimations for the sample of Italian firms do not give significant results for most of the variables. Even when different specifications are tried, results remain relatively poor (available upon request).[18]

[Table 3 around here]

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[18] We conducted also further estimations by introducing interaction terms between size and ownership but the coefficients were in most cases not statistically significant with any impact on the other variables.

Turning again to the sectors of activity, we reported that they were almost never found to be a significant factor in predicting financing obstacles in the previous specifications. Nevertheless, sector specific circumstances might still play an important role when it comes to the effect of certain firm characteristics. Companies that differ in terms of size, age, or ownership structure may be affected differently, depending on the economic branch they are working in. Therefore, we follow the same strategy as before and split the sample according to four main sectors (construction, industry, services and trade) and replicate the estimations to check whether the determinants of financing obstacles change within these subsamples. Analyzing the results presented in Table 4, firm size is found significant in predicting the probability of financing obstacles in the construction sector indicating that medium and large firms suffer more than smaller-sized enterprises. Indeed, one of the consequences of the sovereign debt crisis in the euro area has been the huge cuts in public investment which have hit in particular larger firms in the construction sector. In the other sectors, firm size is statistically not significant to discriminate across firms with respect to micro firms. Age is confirmed to be an important factor across sectors while there are indications that the crisis hit public firms relatively less than other firms in all sectors under analysis except trade.

[Table 4 around here]

5. Financing obstacles and the use of external financing instruments: A bivariate probit analysis

In this section, the analysis will aim to take a closer look at firms' choice regarding the use of various instruments to finance their business, especially taking into account whether a firm is facing major problems in its access to finance. More specifically, firms participating in the SAFE were asked to list the sources of financing they made use of in order to finance normal day-to-day business operations or specific projects or investments in the last six months. They could choose between internal funds and various external financing sources such as grants or subsidised bank loans, bank loans (overdraft, credit line and new ones), credit cards, trade credit, leasing, hire-purchase or factoring, debt securities, subordinated loans, participation loans and equity investments.

Figure 3 shows the use of major financing instruments by firms across countries. It can be observed that a relatively large share of firms is drawing on internal funds (56% in the euro area, with a range between 76% in France and 44% in other euro area countries). Regarding the use of external financing, bank loans are used in a more uniform way across countries. On average, around 40% of firms reported to have used bank loans during the second half of 2009. A similar percentage of firms have also made use of bank overdraft and credit lines, although the disparity across countries is higher than in the case of bank loans.

[Figure 3 around here]

When we differentiate between firms that face access to finance as the most pressing problem and those that are not (Figure 3), the former group show slightly higher use of internal funds. The group of firms that face major problems in the access to finance seem to draw (and therefore rely) more heavily on external financing (84% compared to 72% of unconstrained firms).

[Figure 4 around here]

To further investigate the existence of underlying factors that (simultaneously) determine both the experience of financing obstacles and firms' financing patterns (in terms of external financing), we use a bivariate probit model. Formally, we consider now that equation 1 is simultaneously estimated together with equation 2.

$$FinObst_{i,k} = \sum_k \theta_k country_k + \sum_j \phi_j (FirmCharacteristic_j)_{i,k} + \varepsilon_{i,k} \tag{1}$$

$$External_{i,k} = \sum_k \theta_k country_k + \sum_j \phi_j (FirmCharacteristic_j)_{i,k} + u_{i,k} \tag{2}$$

under the assumption that $Cov(\varepsilon_{i,k}, u_{i,k}) = \rho$

As explained in the literature (Poirer, 1980) the use of a bivariate probit estimation is more efficient than the use of two independent equations when the error terms of the two decisions are correlated. We apply the bivariate estimation using access to finance and use of external funds as dependent variables, which are regressed on the common set of determinants. The results show that the assumption of a correlation in the errors is valid (column 1 in Table 5). As expected, firms that made more use of external financing sources in the last six months of 2009 tend to report that access to finance was the most pressing problem. Moreover, size becomes an important determinant in the choice of financing sources with larger firms being relatively more likely to draw on external funds than smaller ones, while older firms instead seem to make less use of them. At the same time the negative coefficient for ownership indicates that public firms or companies owned by other firms or business associates tend to rely less on external funds than firms with other ownership structures. The third and fourth column in the table introduce the interaction terms between size and ownership. The fact that these terms are negative and statistically significant in the regression on the use of external sources of finance reinforces the importance of ownership to explain the choice of firms between internal and external funds.

[Table 5 around here]

6. Conclusions

The second wave of the new ECB-European Commission Survey on the access to finance of small and medium-sized enterprises provides evidence on the financial situation, financing needs and the access to financing for enterprises in the euro area during the second half of 2009. It has given us the opportunity to test whether firm characteristics such as size, age, economic branch, financial autonomy and ownership

are valid predictors of financing obstacles across countries of the euro area during the recent financial crisis. Our results show that only age and ownership remain important explanatory variables for firms' perceived financing obstacles across countries while mixed results are achieved for size and economic branches. This is confirmed also when probit regressions at country and sector level are conducted as well as when interactions between stating financing obstacles and the use of external sources of finance are considered. Further, we estimated a multinomial logit regression model distinguishing different types of potential obstacles and problems captured in the survey. Again, firm age and ownership were found to be the most robust predictors regarding the existence of financing obstacles. The importance of other factors such as firm size and economic branch on the other hand, is not supported by the findings. Firm size however, seems to have some effect, yet only in combination with ownership. Moreover, firm size becomes important to explain the choice of different sources of finance with larger firms having a preference (or the possibility) to draw more on external funds, which itself appears strongly related to the experience of financing obstacles.

