Measuring the opinion of firms on the supply and demand of external financing in the euro area

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Abstract

The financial crisis has generated renewed interest in how tensions in financial markets affect firms' financing. In this respect, the EC/ECB survey on the access to finance of small and medium-sized enterprises (SAFE) provides rich material for investigating firms' financing patterns and constraints within the euro area. Composite indicators thereby present a useful analytical tool to obtain an overall picture of developments in the external financing markets across a wide range of financing instruments.

The paper develops a composite indicator capturing perceived changes in the needs and availability of external financing of firms as well as in the match (or mismatch) between the two. Moreover, making use of the richness of information provided by the SAFE, it further relates this composite indicator to major firm characteristics (e.g. firm size, age, sector, firm ownership) to investigate potential differences across firms and countries.[3]

JEL classification: E22, G10, G30, O16

Keywords: Financial Crisis, Financing Obstacles, Composite Indicators, Small and Medium-Sized Enterprises, Survey Data

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[3] The authors would like to thank I. Ganoulis for useful comments. Parts of this paper were drafted when Nicolas Griesshaber and Nadine Schmitt were at the ECB. The views expressed in this paper are those of the authors and should not be attributed to the European Central Bank.

Introduction and review of existing evidence

At present times, problems and obstacles in the access to external finance can pose a serious threat to the existence and success of companies in the euro area, especially for small and medium-sized enterprises which are particularly dependent on external funds (for empirical evidence, see, among others, Ferrando and Griesshaber 2011). This is supported by the recently growing literature on firm growth which clearly identifies the experience of financing obstacles as well as problems in the access to finance to negatively affect growth (e.g. Becchetti and Trovato 2002; Beck et al. 2005; Ayyagari et al. 2008).

This paper finds its place in the empirical literature aimed at capturing the existence of financing constraints, which started with the seminal work of Fazzari et al (1988). One strand of the literature relies on balance sheet information and financial statements in order to derive a priori classifications to distinguish between financially constrained and unconstrained firms. As consequence, different classifications have been developed, mainly based on firm criteria related to information costs and information asymmetries which are supposed to serve as proxies for the existence of financing obstacles.

The problem with relying on balance sheet data and financial statements only is that it is often not possible to perfectly infer on financing constraints based on these sources (Beck et al. 2006). Moreover, resulting samples of firms are likely to be biased towards large and listed companies, often neglecting smaller firms for which such data is harder to obtain.

A second strand of the literature focuses more closely to the results of survey data on firms' perceived experience of financing obstacles. Based on the World Business Environment Survey (WBES), Beck et al. (2006) capture financing obstacles i) through firms' perceptions on how much of an obstacle financing poses with respect to the operation and growth of the business and ii) through detailed assessments on how problematic certain aspects related to access to finance are. Ordered probit regressions show that firm age, size and the ownership structure (used for a-priori classifications in previous contributions) are indeed effective predictors of financing obstacles among firms. In addition, higher levels of financial, economic and institutional development seem to reduce financing obstacles with the latter being the most important country characteristic in this respect.

Coluzzi et al. (2012) follow a similar approach using the WBES data for five major euro area countries (i.e. Germany, France, Italy, Spain and Portugal). Their analyses reveal that firm characteristics, which can be linked to higher opacity from the perspective of the lender, are associated with increased probabilities of facing financing obstacles. Especially small and young firms are found more likely to experience financing obstacles compared to larger and older companies. Interestingly, the results also show strong differences across sectors with firms in the construction and manufacturing sector being more affected (similar to the finding of Westhead and Storey 1997).

Angelini and Generale (2008) investigate the relationship between survey measures of financial constraints and firm size using a sample of Italian firms. Financial constraints are captured through firms' answers on whether they experienced certain difficulties in financing their investment or in obtaining requested financing. While the authors find a significant link between financial constraints and firm size (firms that perceive themselves as financially constrained on average tend to be smaller), constraints seem to be only a real problem for a small fraction of the firms. Apart from this finding, constraints appear to be more frequent among young firms, confirming the importance of firm age.

Finally, Ferrando and Griesshaber (2011) use the second wave of the new ECB-European Commission Survey on the Access to Finance of small and medium-sized Enterprises (SAFE), which was conducted in the second half of 2009. Using a sample of 5,320 firms from 11 euro area countries, the authors investigate the determinants of financing obstacles (measured as firms' self-assessment of access to finance being the most pressing problem) among euro

area firms. Their results point to the relevance of firm age and ownership, while firm size and the economic sector appear less important.

The current paper builds on this recent line of research, investigating the existence and determinants of financing obstacles among euro area firms between 2010 and early 2012. While existing research thereby mainly relies on a simple judgement by firms whether they experience obstacles related to their access to finance, this paper specifically focuses on the congruence between demand and supply in external financing markets of euro area companies.

Using data from various waves of the SAFE, the paper develops a new composite indicator that combines firm-level information on perceived changes in external financing needs and availability across a broad set of financing instruments, providing a single measure on current changes in the external financing market of firms. The new indicator combines information based on different questions in the survey regarding the needs and availability of external financing in order to identify a potential external financing gap from the perspective of firms. Compared to the idea of a financing gap that can be calculated based on macroeconomic statistics like the financial accounts, which would reflect broadly the difference between saving and capital formation of non-financial corporations, the present concept also considers the supply side of financing. While a financing gap based on the financial accounts reflects firms' external financing needs to cover real investment beyond what they can finance out of internal funds, the measure discussed in this paper reflects the mismatch between external financing needs and the availability of such financing to the firms. At the same time, instead of capturing the actual size of financing gap, the measure developed here rather provides information on perceived changes (i.e. increases or decreases) in the match (or mismatch) between external financing demand and supply.

The paper also analyses the role of certain firm characteristics and recent financing experiences regarding the perceived mismatch in external financing. This helps to indicate which firms suffer the most from an increasing gap between financing needs and availability. The consistency of the results with previous approaches which aimed to investigate the underlying determinants of financing obstacles is checked, and the robustness of the results is tested across different estimation techniques (i.e. OLS, ordered probit) as well as across various model specifications.

The results clearly indicate a growing gap in external financing of euro area firms, showing an increasing mismatch between external financing needs and availability during the financial crisis (similar to Campello et al., 2010). Firms which experience declines in turnover and profit margin as well as to a slightly less extent firms that make financially autonomous decisions appear to suffer more when external financing becomes difficult. Furthermore, younger firms and firms that are not-listed are also more affected. At the same time, our results do not show clear effects for firm size or sector of activity, which have been identified as important determinants of financing obstacles in the literature. Finally, not surprisingly, southern euro area countries such as Spain, Italy, Portugal and Greece as well as Ireland seem to experience strongly growing mismatches in their corporate financing markets, especially in the more recent past.

