THE FINANCING OF SMALL AND MEDIUM-SIZED ENTERPRISES IN THE EURO AREA

Small and medium-sized enterprises (SMEs) have received particular attention from policy-makers in Europe given their prominent economic role. This article provides an in-depth analysis of how financing patterns differ across firm size categories in the euro area and analyses the financial position of SMEs using firm-level data. It also reviews the available evidence on the existence of financing constraints for SMEs in particular. Evidence based on several surveys points to the perception of financing constraints on the part of SMEs, although not in all countries. Evidence based on aggregated balance sheet data shows that, after controlling for sectoral composition and country effects, differences between the financial position of SMEs and that of larger firms emerge with regard to the degree of reliance on external sources of finance and to holdings of cash and financial fixed assets. Likewise, the smaller a firm is, the lower its debt repayment ability is. In addition, micro-level data show that there has been an increase in the dispersion of SMEs' financial position in the euro area in the last few years. The data also reveal links between various financial indicators which point to firms' fragile financial positions.

1 INTRODUCTION

Understanding corporate financing decisions is important for monetary policy in the context of an assessment of financial and economic developments, as the transmission of monetary policy impulses depends to a certain degree on the financing behaviour and balance sheet structures of firms. Various factors – such as the size and age of the firm, the sector in which it chiefly operates, the country from which it operates (and, in particular, that country's institutions), and the level of economic and financial development – have been found to influence the availability of finance to firms.[1]

In the light of the particular interest in the access of SMEs[2] to financing, this article focuses on one specific factor among those mentioned above – firm size – and analyses how financing patterns differ across large, medium-sized and small enterprises.

Firm size may affect the quality and quantity of information available on a firm's projects and collateral, as well as its relationship with the markets and banks. Smaller firms are often believed to face more severe financing problems than large firms.[3] Unlike large firms, small firms often do not enter into contracts that are publicly visible (contracts with the labour force, suppliers and customers are generally kept private). In addition, small businesses do not normally issue traded securities that are continuously priced in public markets. Among publicly traded firms, smaller, newer firms are less likely to be tracked by analysts. As a result, small firms often cannot credibly convey their quality and may have difficulty in building up a reputation to signal that they are of high quality or low risk. The resulting asymmetry of information between the two sides of the market may even result in firms being completely unable to obtain external finance. For instance, on the supply (bank) side, the costs involved in assessing and setting appropriate premia for risk and the relatively high monitoring costs may hinder the flow of funds to smaller firms. In this respect, the Basel II framework is expected to lead to the development of credit ratings also for SMEs. The possibly stronger relationship between credit ratings and the pricing of external finance may reduce information asymmetries and thus enable firms to benefit from greater access to finance.

Differences related to guarantees and the cost of financing may also affect the financing patterns of SMEs. Small firms often have less collateral that could protect creditors from

1 See "Corporate finance in the euro area", ECB, May 2007.
2 There are several definitions of SMEs. According to the Observatory of European SMEs, they are firms having less than 250 employees.
3 See, among others, M. Gertler, "Financial structure and aggregate economic activity: an overview", *Journal of Money, Credit and Banking*, Vol. 20 (3), pp. 559-88, August 1988, and "The SME financing gap, volume 1, theory and evidence", OECD, 2006.

adverse selection or moral hazard effects. In addition, it is plausible that funding costs contain a significant fixed cost component. These fixed costs would make small loans more expensive than larger ones, which are mostly obtained by large firms.

Given the above reasons, it is reasonable to expect the financing patterns of SMEs to differ from those of large firms. However, one way of reducing asymmetric information is to build up a long-term relationship with finance providers.[4] This way, a firm can signal its quality by meeting its debt obligations. It could then be expected that small firms would have more stable bank relationships. Moreover, with regard to external finance, small firms may not have access to capital markets and may rely more on credit markets. Anticipating financing difficulties, these firms may respond by holding more cash to avoid the risk of not realising valuable projects.

Against this background, this article first focuses on the existence of financing constraints for SMEs and assesses the available empirical evidence. In particular, the analysis uses information derived from surveys (Section 2). On the basis of aggregated balance sheet data, Section 3 then assesses the impact of sectoral and country effects on firms' financial position across firm sizes. In addition, micro-level data are used to further analyse the financial position of SMEs (Section 4). The main conclusions are presented in Section 5.

2 SMALL AND MEDIUM-SIZED ENTERPRISES AND FINANCING CONSTRAINTS: RESULTS BASED ON SURVEYS

The importance of financing constraints is an empirical question, and consensus on their determinants – or even on their definition – has not yet been reached. One line of investigation is to ask firms directly whether they feel that they are subject to financing constraints.[5] Some important caveats should be kept in mind when reviewing the results of the various surveys conducted by the European Commission, the OECD and national authorities.[6] For instance, the way in which questions are posed may mean that surveys miss some of the firms facing financing constraints (for example, they might capture firms which under current conditions feel financially constrained, but not those that would have borrowed more under more favourable conditions). Alternatively, firms' responses may only reflect a general deterioration of credit conditions in the economy, with the result that they might claim to be financially constrained even if they are not. An additional caveat related to the results of the various surveys is that a comparison with large firms is not possible. In this article, the term "financing constraints" should be interpreted as the inability of a company to obtain a sufficient amount of financing to fund its investment needs at current, or even higher, interest rates.[7]

SURVEY RESULTS ON THE CONSTRAINTS ON BUSINESS DEVELOPMENT AND ACCESS TO BANK FINANCING

Although surveys differ considerably in terms of their structure and questions, overall they

4 There is extensive literature on this issue. See, for example, M. A. Petersen and R. G. Rajan, "The benefits of lending relationships: evidence from small business data", *Journal of Finance*, Vol. 49 (1), pp. 3-37, 1994, and, more recently, A. N. Berger, R. J. Rosen and G. F. Udell, "Does market size structure affect competition? The case of small business lending", *Journal of Banking and Finance*, Vol. 31 (1), pp.11-33, 2007.