Even though these findings provide an important insight into the existing patterns of financing obstacles among euro are firms, they also call for further research. A natural next step in the research agenda is to exploit different waves of the survey to check whether firms' determinants of financing obstacles change over time depending, for instance, on macroeconomic conditions The first waves of the SAFE conducted between 2009 and mid-2010 were characterized by the financial crisis and the subdued economic environment and the opinion of firms strongly reflected them. Future waves in a more benign economic environment could give us different results. In order to draw final conclusions on the impact of the financial crisis, comparable analyses at different points in time have to be conducted. As this requires information from a consistent firm level survey over a long period of time (which the SAFE is expected to provide in the future) we leave this for future research.

Figure 1. Most pressing problems for firms in the euro area

(Percentage of responding firms that used a specific type of financing over the previous 6 months)
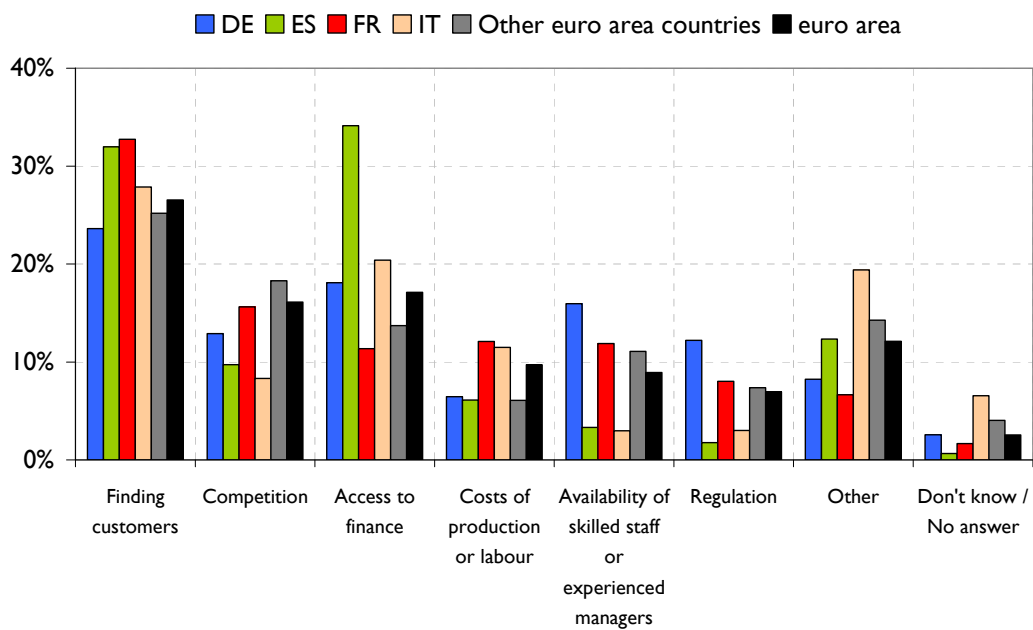
Source: ECB and authors' calculations.