Finally, the financing gap based on the SAFE is compared with evidence on the match (or mismatch) between external financing demand and supply from the euro area bank lending survey (BLS), which reports on the supply and demand of bank lending from the euro area banks' perspective. While both surveys show an increase in the financing gap towards the end of 2011, underlying developments in supply and in particular, in the demand for bank financing partly deviate.

The remainder of the paper is organized as follows. Section 2 describes the data and further reports some descriptive statistics on the change in external financing needs and availability. Section 3 then develops a new composite indicator that combines financing needs and availability in order to capture firms' perception of the change in the mismatch between demand for external financing and its supply. Section 4 presents the results of empirical investigations to identify which firms actually experience an increasing gap in external financing.

Section 5 introduces some comparisons on the evidence of the gap between demand for external financing and its availability based on the euro area bank lending survey. The last section concludes.

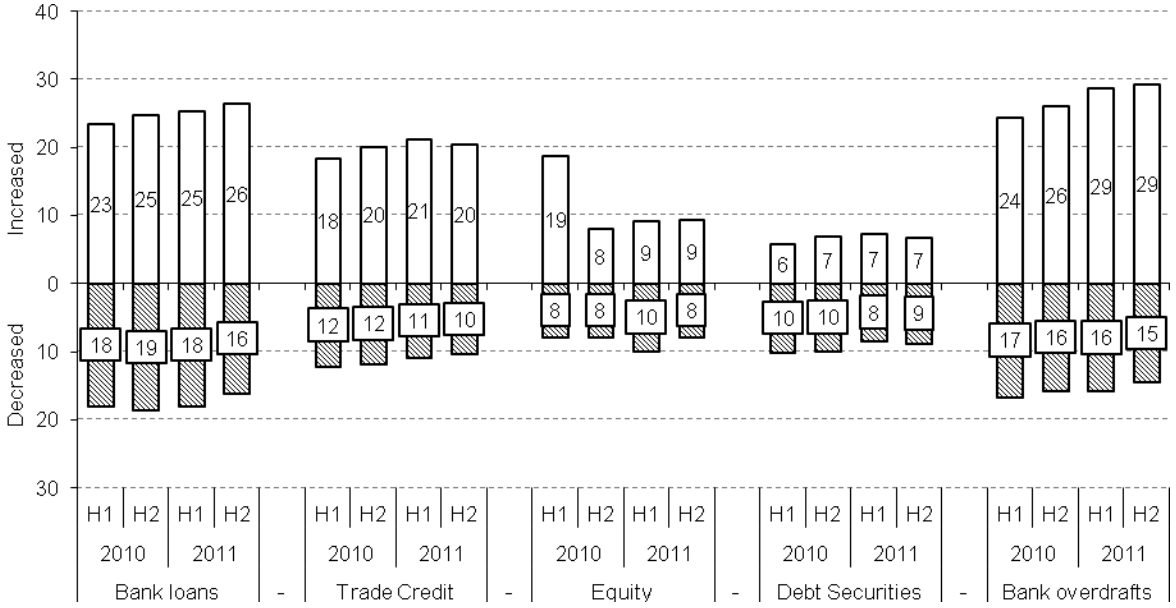
2. The SAFE: a Dataset on access to finance in the euro area

The data used in the present study is taken from a firm-level survey on the Access to Finance for Small and Medium-sized Enterprises (SAFE) which is conducted by the European Central Bank (ECB) in cooperation with the European Commission (EC). The survey started in summer 2009 and since then, a core module of the survey is run by the ECB every six months in the 11 largest countries of the euro area. The survey is mainly focused on the situation of small and medium sized enterprises (SMEs), defined as having less than 250 employees. Nevertheless, each wave also contains a comparable sample of large firms. All companies are non-financial corporations randomly selected and the final sample is stratified by firm size (based on the number of employees), sector and country. We restrict the analysis to data from wave 3 onwards. This is due to the fact that some changes to the questions most relevant for the present research have been introduced after wave 2, affecting comparability of our indicators between the first two waves and subsequent rounds of the SAFE. Some basic unweighted summary statistics for the respective waves are provided in annex 1.

In order to capture developments regarding a potential gap between external financing demand and supply we draw on questions Q5 and Q9 of the SAFE which ask firms to assess whether their external financing needs for six different financing instruments (i.e. bank overdrafts, credit lines and credit card overdrafts; bank loan; trade credit; equity investments in the firm; debt security issuance; other) have increased, remained unchanged or decreased during the previous six months (Q5 of the SAFE), as well as whether the availability of the respective instrument has improved, remained unchanged or deteriorated over this period (Q9 of the SAFE).

Chart 1: External financing needs of euro area firms

(change over the preceding six months, weighted percentage of respondents)

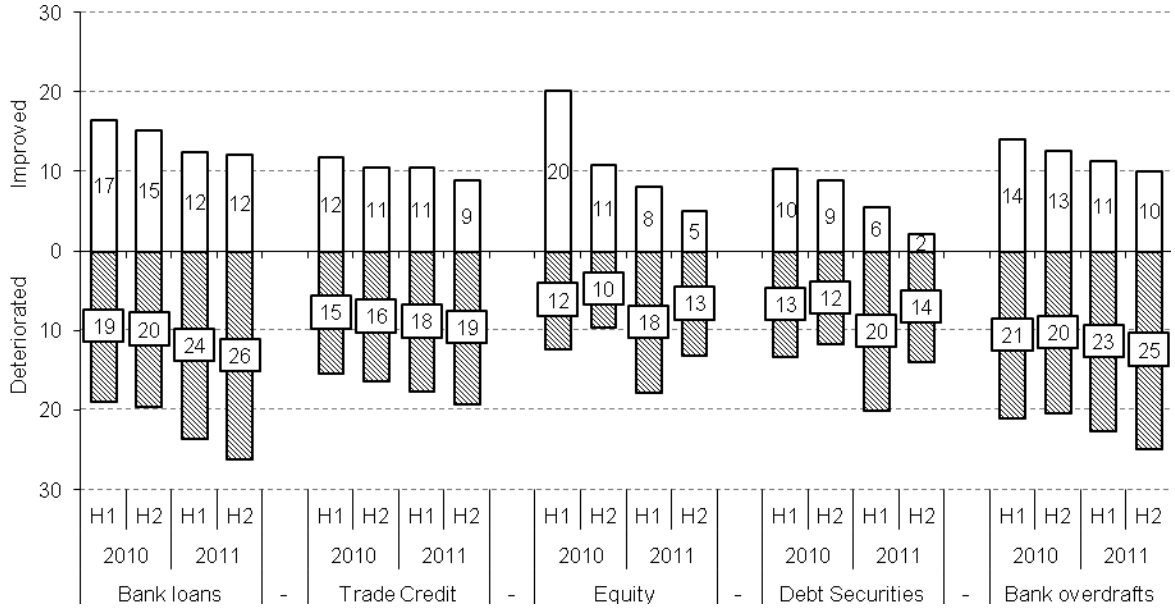


Base: All firms excluding companies for which the respective instrument is not applicable

If we take a look at changes in the external financing needs among euro area firms (see Chart 1) it can be observed that on balance needs for bank loans and for bank overdrafts, credit lines and credit card overdrafts (hereafter referred to as bank overdrafts) seem to be clearly increasing in the euro area in all four rounds of the SAFE that are investigated here. A similar picture is obtained for trade credit. Regarding equity and debt security issuance, while during the first half of 2010, on balance, needs appear to have increased, there seems to be no considerable change during the later periods. However, percentages of firms reporting these two instruments as being not applicable to them are quite high, leaving the base of firms from which these developments are obtained relatively small.

