Chapter 9
Financial Models of Small Innovative Firms: An Empirical Investigation

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Abstract This paper aims at analysing financial models of innovative firms in Italy by means of a sample of firms located in the Marche region. While it is well known that innovative firms have different financial needs and more severe problems in accessing funds than traditional firms, our analysis shows that only a small number of the interviewed firms have faced problems in raising external funds for innovation, even during the current economic and financial crisis. Policy recommendations point towards the improvement of firms' levels of financial culture and the dilution of firms' ownership by means of external private equity.

9.1 Introduction

The current economic crisis is the worst since the post-war period. Between the second quarter of 2008 and the second quarter of 2009 the Italian GDP fell to its 2001 level, while industrial production fell to its mid-Eighties levels. Therefore, it is strategic to understand which firms (having which characteristics) have been suffering from the crisis, and those that are withstanding the economic recession.

As different sources have pointed out, (Bank of Italy, 2009; Bugamelli et al., 2009), the effects of the international crisis on the Italian economy were firstly observed in the fall of the demand for goods, mainly in the manufacturing sectors open to international competition, and in the instrumental goods industry. Then the crisis spread widely to other sectors both because of subcontracting linkages and the credit restrictions imposed by banks.

Firms that started up and have carried out deep reorganization since the beginning of the last decade have better stemmed the negative effects of the crisis. These firms

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G. Calcagnini, I. Favaretto (eds.), *The Economics of Small Businesses*,
Contributions to Economics, DOI 10.1007/978-3-7908-2623-4_9,

have been able to adopt active responses to the crisis such as market and product diversification. Innovation has once more been a key element of economic strength and resulted in the creation of new products that stimulated final demand and higher international competitiveness.

Therefore, even if innovative firms are a small share of all Italian firms, they may substantially contribute to the economic recovery.[1]

The increase in the number of innovative firms should be realized by means of economic policies that promote and finance R&D investments, improve high-quality research with universities, the provision of incentives to make the linkages between high level education and the economy stronger. Last but not least, economic policies should promote the development of venture capital and foreign direct investments in Italy.

Credit access is one of the key elements in the life of firms. In the event of a credit crunch, firms' ability to undertake new investment projects is seriously compromised. Financial constraints and credit rationing undermine firms' profit and growth. On one hand, countries' financial development affects the GDP level and growth rate (Levine, 1997; Papaioannou, 2007). On the other, the quality of the legal system improves the efficiency of the financial system (Beck and Levine, 2008).

A recent survey of the European Central Bank (ECB, 2009) provides evidence on the access to finance of small- and medium-sized enterprises (SMEs) in the euro area in the first half of 2009. Results show that almost half of the euro area SME respondents reported a decrease in turnover and profits during the previous 6 months. Moreover, in the same period, about 40% of them experienced an increase in production costs. This assessment appears more negative than that for large firms and suggests that SMEs have been relatively more affected by the economic downturn.

The survey highlights some of the main differences in the financing model of SME versus large-sized firms. On one hand, SMEs largely rely on banks: 32% reported having used a bank loan in the previous 6 months and 30% a bank overdraft or credit line. Leasing, hire purchase and factoring (used by 27%), and trade credit (15%) also played a relatively important role. On the other hand, market-based financing played a minor role: 0.9% had issued debt securities in the previous 6 months and 1.3% had issued equity or relied on external equity investors. However, it is likely that the financial crisis and the difficult market conditions were also to blame for such low demand for market-based financing.

Financial systems play a crucial role for all firms, but they may substantially foster the start-up and development of new innovative firms.

This chapter aims at analyzing the financial models of innovative firms in Italy by means of a sample of firms located in the Marche region. Compared to traditional firms, innovative firms may have different financial needs and, due to their characteristics, usually face more severe problems in searching for funds.

[1] Italian patents are only one-fortieth of the European average (Persico, 2009). Indeed, the technology content of Italian productions is generally low and, therefore, they suffer relatively more from competition of emerging economies.

First, innovative firms may be subject to negative cash flows or high return volatility. Therefore, they are riskier than traditional firms.

Second, innovative firms typically base their activity on intellectual capital and intangible assets that amplify the problem of financial opaqueness i.e. investors find it more difficult to evaluate the profitability of their investment projects and, therefore, firms' current and future market value.

The consequence of these characteristics is twofold. On one hand, innovative firms usually incur in higher financing costs than traditional firms. On the other hand, innovative firms have a higher probability of being credit rationed than traditional firms. Therefore, because of moral hazard problems and riskier activity, innovative firms should mainly base their financing on internal funds and equity.

At the beginning of 2009, at the peak of the economic and financial crisis, we carried out the empirical analysis on a sample of innovative firms located in the Marche region to provide more evidence on financing innovative firm models. The Marche region represents an interesting case study because it is characterized by a relatively large number of innovative, small-sized firms and long-lasting relationships between banks and firms. The latter is one of the critical success factors of its economy. Indeed, it has been shown that in Italy bank development positively affects firms' innovative processes, especially for small-sized firms and those that operate in high-tech sectors (Benfratello et al., 2006).

Our empirical analysis shows that none of the firms in our sample faced problems in raising external funds for innovation activity. Only 9% of firms declared that banks refused to fund their growth process, and 16% of firms obtained only a share of the requested amount. However, the analysis also shows that the regional bank industry is more willing to finance traditional than innovative firms. Indeed, only 50% of innovative firms obtained the whole amount of the required funds compared to 63% of non-innovative firms.