Table 1: Correlation matrix of major variables

	Financing obstacles	Micro	Small	Medium	Large	Log of firm age	Part of another enterprise	Ind. enterprise	Constr.	Industry	Services
Financing obstacles	1.0000										
Micro	0.0384*	1.0000									
Small	0.0076	-0.4237*	1.0000								
Medium	-0.0164	-0.4233*	-0.4378*	1.0000							
Large	-0.0438	-0.2138*	-0.2211*	-0.2209*	1.0000						
Log of firm age	-0.1006*	-0.3414*	-0.0025	0.2129*	0.1973*	1.0000					
Part of another enterprise	-0.0622*	-0.1550*	-0.1097*	0.1493*	0.1735*	0.0644*	1.0000				
Autonomous enterprise	0.0626*	0.1518*	0.1080*	-0.1462*	-0.1709*	-0.0633*	-0.9927*	1			
Construction	0.0275*	-0.0126	0.0514*	-0.0182	-0.0320*	-0.0291*	-0.0396*	0.0413*	1.0000		
Industry	-0.0149	-0.2174*	-0.0180	0.1652*	0.1030*	0.1962*	0.0916*	-0.0907*	-0.2023*	1	
Services	-0.0078	0.1157*	-0.0161	-0.0710*	-0.0413*	-0.1901*	-0.0349*	0.0327*	-0.3040*	-0.4645*	1.0000
Trade	0.0032	0.0929*	-0.0023	-0.0692*	-0.0309*	0.0455*	-0.0211	0.0214	-0.2022*	-0.3089*	-0.4642*
Turnover Up to €2 million	0.0332*	0.5562*	0.0668*	-0.4407*	-0.2679*	-0.3585*	-0.1995*	0.1998*	0.0315*	-0.2070*	0.1655*
> €2 million, <= €10 million	0.0265	-0.2608*	0.2414*	0.0995*	-0.1280*	0.0882*	-0.0246	0.0262	0.0171	0.0479*	-0.0383*
> €10 million, <= €50 million	-0.0214	-0.2894*	-0.2051*	0.4574*	0.0511*	0.2354*	0.1584*	-0.1564*	-0.0218	0.1361*	-0.1172*
> €50 million	-0.0527*	-0.2016*	-0.2006*	0.0188	0.5831*	0.2075*	0.1610*	=-0.1585*	-0.0325*	0.1359*	-0.1*
Shareholders	-0.0543*	-0.1383*	-0.0803*	0.1277*	0.1364*	0.1314*	0.1911*	-0.1917*	-0.0178	0.0838*	-0.0334*
Family/ entrepreneurs	0.0392*	-0.0194	0.0927*	-0.0251	-0.0742*	0.0876*	-0.1540*	0.1561*	0.0004	-0.0106	-0.0344*
Other firms/ business associates	-0.0237	-0.1268*	-0.0360*	0.0981*	0.0965*	-0.0188	0.2062*	-0.2043*	0.0024	0.0605*	-0.0123
Venture cap. firms/business angel	0.0301*	-0.0471*	-0.0162	0.0315*	0.0477*	-0.013	0.0452*	-0.0443*	-0.0200	0.0390*	-0.0129
A natural person	0.0145	0.2756*	-0.0080	-0.1732*	-0.1390*	-0.1798*	-0.1599*	0.1606*	0.0233	-0.1087*	0.0614*
Other	-0.0278*	-0.0628*	-0.0345*	0.0438*	0.0805*	-0.0046	0.0329*	-0.0394*	-0.0109	-0.0110	0.0504*

Table 1 continued

	Trade	Low turnover (up to €2 mio.)	Between €2 and 10 mio.	Between €10 and 50 mio.	High turnover (>€50 mio.)	Share-holders	Family/entre-preneurs	Other firms/business associates	Venture capital firms/business angel	A natural person	Other
Trade	1.0000										
Low Turnover - Up to €2 million	-0.0085	1.0000									
>€2 million, <=€10 million	-0.0165	-0.4729*	1.0000								
>€10 million, <=€50 million	0.0162	-0.4157*	-0.2711*	1.0000							
>€50 million	0.0045	-0.2794*	-0.1822*	-0.1602*	1.0000						
Shareholders	-0.0316*	-0.1887*	-0.0025	0.1281*	0.1525*	1.0000					
Family/ entrepreneurs	0.0501*	0.0236	0.0461*	-0.0237	-0.0690*	-0.3230*	1.0000				
Other firms/ business associates	-0.0480*	-0.1337*	0.0331*	0.0757*	0.0802*	-0.1495*	-0.4113*	1.0000			
Venture capital firms/ bus. angel	-0.0088	-0.0595*	-0.0198	0.0594*	0.0339*	-0.0418*	-0.1150*	-0.0532*	1.0000		
A natural person	0.0200	0.2685*	-0.0743*	-0.1572*	-0.1337*	-0.1841*	-0.5065*	-0.2345*	-0.0655*	1.0000	
Other	-0.0392*	-0.0632*	-0.0046	0.0278*	0.0653*	-0.0493*	-0.1357*	-0.0628*	-0.0176	-0.0774*	1.0000

All observations are included. * denotes significance level at 5%.

**Table 2: Experiencing financing obstacles – The role of firm characteristics**

Dep var: Financing obstacles	(1)	(2)	(3)	(4)
Firm size[a]				
Small	-0.0188	-0.0116	0.00184	0.0248
	(0.122)	(0.123)	(0.124)	(0.134)
Medium	-0.0341	-0.000710	0.0425	0.117
	(0.0824)	(0.0889)	(0.0922)	(0.110)
Large	-0.149*	-0.0973	-0.0314	-0.0682
	(0.0784)	(0.0881)	(0.0892)	(0.134)
Log of firm age	-0.128***	-0.132***	-0.136***	-0.136***
	(0.0279)	(0.0293)	(0.0299)	(0.0305)
Sector[b]				
Construction	0.110	0.104	0.104	0.103
	(0.128)	(0.123)	(0.125)	(0.125)
Industry	0.0591	0.0665	0.0693	0.0695
	(0.0709)	(0.0759)	(0.0780)	(0.0794)
Trade	0.0523	0.0543	0.0475	0.0475
	(0.0374)	(0.0363)	(0.0370)	(0.0378)
Autonomous		0.216*	0.162	0.152
profit oriented[c]		(0.110)	(0.114)	(0.111)
Firm Ownership[d]				
Shareholders, other firms or			-0.198***	-0.0177
business associates, other			(0.0628)	(0.0567)
Small x Ownership				-0.173**
				(0.0827)
Medium x Ownership				-0.320***
				(0.102)
Large x Ownership				-0.0626
				(0.141)
Spain[e]	0.524***	0.537***	0.566***	0.563***
	(0.00892)	(0.0143)	(0.0149)	(0.0151)
France	-0.334***	-0.321***	-0.288***	-0.288***
	(0.00930)	(0.0146)	(0.0182)	(0.0183)
Italy	0.153***	0.159***	0.182***	0.185***
	(0.00588)	(0.00804)	(0.0128)	(0.0133)
Observations	4,742	4,742	4,742	4,742
Pseudo R^2	0.0645	0.0667	0.0697	0.0709