Chart 2: Availability of external financing to euro area firms

(change over the preceding six months, weighted percentage of respondents)



Base: All firms excluding companies for which the respective instrument is not applicable

To meet increasing needs for external financing, especially with respect to bank-related financing sources, improved supply seems to be required. Yet, the availability of bank loans and bank overdrafts seems to have worsened in 2010-2011 (see Chart 2). Similar tendencies are observed for the availability of trade credits and debt security issuance. For the case of equity issuance, just as before, there are significantly less firms for which such instrument is applicable (meaning a much smaller base of firms) compared to other instruments such as bank financing. Overall, there seems to be a deterioration in the availability of external financing in the period 2010-2011.

Overall, there are signs of an increasing financing mismatch. As it is not clear whether firms that perceive their needs as increasing are also the ones that regard the availability of financing to have deteriorated as well as whether firms that experience unchanged needs in external financing also perceive no change regarding the availability of such, the construction of an additional measure combining both indicators appears necessary in order not to run the risk of over- (or under-) estimating the growth in the financing gap.

3. Developing a composite indicator on the financing gap

This section focuses on combining firms' responses on the change in their financing needs with those on the change in the availability of such. There are many ways in which a composite

indicator can be constructed; several are standard in business tendency surveys (e.g. OECD 2003). Tarantola and Mascherini (2009) argue that their construction should proceed through several steps, starting from a theoretical framework, the selection of variables, the normalization, the relative weighting of the variables, and robustness checks.

In order to construct an indicator that reflects the perceived change in the gap between demand and supply of external financing, we investigate two approaches. The first one adopts a common sense approach in combining the different questions of the survey on demand and supply, and is described below. The second approach attempts to derive a common factor between the different questions through a principal components analysis, and is described in box 1.

For each external financing instrument covered in the SAFE, we distinguish between firms that perceive increased needs and deteriorated availability, only perceive an increasing gap due to a specific change in either needs or availability, firms that regard the situation as unchanged, and those firms that see an improvement in the situation either due to a decrease in needs, an increase in availability or both. In order to appropriately translate this distinction into a symmetric scale, firms which experience a two-sided increase (decrease) in the financing gap for a certain financing instrument are assigned a value of 1 (-1) whereas firms which perceive a one-sided increase (decrease) are ascribed a value of 0.5 (-0.5). Firms which report no change in both, needs and availability of a specific instrument are assigned a value of 0 for that respective instrument (see Table 1).

Finally, it has to be noted that the indicator is computed only for those firms for which the respective type of external financing is relevant, i.e. those firms which have some previous experience with that sort of external financing (captured through question Q4 of the SAFE). An overview of the distribution of this new indicator for each financing instrument is given in annex 2.

Table 1: Indicator of perceived change in the gap between financing needs and availability

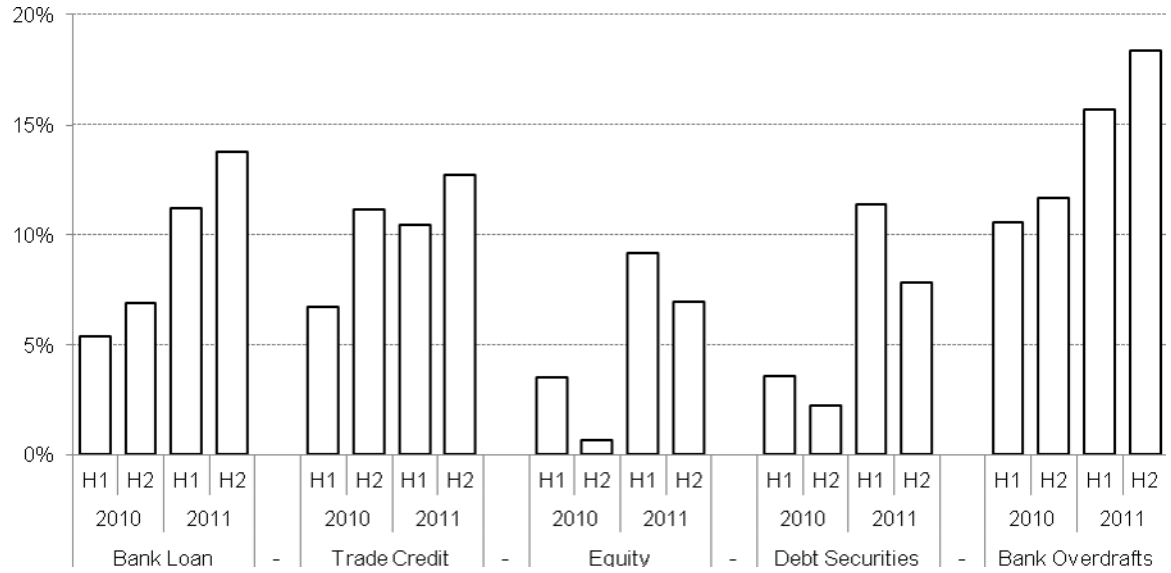
Coding	Change in Financing Gap		Conditions
1	Increasing financing gap (both sides)	-	increased needs & deteriorated availability
0.5	Increasing financing gap (one side)	-	increased needs & unchanged availability
		-	unchanged needs & deteriorated availability
		-	increased needs & availability don't know
		-	needs don't know & deteriorated availability
0	Situation unchanged	-	increased needs & improved availability
		-	decreased needs & deteriorated availability
		-	needs & availability unchanged
		-	needs unchanged & availability don't know
		-	needs don't know & availability unchanged
-0.5	Decreasing financing gap (one side)	-	decreased needs & unchanged availability
		-	unchanged needs & improved availability
		-	decreased needs & availability don't know
		-	needs don't know & improved availability
-1	Decreasing financing gap (both sides)	-	decreased needs & improved availability
.	Instrument not applicable	-	not applicable for needs or availability
99	Don't know	-	needs & availability don't know

The indicator is constructed separately for each of the 5 financing types. It is computed only for firms which have used the respective instrument in the last 6 months or have not used it in the last 6 months but used it in the past (from Q4 of the SAFE).