5 Another approach is based on the econometric estimation of models in which the presence of financing constraints has implications for firms' behaviour that can be tested (see the review of the literature in "Corporate finance in the euro area", ECB, 2007). The evidence is inconclusive, as there are conflicting results regarding the correlation between firm size and financing constraints.

6 The European Commission has had surveys on SMEs conducted about once every other year since 1993. The results of the surveys related to SMEs' access to finance were published in a Flash Eurobarometer in 2005 and by the Observatory of European SMEs in 2003. At the national level, surveys are conducted by national statistical institutes (Portugal), NCBs (France, Italy, Belgium and Finland) or other institutions (the Netherlands, Spain and Germany).

7 The definition does not include, however, those firms that decide not to seek additional financing owing to the perceived "high" cost, which implies that, for the purposes of this article, financing constraints are not a matter of cost but rather a matter of available resources.

tend to indicate that the vast majority of firms are able to obtain the funds they need. However, significant cross-country differences exist. According to the 2003 European Network for SME Research (ENSR) survey,[8] on average around 10% of SMEs in 19 European countries reported that access to finance was the major constraint weighing on their business performance over the previous two years. More firms reported other constraints, such as the purchasing power of consumers (36%), which was related to the unfavourable economic climate at that time, and a lack of skilled labour (13%). The financial constraint was more relevant for firms in the transport and communications sector and for small firms (10-49 workers) than for micro-firms (less than 10 employees) or medium-sized firms (50-249 employees).

Taking a slightly different perspective, the Flash Eurobarometer survey[9] more recently asked firms about the factors which would best ensure their development. "Easy access to means of financing" was cited after "social and fiscal regulations" and "better qualified people available on the market". Firms were also asked whether their current financing was in general sufficient to see their projects through. In all euro area countries, the majority of SMEs replied in the affirmative, but there were some disparities across countries. In Ireland and Finland, more than nine out of ten SMEs reported having sufficient financing, compared with just two-thirds of SMEs in Portugal and Italy.

A recent OECD survey[10] tentatively concludes that in OECD countries, SMEs are able to obtain sufficient credit from banks and other credit institutions, and that there is therefore no significant SME financing gap in these countries. The survey also shows that the gap is greater for equity financing than for debt financing. At the same time, there is a perception in most countries that there are still problems in directing funds to start-ups and young high-risk firms with new business models.[11] It should be noted that, by contrast with the surveys conducted for the European Commission, this survey was not carried out at the firm level but was directed at government policy and central bank experts.

With regard to the sources of finance, the surveys conducted for the European Commission indicate that bank loans are the main instrument for obtaining external funds. The results from the latest Flash Eurobarometer survey indicate that banks are by far the main source of external finance for SMEs, followed by leasing/renting companies and private investors (depending on the country). Access to bank financing is considered most important in France, where 64% of companies agree that without a bank loan their projects could not be successfully completed. Finland stands at the opposite extreme, with 78% of firms disagreeing with this statement. Views about the ease of access to bank loans also differ. For instance, in Finland, 95% of firms reported that access was easy, compared with only 14% in Germany.

The ENSR surveys also show that bank loans and overdrafts are the most widespread debt financing methods for SMEs, although alternative sources such as leasing and factoring have been growing in importance. The 2002 ENSR survey shows that, during the three years prior to the survey year, only 37% of firms did not request an additional bank loan. Of the firms surveyed, 50% asked for a loan and received the amount requested, 2% received part of the loan, and only 6% were denied a loan (which corresponds to 10% of the firms which applied for a bank loan) (see Table 1). The demand for loans was better served for medium-sized firms and least well served for micro-firms (0-9 employees) and firms in the

8 See Observatory of European SMEs, European Commission, 2003.

9 See "SME access to finance", Flash Eurobarometer 174, European Commission, 2005.

10 See "The SME financing gap, volume 1, theory and evidence", OECD, 2006.

11 See also the report "IT innovations and financing patterns: implications for the financial system", BIS, 2002, which explores the linkage between the use of new technologies and firms' financing needs, and the role of financial markets and intermediaries in financing innovative activities.

Table 1 Access to finance: difficulties in obtaining bank loans for SMEs

(percentages)

Did you get all the loans you needed from your bank in the last three years?

	Number of employees, 2001			Main activity			Total
	0-9	10-49	50-249	Industry	Trade	Services	
Not applicable: no need for loans in the last three years	38	28	23	34	36	39	37
Yes	49	55	53	54	52	46	50
Partly	2	2	1	2	2	2	2
No	6	6	5	6	6	6	6
Don't know/no answer	5	9	18	4	4	6	5
Total	100	100	100	100	100	100	100

Source: 2002 European Network for SME Research survey.

services sector. According to the survey, the main reason for additional loans to be refused is the lack of sufficient collateral, especially for micro-firms and small enterprises (10-49 employees). The importance of collateral diminishes as the enterprise size increases, whereas good performance and the information flow gain in importance.

RESULTS BASED ON NATIONAL SURVEYS

In addition to the regular surveys conducted for the European Commission, several euro area countries conduct national surveys on enterprises.[12] The main focus of these surveys is to monitor developments in investment and employment; however, they generally also contain alternative measures of financial constraints and access to finance, albeit according to ad hoc methodologies (in terms of both the formulation of the questions and the definition of the size categories). Although the answers cannot easily be compared across countries, the survey results suggest the existence of some financing constraints for small firms. They also indicate that the relationship between the size of the company and the perceived financing constraints is not necessarily either monotonic or constant over time. However, this might be due to the fact that other relevant factors, e.g. the age of the firm, are not taken into account.