Probit regression results for access to finance being the most pressing problem as dependent variable (0,1). Firm ownership is equal to 1 if the frim is listed or belongs to other firms or business associates and equal to 0 if it belongs to family, entrepreneur or single person, venture capitalist and business angel.

Country dummies for remaining euro area countries are included but not reported. Only observations with non missing values on all relevant variables considered. Regression coefficients reported. Cluster robust standard errors in parentheses. Significance levels: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

[a] Reference category is micro firms; [b] Reference category is service sector [c] Reference category is part of a profit-oriented enterprise;; [d] Reference category is Family or entrepreneur, venture capital firm or business angel or natural person (one person only) as owner; [e] Reference category is Germany.

Figure 2. Firm characteristics and financing obstacles – multinomial logit results
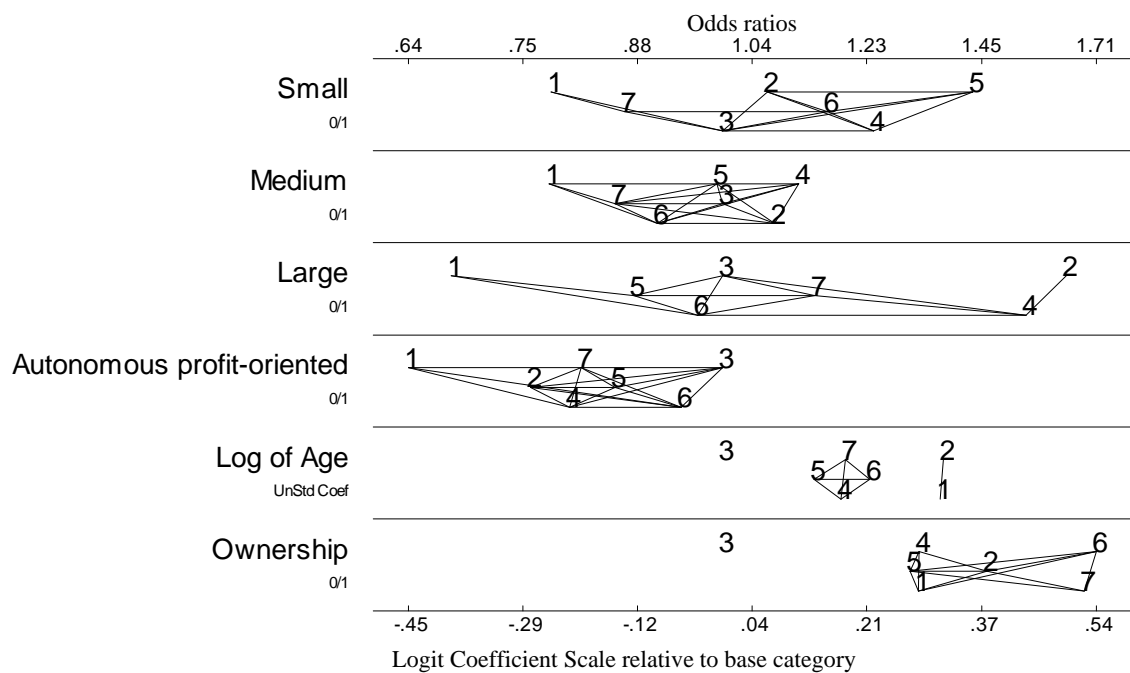
Source: ECB and authors' calculations.

Note: Multinomial logit regression results taking firms most pressing problem as dependent variable. Access to Finance as base outcome (coefficient = 0 and odds ratio = 1). Sector and country dummies included but not reported. Level of significance level: 10%. Dependent variable categories: 1 = Finding customers; 2 = Competition; 3 = Access to finance; 4 = Costs of production and labour; 5 = Availability of skilled staff and experienced managers; 6 = Regulation; 7 = Other. Reference category for size is micro firms; Reference category for autonomous profit oriented firms is part of a profit-oriented enterprise; Reference category for ownership is Family or entrepreneur, venture capital firm or business angel or natural person (one person only) as owner.

