

Box 2

THE PERCEIVED EXTERNAL FINANCING GAP INDICATOR FOR SMALL AND MEDIUM-SIZED ENTERPRISES IN THE EURO AREA

This box introduces a new composite indicator of the changes in the external financing gap for small and medium-sized enterprises (SMEs) in the euro area as perceived by firms themselves.¹ The indicator is based on data from the “Survey on the Access to Finance of small and medium-sized Enterprises in the euro area” (SAFE).² It combines survey answers on changes in firms’ external financing needs with answers on perceived changes in the availability of external financing.³ The granularity of the survey (with responses at enterprise level) permits an assessment of the perceived changes in the external financing gap across countries, firm size and sectors of economic activity. In addition, regression analysis is presented of the link between the composite indicator and firm-level characteristics as reported in the SAFE.

Rationale for having an indicator of the changes in the perceived external financing gap

The gap between SMEs’ perceived external financing needs, in particular for fixed investment or working capital, and the perceived availability of external financing to SMEs (such as bank loans, bank overdrafts, trade credit, debt securities and equity), as reported by SMEs in the SAFE, forms the basis for an assessment of the degree to which SMEs face financing constraints. In the event that SMEs require a high level of external financing, especially if combined with limited availability of external finance, this is expected to have significant adverse implications for the effective funding of economic activity, delaying corporate investment and hiring plans and increasing SMEs’ liquidity risks. Conversely, limited access to external finance may have comparatively fewer adverse effects on the real economy when external financing needs remain subdued. Against this background, an indicator of the external financing gap aims to combine information on supply and demand conditions (in both cases from the borrowing firms’ perspective) in the provision of external financing.

1 For details, see Ferrando, A., Griesshaber, S., Köhler-Ulbrich, P., Perez-Duarte, S., Schmitt, N., Measuring the opinion of firms on the supply and demand of external financing in the euro area, in: Bank for International Settlements, Proceedings of the Sixth IFC Conference on “Statistical issues and activities in a changing environment”, Basel, 28-29 August 2012, IFC Bulletin No 36, February 2013.

2 The SAFE is published bi-annually on the ECB website.

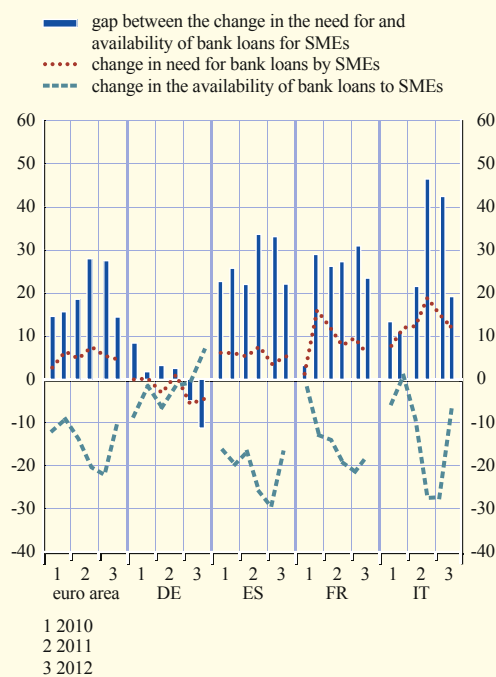
3 The survey-based perceived change of the external financing gap, based on the SAFE, differs from the financing gap calculated on the basis of the Integrated Euro Area Accounts, which is the ratio of net lending/net borrowing to GDP and broadly measures the surplus/deficit of corporate revenues over capital expenditures.

SMEs' need for and availability of bank loans at the aggregate level

As a starting point, Chart A shows the net percentage of SMEs reporting an increase/decrease in their need for bank loans (as the main external financing instrument of SMEs), the net percentage of SMEs reporting an increase/decrease in the availability of bank loans, and the difference between the two series. This difference reflects a proxy, derived from the aggregate level, of the perceived changes in the external financing gap of SMEs for bank loans. It can be seen that the gap widened increasingly for euro area SMEs until September 2012, but less so in the period from the fourth quarter of 2012 to the first quarter of 2013 (which represents the latest SAFE survey wave). In respect of the larger euro area countries, the gap for bank loans widened considerably up to 2012, in particular for SMEs in Italy and Spain, and to a lesser extent in France. By contrast, the gap widened very slightly for SMEs in Germany in 2010-11, before narrowing (i.e. a larger increase in availability than in needs in net terms) in 2012.

Chart A Change in the need for and availability of bank loans for SMEs across large euro area countries

(over the preceding six months; net percentage of respondents)



Source: SAFE.

Note: The chart covers the survey period from Q1 2010 to Q1 2013 (which corresponds to the end of the latest survey period).