The importance of innovative firms for economic growth suggests that all economic and institutional actors should cooperate to increase the number of innovative firms. Firms can do so by pursuing dimensional consolidation and the adoption of organizational models that favour financial strategies oriented to supporting innovation. Banks can do so through new financial instruments suitable to promote innovative processes and sustain firm growth. Trade associations and local governments can do so by identifying firms' need for a new breed of employee, and supporting the educational system in its design of new curricula. Universities can do so by strengthening their research activities, while politicians should design economic policies oriented to promote long-run investments in industries such as energy, transportation, communications, the health sector and collective security.

The chapter is organized as follows. Section 9.2 reviews the theoretical and empirical literature on innovative firms' financial problems with a special focus on small-sized and innovative firms. Section 9.3 describes the sample selection and the questionnaire used for the survey, while Sect. 9.4 analyzes our main empirical findings. Section 9.5 concludes.

9.2 Theoretical and Empirical Models of Small Firm Financing: A Review

Financial models of innovative firms are an issue of great interest in the economic literature and have generated a huge amount of research work. The starting point is that, compared to traditional businesses, innovative firms typically face financial constraints or credit rationing because their investments are riskier, and due to the presence of more severe problems of asymmetric information and informational opaqueness. These problems are generally bigger in the case of small-sized innovative firms.

Theoretically, the analysis of firms' financial structure starts with the pioneering work of Modigliani e Miller (1958). In a situation of perfect capital markets and in the absence of transaction costs, the market value of firms is independent of their debt and equity mix. However, capital markets are generally characterized by both high transaction costs and asymmetric information. In these situations, firms are better informed than potential investors, and there is a pecking order of financial sources: firms find it most convenient to finance their investment projects with internal sources, followed by debt, and finally with equity finance (Myers, 1984; Myers and Majluf, 1984). Moreover, asymmetric information may discourage potential investors because of agency costs that give rise to monitoring costs that the external investors should bear to control the financed firm (Barnea et al., 1981; Jensen and Meckling, 1976). Indeed, moral hazard problems may arise in the case of asymmetric information because the entrepreneur (or the firm manager) could make choices that do not necessarily maximize profits (and the utility) of external investors. Furthermore, even if we assume the absence of moral hazard, in case of asymmetric information the firm could decide to issue new equity only if overvalued (Leland and Pyle, 1977).

Finally, to maintain firm control, the owner may prefer internal funds or debt to external equity when financing investment projects (Aghion and Bolton, 1992; Aghion et al., 2004). In this case, the lower the amount of tangible assets the firm can use as collateral is, the higher is the share of firm control that external investors require to finance investment projects. As a consequence, the entrepreneur reluctant to lose firm control typically decides to finance the firm, first by using internal funds, second with debt and, eventually, by issuing equity.

Asymmetric information problems may also generate adverse selection problems when the firm decides to finance its investment projects by debt finance. Indeed, in the case of firms of differing quality, banks may find distinguishing between high-risk and low-risk firms difficult or too expensive. Therefore, banks may decide to increase the cost of debt to all potential borrowers to a level that makes credit rationing profitable (Stiglitz and Weiss, 1981).

From the perspective of investment theory, R&D expenses have a number of characteristics that make them different from fixed investment (Hall, 2009): (i) they need to be smoothed in order to retain valuable employees and their knowledge; (ii) they are highly uncertain and information about success or failure is revealed over time; and (iii) they create an idiosyncratic intangible capital with a limited resale market.

Therefore, in the case of innovative firms, financial problems may become particularly tough due to the following reasons.

First of all, the success of innovative firms depends on the evaluation of their growth potential that is derived from scientific knowledge and intellectual property; second, innovative firms, especially in the first stages of their life cycle, usually have limited physical capital to use as collateral to mitigate moral hazard or adverse selection problems; finally, innovative firms produce goods subject to quick depreciation and, therefore, they are riskier. These problems are amplified in the case of small innovative firms.

Berger and Udell (1998) analyze a life-cycle theory of firm financial models. The theory assumes that the optimal strategy for firms is to use different sources of funding at different stages of their dimensional/age/informational growth.

The authors assume that small firms suffer informational opaqueness problems more heavily and, therefore, mainly finance themselves through internal funds, trade credit or informal investors. The latter are known as business angels. Informational opaqueness problems decrease along firms' life cycle so that they may start using external equity provided by institutional investors, such as the venture capitalists or debt finance provided by banks and other financial institutions. Eventually, if firms keep being profitable and continue to grow, they may gain access to public equity and debt markets.

Therefore, the financing of innovative firms may be particularly difficult and onerous, and consequently two opposite effects have to be kept in mind.

On one hand, the innovative nature of the their activity implies a higher opaqueness and more severe asymmetric information problems. Then external funds become particularly costly. On the other, innovative firms, as opposed to traditional ones, tend to experience rapid growth rates and the need to attract increasing amounts of external funds, especially risk capital.

The theoretical literature analyzed emphasizes that debt financing is less suitable than other sources to finance innovative, small-sized firms, especially during their start up phase. This is due to the presence of tougher moral hazard problems, riskier activity, lower collateral, and therefore to potential investors' difficulties in valuing their investment projects.