Table 3: Firm characteristics and financing obstacles across countries

Dep var: Financing obstacles	Germany	Spain	France	Italy	Other euro area countries
Firm size[a]					
Small	-0.185	0.413***	-0.508***	0.135	-0.0607
	(0.129)	(0.121)	(0.177)	(0.124)	(0.120)
Medium	-0.0975	0.350***	-0.261	0.0608	0.0194
	(0.139)	(0.131)	(0.176)	(0.141)	(0.131)
Large	-0.0335	0.287	-0.239	-0.0127	-0.274
	(0.203)	(0.186)	(0.245)	(0.211)	(0.226)
Log of firm age	-0.135***	-0.243***	-0.123**	-0.0395	-0.0934*
	(0.0497)	(0.0564)	(0.0538)	(0.0499)	(0.0481)
Sector[b]					
Construction	-0.0299	0.361***	-0.394	-0.247	0.360**
	(0.160)	(0.132)	(0.252)	(0.193)	(0.153)
Industry	-0.0103	0.0552	0.289*	-0.182	0.385***
	(0.124)	(0.125)	(0.154)	(0.129)	(0.139)
Trade	-0.108	0.0411	0.0454	0.0330	0.381***
	(0.153)	(0.116)	(0.145)	(0.126)	(0.123)
Autonomous	0.180	0.395***	0.328*	-0.185	0.135
profit oriented[c]	(0.192)	(0.138)	(0.186)	(0.155)	(0.141)
Firm Ownership[d]					
Shareholders, other firms,	-0.272*	-0.234**	0.131	-0.225*	-0.361***
business associates, other	(0.153)	(0.0992)	(0.132)	(0.120)	(0.124)
Observations	900	902	933	825	1,182
Pseudo R^2	0.0202	0.0485	0.0613	0.0142	0.0379

Probit regression results for access to finance being the most pressing problem as dependent variable. Only observations with non missing values on all relevant variables considered. Regression coefficients reported. Cluster robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

[a] Reference category is micro firms; [b] Reference category is service sector [c] Reference category is part of a profit-oriented enterprise;; [d] Reference category is Family or entrepreneur, venture capital firm or business angel or natural person (one person only) as owner.

Table 4: Firm characteristics and financing obstacles across sectors

Dep var: Financing obstacles	Construction	Industry	Services	Trade
Firm size[a]				
Small	0.0232	-0.0692	0.0402	-0.0578
	(0.218)	(0.232)	(0.101)	(0.127)
Medium	0.425*	-0.0504	0.0742	-0.167
	(0.248)	(0.132)	(0.101)	(0.122)
Large	0.703***	-0.114	-0.0552	-0.282
	(0.186)	(0.170)	(0.158)	(0.188)
Log of firm age	-0.259**	-0.148***	-0.104***	-0.129**
	(0.127)	(0.0355)	(0.0370)	(0.0505)
Autonomous	-0.188	0.292**	0.185	0.135
profit oriented[b]	(0.244)	(0.125)	(0.154)	(0.202)
Firm Ownership[c]				
Shareholders, other firms or	-0.373***	-0.283**	-0.198**	-0.00866
business associates, other	(0.0799)	(0.112)	(0.0823)	(0.0865)
Spain[d]	0.874***	0.595***	0.466***	0.555***
	(0.0296)	(0.0140)	(0.0257)	(0.0377)
France	-0.867***	-0.0277*	-0.341***	-0.240***
	(0.0701)	(0.0161)	(0.0168)	(0.0177)
Italy	-0.104*	0.118***	0.210***	0.320***
	(0.0610)	(0.0247)	(0.0152)	(0.0174)
Observations	565	1,141	1,916	1,113
Pseudo R^2	0.1766	0.0658	0.0653	0.0750

Probit regression results for access to finance being the most pressing problem as dependent variable. Country dummies for remaining euro area countries are included but not reported. Only observations with non missing values on all relevant variables considered. Regression coefficients reported. Cluster robust standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

[a] Reference category is micro firms; [b] Reference category is part of a profit-oriented enterprise [c] Reference category is; Family or entrepreneur, venture capital firm or business angel or natural person (one person only) as owner; [d] Reference category is Germany.