A composite indicator of perceived changes in the external financing gap for SMEs at firm level

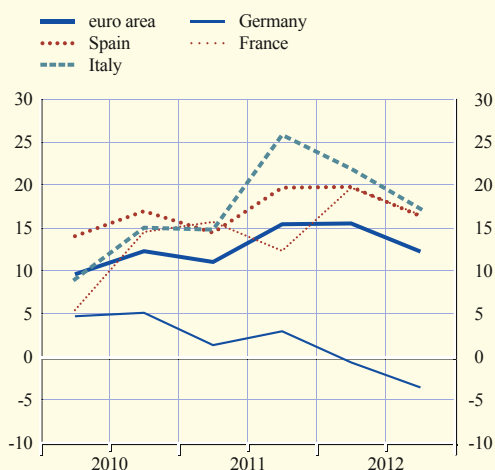
On the basis of aggregate data, as presented in Chart A above, it is not possible to know whether firms which perceive their external financing needs as increasing/decreasing are also the ones which regard the availability of external financing to have deteriorated/improved. By contrast, the composite indicator of the perceived changes in the external financing gap, which is based on firm-level data, can take this key information into account. First, at the firm level, the perceived change in the external financing gap is calculated for each financing instrument (bank loans, bank overdrafts, trade credit, debt securities and equity⁴) that is relevant for the respective firm, based on evidence also provided in the SAFE.⁵ Second, the perceived financing gaps for each relevant financing instrument are aggregated to a composite indicator of the perceived financing gap at the firm level by taking an average of the single financing gaps. Third, the perceived changes in external financing gaps at the firm level are aggregated further (for instance, across firm size, sectors, across countries or at the euro area level), based on the weighted number of firms, reflecting the

4 Debt securities and equity are only used to a small extent by SMEs in the euro area.

5 Specifically, to consider all possible cases of a change in the financing gap, the composite indicator assigns a value of 1 (-1) to a two-sided increase/decrease of the financing gap and 0.5 (-0.5) to a one-sided increase/ decrease respectively. An increasing/decreasing financing gap can be composed of an increase/decrease in financing needs and, at the same time, a decrease/increase in the availability of financing (two-sided change). However, the financing gap can also increase/decrease when only one side changes, i.e. either an increase/decrease in financing needs or a decrease/increase in the availability of financing (one-sided change), while the other side remains unchanged. The composite indicator assigns a value of 0 when the situation remains unchanged.

Chart B Perceived change in the external financing gap of SMEs across large euro area countries

(net percentage of respondents)

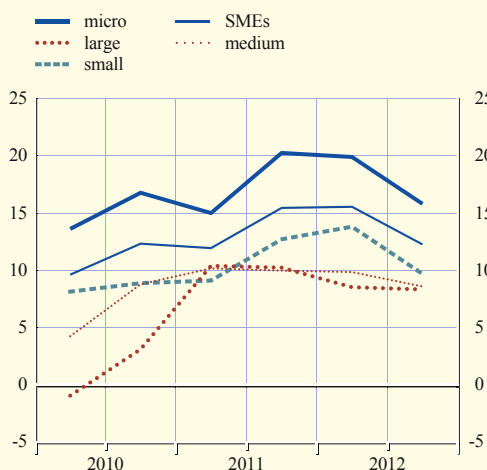


Sources: ECB (SAFE) and ECB staff computations.

Notes: The perceived financing gap indicator combines financing needs and availability of bank loans, bank overdrafts, trade credit, debt securities and equity at the firm level. A positive value of the indicator suggests an increasing financing gap.

Chart C Perceived change in the external financing gap of euro area firms across firm size

(net percentage of respondents)



Sources: ECB (SAFE) and ECB staff computations.

Notes: The perceived financing gap indicator combines financing needs and availability of bank loans, bank overdrafts, trade credit, debt securities and equity at the firm level. A positive value of the indicator suggests an increasing financing gap.

economic importance of the firms (based on the number of persons employed).⁶ A positive value of the composite indicator suggests an increase in the perceived external financing gap, whereas a negative value suggests a decrease. However, while an assessment of the level of the financing gap would be ideal, the SAFE only allows the construction of a composite indicator of the perceived changes in the external financing gap.

Looking at the resulting overall composite indicator, the perceived external financing gap across the larger euro area countries has increased most since the second half of 2011 for Italian SMEs, followed by Spanish SMEs (Chart B). This evidence broadly resembles the gap between the change in the need for and availability of bank loans for SMEs (Chart A above). The higher increase in the perceived external financing gap for Italian and Spanish SMEs reflects the stronger decline in SMEs' creditworthiness in these countries compared with SMEs in France or Germany, but also more severe strains in the banking system. In the most recent period, the gap did not grow so much, reflecting some receding financing tensions despite a continued challenging financing situation for SMEs. In Germany, by contrast, SMEs reported only a very small increase in their external financing gap in 2010-2011, and a declining gap thereafter (as indicated by negative values of the indicator), until the first quarter of 2013.