Brierley (2001), O.E.C.D. (2006), and (Coleman and Robb 2010) review the main empirical research findings on the financing of innovative firms and underline how the results are not unique. On one hand, there are outcomes that also confirm the pecking order theory for innovative firms; on the other, there are studies that support the life-cycle theory of financial sources. Eventually, other studies point out that equity finance is more important for innovative firms than for traditional firms (Coleman and Robb 2010).

Chavis et al. (2010) analyze financial models of new firms in more than 100 countries. The authors find that younger firms systematically finance their projects by using internal sources of funds and by referring to informal investors, such as business angels. They also find that firms that operate in countries where the quality of their legal system is higher, and asymmetric information problems are less severe, are able to access bank funding more easily.

Finally, other works analyze the financial models of Italian innovative firms.

Guidici and Paleari (2000) analyze a sample of 46 small- and medium-sized innovative Italian firms. The authors find support for the pecking order theory. Indeed, a firm owner's wealth is the main source of funds, followed by short-term debt. The entrepreneur's fear of losing control of the firm is the main obstacle to issuing new equity. Indeed, outside equity finance is used only if the new investors also provide new financial skills.

Pozzolo (2003) does not find substantial differences between the financial structure of traditional and innovative Italian firms, i.e., firms linked to the new economy industry or characterized by a higher share of technological immobilizations.

Nucci et al. (2004) find an inverse relationship between firms' leverage and their share of intangible assets; i.e., most innovative firms are those with lower leverage.

Colombo and Grilli (2007) study the determinants of financing sources for a sample of 386 small-sized innovative Italian firms and find confirmation of the pecking order hypothesis. Indeed, only a small share of firms finances investment projects by using external equity or debt. The main financing source is the entrepreneur's personal wealth, followed by bank loans and, finally, private equity. Moreover, the authors find that small innovative firms may experience a higher likelihood of credit rationing if they heavily rely on debt.

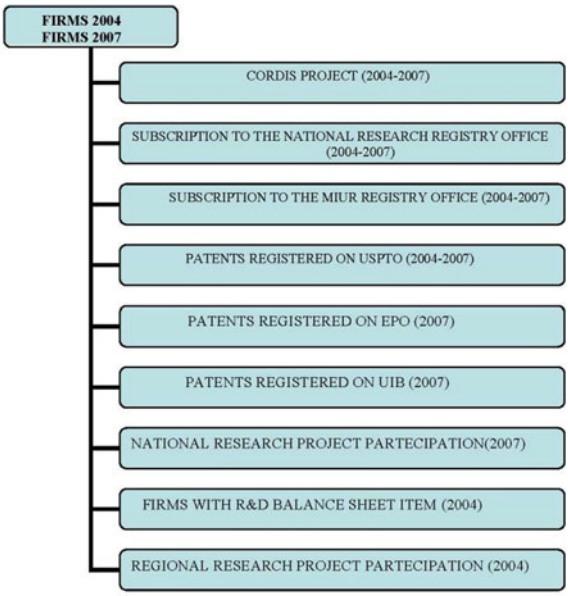
Magri (2007) finds that small-sized innovative firms: (i) show a lower degree of leverage than small-sized traditional firms; (ii) rely more heavily on equity; (iii) and are less sensitive to cash-flow fluctuations than small-sized traditional firms. Finally, small-sized innovative firms face more difficulties in using external equity than innovative larger firms.

Therefore, empirical findings concerning the financial models of Italian innovative firms are not unique. Indeed, while some analyses show the presence of a hierarchy of financial sources in which debt capital is preferred to equity finance, other analyses find that innovative firms show lower leverage levels and a higher recourse to external equity finance than traditional firms.

9.3 The Empirical Investigation: Sample Selection and Questionnaire

The non-unique findings on the financial structure of Italian innovative firms, as it appears from the review of the literature in the previous Section, stimulated us to carry out a new survey. We focused on a sample of small- and medium-sized (SME) located in the Marche region, traditionally known as the "SME region". We started from the outcomes of a previous research project on innovation (Favaretto and Zanfei, 2007) that allowed us to identify 346 innovative firms located in the Marche region. These firms emerged to carry out, in 2007, at least one of the innovative activities listed in Table 9.1 and constituted a large share of all innovative firms located in the Marche region. Indeed, they represented around 58% of all residents registered in the national register of research projects (universities and state-owned laboratories of research were the remaining 42%) and 50% of all patents registered

Table 9.1 Variables used to identify innovative firms



Source: Favaretto and Zanfei (2007), p. 351

with the United States Patent and Trademark Office (USPTO) between 1991 and 2007 by residents in the Marche region.

According to Favaretto and Zanfei (2007) firms are concentrated in a few and often non-front-rank innovative activities. Most of the firms (192 over 346, that is 55% of all firms) are included in the sample because they are registered with the national register of research projects.

Together with the dataset containing innovative firms, we built a control sample with firms owned by young entrepreneurs and not necessarily located in the Marche region (for simplicity's sake we will also call them traditional firms). Overall, our dataset included almost 500 firms to which we emailed a link to a webpage containing the electronic questionnaire. We opted for this modern survey procedure hoping to reduce the bother to firms and thus increase the number of answers. Only 66 innovative firms and 44 non-innovative firms filled in the questionnaire (i.e., around 20% of the original dataset).

Instead of developing a new questionnaire from scratch, we received permission to use a questionnaire previously used by the O.E.C.D. and the Kauffman Foundation for a pilot research project on innovative and high-growth SMEs (O.E.C.D., 2008).