To sum up, there is some evidence from surveys to suggest that some euro area SMEs face binding financing constraints (i.e. have no access to finance despite having borrowing requirements), while the vast majority enjoy appropriate access to finance. In addition, the OECD survey results show that in OECD countries the financing gap is larger in the financing of innovative SMEs.[13] All in all, the evidence of a gap in the financing of a minority of SMEs does not per se point to a lack of efficiency in the allocation of credit.

3 DIFFERENCES BETWEEN THE FINANCING OF SMALL AND MEDIUM-SIZED ENTERPRISES AND THAT OF LARGE FIRMS

As large firms are more diversified, can offer more collateral and have more bargaining power vis-à-vis banks on account of their size, they may have easier access to market and bank financing. In addition, they probably face less severe asymmetric information problems than SMEs. Accordingly, one might expect smaller firms to rely more on internal financing than large firms and, thus, to show lower levels of indebtedness. However, if small firms are less

12 See footnote 6.

13 This could imply that firms facing financing constraints can be classified into two categories: a) innovative firms, usually in riskier sectors, which request finance from credit institutions although their investment would be better covered by equity; and b) those which are not able to create value and represent a high credit risk.

profitable, their levels of indebtedness could be higher than those of larger firms. In addition, with regard to external financing, small firms may not have access to capital markets and may thus be forced to rely more on credit markets. It is therefore to be expected that, in terms of external financing, they use comparatively more bank financing than large firms.

On the assets side, the empirical and theoretical literature has often emphasised the potential link between cash holdings and financing constraints.[14] This link suggests that smaller firms hold more cash if they are more affected by financing constraints. Likewise, large firms are often said to be more financially sophisticated and hence may hold more diversified portfolios.

However, the assertion that SMEs are more financially constrained than large firms may possibly reflect their larger presence in sectors or economies with specific characteristics (e.g. asymmetric information problems or institutional factors) that result in greater difficulties with regard to accessing external finance. The data from the Observatory of European SMEs show that SMEs play a prominent role in sectors such as construction, wholesale trade and retail trade. By contrast, large firms predominate in large-scale industries, such as extraction and transport and communications. Firms also tend to be larger in industries with a greater need for external financing owing to the relative ease of accessing finance.

In addition, there are large disparities in the SME landscape across countries. Compared with the euro area average, the share of SMEs in employment is much higher in Italy, Spain, Portugal and Greece and much lower in Germany, the Netherlands and Finland. In terms of value added, the contribution from SMEs is well above the euro area average in Italy, Greece and Luxembourg, and well below it in Ireland, Finland and France.

A way of assessing the impact of sectoral and country effects on firms' financial position across firm sizes is to compare relevant financial indicators directly derived from aggregated balance sheet data ("unadjusted indicators" from the European Commission's BACH database[15]) with the same indicators adjusted for those effects. The adjustment consists in applying the same country and sectoral composition to all size classes. The weights used for each sector in each country, for all sizes, are the shares of value added for the sector/country combinations in total value added for the euro area.

Chart 1a suggests that large firms have witnessed, on average, the highest return on assets (ROA).[16] However, this pattern is largely driven by country and sectoral effects: if the same country and sectoral composition is imposed on all size groups, no marked differences in the ROA are observed for the different size groups in the last few years of the sample. In the second half of the 1990s the ROA is higher for large firms if adjusted indicators are used.

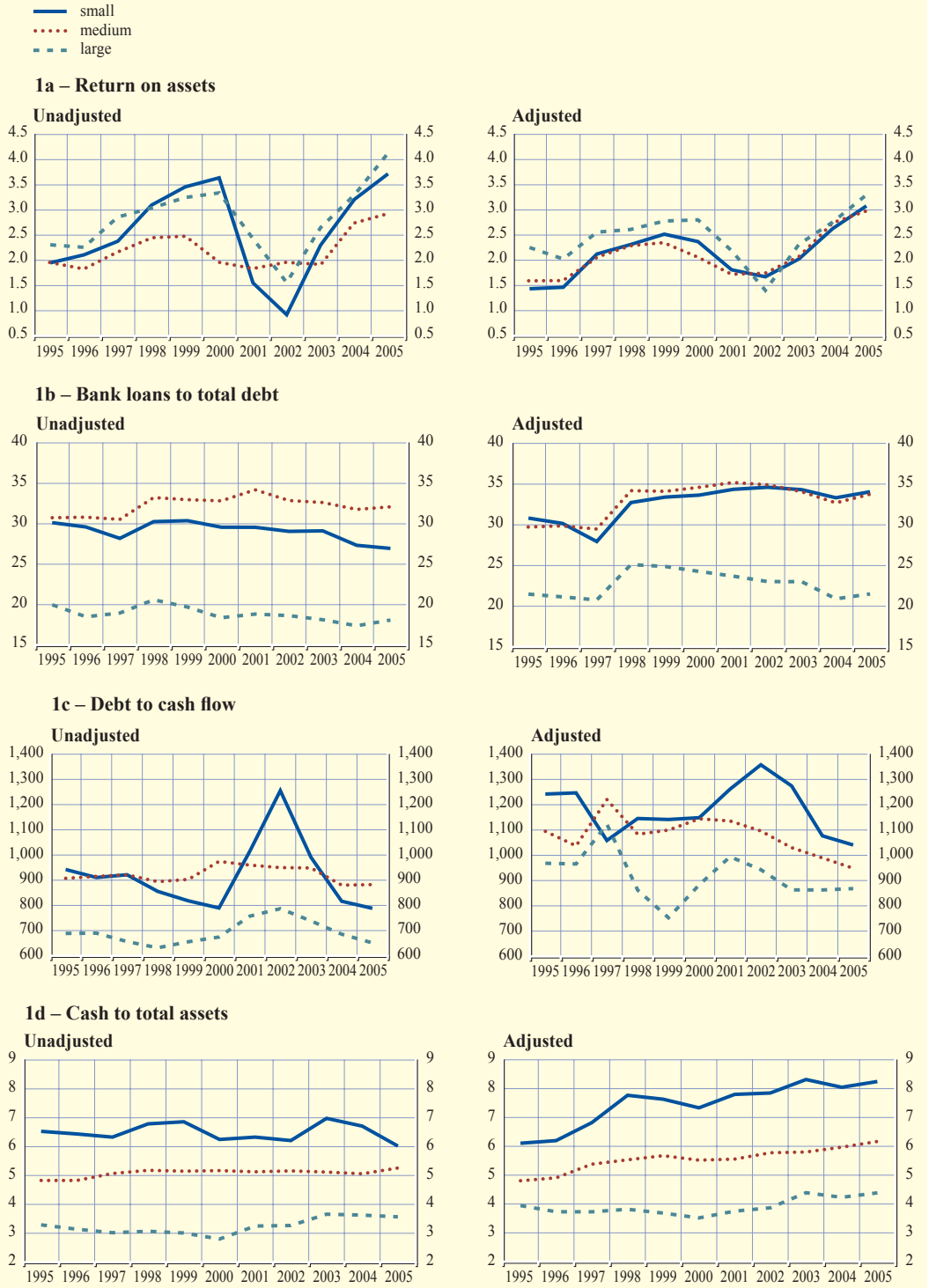
Turning to the analysis of external financing, size appears to matter considerably for specific sources of funds. Small and medium-sized firms rely more on loans than large firms, and this pattern remains after adjusting for sectoral and country effects (see Chart 1b).

