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Assessing and measuring the equity gap and the equity requirements for innovative SMEs

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Agenda

- Equity gap: definition, measurement and international evidence
- Computation of the additional amount of equity needed in order to finance the expected growth in sales: presentation of the Model
- Estimation of equity requirements for SMEs in the Emilia Romagna region
- Conclusions

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Equity gap: definition

- Innovation is generally considered one of the main drivers of economic growth (European Commission 2001 and 2002)
- The last few years have seen a large number of studies underlining the importance of financial constraints for the SMEs most involved in innovative projects (Beck and Demirguc-Kunt, 2006; Hall, 2005)
- Various authors (Berger and Udell, 1998) have reported that, due to market failure, equity is the form of finance best suited to finance innovative projects
- The relative backwardness of European financial systems (Rajan and Zingales, 2001; European Commission, 1998 and 2003), compared to that of US aggravates the structural difficulties faced by SMEs in obtaining access to finance, and in particular amplify the problems related to the availability of equity
- Situations may arise in which the financial requirement is too small to be economically viable for venture capitalists but too large for business angels to cover
- **This is the situation known as the equity gap in which there is a shortage of equity investments during the initial stages of firm's life-cycle**
- During the last few years, the "question" of the existence and the size of the equity gap has attracted a large number of researchers; however, there is still a great deal of uncertainty concerning the method to be used in order to quantify the GAP

Equity gap: measurement

- *Supply-side analysis*
  - → Monitoring the distribution of private equity investments by amount and by firm life-cycle stage ⇨ difficulties to collect data on business angels
  - → Qualitative analysis by means of interviews/questionnaires targeting experts ⇨ findings tend to be affected by the composition of the panel/sample which may fatally influence replies as well as by anecdotal convictions
- *Demand-side analysis*
  - → Not so frequent and usually developed using a qualitative approach ⇨ even greater problems deriving from the panel composition criteria and the resulting degree of representativeness
  - → Quantitative approach, at present least widely used but definitely the most interesting from a methodological point of view, based on empirical analyses of demand-side data sets
- *Findings*
  - → Equity gap linked to the type of financial system and the presence of venture capital and private equity operators as well as business angels
  - → The size of the equity gap varies over time probably due to
    - differences in survey procedures
    - point in economic cycle
    - evolution of the financial industry

Equity gap: international evidence

1 - International level

- ✓ OECD Survey 2006
  - Questionnaire-based survey evidence of an equity gap for innovative SMEs even in OECD countries where however no significant financing gap were found for SMEs in general
- ✓ European Commission 2005
  - Starting from less than € 100,000 to over 1 million, with relevant national difference (Germany € 5 million; UK between € 400,000 and 3 million)

2 - National context

- ✓ United Kingdom
  - several supply-side studies based on a qualitative approach. The most recent study (Harding and Cowling, 2006): lower end between £ 150,000 and £ 250,000; upper end between £ 1.5 and £ 2 million
- ✓ Germany
  - KFW survey: evidence of an equity gap until Euro 5 million
- ✓ Sweden
  - between € 100,000 and 500,000 (supply-side interviews)
- ✓ Finland
  - between € 200,000 and 1 million (supply-side interviews)

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FE_{LC}: Equity requirement estimation model (1/2)

- Hypothesis adopted with regard to the role of financial indebtedness in covering additional financial needs → STABLE LEVERAGE
- Further assumptions → NO significant changes in
  - Capital intensity (K)
  - Ratio of Self-financing on sales (A)
    - → Self-financing = Net earning + Amortisation − Profits distributed
  - Ratio of Current debt on sales (D_c)

$$\boxed{FE_{LC} = FA - CDC - CA - CDF}$$

- FE_{LC}: Equity requirement at constant leverage
- Additional financial requirements generated by the growth in sales = FA = $X \cdot V_{t-1} \cdot K$
  - → X = Expected rate of growth in sales
  - → V_{t-1} = Sales for the period previous the one being analysed
- Coverage provided by current debt = CDC = $X \cdot V_{t-1} \cdot D_c$
- Coverage provided by self-financing = CA = $X \cdot V_{t-1} \cdot A$

