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## FINANCIAL STRUCTURE AND PROFITABILITY OF INNOVATIVE SMES IN ITALY

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### Abstract

The size and degree of innovation of a company strongly affect its profitability and financial structure: literature has extensively investigated the causal links between innovation and profitability of firms; moreover, many authors have studied the peculiarities of the financial structure of innovative companies. In both topics, however, the conclusions are not unambiguous. The paper aims to make a contribution to reducing the literature gap providing further evidence on these issues by evaluating Italian small and medium-sized innovative enterprises. The case of Italy was considered as an example of the introduction into the legal system of a country of a specific entity for innovative companies. The study presents the main structural data referring to these firms, based on last updated statistics by the Italian Innovative Business Register. This verification was furthermore deepened using the tools of balance sheet and profit and loss account analysis of innovative SMEs, with available data for the period 2010-2017 on Orbis database by Bureau Van Dijk. The results confirm the reversal of the traditional hierarchy of funding sources for innovative firms, as firstly theorized by Berger and Udell; profitability is negative, according to literature underlining that innovation is positively associated with turnover and employment growth, but not necessarily with higher profitability. This also confirms that the benefits of innovation can be appreciated in a medium-long term period.

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### Key Words

Innovative firms; capital structure; firm performance.

## INTRODUCTION

The first results of the introduction of the quality system in Japan are beginning to appear in the 1950s and the next twenty years the Japanese economy is experiencing flourishing, while the American economy, which was "the leading" in quality, increasingly understands that it loses a large market share because of its low quality of products and then Deming at the beginning of the 80s introduced quality to American organizations by educating management. Many US organizations introduced quality management in 1985, and in 1987 the US Senate introduced the Malcolm Baldrige national quality award. All these steps have led to today's degree of quality development that can and must be measured in companies through specific indicators if organizations want to be efficient and effective and thus achieve sustainable success. Innovative companies represent a crucial resource for the development of modern industrial economies: the liveliness and performance of these companies strongly affect the innovative capacity and competitiveness of the economic system (Nadotti, 2014). The birth and survival of these companies is influenced by many factors that can be summarized in the two main themes of the knowledge gap and the funding gap. In particular, some characteristics of innovative companies, such as information asymmetries, the absence of guarantees and the high costs related to the estimate of creditworthiness, can become strong impediments to the provision of capital in the form of debt, with impacts on the financial structure and profitability of these companies. These aspects are particularly stressed in countries whose economy is typically characterized by small and medium-sized enterprises: among these, for example, there is Italy, where SMEs represent about 99% of total enterprises (ISTAT, 2018).

The ability of companies to innovate can become a critical factor for success, able to facilitate the development of the business; however, difficulties for potential financiers in attributing a representative and reliable value to innovations represents an important brake on the possibility for firms of finding the financial resources to support investments in innovation. Even if it is possible to obtain financing, the cost could still be too burdensome compared to the profitability of the company. Aware of the contribution that small and medium-sized enterprises offer to the economy of the country, the Italian Government has therefore decided to introduce in its legal system a specific entity, that is the Innovative SME, to which recognize particular advantages to overcome the main difficulties just reported. This legislative intervention recognizes the peculiarities of innovative small and medium-sized enterprises and represents a virtuous example of measures that encourage innovation as a driver of economic growth. Among the facilitation for Innovative SMEs, particular attention must be paid to the available solutions for the collection of capital: as an exception to the ordinary corporate regulations, limited liabilities companies can create categories of shares with specific rights (for example, shares that do not attribute rights to vote or that attribute such rights in non-proportional terms to the participation); carry out operations on one's shares; issue participative financial instruments; offer capital shares to the public. These measures

involve a radical change in the financial structure of limited liabilities companies, bringing it closer to that one of a joint stock company. Innovative SMEs can also use equity crowdfunding and, therefore, raise capital with special campaigns on authorized online portals. For the same companies, there is also a simplified, free and direct access to the Guarantee Fund for Small and Medium-Sized Enterprises, a public fund that facilitates bank financing by granting a guarantee on bank loans. This guarantee can cover up to 80% of the credit granted by the bank to innovative SMEs, within a maximum limit of 2.5 million euros, and can be granted through a simplified procedure. Innovative SMEs also benefit from some important facilitations and exemptions on terms for covering losses and on computation of a minimum income and taxable base for corporate taxation. Finally, to promote the investments in the equity of these companies, special tax incentives have been introduced, both for individuals and legal entities investors. These measures therefore contribute to creating a favorable scenario for the development of innovative companies in Italy. In the following paragraphs, an analysis of the main updated structural and accounting data of these companies will be proposed. Furthermore, the analysis of the main financial ratios of a sample of firms will be presented.