The questionnaire is made up of five sections. The first section collects general information on the firm such as the type, the year of foundation, etc. The second and the third sections focus on the growth strategy implemented by the firm and

its financing, respectively. Finally, sections four and five collect information on the relationships existing between the firm and its financers and especially with its equity finance providers.

9.4 Empirical Findings

9.4.1 Firm Characteristics

The innovative firms of the Marche region are mainly limited liability companies (89.4%), followed at a distance by partnerships (6.1%) and by sole proprietorships (3.0%), (Table 9.2). Therefore, innovative firms possess a more structured organization compared to our control sample; the latter is made up of non-innovative firms, and the distribution of firms is by type at the national level. The latter may be reconnected to the more specific and riskier activity carried out by firms, firm size, or the number of years from the firm's foundation. Indeed, Berger and Udell (1998) showed that a sole proprietor often owns small-sized and recently-established firms.

Information on firm size supports the hypothesis that innovative businesses are generally larger than traditional ones. Innovative firms with fewer than 10 employees make up only 23% of the total, compared to 72.5% and almost 95.0% in the cases of the control sample and Italy, respectively (Table 9.3). Innovative firms in our sample are mainly concentrated in the two size classes 10–49 and 50–249 employees. The two shares are similar and add up to over 70% of all firms. This value compares with 27.5% in the case of the control sample, and 5.1% in that of the whole Italian economy.

Table 9.2 Distribution of firms by type (%)

Type of firm	Innovative firms	Control sample	Italy 2008
Sole proprietorship	3.0	25.0	56.2
Partnership	6.1	36.4	19.7
Limited Liability	89.4	36.4	20.8
Others	1.5	2.3	3.3
Total	100.0	100.0	100.0

Table 9.3 Distribution of firms by size (%)

Size	Innovative firms	Control sample	Italy 2007
1–9	23.0	72.5	94.8
10–49	37.7	22.5	4.6
50–249	34.4	5.0	0.5
> 249	4.9	0.0	0.1
Total	100.0	100.0	100.0

As already pointed out, size plays an important role in firms' financial structure (Berger and Udell, 1998). Small-sized firms mainly have access to the debt and private equity markets, while larger firms have more opportunities to be listed on the stock exchange market. Indeed, asymmetric information and informational opaqueness are generally more severe for small-sized firms than larger ones. Further, issuing costs are characterized by economies of scale that once more favor larger firms.

The number of years passed from firm foundation is another determinant of firms' financial structure. According to Berger and Udell (1998) younger firms may have more difficulties accessing capital markets than older firms. The latter have had time to build up a reputation compared to younger firms that, therefore, are considered riskier.

Innovative firms, besides being on average larger than those included in the control sample, are also older.[2] The number of innovative firms established before 1970 is almost three times larger than that of the control sample. Overall, almost 86% of innovative firms were established before year 2000 versus 39.5% in the case of the control sample (Fig. 9.1).

One question in the survey aimed at discovering if and how important participations in other firms are. Indeed, the existence of even minority participations among firms may generate positive externalities that financial markets do not always fairly price.

Innovative firms located in the Marche region only hold control shares in other companies in 14% of the cases, while almost 48% own minority participations. Finally, only 6% of innovative firms show some state-owned participations. Brierley (2001) shows that state-owned participations may play an important role in supporting innovative firm start-ups and growth.

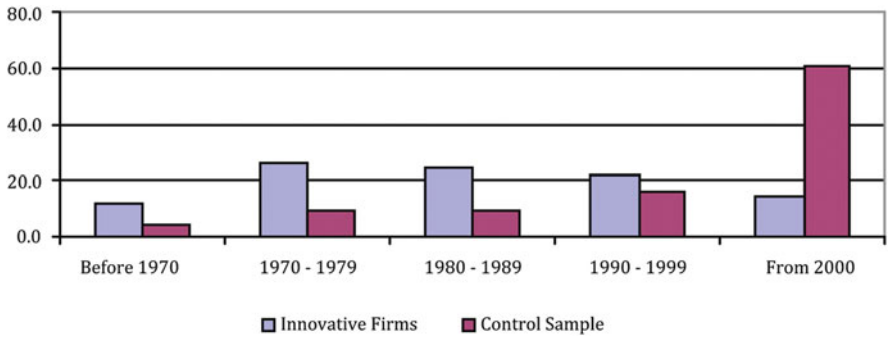


Fig. 9.1 Distribution of firms by year of foundation (%)

[2]This is not surprising since young entrepreneurs own most of the firms included in the control sample.

Table 9.4 Distribution of innovative firms by industry (%)

Industry	%
Utilities	3.1
Construction	6.2
Manufacturing	58.5
Wholesale trade	6.2
Technical, scientific, and professional services	12.3
Educational services	1.5
Other industries (public administration excluded)	12.3
Total	100.0

As noted above, most of the firms located in the Marche region are not concentrated in front-rank innovative activities. Indeed, a large share of firms is concentrated in Manufacturing (58.5%), while only 12.3% belongs to the Technical, Scientific, and Professional Services industry (Table 9.4).