14 T. Opler, L. Pinkowitz, R. Stulz and R. Williamson, "The determinants and implications of corporate cash holdings", *Journal of Financial Economics*, Vol. 52, pp. 3-46, 1999.

15 The Bank for the Accounts of Companies Harmonised (BACH) database contains harmonised annual accounts statistics for non-financial corporations provided by national central balance sheet offices. It allows cross-country comparisons to be made and is published on the European Commission's website. The database provides annual aggregated data for nine euro area countries (Belgium, Germany, Spain, France, Italy, the Netherlands, Austria, Portugal and Finland). Data are broken down into NACE Rev. 1 industrial sub-sectors with three different size classes. Small companies are defined as those with a turnover of below €10 million, medium-sized enterprises as those with a turnover of between €10 and €50 million, and large ones as those with a turnover of more than €50 million.

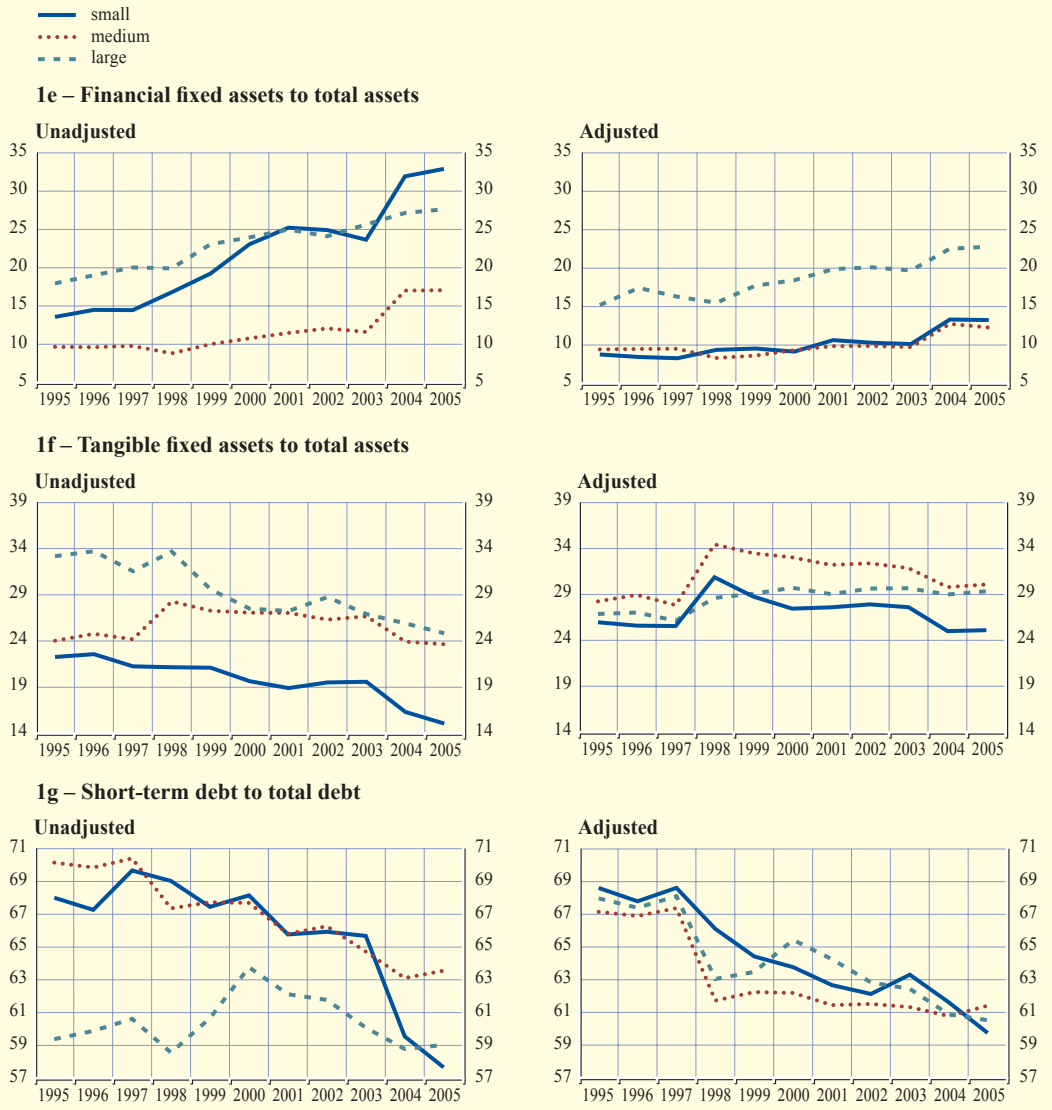
16 Large firms also show the highest values for the return on equity. However, the positive relationship between profitability and size does not appear to be linear, as medium-sized firms generally show lower return on assets than smaller firms over time, as well as lower return on equity in some years.