## **LITERATURE REVIEW**

Literature on the subject is robust; for the purposes of this study, it is possible to distinguish two main strands: the first one focuses on issues relating to the financing of innovative firms; the second one deepens the relationship between the degree of innovation of the company and its profitability.

About the first topic, it can be addressed into the most relevant theoretical frameworks that explain the financial structure of SMEs: the pecking order theory (Myers and Majluf, 1984); the trade-off theory (Jensen and Meckling, 1976; Myers, 1977; Jensen, 1986); the market timing theory (Baker and Wurgler, 2002). Even with their own specific hypotheses, all these main theories on the financial structure of companies are formulated on large companies, not enough deepening for small firms. Besides, for innovative companies the results of these main theories are compromised by some substantial elements (Berger and Udell, 1998): innovative companies have a financial need and a level of risk that depends on the degree of development of the project; the screening and monitoring activities are difficult, due to the high level of agency costs and the degree of information opacity of these companies (Huyghebaert and Van de Gucht, 2007; Hall and Lerner, 2010); innovative firms are often not able to provide adequate guarantees to the loan, because they are mostly made up of intangible and/or highly firm-specific assets. These constraints mean that access to traditional sources of financing is difficult for innovative companies and therefore the financing of innovation could represent a serious and real obstacle for them. Berger and Udell (1998) re-proposed the pecking order theory for this type of company, referring to their financial growth cycle: the traditional hierarchy of funding

sources is modified not only according to the company size, but also for the degree of development of the project, to which different levels of information opacity and financial requirements correspond. For these companies, therefore, the traditional hierarchy is reversed. Following the financial growth cycle theory, a more recent literature on innovative SMEs' financing has been developed (Zoppa and McMahon, 2001; Sogorb-Mira and Lopez-Gracia, 2003; Hogan and Hutson, 2005; Hall and Lerner, 2009; Kuniy *et al.*, 2010; Abraham and Schmukler, 2018). The results they achieve are not unequivocal: differences are mainly attributable to the type of innovation (product, process; incremental, disruptive; Cainelli *et al.*, 2004; Koellinger, 2008; Czarnitzki and Hottenrott, 2010); to the business sector and firm market share (Schock, 2013; Mac an Bhaird and Lynn, 2015); to the attitude for innovation of the macroeconomic context (Arnone *et al.* 2015; Wilson 2015).

Besides, the specific competitive and business strategy of firms should also affects these results (Miles and Snow, 1978). The second strand of literature refers to the relationship between the degree of innovation of the company and its profitability. As a proxy for the degree of innovation of the companies, the empirical literature largely refers to investments in research and development by firms (R&D). Main results, even in this case not unambiguous, confirm the relevance of some structural factors (inclination of the management to innovation and the macroeconomic context; type of innovation; dominant or marginal position of the company in its reference market; specific source of financing; R&D location) in determining the contribution of innovation to the profits of the firm. Koellinger (2008) found that innovation is positively associated with turnover and employment growth, even if innovative activity is not necessarily associated with higher profitability. Dibrell *et al.* (2008) investigate the mediating effects of information technology on the relationships among product and process innovations and firm performance, measured in multiple profitability and growth rate metrics, on a sample of 397 small and medium-sized enterprises (SMEs). They find, among others, that the impact of innovation (both product and process) on performance (both profitability and growth) is primarily indirect, felt via the mechanism of the importance managers place on IT and an increased emphasis on IT abets managers' perception of their firms' performance, as compared with that observed among other peer firms. Peters and Schmiele (2011) address the question whether international R&D activities boost profitability, using a large data set of about 1,300 firms from the German Community Innovation Survey (CIS). The empirical results demonstrate that R&D location matters for profitability. Firms with both domestic and foreign R&D activities make significantly higher profits than all other firms, including those that carry out solely domestic R&D. Tran and Santarelli (2013) investigate the determinants of innovative activities and the innovation-performance relationship for the firm population in Vietnam. Private innovative firms significantly outperform their peers whereas the combination of young, small, and innovative characteristics in young innovative companies does not bring the expected higher