Chart 3 shows weighted averages of the new indicator on the perceived change in the mismatch between demand and supply of external financing, separately for each external

financing instrument covered in the SAFE (the category other external financing is not considered). Averages are multiplied by 100, so that the resulting figures equal the net percentages of firms' perceptions when accounting for the different intensities of changes in the financing gap that are covered in the new indicator.

Chart 3: Financing gap indicator by financing instrument, net balances (*weighted average in %*)



Base: All firms which have used the respective instrument in the last 6 months or have not used it in the last 6 months but used it in the past (from Q4 of the SAFE); 'Not applicable' and 'Don't know' answers excluded; Original measure (ranging between -1 and 1) is multiplied by 100 to obtain net balances in %

Results clearly indicate an increasing mismatch between financing needs and availability when it comes to bank loan financing, trade credits and bank overdrafts. Moreover, the degree to which the financing situation deteriorates appears to rise over time.

In order to finally derive a composite measure $FinGap_i$ for the perceived change in the overall gap of external financing of an individual firm i, the average of the constructed financing gap indicators is taken across those instruments that are relevant (previous experience with the financing type) to the respective firm:

$$FinGap_i = \frac{1}{k} \sum_{j=BL}^{OvD} InstrGap_{j,i}$$

where k equals the number of the relevant external financing instruments and j includes the instruments bank loan, trade credit, equity, debt securities and bank overdrafts if relevant. The resulting index therefore also ranges between -1 (decreasing gap on both sides with respect to all relevant financing instruments) and 1 (increasing gap on both sides with respect to all relevant instruments). A brief descriptive summary of the distribution of this new composite indicator capturing firms' perception regarding the change in the external financing gap aggregated over all instruments is reported in Table 2.

Table 2: Composite measure of perceived change in the external financing gap

	2010 H1	2010 H2	2011 H1	2011 H2
Firms perceiving a decreasing gap	23.37	23.48	20.85	17.89
Firms perceiving situation as unchanged	40.41	36.97	38.46	37.58
Firms perceiving an increasing gap	36.21	39.55	40.69	44.53
Net balance (i.e. weighted average in %)	6%	9%	11%	14%

Weighted percentages displayed; Base is all firms which have used the respective instrument in the last 6 months or have not used it in the last 6 months but used it in the past (from Q4 of the SAFE); 'Non-applicable' and 'Don't know' answers are excluded

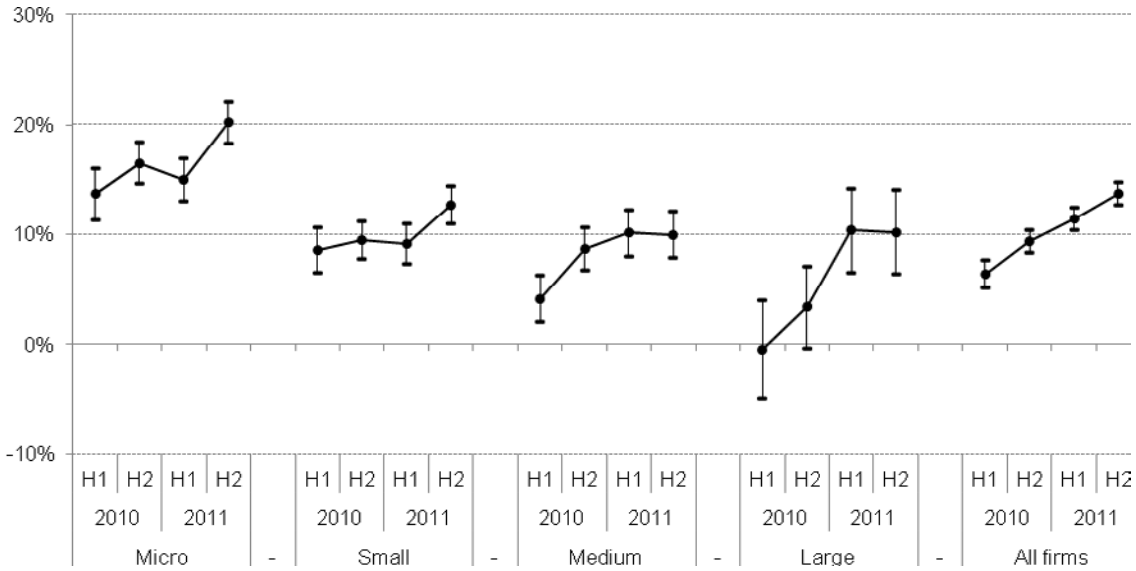
Looking at the average of the composite financing gap indicator (displayed in %), firms seem to be increasingly confronted with a growing mismatch between demand and supply of external financing. The average perceived increase in the external financing gap thereby grows from 6 to 14% over the two years. Hence, overall, there appear to be clear signs of a growing gap between demand and supply of external financing during the financial crisis.

Turning to potential differences in the perceived changes of the financing gap among different size classes (see Chart 4), the perceived growth in the overall financing mismatch seems to increase with decreasing firm size. Hence, especially micro firms (defined as having less than 10 employees) appear to experience a strongly increasing mismatch between their needs regarding relevant external financing instruments and the availability of such. This result is rather worrisome since it is mostly smaller firms that rely more heavily on external financing.

In order to investigate possible country differences, Chart 5 shows the average change in the financing gap for the 4 biggest euro area countries separately, as well as for the remaining 7 euro area countries in the sample grouped together. Indeed, considerable differences between countries seem to exist. While there are no signs that the gap in external financing in Germany is growing, things are different in the other countries. Particularly among Spanish and Italian firms, the perceived gap in external financing has become larger over time at an increasing rate.[4]

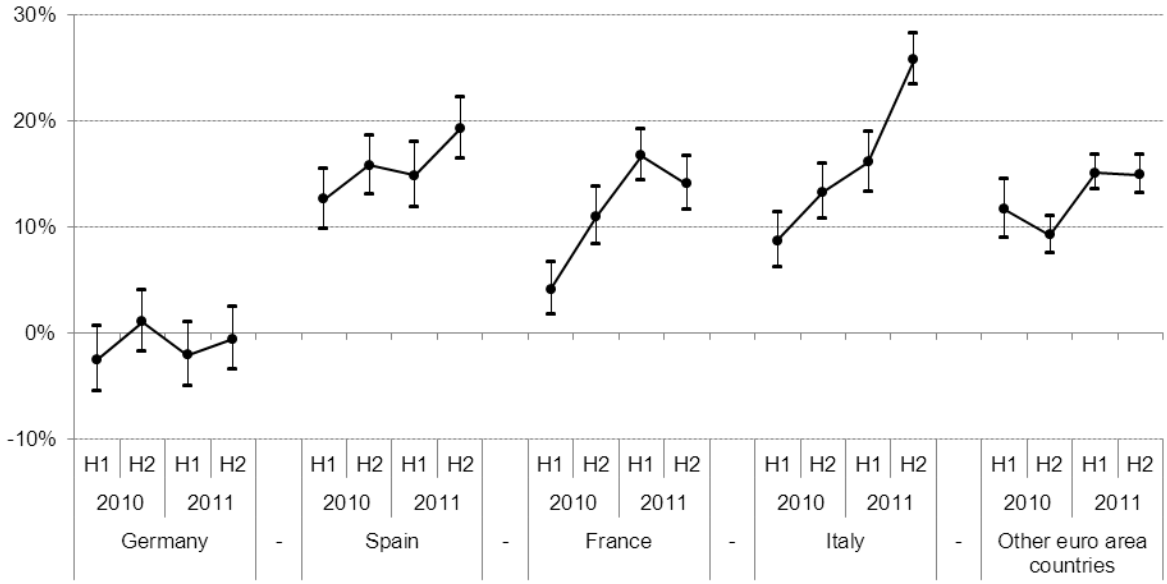
[4] The indicator of the financing gap is not known in absolute terms; only its changes have a clear interpretation.