It appears that the change in the perceived external financing gap is inversely related to firm size, indicating that very small firms are subject to the largest widening of the gap between external financing needs and available external financing (Chart C). Indeed, euro area micro firms have perceived the strongest increase in their external financing gap since 2010, whereas the rise in the perceived financing gap has been rather modest for large firms. In the most recent survey period

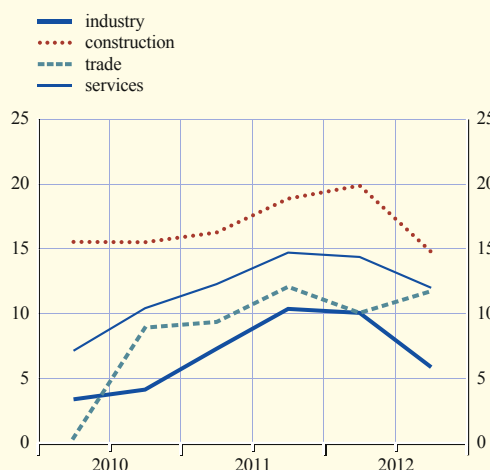
⁶ For details of the methodology used in the SAFE, including the aggregation method, see Annex 3 of the bi-annual website report: "Survey on the access to finance of small and medium-sized enterprises in the euro area", published on the ECB's website.

(covering the fourth quarter of 2012 to the first quarter of 2013), the increase in the perceived external financing gap became smaller, in particular for micro and small firms.

SMEs in the euro area construction sector have perceived the strongest rise in their external financing gap since 2010, although the increase has moderated more recently (Chart D). The bursting of the housing market bubble in some euro area countries and the related stronger decline in SMEs' profits in the construction sector compared with other sectors is likely to have contributed to the increase in the financing gap. By contrast, euro area SMEs in the industry sector reported the smallest rise in the gap between external financing needs and the availability of external financing. The more moderate worsening of the external financing gap for SMEs in this sector is probably related to the lower decline in profits and hence to SMEs' creditworthiness, as well as possibly to assets that may be used as collateral. Moreover, a larger share of firms in the industry sector are export-oriented (unlike, for example, the services sector) and thus relatively more resilient to weak domestic demand.

Chart D Perceived change in the external financing gap of euro area SMEs across different sectors of economic activity

(net percentage of respondents)



Sources: ECB (SAFE) and ECB staff computations.

Notes: The perceived financing gap indicator combines financing needs and availability of bank loans, bank overdrafts, trade credit, debt securities and equity at the firm level. A positive value of the indicator suggests an increasing financing gap.

SMEs' perceived changes in financing gap and firm characteristics

A simple way to investigate the role of firm characteristics in the perceived changes in the external financing gap is to regress the composite indicator of specific firm characteristics based on the following equation:

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

where $FinGap_{i,k}$ is the composite measure for firm i in country k . $FirmCharacteristics$ is a vector of major firm attributes which are derived from the SAFE survey. $Country$ is a vector of country dummies to control for country-specific impacts on firms' perceptions with respect to changes in the financing gap and $\varepsilon_{i,k}$ 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 a continuous variable in the regression analysis.⁷ The table reports the regression results individually for the survey waves starting from mid-2010 (the second and third quarters of 2010) until the most recent one (the fourth quarter of 2012 and the first quarter of 2013). The model includes some major firm characteristics expected to be important determinants of firms' perceptions of recent developments in the (mis)match of supply and demand of relevant external financing: i.e. firm size (in terms of employees), a dichotomous variable which shows if a firm is an autonomous profit-oriented enterprise that makes independent financial

⁷ See Ferrando, A., Griesshaber, S., Köhler-Ulbrich, P., Perez-Duarte, S., Schmitt, N., *op.cit.* for a discussion on alternative econometric specifications if the indicator is considered as ordinal.