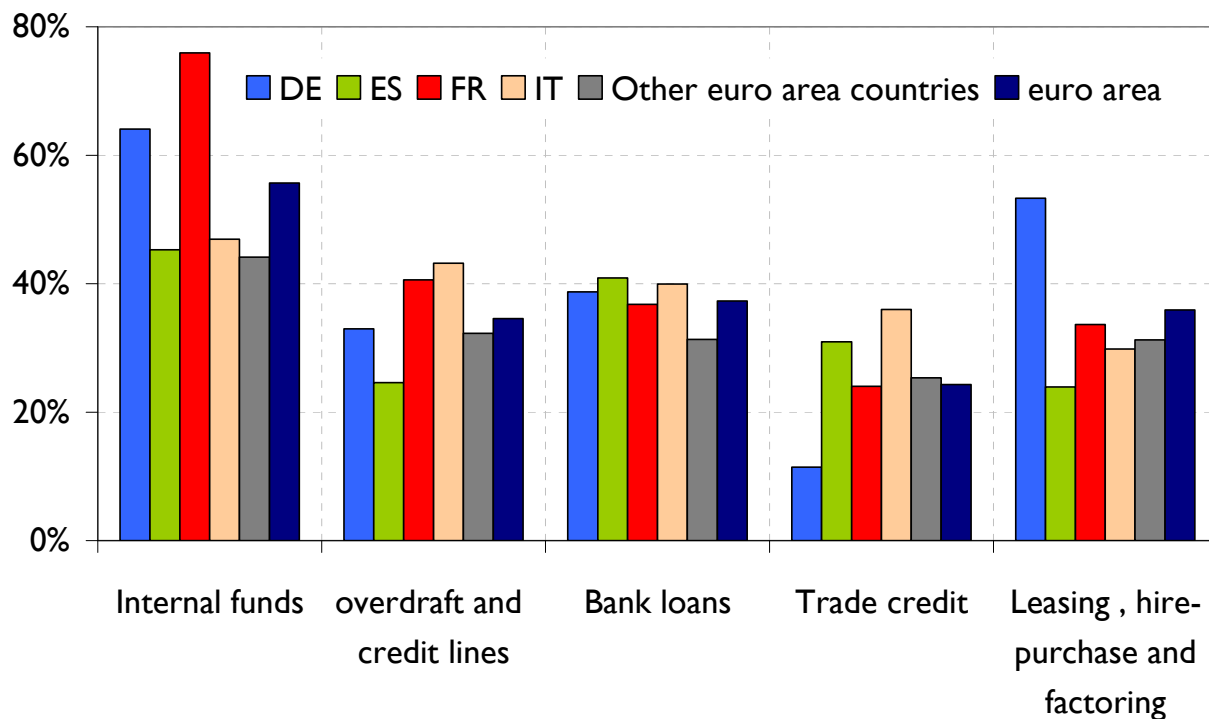**Table 5: Financing obstacles and use of external financing instruments: the bivariate probit model**

VARIABLES	(1) External finance	(2) Access to finance	(3) External finance	(4) Access to finance
Firm size[a]				
Small	0.440***	0.00366	0.459***	0.0281
	(0.0508)	(0.133)	(0.0594)	(0.141)
Medium	0.499***	0.0436	0.529***	0.106
	(0.0517)	(0.103)	(0.0689)	(0.121)
Large	0.634***	-0.0319	0.725***	-0.0366
	(0.0861)	(0.110)	(0.106)	(0.153)
Log of firm age	-0.0600***	-0.133***	-0.0598***	-0.133***
	(0.0205)	(0.0315)	(0.0201)	(0.0318)
Sector[b]				
Construction	0.0532	0.112	0.0546	0.113
	(0.0856)	(0.121)	(0.0852)	(0.120)
Industry	0.0194	0.0823	0.0205	0.0830
	(0.0393)	(0.0627)	(0.0389)	(0.0647)
Trade	0.0581	0.0419	0.0595	0.0422
	(0.0830)	(0.0388)	(0.0837)	(0.0395)
Autonomous	0.111	0.146	0.102	0.136
profit oriented[c]	(0.0792)	(0.126)	(0.0810)	(0.122)
Firm Ownership[d]				
Shareholders, other firms or	-0.0853	-0.217***	0.0463	-0.0395
business associates, other	(0.0527)	(0.0690)	(0.0862)	(0.0534)
Small x Ownership			-0.136*	-0.180**
			(0.0762)	(0.0772)
Medium x Ownership			-0.162	-0.285***
			(0.128)	(0.0905)
Large x Ownership			-0.259**	-0.123
			(0.126)	(0.142)
Spain[e]	-0.109***	0.582***	-0.114***	0.577***
	(0.0134)	(0.0153)	(0.0132)	(0.0147)
France	0.115***	-0.294***	0.113***	-0.294***
	(0.0177)	(0.0198)	(0.0176)	(0.0197)
Italy	0.184***	0.193***	0.185***	0.195***
	(0.00916)	(0.0117)	(0.00955)	(0.0123)
	(0.0115)	(0.00893)	(0.0114)	(0.00819)
Rho		0.260***		0.259***
		(0.0272)		(0.0271)
Observations	4,496	4,496	4,496	4,496

Bivariate probit regression results for external finance and access to finance being the most pressing problem as dependent variables. Regression coefficients reported. Standard errors in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

[a] Reference category is micro firms; [b] Reference category is service sector [c] Reference category is part of a profit-oriented enterprise;; [d] Reference category is Family or entrepreneur, venture capital firm or business angel or natural person (one person only) as owner; [e] Reference category is Germany.