Chart 4: Perceived change in the external financing gap (by firm size)



Note: Weighted average of new composite measure displayed (with 95% confidence interval); Values multiplied by 100 to obtain weighted net balances in %.

Chart 5: Perceived change in the external financing gap (by country)



Note: Weighted average of new composite measure displayed (with 95% confidence interval); Values multiplied by 100 to obtain weighted net balances in %.

Box 1: Alternative derivation of a composite indicator

In order to determine the combinations of variables with the highest explanatory power, a principal components analysis (PCA) was used on the same variables on the needs and the availability of external finance described in the previous section.

PCA is a technique used to reduce the dimensionality of data, by considering the linear combination of the variables which explain the highest fraction of total variance. The main directions thus detected are the eigenvectors of the covariance matrix. PCA is sometimes used in business tendency surveys to construct common factors across different variables (e.g. Hild 2002).

One particular difference with the previous section is that "Don't know" and "Not applicable" were recoded as 0, while "Increased" was coded as 1, and "Decreased" was recoded as -1, "Unchanged" being also coded 0. This is required for the PCA to include all firms, and is consistent with the net percentages used in the regular ECB reports on the SAFE. An additional difference is the inclusion of "Other" forms of financing, which we include for completeness purposes. A final difference is that the actual experience with the financing types is not used in the PCA.

The first component of the PCA explains 31.0% of the variance, the second one adding 20.3%; the other components are all at 10% or below, and are marginally relevant according to the scree plot. The eigenvectors are displayed in table A below.

Table A: Eigenvectors of the principal component analysis

		Component	
		1st	2nd
Needs	Overdrafts	0.510	0.369
	Bank loans	0.496	0.482
	Trade credit	0.206	0.199
	Equity	0.044	0.050
	Debt securities	0.029	0.025
	Other	0.154	0.135
Availability	Overdrafts	-0.428	0.459
	Bank loans	-0.435	0.528
	Trade credit	-0.212	0.265
	Equity	-0.040	0.040
	Debt securities	-0.029	0.031
	Other	-0.074	0.096

Note: weighted PCA on waves 3 and higher.

The first component has all the components on the Needs side positive, and all the Availability ones negative. In spirit, it is thus very close to the Financing Gap described above, with weights reflecting the overall contribution of the different components: overall, higher (in absolute terms) for overdrafts, bank loans, and trade credit, which concern most firms, and lower for equity and debt securities. A positive 1st component score indicates an increasing financing gap.

The second component is less intuitively clear. It adds up parallel movements in needs

and availability, and could therefore be interpreted as the intensity, or volumes, of financing activity in the economy; a positive value is associated with a booming demand and supply of financing. A score can be calculated on each component, shown across firm sizes in table B, and across countries in table C.

Table B: Component scores by wave and company size

			Micro	Small	Medium	Large	All firms
1st component	2010	H1	0.205	0.116	0.065	-0.011	0.097
		H2	0.239	0.146	0.125	-0.007	0.123
	2011	H1	0.224	0.134	0.143	0.152	0.170
		H2	0.324	0.211	0.161	0.150	0.220
2nd component	2010	H1	-0.056	-0.024	0.025	0.127	0.021
		H2	-0.049	0.011	0.057	0.059	0.015
	2011	H1	-0.051	-0.029	0.019	0.016	-0.014
		H2	-0.088	-0.004	-0.024	0.030	-0.023

Table C: Component scores by wave and country

			Germany	Spain	France	Italy
1st component	2010	H1	-0.024	0.213	0.041	0.159
		H2	-0.049	0.260	0.169	0.225
	2011	H1	-0.035	0.249	0.313	0.259
		H2	-0.025	0.308	0.257	0.493
2nd component	2010	H1	0.036	-0.045	0.119	0.091
		H2	0.018	-0.017	0.048	0.105
	2011	H1	-0.041	-0.026	-0.012	0.095
		H2	0.066	-0.091	-0.046	0.022

Just as in the Financing Gap, the 1st component shows an increasing financing gap over the two years covered by this study, with a particularly high increase for micro and small firms in the last semester. The 2nd component exhibits much smaller values in absolute terms; they are decreasing overall, but the pattern is less clear by company size. The overall picture seems to indicate a slightly decreasing intensity in the financing activity. When looking at the results by country, the biggest drop in the intensity of financing has taken place in France, which can be contrasted with the relatively limited increase of the financing gap in that country, compared to Italy and Spain. Intensity of financing remained slightly higher in Germany throughout the period of analysis (see table C).

Overall, the results of the principal component analysis vindicate the results of the previous section, and add an additional indicator of interest to the survey.

4. Which firms perceive an increasing financing gap?

After having identified a growing mismatch between perceived external financing demand and supply, indicating a negative development in the access to finance for firms in the euro area, the question arises which firms are affected most by such an increasing gap. As shown in the previous section through some simple descriptive analysis, firm size and country differences seem to play a role. In the following, we go a step deeper and we investigate the role of firm characteristics by estimating multiple regression models based on the following simple equation:

$$FinGap_{i,k} = \alpha + \beta\, FirmCharacteristiccs_{i,k} + \gamma\, Country + \varepsilon_{i,k}$$

where FinGapi,k represents the newly created composite measure indicating the view of firm i in country k on whether it perceives an increasing gap in the overall external financing that is relevant for it. FirmCharacteristics is a vector of major firm attributes (e.g. firm size, sector of activity, turnover and profit growth, ownership and log of firm age). Country is a vector of country dummies to control for country-specific impacts on firms' perceptions with respect to changes in the financing gap, εi,k represents an error term. Although FinGap can only take a finite set of values within its range from -1 to 1, it is treated as continuous throughout the remainder of this analysis. All estimations allow for error terms clustered by country and sector to control for sector and country-specific characteristics that might produce correlated residuals for firms within sectors of a certain country. No weights are included in the estimations.