The distribution of innovations by type sheds light on the differences between innovative and traditional firms. Overall, 30.4% of innovations are concentrated

Table 9.5 Distribution of innovations by type (%)

Activity	Innovative Firms	Control Sample
Intramural (in-house) R&D: creative work undertaken on a systematic basis to increase the stock of knowledge	23.7	12.4
Extramural R&D: same activities as in-house R&D but purchased from research organizations or other firms	6.7	3.1
Acquisition of other external knowledge: acquisition of patent rights, non patented inventions, trademarks, know-how and other types of knowledge, other than R&D, from other enterprises or institutions	3.6	5.2
Acquisitions of advanced machinery, equipment, computer hardware and software, land and buildings for the purpose of product or process innovation	16.5	16.5
Internal design, planning or testing activities, that are not already included in R&D, for new or significantly improved products, production processes and delivery methods	13.9	8.2
Market preparations for product innovations: activities aimed at the market introduction of new or significantly improved goods or services	12.4	13.4
Training: training (including external training) linked to the development or implementation of product or process innovations	12.4	18.6
Preparations for marketing innovations: activities related to the development and implementation of new marketing methods specifically related to marketing innovations	2.1	8.2
Preparations for organizational innovations: planning and implementation of new organization methods, or acquisition of external knowledge and other capital goods related to organizational innovations	8.8	14.4
Total	100.0	100.0

in intramural (23.7%) and extramural (6.7%) R&D investments. In contrast, only 15.5% of innovations of the control sample are of the R&D type.

Both firm types (innovative and traditional) consider it important (16.5%) to acquire advanced-technology machinery and equipment, and hardware and software that support product and process innovations, while the percentage of innovations such as internal design for new or significantly improved production processes and methods is significantly larger among innovative firms than among traditional ones (13.9% and 8.2%, respectively) (Table 9.5).

As expected, traditional firms invest relatively more resources (18.6%) in training. In other words, on average, innovative firms have employees with more developed professional skills and thus find it more convenient to invest in R&D and fixed capital. The opposite is true for traditional firms that are likely less capital intensive than innovative firms, but need to improve their employees' professional skills by means of training.

Finally, innovative firms are more oriented towards international markets than traditional firms, even though only 18% of the former shows a foreign-sales-to-total-sales ratio larger than 50%. Further, 27% of innovative firms do not (directly) export at all (Fig. 9.2), while in the case of traditional firms this value is over 73%.

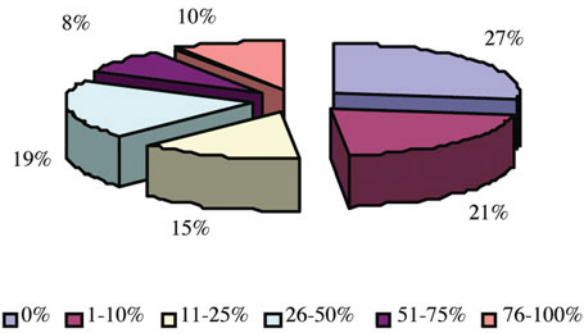


Fig. 9.2 Export share of total sales of innovative firms

9.4.2 Firm Growth Strategies

This section describes our survey outcomes concerning innovative firms' growth strategies.

In 2008 almost 79% of innovative firms, and 78% of traditional firms, made investment decisions oriented towards supporting their economic growth.[3] The analysis of the types of investment sheds light on the differences in growth strategies between innovative and traditional firms.

[3] All firms with some state-owned participations made growth-oriented investments.

Table 9.6 Distribution of investment by type (%)

Investment type	Innovative firms	Control sample
ICT	2.0	0.6
Creation of new products	7.8	2.9
Improvement of existing products	5.2	4.5
Improvement of existing processes	2.1	2.4
Marketing	2.7	4.0
Land, buildings and other facilities	28.2	43.1
Machinery and equipment	33.9	34.4
Patents, licences and other intangible assets	2.0	0.9
Human resources	13.4	5.4
Other	2.7	1.8
Total	100.0	100.0

As expected, investments are concentrated in the acquisition of machinery and equipment, and in land, buildings and other facilities. However, while the former have the same importance for innovative and traditional firms, the latter are significantly larger in the case of traditional firms (Table 9.6). Investment in ICT, human resources, and the creation of new products are, instead, larger in the case of innovative firms. It is surprising that investments in patents, licences and other intangible assets are only 2% of total investment even for innovative firms (0.9% for traditional firms).

9.4.3 The Financing of New Growth Strategies

Given the observed differences in the type of business organization, size and type of investment between innovative and traditional firms, it is now interesting to analyze their financial structures. As discussed in Sect. 9.2, the group of traditional firms should show a financial structure in accordance with the pecking order theory, while innovative firms should rely relatively more on equity.

Information from our survey clearly shows that the role of equity finance is significantly larger in the case of innovative firms than in that of traditional firms. The former fund themselves mainly by means of debt (57.5%), but equity still plays an important role (42.5%). The latter make use of debt for a share slightly larger than 83% and equity for the remaining 17% (Fig. 9.3).[4]

The fact that even innovative firms make large use of financial debt is not necessarily in contrast with the theory that stresses the role of equity for these types of firms. Indeed, we already noted that innovative firms included in our sample belong to traditional industries and are still SMEs. Further, not being particularly young,

[4]There are not significant differences if the analysis is broken down according to firm size or age.