FE_{LC}: Equity requirement estimation model (2/2)

$$CDF = \text{Coverage provided by new financial debt} = CDF_1 + CDF_2 = \frac{X \cdot V_{t-1} \cdot \frac{D_f}{E} \cdot (K - D_c)}{1 + \frac{D_f}{E}}$$

with

$$CDF_1 = \frac{D_f}{E} \cdot X \cdot V_{t-1} \cdot A$$

$$CDF_2 = X \cdot V_{t-1} \cdot \left[K - D_c - A \cdot \left(1 + \frac{D_f}{E} \right) \right] \cdot \frac{\frac{D_f}{E}}{1 + \frac{D_f}{E}}$$

$$\boxed{FE_{LC} = X \cdot V_{t-1} \cdot \left[K - D_c - A \cdot \left(1 + \frac{D_f}{E} \right) \right] \cdot \frac{1}{1 + \frac{D_f}{E}}}$$

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Description of the sample

- Firms with registered offices in the Emilia Romagna region with data available for each of the years being analysed (2003-2005)
- Average annual growth in sales for the reference period between 0% and 100%
- Ratio of current debt/sales lower than 100%
- Leverage ratio between 0 and 10
- Sales 2005y lower or equal to Euro 50 million
- Trimmed outliers in all key variables at 1% level

The application of these selection criteria enabled us to identify a sample of 4508 firms

The equity requirement of SMEs in the Emilia Romagna region

	Rate of growth in sales (%)	Self financing margin (%)	Capital intensity	Current Debts/Sales (%)	Financial Debts/*Equity*
Average	13.8	5.5	0.8	44.0	0.76
Coeff. of variation	0.99	0.99	0.38	0.43	2.18

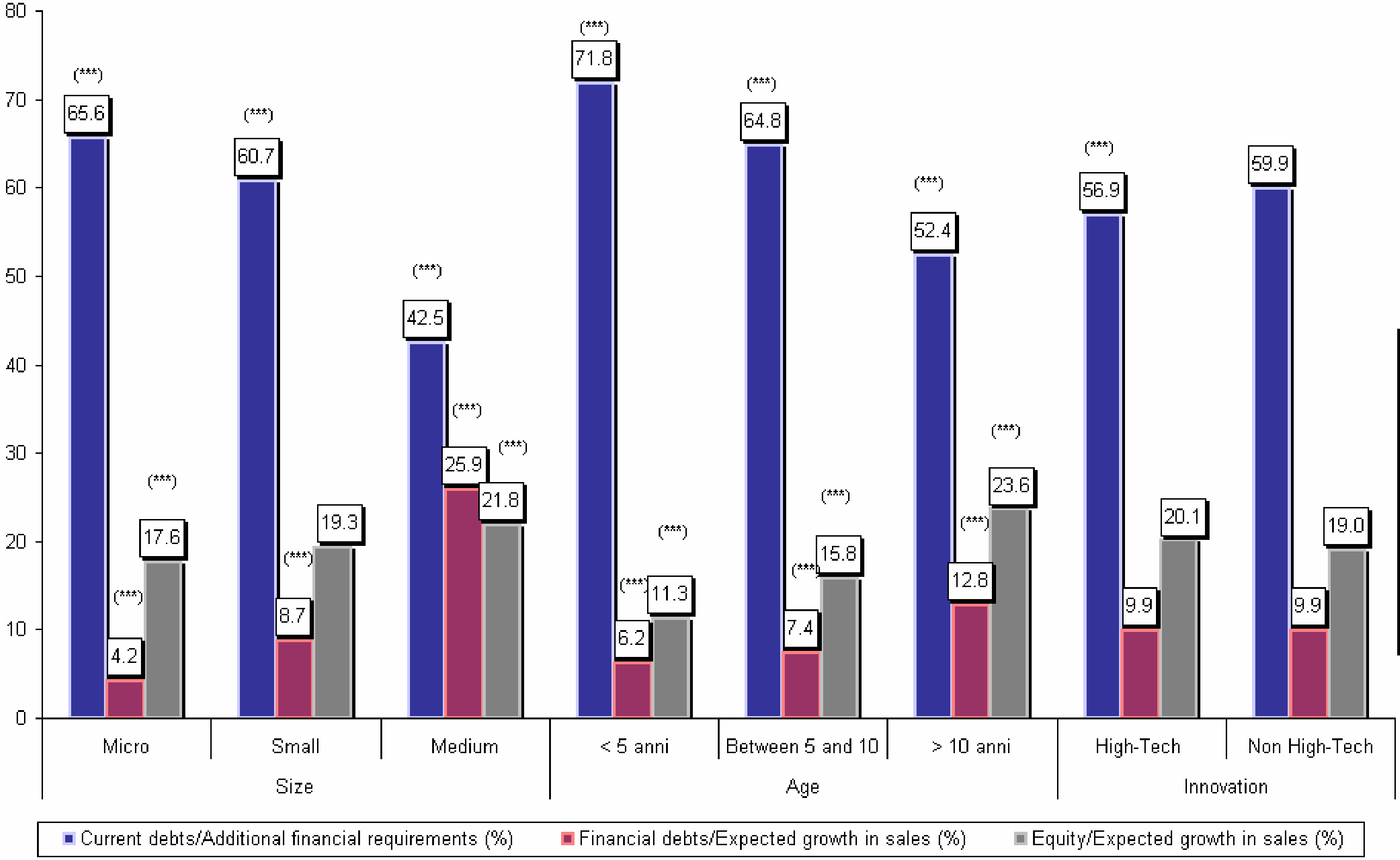
Source: our estimation on Database AIDA data