Table 3 reports the multiple regression results individually for each wave. The models include some major firm characteristics expected to be important determinants of firms' perception regarding recent developments in the overlap of demand and supply of relevant external financing: i.e. firm size (in terms of employees), a dichotomous variable capturing whether a firm is an autonomous profit oriented enterprise that makes independent financial decisions, the sector of main activity (industry, construction, trade or services), the natural log of firm age as well as a dichotomous variable capturing firm ownership (family or entrepreneurs, venture capital firms, business angels or a single natural person versus listed firms or firms owned by other companies or business associates). In addition, recent developments in turnover and profit margins over the previous six months are considered to serve as proxies for recent firm growth, performance and credit quality.

The results show that, contrary to expectations based on findings of previous studies on the determinants of financing constraints (e.g., among others, Beck et al. 2006; Angelini and Generale 2008; Coluzzi et al. 2012) as well as on the descriptive analysis provided in section 3, firm size (in terms of the number of employees) is not significant. In this respect, the finding is more in line with Ferrando and Griesshaber (2011). Here it should be noted that there may be a link between firm size and turnover growth, which may be the cause of counterintuitive signs as well as the missing significance for size. Indeed, when changes in turnover and profit margin are excluded from the estimations, the expected relationship for firm size is retrieved in most cases, indicating smaller firms to be more likely to face a growing gap compared to larger companies (results available on request). So while this effect vanishes when changes in turnover and profit margin are controlled for, the later variables prove to be quite important, indicating firms with negative growth in turnover and profit margin to experience increases in the external financing gap. The importance of growth in turnover and profit margin appears reasonable, since enterprises that experience decreases in turnover and profit margin should i) be less likely to have internal funds available, and ii) are likely to be perceived as less creditworthy.

Table 3: Characteristics of the firm and the perceived change in the financing gap

	2010 H1	2010 H2	2011 H1	2011 H2
Small[a]	-0.023	-0.016	-0.031	-0.024
	(0.02)	(0.016)	(0.018)	(0.015)
Medium	-0.047*	0.008	0.011	-0.019
	(0.019)	(0.017)	(0.02)	(0.013)
Large	-0.063*	-0.003	0.031	0.022
	(0.031)	(0.022)	(0.031)	(0.021)
Autonomous profit oriented firm[b]	0.005	0.038*	0.045**	0.050*
	(0.019)	(0.018)	(0.014)	(0.018)
Industry[c]	-0.007	-0.005	-0.028**	-0.018
	(0.018)	(0.011)	(0.01)	(0.012)
Construction	0.011	0.005	0.007	0.001
	(0.02)	(0.019)	(0.012)	(0.016)
Trade	-0.039**	-0.019	-0.031**	0.004
	(0.012)	(0.015)	(0.009)	(0.009)
Log of firm age	-0.006	-0.029***	-0.021**	-0.016*
	(0.007)	(0.007)	(0.007)	(0.007)
Ownership[d] – Family, Entrepreneurs,	0.035*	0.028*	-0.008	0.022
Business Angel or Single Person	(0.013)	(0.011)	(0.014)	(0.016)
Change in turnover - Increased[e]	0.009	-0.032*	-0.01	0.004
	(0.019)	(0.013)	(0.011)	(0.017)
Change in turnover - Decreased	0.091***	0.048**	0.061**	0.066***
	(0.018)	(0.014)	(0.017)	(0.013)
Change in profit margin - Increased[e]	-0.062***	-0.068***	-0.044***	-0.038
	(0.015)	(0.011)	(0.011)	(0.02)
Change in profit margin - Decreased	0.101***	0.094***	0.119***	0.105***
	(0.013)	(0.014)	(0.012)	(0.013)
Austria[f]	-0.036	0.031	0.099***	0.047*
	(0.03)	(0.018)	(0.017)	(0.019)
Belgium	0.059	-0.006	0.029	0.044*
	(0.034)	(0.016)	(0.016)	(0.022)
Spain	0.002	0.064***	0.060***	0.095***
	(0.029)	(0.018)	(0.016)	(0.02)
Finland	-0.049	-0.049	0.01	0.023
	(0.038)	(0.035)	(0.022)	(0.016)
France	-0.002	0.091***	0.134***	0.082***
	(0.026)	(0.016)	(0.012)	(0.014)
Greece	0.104***	0.124**	0.263***	0.284***
	(0.029)	(0.036)	(0.014)	(0.023)
Ireland	0.167**	0.164***	0.191***	0.162***
	(0.051)	(0.022)	(0.013)	(0.024)
Italy	0.007	0.059**	0.130***	0.173***
	(0.027)	(0.018)	(0.01)	(0.015)
Netherlands	0.056	0.011	0.050***	0.009
	(0.032)	(0.02)	(0.012)	(0.019)
Portugal	0.092**	0.05	0.214***	0.257***
	(0.03)	(0.026)	(0.026)	(0.017)
Observations	3792	5428	5382	5448
Adjusted R^2	0.071	0.077	0.090	0.103

OLS regression results using a composite measure on the perceived change in the gap between needs and availability of external financing relevant to a firm as dependent variable. Missing elements for certain variables (i.e. financial autonomy, ownership, change in turnover and profit margins) are included as separate categories but not reported. Unstandardised regression coefficients reported, cluster robust (by sector within countries) standard errors in parentheses. Significance levels: *** p<0.001, ** p<0.01, * p<0.05

[a] Reference category for firm size is micro firms; [b] Reference category for firm type is part of a profit-oriented enterprise; [c] Reference category is service sector; [d] Reference category for ownership is firms listed on the stock market or firms owned by other firms or business associates; [e] Reference category is turnover/ profit margin remained unchanged during the previous 6 months; [f] Reference category is Germany

Another firm characteristic that has been given a lot of attention in the literature regarding its effect on financing obstacles is the age of the firm (e.g. Westhead and Storey 1997; Beck et al. 2006; Coluzzi et al. 2012; Angelini and Generale 2008; Ferrando and Griesshaber 2011). One would expect that it is mainly young firms which experience a growing problematic in their external financing situation as such firms are less likely to already possess an established network of good relations with lenders as well as a good credit standing. With exception of wave 3, where no significant effect of firm age is found, firm age proves to be significantly related to perceived changes in the external financing gap. In line with expectations, the younger the firm the more likely it is to suffer from an increasing gap.

Autonomous profit oriented firms that take independent financial decisions are, from wave 4 onwards, significantly related to higher values on the financing gap indicator, implying that they suffer more from an increasing financing mismatch compared to firms which are part of a profit-oriented enterprise (e.g. a subsidiary or branch) and which do not take fully autonomous financial decisions. Differences in the sector of economic activity overall appear fairly small and insignificant in most cases.