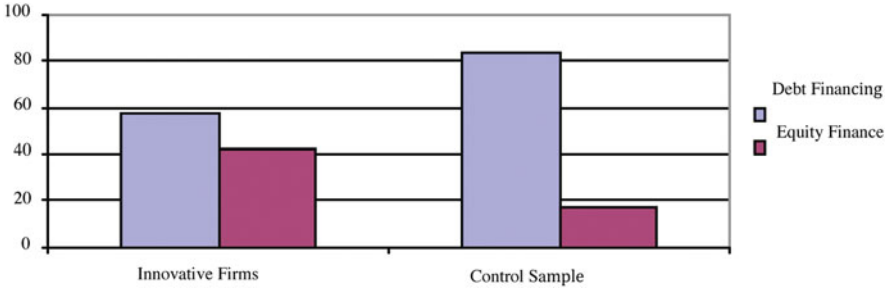


Fig. 9.3 Investment financing (%)

they had time to build a reputation by means of which they are able to access the bond and bank loan markets (Berger and Udell, 1995).

As for the different types of debt finance, innovative firms prefer leasing (35.8%), followed by short- and medium-term bank loans (26.5%) and lines of credit (24%). Differently, traditional firms – finding access to the equity market more difficult – mainly rely on long-term bank loans (55.3%), and then leasing (31.6%) (Table 9.7).

Innovative and traditional firms are also different with respect to their equity composition. In the former case, almost 80% of equity is represented by the risk capital staked by firm owners, and 20% by capital provided by private investors (venture capitalists). In the latter case, risk capital is almost completely represented by funds staked by the owners, and for a very small share (0.4%) by capital provided by their relatives and friends (Table 9.8).

For both type of firms, and more surprisingly in the case of innovative firms, the provision of capital by business angels is nil. In other countries business angels are informal investors who represent a proven solution for early stage ventures and a source of funds available to develop innovative and emerging technologies. Further,

Table 9.7 Distribution of financial debt (%)

Debt finance	Innovative firms	Control sample
Long term bank loans	7.7	55.3
Short and medium term bank loans	26.5	11.3
State-guaranteed bank loans	0.0	0.0
Loans from family members and friends	0.0	1.8
Loans from other third parties (shareholders, companies, etc.)	1.7	0.0
Lines of credit	24.0	0.0
Credit cards	0.0	0.0
Leasing	35.8	31.6
Other types of long term debt financing	1.1	0.0
Other types of short and medium term debt financing	3.1	0.0
Total	100.0	100.0

Table 9.8 Distribution of the equity finance (%)

Equity finance	Innovative firms	Control sample
Own Capital	79.5	99.6
Equity from employees	0.0	0.0
Equity from family members or friends	0.0	0.4
Equity from Business Angels	0.0	0.0
Equity from Venture Capital firms	20.4	0.0
Equity from other private equity sources	0.1	0.0
Equity from government capital transfers through business supporting policies and incentives	0.0	0.0
Total	100.0	100.0

business angels invest locally, and their proximity with innovative firms helps to reduce asymmetric information problems. Differently form venture capitalists, business angels are less interested in the acquisition of firm control, but they generally provide fewer financial skills and resources.

A likely explanation for the lack of business angels in the Marche region is that most firms in our sample are not in their early stage of development. Indeed, as already shown, our innovative firms are long established ones for whom it is more convenient to turn to formal investors such as venture capitalists.

Innovative firms are often growth oriented and characterized by high investment dynamics and are, therefore, riskier. Their riskier nature may be reflected in stricter liquidity constraints and, then, in more obstacles to investment. However, only 24% of innovative firms belonging to our sample were prevented from making the desired growth investment due their inability to borrow, as opposed to 44% in the case of traditional firms (Fig. 9.4). This different behavior between the two groups of firms may be explained by the composition of their investment financing: innovative firms are, on average, less dependent on debt than traditional firms (Fig. 9.3).

There are several reasons why firms did not invest in innovation and, of course, they are different for the two groups of firms. Recalling that the survey was carried out in January 2009, when the economic and financial crisis started to bite, innovative firms reported that the two most important reasons were their (a) insufficient

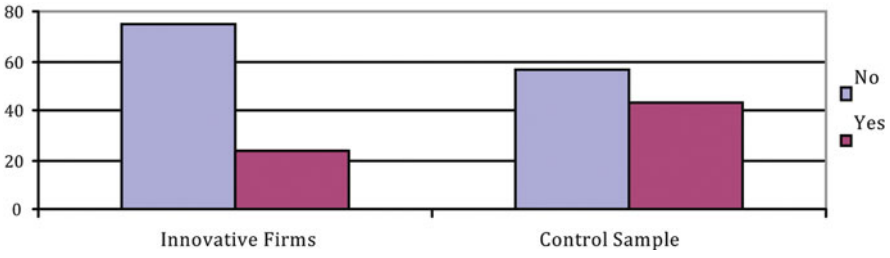


Fig. 9.4 Firm growth investment and financial constraints (%)

Table 9.9 Reasons why firms did not invested in innovation (%)

Motivation	Innovative firms	Control sample
The firm has insufficient revenues or assets to support growth-oriented policies	11.8	12.5
The firm does not think it can raise the required funds through external finance providers	0.0	0.0
The firm does not feel there is the potential to increase demand enough to support a growth strategy	5.9	37.5
At the present time, the firm has no interest in expanding production, changing processes or exploiting new markets	5.9	0.0
The firm prefers to retain revenues and assets for future operational expenditures	11.8	0.0
The firm is consolidating activities and a growth-oriented strategy is premature	5.9	12.5
None of the above	58.8	37.5
Total	100.0	100.0

revenues or assets to support growth-oriented policies (11.8%) and (b) preference for retaining revenues and assets for future operational expenditures (11.8%). Firms belonging to the control sample – that are more dependent on the business cycle than innovative firms – pointed out their feeling that demand would not have been enough to support a growth strategy as the most important reason to not invest in innovation (37.5%) (Table 9.9). Therefore, even though firms belonging to the control sample are not classified as innovative, they understand the importance of innovations, but only ones that are limited to periods with expectations of expanding markets.[5] The lack of revenues or assets to support growth-oriented policies (12.5%), and the beginning of consolidating activities (12.5%) are the next main reasons mentioned by traditional firms for not investing in innovations (Table 9.9).