Chart 1 Selected indicators of firms' financial position across firm sizes



Sources: BACH database and ECB calculations.
Note: The adjusted values are calculated giving the same weight to each sector in each country for all size groups. The weights used correspond to the shares of value added for the sector/country combinations in total value added in the euro area.

Chart 1 Selected indicators of firms' financial position across firm sizes (cont'd)



Sources: BACH database and ECB calculations.
Note: The adjusted values are calculated giving the same weight to each sector in each country for all size groups. The weights used correspond to the shares of value added for the sector/country combinations in total value added in the euro area.

According to the debt-to-cash flow ratio, which provides a measure of the ability of a firm to repay its debt, large firms display the soundest financial situation (see Chart 1c). The adjusted data show a broadly monotonic relationship between size and debt repayment (that is, the smaller the size of the firm, the lower its repayment capacity), which is not as clearly demonstrated by the unadjusted indicators.[17]

With regard to the structure of assets, the ratios of cash and financial fixed assets to total assets differ considerably across size classes: large firms show the highest values for the ratio of financial fixed assets to total assets when adjusted and the lowest values for the ratio of cash to total assets (see Charts 1d and 1e). In addition, these ratios differ widely across

17 The same pattern is observed for the debt-to-total assets ratio.

countries, possibly pointing to cross-country disparities in financial market developments, and to a lesser extent across sectors. Differences across sectors are considerable for the ratio of tangible fixed assets to total assets, which is in line with the huge sectoral disparities in capital intensity. Since large firms play an important role in sectors such as electricity, transport, storage and communications, which are – together with "other services" – the most capital-intensive sectors, the ratio of fixed assets to total assets is highest for large firms in all countries (on the basis of unadjusted data). When controlling for sectoral and country factors, the monotonic positive relationship between size and the ratio of tangible fixed assets to total assets observed on the basis of unadjusted data is reversed and becomes uncertain (see Chart 1f).

Turning to the maturity structure of liabilities, the ratio of short-term debt to total debt appears to be basically the same across firm classes on the basis of adjusted data (see Chart 1g). By contrast, unadjusted data show lower values for this ratio for larger firms. This difference is largely caused by sectoral effects: the construction sector and the wholesale and retail sector, where small firms predominate, show the shortest maturity of assets.

To sum up, some of the differences observed between the financial position of SMEs and that of larger firms are driven by differences in their sectoral composition and relative concentrations across countries. This seems to be the case for the ratios of tangible fixed assets to total assets and short-term debt to total debt. In other cases, differences remain even after controlling for sectoral and country characteristics, for instance in the share of fixed financial assets to total assets, the degree of reliance on cash and bank loans and the ratio of debt to cash flow. Similar results are obtained by using a variance decomposition (see the box below).

However, there are some caveats to the conclusions reached here. Some possibly important determinants of access to finance, such as the age of the firm or the form of ownership (which are likely to be correlated with the size of the firm), have not been taken into account. Another caveat relates to a selection bias of the BACH database, whereby the small firms covered tend to be those in a better financial situation.

Box

THE ROLE OF SIZE IN EXPLAINING DIFFERENCES IN FINANCING PATTERNS ACROSS FIRMS: A VARIANCE ANALYSIS

The variance decomposition method is used to compare the variance of a set of financial ratios that can be explained by firm size with what is left unexplained by that factor, but could be explained by other existing sources of variability.

To this end, the total variance for a given ratio is decomposed into the variance between and the variance within size classes.[1] In particular, the variance within a given size class captures

1 This consists in decomposing the variance (the sum of squares SS) of a dataset organised by classes into the variances between and within these classes. The classes can be organised around factors such as size (J = 1, ... 3), sector (S = 1, ... 6) and country (C = 1, ... 9). For instance, in the case of size, with d representing size classes: *SS=SS between d +SS within d*
The variances between and within size classes for indicator I can be calculated as follows:
Variance between size classes to total variance:

$$\frac{1}{3}\cdot\sum_{J=1}^{3}\left(\sum_{C=1}^{9}\sum_{S=1}^{6}W_{CS}I_{CS}\right)^2-\left(\left(\frac{1}{3}\right)\cdot\left(\sum_{J=1}^{3}\sum_{C=1}^{9}\sum_{S=1}^{6}W_{CS}I_{CS}\right)\right)^2$$

Variance within size classes to total variance:
Sum (Weighted variance (I large), weighted variance (I medium), Weighted variance (I small))
where Weighted variance (I_J)

$$\left(\frac{1}{3}\right)\cdot\left(\sum_{C=1}^{9}\sum_{S=1}^{6}W_{CS}I_{CS}^2\right)-\left(\sum_{C=1}^{9}\sum_{S=1}^{6}W_{CS}I_{CS}\right)^2$$

the heterogeneity of this size class, calculated using the observations in the different sectors and countries. The variance decomposition is conducted in a similar way for the sector and country factors. The "variance between" obtained from these decompositions can then be compared to assess how relevant the size dimension is in explaining financing patterns, relative to the sector of activity or country of origin.