Concerning the potential effect of ownership, Ferrando and Griesshaber (2011) have shown that firms whose owners are a family or entrepreneurs, venture capital firms, business angels or a single natural person are more likely to face financing obstacles than firms that are listed on the stock market or owned by other firms or business associates. Indeed, inclusion of the same variable for firm ownership as potential determinant of perceived changes in the financing gap reveals a similar effect using rounds 3 to 4 of the SAFE, but does not considerably add to the explanatory power of the model for waves 5 and 6.

With respect to potential country specific differences, the patterns discussed in section 3 can be confirmed. Compared to German firms, companies in France, Spain and Italy seem to be significantly more affected by an increasing gap between external financing demand and supply (at least for the last 3 waves). Moreover, the difference with respect to German firms is increasing over time. Turning to the remaining euro area countries investigated in this study, not surprisingly, it is in the crisis-ridden countries of Portugal and especially Greece, and Ireland, where firms seem to perceive a strongly growing gap between demand and supply of external financing.

Overall, the explanatory power of the model increases in the later waves of the SAFE, indicating that the factors considered appear more important in the most recent past. Moreover, while firm size and ownership seem to play some role regarding firms' experience of changes in the external financing mismatch in the first half of 2010, it is mostly financial autonomy, firm age and especially country differences that, together with change in turnover and profit margin, present important determinants in the later waves.

5. Comparison with evidence from the euro area bank lending survey

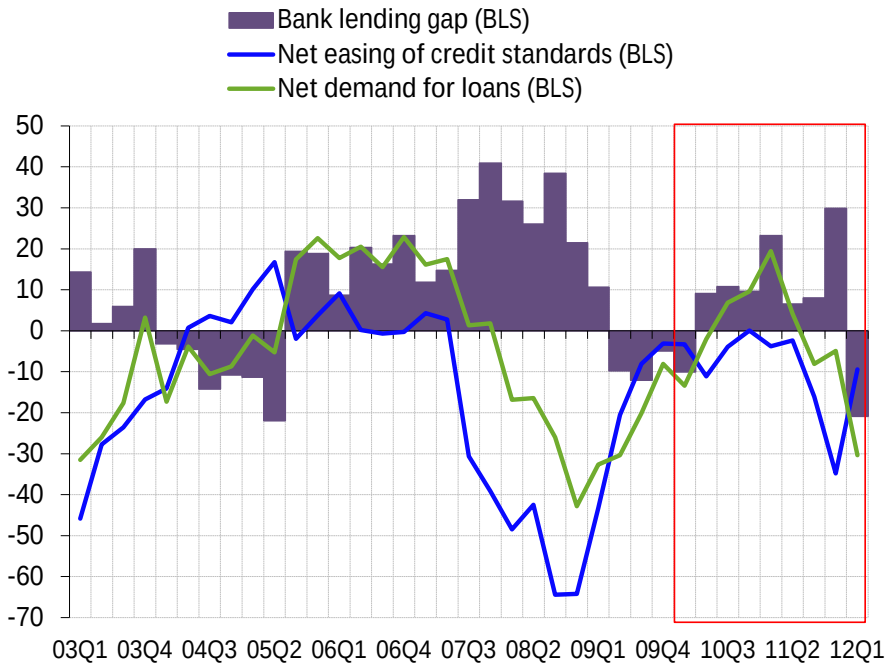
The SME access to finance survey (SAFE) and the euro area bank lending survey (BLS) share some common features as both intend to collect qualitative information on the supply and demand of financing. Compared with the SAFE, the BLS focuses on bank lending only, but provides a higher frequency (i.e. quarterly) and a longer history as it started already in 2003. In addition, while the SAFE collects answers from the firms directly, the BLS collects the evidence from participating euro area banks, which may lead to some differences in the results.

A financing gap broadly comparable with the evidence presented on the SAFE can be calculated for bank lending based on the BLS. As for the SAFE, the survey does not provide information on the level of the financing gap, but only on its change. The need for bank loans is captured by the net percentage of banks reporting an increase in the demand for bank lending by enterprises in the euro area. The availability of bank loans is captured by the net easing of credit standards (i.e. the inverse of the net tightening of credit standards) on bank loans to

enterprises as reported by euro area banks. A net easing of credit standards should reflect an improvement in the availability of bank loans to euro area enterprises.

The BLS bank lending gap is then calculated as the difference between the net percentages of banks reporting an increase in the demand for bank loans and the net percentages of banks reporting an easing in credit standards. A higher need for bank loans combined with a decline in the availability of bank loans (i.e. a net tightening of credit standards) would result in an increase in the BLS bank lending gap.

Chart 6: Bank lending gap of euro area enterprises
(net percentages of reporting banks)



Source: Euro area bank lending survey.

Note: The bank lending gap is defined as the difference between the net demand for loans and the net easing of credit standards. Net easing of credit standards is defined as is defined as the difference between the sum of the percentages for "eased considerably/somewhat" and the sum of the percentages for "tightened considerably/somewhat" and can be interpreted as measure of the change in the availability of bank loans. The period marked with a red border is the one that can be compared with the results of the SAFE.

The BLS bank lending gap broadly increased in 2010 and 2011, as did the SAFE bank lending gap (see Chart 3), but in a more volatile manner (see Chart 6). The increase of the BLS bank lending gap in 2010 was mainly related to an increase in the net demand for loans and only in some quarters to a decline in the availability of bank loans. In 2011, the strong fall in the availability of bank loans was only partly reflected in a rising gap, due to a parallel decline in the net demand for bank loans in some quarters. The main increases in the gap in the first and fourth quarter of 2011 were due to parallel increases in net demand and declines in the availability of bank loans. In the period 2010-2011, both the BLS and the SAFE bank lending gap reached their highest level in the fourth quarter of 2011. At the same time, the longer history available for the BLS shows higher bank lending gaps in 2007-2008, in the early period of the financial crisis.

Overall, compared with the SAFE bank lending gap, the BLS bank lending gap also reveals an increasing gap in 2010-2011, but the development is more volatile. The decline in the BLS bank

lending gap in the first quarter of 2012 mainly reflects an improved availability of bank loans possibly driven by the positive impact of the provision of the 3-year longer-term refinancing operations (LTRO) by the ECB, which may not yet be fully captured by the SAFE.

Conclusion

The current paper analysed recent developments in the external financing gap among euro area firms. Using SAFE survey data collected between August 2010 and March 2012, a new indicator on the (mis)match between demand and supply of external financing was introduced which combines information on changes in firms' external financing needs with perceived changes in the availability of such financing. The results for this new composite measure clearly indicate a growing gap, at an increasing rate, in external financing of euro area firms between 2010 and 2012, especially with respect to bank financing.