9.4.4 Firm Relationships with Their Debt Finance Providers

Relationships with debt finance providers are another issue that needs to be analyzed to better understand innovative firms' funding decisions.

Notwithstanding equity appears to be the preferred financial source to support innovation, debt (especially bank) finance is always one of the main sources of funds for all types of firms. Therefore, the question requires some closer scrutiny. Our information shows that only 50% of innovative firms obtained all funds requested of the bank, as opposed to 62% in the case of firms belonging to the control sample.

[5]Unfortunately, almost 60% of innovative firms and 38% of firms belonging to the control sample answered that none of the motives shown in the questionnaire was responsible for their decision to not invest in innovations. Therefore, this interpretation should be taken with some caution.

Table 9.10 Firm-bank relationship and investment (%)

Type of relationship	Innovative firms	Control sample
Banks provided all the funds that were requested	50.0	62.5
Banks provided only partial funding	15.9	15.6
Banks refused to provide the requested funds	9.1	6.3
The firm did not apply to banks for financing	25.0	15.6
Total	100.0	100.0

Moreover, banks refused to provide finance to 9.1% of innovative firms, but only to 6.3% of other firms. Finally, a larger share of innovative firms (25%) decided not to apply to banks for loans compared to traditional firms (15.6%) (Table 9.10).

However, information from our survey does not help us in determining why the relationship between banks and innovative firms should be different from that with traditional firms. Indeed, in a larger number of cases (12.5% versus 0%) banks seem to consider traditional firms' investment riskier than those of innovative firms. Further, traditional firms are denied credit because of insufficient collateral (25% versus 0%) and the requested loan has been considered too large (25% versus 7.1%). Finally, firms find the access to bank loans difficult because of their low credit rating score, more frequently in the case of traditional firms (12.5%) than in that of innovative firms (10.7%) (Table 9.11).

Table 9.11 Main reasons why banks provided no credit e or only part of the requested amount (%)

Type of reason	Innovative firms	Control sample
Project considered to be too risky	0.0	12.5
Firm considered to be over-exposed to lenders	3.6	0.0
Firm had weak business plan	0.0	0.0
Firm had insufficient collateral	0.0	25.0
Firm had low credit rating score (Basel II)	10.7	12.5
Firm had insufficient growth potential	0.0	0.0
Too large a loan was requested	7.1	25.0
Banks gave no explanations for decision	10.7	0.0
Other reasons	67.9	25.0
Total	100.0	100.0

9.4.5 The Relationship of Firms with Their Equity Finance Providers

Firms' equity finance providers, as discussed in Sect. 9.4.3, may be formal investors, such as venture capitalists, or informal investors, such as business angels. Formal and informal investors are not necessarily alternatives. Indeed, they are often

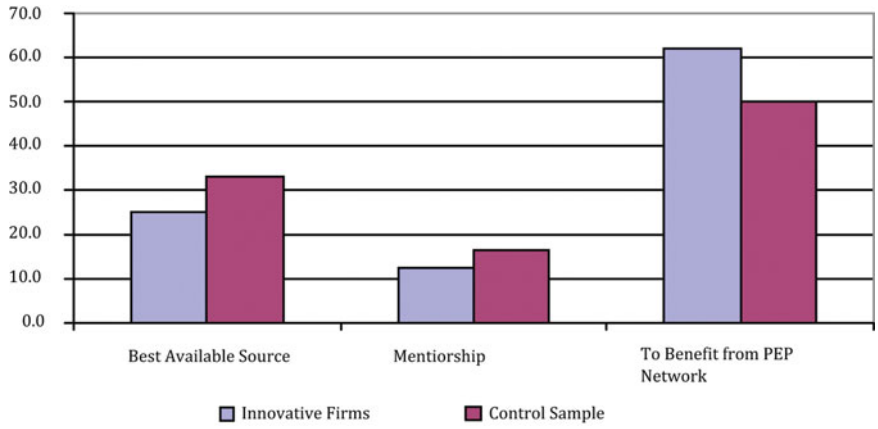


Fig. 9.5 Reasons why firms applied for finance with Private Equity Providers (%)

complementary: business angels seldom come before venture capitalists, and the arrival of the latter is the prelude to stock exchange listing.

Innovative firms apply for finance with private equity providers (PEP) mainly because, through their network, they also provide connections with other finance providers (62.5%). Only 25% of innovative firms find private equity providers the best available source of funds. They also represent for 12.5% of firms a source of professional financial skills (Fig. 9.5).

Differences between innovative and traditional firms can also be traced back from the analysis of why firms refrained from involving private equity providers in their financing.

Two issues are worth mentioning given that they are the most important ones and show the largest differences between the two groups of firms. The first issue concerns the knowledge of private equity providers: almost one out of two traditional firms do not know of their existence. Private equity providers, as expected, are instead better known among innovative firms: only one out of five declared to have refrained from contacting PEPs because they had no information on them (Table 9.12).