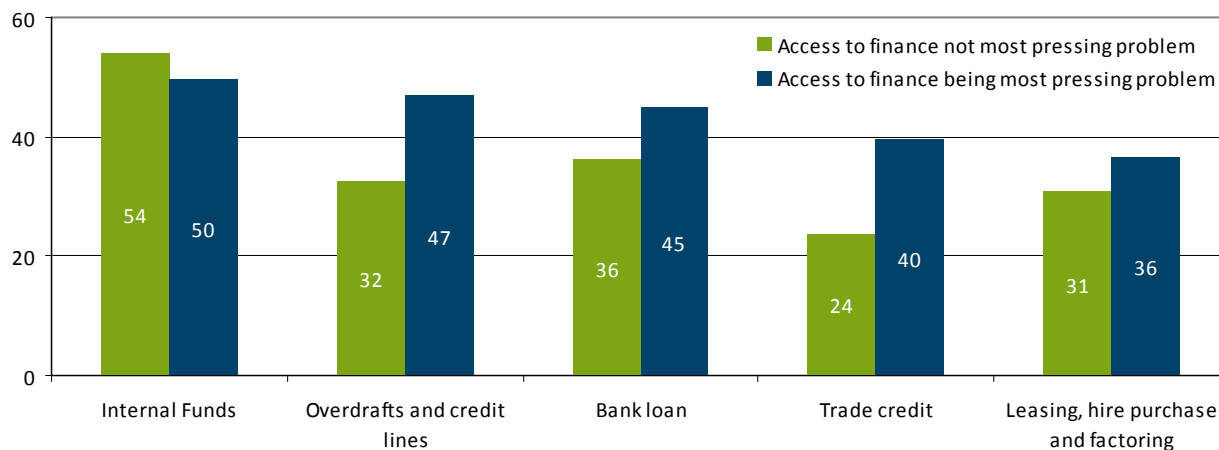**Figure 3. Use of financing instruments at country level**
(Percentage of responding firms that used a specific type of financing over the previous 6 months)

Legend: DE, ES, FR, IT, Other euro area countries, euro area

Categories: Internal funds | overdraft and credit lines | Bank loans | Trade credit | Leasing , hire-purchase and factoring

Source: ECB and authors' calculations

Figure 4. Use of financing instruments distinguished by the occurrence of financing obstacles

(Weighted percentage of responding firms that used a specific type of financing over the previous 6 months)

Legend: Access to finance not most pressing problem / Access to finance being most pressing problem

	Internal Funds	Overdrafts and credit lines	Bank loan	Trade credit	Leasing, hire purchase and factoring
Access to finance not most pressing problem	54	32	36	24	31
Access to finance being most pressing problem	50	47	45	40	36

Source: ECB and authors' calculations
Notes: All firms (including don't know answers)

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8.   Annex

Annex 1: Description of main variables

Variable	Source	Coding
Dependent Variables		
Financing obstacles (FinObst)	Question Q0 of the SAFE: *"What is currently the most pressing problem your firm is facing?"* [1] Finding customers [2] Competition [3] Access to finance [4] Costs of production or labour [5] Availability of skilled staff or experienced managers [6] Regulation [7] Other	Dichotomous variable: 1 = Access to finance is most pressing problem [3] 0 = Access to finance is not most pressing problem [≠ 3] Categorical variable: Categories according to original categories in the questionnaire
Internal financing	Question Q4_A of the SAFE: *"Turning to the financing structure of your firm, to finance normal day-to-day business operations or more specific projects or investments, you can use internal funds and external financing. For each of the following sources of financing, could you please indicate whether you used them OR NOT during the past 6 months?"* (a) Internal Funds	Dichotomous variable: 1 = Did use internal funds 0 = Did not use internal funds
External financing	Questions Q4_B to Q4_k of the SAFE: *"Turning to the financing structure of your firm, to finance normal day-to-day business operations or more specific projects or investments, you can use internal funds and external financing. For each of the following sources of financing, could you please indicate whether you used them OR NOT during the past 6 months?"* (b) Grants or subsidised bank loan (c) Bank overdraft, credit line or credit cards (d) Bank loan (new or renewal; excluding overdraft and credit lines) (e) Trade credit (f) Other loan (g) Leasing or hire-purchase or factoring (h) Debt securities issued (i) Subordinated loans, participation loans or similar financing instruments (j) Equity investments in your firm (k) Other	Dichotomous variable: 1 = Did use at least one of the mentioned external financing instruments 0 = Did not use any external financing instrument
Independent variables		
Firm size	Question D1 of the SAFE: *"How many persons does your company currently employ in full time or part time in [YOUR*	Categorical variable:

	COUNTRY] at all locations?"	[1] Micro (1 to 9 employees)
		[2] Small (10 to 49 employees)
		[3] Medium (50 to 249 employees)
		[4] Large (250 employees and more)
Log of firm age	Question D5 of the SAFE: "In which year was your firm registered?"	Continuous variable: Log of firm age = ln(year of survey – year of founding + 1)
Financial autonomy	Question D2 of the SAFE: "How would you characterise your enterprise? Is it…" [1] part of a profit-oriented enterprise (e.g. subsidiary* or branch) not taking fully auto- nomous financial decisions [2] an autonomous profit-oriented enterprise, making independent financial decisions	Dichotomous variable: 1 = autonomous profit oriented enterprise 0 = part of a profit-oriented enterprise
Sector	Question D3 of the SAFE: "What is the main activity of your company?" [1] Mining [2] Construction [3] Manufacturing [INCLUDING ELECTRICITY, GAS AND WATER SUPPLY] [4] Wholesale or retail trade [5] Transport [6] Real estate [7] Other services to businesses or persons	Categorical variable: [1] Construction [2] Industry (Mining, Manufacturing) [3] Services (Transport, Real Estate, Other Services) [4] Trade (Wholesale or Retail Trade)
Turnover	Question D4 of the SAFE: "What was the annual turnover of your company in [YOUR COUNTRY] in 2008*?" [1] Up to € 2 million [2] More than € 2 million and up to € 10 million [3] More than € 10 million and up to € 50 million [4] More than € 50 million	Categorical variable: Categories according to original categories in the questionnaire
Firm ownership	Question D6 of the SAFE: "Who are the owners of your firm?"	Dichotomous variable: 1 = Shareholders, as your company is listed on the stock market; Other firms