Although on balance, an increasing mismatch in external financing seems to exist among almost all types of firms, signs of structural differences regarding the extent of perceived changes in their financing gap were found for certain firm characteristics. Multiple regression analysis, aimed at relating firms' perception of the change in their financing gap to some basic firm characteristics, revealed that in particular firms which recently experienced decreases in turnover and profit margins, but also autonomous profit-oriented firms that take independent financial decisions seem to be affected by an increasing gap in their external financing. In addition, firm age and firm ownership play an important role. By contrast, firm size seems to be dominated by recent changes in turnover and profit margin, and mostly disappears once it is controlled for. The sector of activity does not seem to matter very much regarding the experience of a growing mismatch in external financing. Considerable country differences could also be identified. While on average, there seems to be no increase in the financing gap for Germany, countries like France, Spain and Italy and especially Portugal, Ireland and Greece, which are particularly affected by the financial crisis, appear to recently experience considerable growth in the overall mismatch between external financing demand and supply. Consequently, the difference with respect to German firms is increasing over time. Finally, evidence from the euro area BLS broadly confirms the existence of an increase in the mismatch between external financing demand and supply towards the end of 2011, although underlying developments in supply and in particular, in the demand for bank financing partly deviate.

Although the results presented here clearly promote a further use of the new indicator, they have to be qualified. One clear weakness of the financing gap indicator is that, while distinguishing between developments on both sides (demand and supply) and developments on one side only, it neglects the intensity of the individual effects. This means that, for example, firms which experience only slight increases in their financing needs and those that perceive a very large growth in the demand for external financing are treated equally. Moreover, the indicator exclusively focuses on the change in the financing mismatch and therefore is unable to reveal information on the actual degree of the mismatch, i.e. how bad (or good) the situation actually is. However, despite the mentioned shortcomings, the proposed indicator clearly captures overall developments in the perceived mismatch between financing needs and availability and therefore provides a valuable complement to quantitative hard data on the financial situation of euro area firms.

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Annex

Annex 1: Main data characteristics across the different waves of the SAFE

Firm Characteristic	2010 H1	2010 H2	2011 H1	2011 H2
Country				
Austria	3.77	6.64	6.68	6.66
Belgium	3.82	6.86	6.65	6.70
Germany	18.83	13.28	13.38	13.31
Spain	18.83	13.28	13.32	13.31
Finland	1.88	6.64	6.65	6.66
France	18.88	13.33	13.33	13.38
Greece	3.77	6.64	6.65	6.66
Ireland	1.88	6.64	6.68	6.66
Italy	18.83	13.28	13.32	13.31
Netherlands	4.82	6.66	6.65	6.66
Portugal	4.71	6.76	6.68	6.70
Firm Size				
Micro (less than 10 employees)	30.16	33.32	33.83	33.94
Small (10 to 49 employees)	31.51	34.72	34.15	33.91
Medium (50 to 249 employees	30.69	24.11	24.72	24.94
Large (250 employees or more)	7.64	7.85	7.29	7.22
Sector				
Industry	29.61	26.02	26.33	27.13
Construction	9.75	10.18	10.20	10.41
Trade	25.43	27.51	27.63	27.52
Services	35.20	36.29	35.83	34.94
Annual Turnover				
Up to € 2 million	42.26	46.03	46.57	47.26
More than € 2 and up to € 10 million	28.01	26.59	27.22	26.57
More than € 10 and up to € 50 million	18.66	16.57	16.66	17.02
More than € 50 million	7.94	7.70	7.17	7.24
Don't Know/ Not applicable	3.13	3.11	2.38	1.90
Firm Age				
10 years or more	76.32	77.59	74.55	75.4
5 years or more but less than 10 years	13.06	13.5	12.12	11.88
2 years or more but less than 5 years	8.28	7.5	6.57	5.45
Less than 2 years	2.01	1.17	1.25	1.05
Don't know/ No answer	0.32	0.24	5.51	6.23
Unweighted number of firms	**5,312**	**7,532**	**7,516**	**7,511**

The table shows unweighted percentages of firms in the respective samples.

Annex 2: Distribution of financing gap indicator by financing instrument

Perceived change in financing gap	2010 H1	2010 H2	2011 H1	2011 H2
Bank loan				
Strongly decreasing gap (both sides)	6.15	4.61	4.2	4.28
Decreasing gap (one side)	15.25	17.63	14.23	11.84
Situation unchanged	48.83	46.12	47.34	47.37
Increasing gap (one side)	21.06	22.49	23.34	25.13
Strongly increasing gap (both sides)	8.66	9.04	10.89	11.36
Don't know/ Not applicable	0.04	0.1	0.01	0.02
Number of firms	*3,173*	*4,377*	*4,246*	*4,423*
Trade credit				
Strongly decreasing gap (both sides)	2.5	1.58	1.58	1.12
Decreasing gap (one side)	10.83	10.06	10.43	9.98
Situation unchanged	63.77	61.03	61.04	60.36
Increasing gap (one side)	16.45	18.71	18.87	19.19
Strongly increasing gap (both sides)	6.42	8.45	7.75	9.24
Don't know/ Not applicable	0.04	0.17	0.33	0.13
Number of firms	*2,017*	*3,032*	*3,049*	*3,237*
Equity				
Strongly decreasing gap (both sides)	3.07	1.31	1.32	0.3
Decreasing gap (one side)	10.96	11.79	11.06	5.89
Situation unchanged	65.47	74.05	62.32	76.53
Increasing gap (one side)	16.94	9.7	18.58	13.6
Strongly increasing gap (both sides)	3.57	2.97	6.72	3.34
Don't know/ Not applicable	-	0.17	-	0.34
Number of firms	*595*	*437*	*361*	*415*
Debt Securities issuance				
Strongly decreasing gap (both sides)	5.33	0.67	2.69	-
Decreasing gap (one side)	6.13	20.35	10.95	9.97
Situation unchanged	68.04	59	53.76	67.97
Increasing gap (one side)	17.11	13.56	26.03	17.82
Strongly increasing gap (both sides)	3.39	6.33	6.58	3.93
Don't know/ Not applicable	-	0.09	-	0.3
Number of firms	*152*	*249*	*235*	*231*
Overdrafts				
Strongly decreasing gap (both sides)	5.41	3.65	2.94	4.11
Decreasing gap (one side)	14.2	15.93	14.55	10.63
Situation unchanged	46.03	45.54	44.57	44.65
Increasing gap (one side)	22.64	23.03	24.03	25.5
Strongly increasing gap (both sides)	11.73	11.82	13.91	15.08
Don't know/ Not applicable	-	0.04	-	0.03
Number of firms	*2,886*	*3,997*	*3,875*	*4,042*

Weighted percentages of firms which have used the respective instrument in the last 6 months or have not used it in the last 6 months but used it in the past (from Q4 of the SAFE); 'Non-applicable' answers excluded