In many cases, (45.5% in the case of innovative firms and 25% in that of the firms belonging to the control sample) private equity providers provided no explanations for their decision to not fund the firm. When these explanations are available, they point to the existence of a weak business plan, insufficient growth potential, and the size of the requested loan for innovative firms, and to personal incompatibilities of firm founders and private equity providers and, again, the size of the requested loan for traditional firms (Table 9.13).

Finally, we tried to understand why firms would decide to turn to informal investors to fund themselves. However, we should recall that – at the time of the survey – only 0.4% of traditional firms' equity was in the hands of their family and friends, and none was in the case of innovative firms.

Table 9.12 Main reasons why firms refrained from involving private equity providers (%)

Motivations	Innovative Firms	Control sample
Firm has no knowledge of private equity providers	19.4	44.0
Concern that founders would loose control by sharing firm ownership	6.5	8.0
Concern that private equity providers' "exit" strategy would affect firm's stability	9.7	8.0
Firm's size and sector of activity	6.5	8.0
No interest in private equity providers as a financing source	25.8	16.0
Others	32.3	16.0
Total	100.0	100.0

Table 9.13 Main reasons why PEPs provided none or only part of the requested amount (%)

Motivation	Innovative firms	Control sample
Project considered to be too risky	0.0	0.0
Firm had weak business plan	9.1	0.0
Firm had insufficient collateral	0.0	0.0
Firm had insufficient growth potential	9.1	0.0
Personal incompatibility of firm founders and private equity providers	0.0	50.0
Too large a loan was requested	9.1	25.0
Private equity providers gave no explanations for their decision	45.5	25.0
Other reasons	27.3	0.0
Total	100.0	100.0

Innovative firms only bring up two reasons: to allow increased involvement of family and friends in the firm management (20%) and to overcome procedural difficulties encountered with traditional fund providers (10%). Unfortunately, in 70% of the cases answers point to reasons not present in the questionnaire (Table 9.14).

Table 9.14 Main reasons why firms would seek informal and individual investors' involvement (%)

Motivation	Innovative firms	Control sample
Family and friends were the only available source in the current stage of development	0.0	11.1
To overcome procedural difficulties encountered with traditional fund providers	10.0	22.2
To reduce the firm's exposure towards external fund providers	0.0	66.7
To allow family and friends an active and operational role in the firm's management	20.0	0.0
Other reasons	70.0	0.0
Total	100.0	100.0

In the case of firms belonging to the control sample, the main reason for turning to informal investors is to reduce the firm's exposure towards external fund providers (66.7%), followed by the need to overcome procedural difficulties encountered with traditional fund providers (22.2%), and the fact that family and friends were the only available source in that specific stage of development (11.1%).

9.5 Conclusion

Our survey of innovative SMEs in the Marche region at the beginning of 2009 brings to the fore some interesting conclusions about the role of finance in the development of these ventures. Innovative firms are riskier than traditional firms, and they have less collateral to provide to financial markets since their capital stock is often made up of intangible capital, or the proportion between intangible and tangible favors the former. These two characteristics, when accompanied by small dimensions, make innovative firms' financial market access more difficult and onerous than that of traditional firms. In this work we analyzed how 66 innovative firms located in a specific region, well known for being a small business laboratory, funded themselves and compared the outcomes with those of a control sample of 44 small-sized traditional firms.

Several outcomes from our analysis are worth recalling.

First, debt also plays an important role as a finance source for innovative firms. It contributes to financing almost 60% of investment. However, this share is significantly lower than that (83%) observed in the case of non-innovative firms. Leasing, bank loans, and lines of credit are the main components of firms' financial debt. All three types of debt imply relationships with banks that, overall, continue to represent a main financial supporter of firms. Indeed, even in the middle of the current economic and financial crisis, banks refused to provide the requested funds to only 9% of innovative firms. Reasons behind bank loan refusal were the firm's low credit rating score and the size of the loan requested.

Second, innovative firms need to fund their investment by means of equity. On average, it represents 40% of all funds. However, most equity (80%) comes from owners and only one-fifth from external equity providers. This result is a further confirmation of the attitude of Italian entrepreneurs to not dilute their ownership of companies that, in most cases, are family owned. We also reported that external private equity providers are in most cases venture capital firms; that is, firms tend to mainly use formal channels of equity provision, while informal providers – such as business angels – are completely missing from the regional economic context. This is true even though entrepreneurs declared that business angels would be useful to overcome procedural difficulties encountered with traditional fund providers. Further, in most cases private equity providers become firms' co-owners because, through their network, they allow original owners to enter into contact with other finance providers, and because PEPs provide financial skills that are lacking within firms. Finally, one of the main reasons for which external equity providers refused to provide funds is that firms had weak business plans.

If innovation is still the key issue for the economic development of the future, and if finance is believed to play a central role in supporting innovation especially in those economies characterized by the presence of small-sized firms, then a few specific and effective policy recommendations can be drawn from the conducted survey. They mostly center on the low level of firms' financial development. Therefore, actions should be taken to (a) improve entrepreneurs' and firm managers' financial culture (business plans, rating, etc.); (b) favor the dilution of firms' ownership by means of external private equity; (c) increase the rate of firm transformation from partnerships into limited liability companies since the latter are, in modern economies, usually associated with both concerns raised under a) and b).

Acknowledgments We thank the Pesaro-Urbino Chamber of Commerce for funding the survey through the Laboratory of Regional Economics at the Department of Economics and Quantitative Methods, Università di Urbino "Carlo Bo".

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