- The self-financing cannot represent one of the principal means of coverage of the additional financial requirements generated by the growth in sales
- The firms belonging to the sample cannot be qualified, on average, as capital intensive companies
- On average, current debt provides financial coverage for 44% of sales
- On average, the degree of financial leverage is fairly low; coherence with the assumptions of the model

The equity requirement of SMEs in the Emilia Romagna region: descriptive statistics

	Self-financing/Additional financial requirements (%)	Current debts/Additional financial requirements (%)	Financial debts/Additional financial requirements (%)	Equity/Additional financial requirements (%)	Equity/Expected growth in sales (%)	Equity Requirement (000 euro)
Average	7.1	59.5	10.7	22.8	19.1	147.3

Source: our estimation on information Database AIDA



	D/E
Size	
Micro	0.4
Small	0.7
Medium	1.7
Age	
< 5 anni	0.6
Between 5 and 10 y	0.7
> 10 anni	0.8
Innovation	
High-Tech	0.7
Non High-Tech	0.8

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- In the last years, several approaches have been developed in order to assess and measure the equity gap; however, there is still a great deal of uncertainty concerning the methods to be used to produce a quantitative estimate
- The thresholds identified in international studies starts from less € 100,000 to over 1 million with relevant national differences
- The application of the model to a sample of 4508 growing SMEs located in Emilia Romagna's region points out that, under the hypothesis of constant leverage, the additional financial requirements generated by the growth in sales is principally covered by the increase in current debts. New equity capital contributes for about 23%
- A direct and significant relationship can be found between equity requirement per unit of marginal sale and size and age of firms; no significant differences were found with regard to firm's degree of innovation
- Finally, the paper compute the equity required in monetary terms; it appears to be relatively low in all contexts and in the various samples studied. On average, in compliance with the constant leverage constraint, the equity requirements is equal to Euro 147.3 K
  - **overall the amount of equity required is in line with the thresholds identified by the main international studies which could indirectly confirm the problem of a gap in the availability of risk capital**

Thank you for your attention

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