In the analysis that follows, one observation – corresponding to the average over the period 1999-2005 – is taken for each size/sector/country observation, with the analysis thus focusing on structural differences across financing patterns.

Variance contribution of size, sector and country factors

(adjusted indicators; 1999-2005 average; in percentages)

Profitability and external financing

Indicator	Return on assets	Bank loans to total debt
Size	0.5	8.6
Sector	12	19
Country	43	37

Balance sheet structure

Indicator	Debt to cash flow	Cash to total assets	Short-term debt to total debt	Financial fixed assets to total assets
Size	4.8	31	0.1	19
Sector	22	13	66	10
Country	22	40	20	33

Sources: BACH database and ECB calculations.

The results of the variance decomposition are shown in the table, which reports the percentage of the variance that is explained by the size, sector or country factors for each financial ratio analysed. The presence or the lack of differences across size classes for the set of adjusted indicators presented in the main text is broadly confirmed by the contribution of size to the total variance across firms.

Profitability and external financing

Looking at the upper panel of the table, the first column indicates that differences in the return on assets do not appear to be significantly related to size – less than 1% of the variance is explained by this factor – but are more likely to be mainly driven by the relative weights of SMEs in the various sectors and countries.

The country of origin matters more than the size and sector for the degree of reliance on loans (second column). Additional analysis points to the fact that there are large disparities across countries in the weight of loans for SMEs (particularly for small firms), while disparities are low across countries for large firms. Thus, this large variability in the weight of loans for SMEs probably reflects institutional disparities. These results are in line with the finding that the corporate bond market in the euro area has achieved a high degree of integration, whereas retail banking continues to be fragmented.[2]

Balance sheet structure

The lower panel of the table reports four indicators related to the balance sheet structure. For the debt-to-cash flow ratio, the variance decomposition shows that the country and sector are both more important factors than size, with each accounting for nearly 25% of the variability observed. Regarding the structure of assets, the ratios of cash and financial fixed assets to total assets differ widely across countries, possibly pointing to cross-country disparities in financial

2 See "Financial integration in Europe", ECB, March 2007.

market developments, and to a lesser extent across sectors. Size does not seem to play a major role with regard to the maturity structure of liabilities, where the dominant factor is the sector.

4 THE FINANCIAL POSITION OF SMALL AND MEDIUM-SIZED FIRMS: A FIRM-LEVEL ANALYSIS

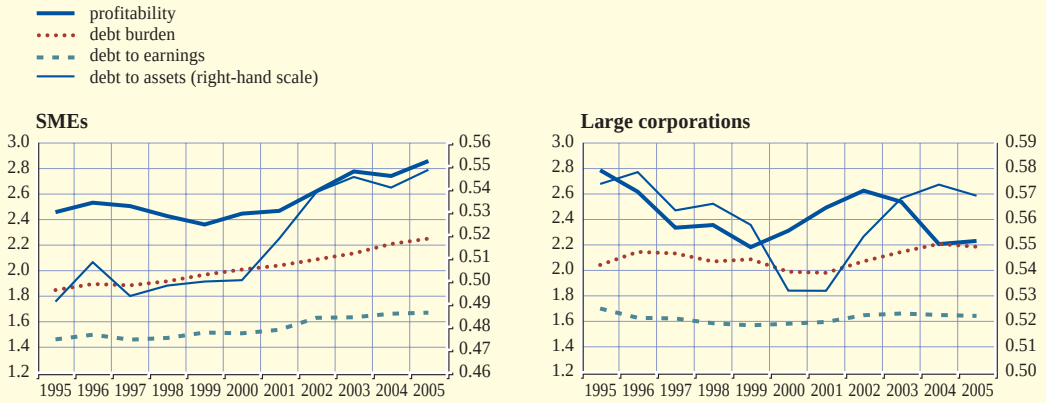
There is ample empirical evidence that firms' real decisions (on investment and employment, for example) are conditioned by their financial situation. This is especially true of those companies which are in a more fragile financial position[18], which indicates the advisability of complementing aggregated information with a micro-analysis in order to further assess the financial situation of SMEs in the euro area. A first step in the assessment includes a measure of the dispersion of financial indicators across companies. A further assessment of the changes in the dispersion requires a more detailed analysis of the distributional patterns. Against this background, this section relies on firm-level data which are derived from the AMADEUS database of Bureau van Dijk. The analysis covers the period 1995-2005.

Chart 2 presents a measure of dispersion that takes into consideration the difference between values observed in the upper and lower part of the distribution of firms – the inter-quartile coefficient of variation. The measure is calculated for profitability, debt burden and indebtedness (the latter with respect to both assets and results) for SMEs (panel a) and for large firms (panel b). The comparison indicates that SMEs do not record greater variability in their financial position than large firms.[19] However, the measure of dispersion has increased in recent years in all the ratios analysed, with the largest increase being recorded in the profitability indicator, a

18 See I. Hernando and C. Martínez-Carrascal, "The impact of financial variables on firms' real decisions: evidence from Spanish firm-level data", Working Paper No 0319, Banco de España, 2003.