	[1] Shareholders, as your company is listed on the stock market [2] Family or entrepreneurs [3] Other firms or business associates [4] Venture capital firms or business angels [5] A natural person, one owner only [7] Other	or business associates; Other 0 = Family or entrepreneurs; Venture Capital Firms or business associates; A natural person, one owner only

Bank loan applications	Question Q7A_A of the SAFE: "For each of the following ways of financing, could you please indicate whether you applied for them over the past 6 months, or if you did not apply because you thought you would be rejected, because you had sufficient internal funds, or you did not apply for other reasons?"
	    (a) Bank loan (new or renewal; excluding overdraft and credit lines)
	
	Question Q7B_A of the SAFE: "If you applied and tried to negotiate for this type of financing over the past 6 months, did you receive all the financing you requested, or only part of the financing you requested, or only at unacceptable costs or terms and conditions so you did not take it, or you have not received anything at all"
	    (a) Bank loan (new or renewal; excluding overdraft and credit lines)
		Categorical variable:
		[1] Applied and received everything (Q7A_A = 1 & Q7B_A = 1)
		
		[2] Applied and got part of it (Q7A_A = 1 & Q7B_A = 2)
		
		[3] Applied but costs to high (Q7A_A = 1 & Q7B_A = 3)
		
		[4] Applied but rejected (Q7A_A = 1 & Q7B_A = 4)
		
		[5] Did not apply because of fear to be rejected (Q7A_A = 2)
		
		[6] Did not apply because of sufficient internal funds (Q7A_A = 3)
		
		[7] Did not apply for other reasons (Q7A_A = 4)

Annex 2: Main characteristics of the surveyed firms across countries (*percentages*)

	Germany	Spain	France	Italy	Other euro area countries	Euro area
Firm Size						
Micro	29.77	29.88	25.27	29.88	30.15	29.06
Small	30.37	29.78	31.67	30.28	30.31	30.47
Medium	29.67	30.18	32.17	30.08	30.15	30.43
Large	10.19	10.16	10.89	9.76	9.39	10.04
Firm autonomy						
part of a profit-oriented enterprise	9.09	15.94	17.68	11.95	19.01	14.98
an autonomous profit-oriented enterprise	90.81	84.06	82.32	87.75	80.53	84.83
DK/ NA	0.1			0.3	0.46	0.19
Sector						
Construction	11.79	14.44	10.89	8.07	12.9	11.69
Industry	24.38	21.71	24.88	25.2	22.29	23.61
Services	50.25	40.34	38.56	44.12	34.35	41.11
Trade	13.59	23.51	25.67	22.61	30.46	23.59
Turnover in 2008						
Up to €2 million	49.35	41.43	38.96	39.94	40.84	42
More than €2 million and up to €10 mi	23.68	26.39	25.47	17.13	24.81	24
More than €10 million and up to €50	15.78	19.92	21.98	20.42	18.4	19
More than €50 million	8.79	9.56	8.59	11.16	10.31	9.72
DK/ NA	2.4	2.69	5	11.35	5.65	5.43
Firm Age						
10 years or more	57.24	67.33	68.73	50.1	70.08	63.12
5 to 9 years	15.28	12.65	9.39	20.42	14.5	14.45
2 to 4 years	20.18	18.03	5.09	17.73	9.16	13.76
Less than 2 years	3.1	1.39	16.68	7.47	3.82	6.33
DK/ NA	4.2	0.6	0.1	4.28	2.44	2.33
Ownership						
Shareholders, as your company is listed	2	10.96	11.49	12.95	14.05	10.51
Family or entrepreneurs	46.45	51.39	40.16	50.2	47	47
Other firms or business associates	11.89	20.52	22.68	12.45	13	16
Venture capital firms or business angel	1.1	1.29	1.1	2.59	1	1.47
A natural person, one owner only	35.86	14.84	23.88	17	21.22	22.41
Other	2.6	0.7	0.7	2.99	2.90	2.03
DK/ NA	0.1	0.3		2.19	0.23	0.55
Number of observations	1,001	1,004	1,001	1,004	1,310	5,320

All figures refer to percentages of responding firms. Deviations from a cumulated percentage of 100% are due to rounding.