Perceived external financing gap and firm characteristics – regression results

	Q2 2010- Q3 2010	Q4 2010- Q1 2011	Q2 2011- Q3 2011	Q4 2011- Q1 2012	Q2 2012- Q3 2012	Q4 2012- Q1 2013
Small ¹⁾	-0.027	-0.020	-0.030*	-0.024	0.002	-0.008
Medium	-0.044**	0.005	0.013	-0.020	-0.014	-0.013
Large	-0.045	-0.015	0.034	0.021	-0.019	-0.020
Autonomous ²⁾	0.011	0.046**	0.042***	0.051***	0.027	0.020
Industry ³⁾	-0.008	-0.005	-0.029***	-0.018	-0.006	-0.025*
Construction	0.007	0.002	0.006	0.001	0.027	-0.009
Trade	-0.040***	-0.017	-0.032***	0.0042	-0.019	-0.0097
Log of firm age	-0.009	-0.032***	-0.026***	-0.016**	-0.019***	-0.026***
Ownership ⁴⁾	0.031**	0.007	0.002	0.018	0.005	-0.006
Increase in turnover ⁵⁾	0.007	-0.033**	-0.0098	0.004	0.022*	0.002
Decrease in turnover	0.091***	0.048***	0.062***	0.066***	0.068***	0.061***
Increase in profit margin	-0.076***	-0.069***	-0.044***	-0.038*	-0.069***	-0.066***
Decrease in profit margin	0.089***	0.092***	0.12***	0.105***	0.118***	0.099***
Observations	5,127	5,636	5,383	5,448	5,540	5,606
R-squared	0.077	0.081	0.094	0.108	0.108	0.085

Notes: OLS regression results using the composite measure of the perceived change in the gap between needs and availability of external financing as dependent variable. Missing elements for certain variables (i.e. financial autonomy, ownership, change in turnover and profit margins) are included as separate regressors but the results are not reported in the table. Estimated coefficients with robust standard errors using clusters by sector within countries. Significance levels: *** p<0.001, ** p<0.01, * p<0.05. 1) Reference category for firm size is micro firms; 2) Reference category for firm type is a non-autonomous enterprise; 3) Reference category is service sector; 4) Reference category for ownership is firms listed on the stock market or firms owned by other firms or business associates; 5) Reference category is turnover/profit margin remained unchanged during the previous six months. Country dummies are included but not reported.

decisions, the sector (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 performance and credit quality.

The results show that changes in turnover and profit margin prove to be important variables for explaining changes in the perceived external financing gap. Firms that report a deterioration of their profit margins see their perceived external financing gap increase between 9% and 12% during the period, while the impact of a deterioration in turnover is slightly smaller, between 5% and 9%. The importance of growth in turnover and profit margin appears plausible, since enterprises which experience decreases in turnover and profit margin should be less likely to have internal funds available and, over time, might be perceived as less creditworthy. Contrary to the descriptive analysis provided in the previous section, firm size (in terms of the number of employees) turns out not to be significant, unless changes in turnover and profit margin are excluded from the model.⁸

Firm age also proves to be significantly related to perceived changes in the external financing gap.⁹ In line with expectations, the younger the firm, the more likely it is to experience greater problems in its access to external financing, as it is less likely to possess an established network of good relations with lenders as well as a credit record. Moreover, autonomous firms seem to suffer more from an increasing financing mismatch than firms which are subsidiaries

8 This finding is more in line with Ferrando, A. and N. Grieshaber (2011): Financing obstacles among euro area firms. Who suffers the most? ECB Working Paper No 1293.

9 See, for instance, Westhead, P. and D.J. Storey (1997): Financial constraints on the growth of high technology small firms in the United Kingdom. Applied Financial Economics, 7 (2): 197-201 and Beck, T., Demirgüç-Kunt, A., Laeven, L. and V. Maksimovic (2006): The determinants of financing obstacles. Journal of International Money and Finance, 25: 932-952.

or branches. Overall, although the explanatory power of the model is limited, it increases in the later waves of the SAFE, indicating that the factors considered appear more important in the most recent past.

Conclusion

The composite indicator of the perceived changes in the external financing gap presented in the box is an instrument to gauge the financing constraints of SMEs. It is a synthetic indicator which combines information on both supply and demand conditions in the provision of external financing to SMEs, as reported by euro area firms in the SAFE. A positive or negative reading of the composite indicator would be interpreted as an increase or a decrease of firms' external financing constraints. As the indicator considers a range of financing instruments, it gives a broad-based assessment of the change in the gap between the demand and supply of external funds. In addition, as the gap is calculated at the firm level and aggregated only thereafter, it provides an assessment of the gaps that are actually perceived by the firms. At the same time, it has to be acknowledged that the indicator is not able to provide quantitative information on the actual level of the external financing gap, but only on the changes to it. Moreover, it depends on the subjective assessment of the firms and should therefore be interpreted with some caution. With respect to its development during the financial crisis, a descriptive analysis shows that SMEs in stressed euro area countries, such as Italy and Spain, and especially SMEs in the construction sector, were particularly affected by an increase in their financing gap. The econometric investigation, which takes into account firms' individual characteristics, reveals that changes in turnover and profit margins are key variables for explaining changes in the perceived external financing gap, while firm size turns out to be dominated by these variables. In addition, younger firms and autonomous profit-oriented firms tend to be more affected by increases in the financing gap.