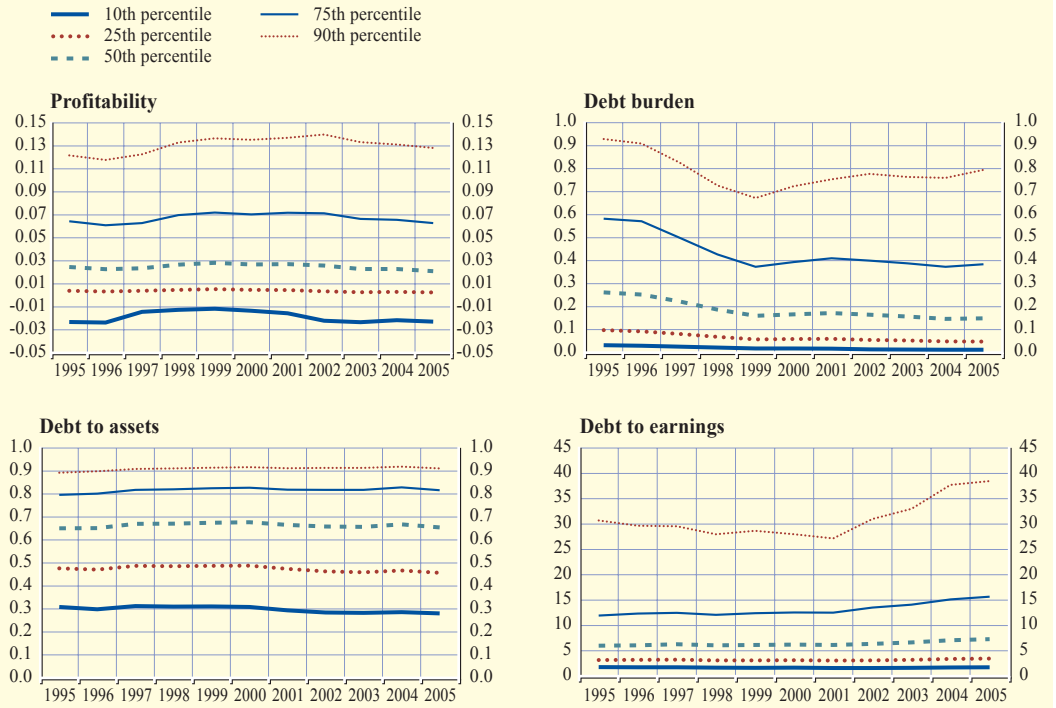
19 It is worth noting that the dispersion would be higher for SMEs if it was measured using the highest and lowest decile instead of the highest and lowest quartile, i.e. taking into consideration only the most extreme values.

Chart 2 Inter-quartile coefficient of variation: SMEs and large corporations



Sources: Bureau van Dijk (AMADEUS database) and ECB calculations.
Notes: The inter-quartile coefficient of variation is defined as the distance between the 75th and 25th percentiles divided by the value of the 50th percentile. Profitability is defined as profits over the average value of assets for the year. The debt burden is defined as interest payments over earnings before interest, taxes, depreciation and amortisation. Indebtedness is defined as debt over earnings before interest, taxes, depreciation and amortisation. Debt includes trade credit, as this variable is not available separately for all countries in the database used for this analysis.

Chart 3 Selected financial ratios for SMEs



Sources: Bureau van Dijk (AMADEUS database) and ECB calculations.

development which has not been observed for large companies. As this increase in dispersion can potentially reflect a divergent pattern in the different percentiles of the distribution, it is interesting to focus on the evolution over time of these percentiles for each of the financial indicators.

Chart 3 shows the values of the 10th, 25th, 50th, 75th and 90th percentiles for the four indicators analysed here. These percentiles capture, for each year, the level of the ratios that, after ordering all the observations from lower to higher values, leaves below 10%, 25%, 50%, 75% and 90% of the observations. For example, 50% of the companies display lower values than the 50th percentile, while the rest display higher values. Hence, this percentile can be considered representative of the "typical" SME, while the higher percentiles capture – except in the case of the profitability indicator – the situation of those firms that bear higher financial pressure.

Several conclusions can be extracted from the chart. First, the evolution shown by the typical firm (the 50th percentile) is in most cases in line with the evolution shown by the corresponding aggregate indicator. However, this is not the case for the profitability indicator (see the upper-left panel of Chart 3): while aggregate profitability shows a recovery from 2002 after the downturn observed between 1999 and 2001, the median firm has continued the decline which started at the end of the 1990s. Those companies in a more vulnerable situation (those in the lower decile) have also registered a reduction in profitability. This development contrasts with that observed for large firms, where a positive trend is observed in the last few years of the sample in the different percentiles of the distribution, including those corresponding to firms in a more fragile financial situation.

Second, the reduction of the debt burden observed at the aggregate level from 2002

reflects positive developments for most SMEs but has not been observed for those companies in a more vulnerable situation (that is, those in the upper part of the distribution, as shown in the upper-right panel of Chart 3). The overall result is the increase in the inter-quartile coefficient of variation mentioned previously. It can also be observed that the reduction in interest rates in the second half of the 1990s benefited in particular companies with higher debt burden ratios.

Finally, the increase in the aggregate dispersion observed for the debt-to-earnings ratio reflects a higher increase for those firms in the upper part of the distribution (see the lower-right panel of Chart 3), which again is higher than that observed for large companies. The debt-to-assets distribution has remained broadly stable over the last decade (see the lower-left panel of Chart 3).

THE INTERACTION BETWEEN FINANCIAL INDICATORS: AN ANALYSIS OF THE TAILS OF THE DISTRIBUTION

In order to draw conclusions about the financial soundness of the corporate sector, it is useful to jointly analyse alternative indicators of financial health. For example, the risks associated with high indebtedness levels are lower if accompanied by high profitability and/or high liquidity ratios. By contrast, the coexistence of high indebtedness with low profitability, a high debt burden and a low liquidity ratio is expected to increase the sensitivity of a given firm to unexpected shocks.

Table 2 shows the median value for profitability[20], the debt burden, liquidity and the debt-to-earnings ratio for four different groups of firms, classified according to the debt-to-assets ratio. The first group includes firms with a debt-to-assets ratio below the 25th percentile of the distribution in a given year. The second group includes those between the 25th and 50th percentiles, while the third includes those between the 50th and 75th percentiles. The last group contains firms in the upper quartile of the distribution of this variable. As can be seen, firms in the latter group – that is, firms with the highest indebtedness with respect to assets – show the lowest median values for the liquidity and profitability ratios,

20 In this analysis, profitability is calculated using earnings before interest, taxes, depreciation and amortisation, in order to avoid this ratio being affected by large interest payments associated with high indebtedness.

Table 2 Distribution of selected financial indicators according to the debt-to-assets ratio

	Low debt-to-assets ratio (below 25th percentile)				Low-medium debt-to-assets ratio (between 25th and 50th percentile)			
	Median liquidity	Median profitability	Median debt burden	Median debt to earnings	Median liquidity	Median profitability	Median debt burden	Median debt to earnings
1995	0.112	0.118	0.135	2.663	0.076	0.125	0.199	4.667
2000	0.117	0.128	0.077	2.468	0.084	0.131	0.120	4.643
2005	0.128	0.106	0.063	2.713	0.084	0.107	0.105	5.333
	Medium-high debt-to-assets ratio (between 50th and 75th percentile)				High debt-to-assets ratio (above 75th percentile)			
	Median liquidity	Median profitability	Median debt burden	Median debt to earnings	Median liquidity	Median profitability	Median debt burden	Median debt to earnings
1995	0.058	0.109	0.294	6.908	0.045	0.086	0.482	10.826
2000	0.061	0.108	0.196	7.300	0.047	0.079	0.333	12.346
2005	0.058	0.089	0.178	8.538	0.043	0.066	0.304	14.470

Sources: Bureau van Dijk (AMADEUS database) and ECB calculations.

and the highest median values for the debt burden indicator. Moreover, these companies display the highest levels of indebtedness with respect to the earnings they generate. Similarly, more than 40% of the companies with debt-to-assets ratios over the 75th percentile of the distribution also show values in the upper tail, or quartile, of the debt burden and debt-to-cash flow indicators, and values in the lower tail of the profitability indicator. 35% of these companies show values in the lower quartile of the liquidity ratio distribution. This evidence illustrates that there are substantial links between various financial position indicators which point to a fragile financial situation.[21]

5 CONCLUSION

Differences in the financing patterns of small and large firms and the existence of financing constraints (which are an extreme case of market imperfection) may suggest that monetary policy has a different impact on firms of different sizes, with implications for the transmission mechanism itself. In this respect, the existence of possible differences in small and medium-sized enterprises' access to finance as compared with that of large firms has been widely discussed. Evidence based on several surveys conducted at the European level for the European Commission shows that some euro area SMEs may face financing constraints (i.e. have no access to finance despite having borrowing requirements), while the vast majority enjoy appropriate access to finance. At the same time, the perception of the existence of financing constraints also differs across countries. Some national surveys also suggest the existence of some financing constraints for small firms, although results vary across countries and are not easily comparable. Moreover, the measurement of financing constraints might be distorted by existing subsidies for small enterprises. It may also be the case that small firms find ways around financial obstacles.

Several studies have described differences in the financing patterns of SMEs and large firms. The analysis carried out here indicates that some of the differences are caused by factors such as heterogeneous sectoral compositions and relative concentrations across countries. The institutional factors behind cross-country differences have not been investigated in this article but may be very relevant from a policy perspective. However, differences across size classes remain for some aspects of the financing patterns, that is, even within a given sector and a given country. This applies to the share of financial assets in total assets (which is positively related to the size of the firm), to the degree of reliance on cash and bank loans, and to the ratio of debt to cash flow (which are all negatively related to the size of the firm). The results on the retention of cash are particularly robust. As this variable is often considered to be an indicator of the existence of financing constraints, the analysis seems to indicate that differences might exist across size classes in terms of access to finance. Regarding bank loans, the analysis also points to the fact that there are large disparities across countries in the weight of loans for SMEs (particularly for small firms), while disparities are low across countries for large firms. Thus, this high variability in the weight of loans for SMEs probably reflects institutional disparities.[22]

There are some caveats to these conclusions related to the characteristics of the database used, such as the existence of a selection bias whereby the small firms covered tend to be those in a better financial situation.

The analysis based on firm-level data shows that large differences do not exist in the overall dispersion of the financial conditions across size classes. However, while the dispersion has increased for SMEs in the last few years, this development has not been observed for large firms. A more detailed distributional analysis

21 This pattern is also observed for the whole UK non-financial corporation sector (see A. Benito and G. Vlieghe, "Stylised facts on UK corporate financial health: evidence from micro-data", *Financial Stability Review*, Bank of England, June 2000.

22 See Box 2 in "Corporate finance in the euro area", ECB, May 2007.

points to a deterioration in the financial position of SMEs in a more fragile financial situation, but such a development cannot be as clearly observed in the case of large firms in a similar situation. The analysis also reveals links between the values of financial indicators reflecting a fragile financial position, since firms with the highest indebtedness show the lowest median values for the liquidity and profitability ratios. This indicates the advisability of supplementing macro-indicators with information at the micro level, since the fragility of certain companies is not necessarily compensated for by the soundness of others, and the financial position – whether solid or weak – might be exerting asymmetric non-linear influence on firms' real decisions.[23]

23 See Box 4 in "Corporate finance in the euro area", ECB, May 2007.