entrepreneurial performance as how it works in advanced countries; highly-leveraged firms, exporting firms, and diversified firms are more likely to be innovative than their counterparts, but the ability to transform innovative efforts into higher profitability and growth can only be witnessed among diversified firms; companies being endowed with larger asset pool have more favorable conditions to engage in innovation activities, but do not necessarily produce better performance relatively to their smaller counterparts. Adewale *et al.* (2015) consider the relationship between competitive advantage, innovation strategy and profitability level of firms in Nigeria. The authors deduce that competitive advantage and innovation strategy are both statistically significant to achieving high and persistent profitability level. Baussola and Bartoloni (2016) deepen complementarities between technological and non-technological innovation as crucial determinants of firm performance. This topic was not stressed by previous studies, as the focus has been primarily placed on technological innovation alone or on innovation efforts as measured by R&D or patent activities. They underline that capacities to develop market-oriented behaviour and introduce new organisational innovations are the drivers - together with technological innovation - of a firm's productivity and profitability. The authors also observe how the impact of such activities is larger when they persist over time, thus introducing a more general concept of innovation persistence. They present an empirical model based on a large panel of Italian manufacturing firms covering the period 2000-2012. About the relevance of persistence, also Othman and Ameer (2009). Hombert and Matray (2017) study whether R&D-intensive firms are more resilient to trade shocks. They provide evidence that R&D-intensive firms downsize considerably less. Curtis *et al.* (2018) provide evidence of an economically and statistically significant decline in the profitability associated with R&D expenditures. This result is consistent with diminishing marginal returns to R&D expenditures over time, in which spending has outpaced investment opportunities. However, despite the economic significance of the decline, analysts' long-term earnings growth forecast errors are systematically optimistic for firms with high R&D intensity. This evidence highlights the complexities associated with forecasting long-term earnings growth from innovation. Loukopoulos *et al.* (2017) examine whether a firm's business strategy is an underlying determinant of downside risk in accounting earnings and its components. Based on organizational theory, they predict that firms following an innovative "prospector" strategy exhibit lower profitability tendencies than firms following a cost-oriented "defender" strategy. Further, they anticipate that these strategies are asymmetrically positioned towards environmental uncertainty, with defenders focusing their efforts to efficiency, cost control, and minimizing exposure to downside risk, whereas prospectors direct their resources to flexibility, innovation, and maximizing the growth potential through aggressive expansion to new product markets.

Successful innovative activity is a major contribution to the intangible capital of firms; although its importance is generally acknowledged, the

contribution to companies' profits is a priori unclear. The literature review shortly summarized let us to underline how it is still difficult to affirm an absolute and direct relationship between innovation, financial structure and profitability for SMEs, as there are many other variables that strongly influence these links.

## **EMPIRICAL ANALYSIS**

### **Methodology**

The empirical verification is on two levels: the first one, with the objective to delineate the demographics of Italian innovative SMEs; the second one, with the aim of deepening the previous analysis, on a significant sample of such firms. For the first verification, we use the data publicly available on the Italian Business Register, updated at March, 2019, referring to the entire population of registered innovative SMEs (1,024); for the second one, we consider firms with available financial data for the 2010-2017 period in Orbis database by Bureau Van Dijk (433). The coverage of the sample is 42.3%.

The first analysis uses, substantially, a case study methodology, as an intensive analysis of an individual unit stressing developmental factors in relation to a broad definition of environment (Flyvbjerg, 2011). The unit is the whole innovative Italian SMEs. The methodology used for the second level of investigation is the financial ratio analysis, that is broadly recognized as a vital tool in identifying the financial soundness and cost effectiveness of firms, by establishing relationship between the items of balance sheet and profit and loss account (Shivam and Probhakar, 2013; Khairi *et al.* 2014). The combination of qualitative and quantitative methodologies allows us a more adequate answer to the following research questions: *a.* does the hierarchy of firms' funding capital structure follow the trends firstly outlined by Berger and Udell?; *b.* does innovation improve firms' profitability?

### **Results**

#### ***The Italian Innovative SMEs***

In this section, it is proposed the demographics Italian innovative SMEs. The definition of innovative SME was introduced in Italy in 2015, with the Decree-Law 3/2015 (known as "Investment Compact"), converted into Law 33/2015, which has extended most of the benefits envisaged for innovative startups to a broader range of companies, Innovative SMEs. This regulatory intervention acknowledges established principles of the contemporary economic doctrine, which unanimously ascribes to technological innovation a decisive impact on the levels of competitiveness and growth and on the processes of job creation. The aim of the legislator was thus to foster with greater effort and reach the propagation of technological innovation within the domestic entrepreneurial system. According to this legislation, this type of enterprise enjoys a vast and diversified package of measures that touch every aspect

of a company's lifecycle, including the introduction of more flexible corporate management tools, the liberalisation of remuneration schemes, the facilitation of the access to credit – for example by facilitating the investment in equity, and the support in the process of internalisation of innovative enterprises.

Innovative SMEs are companies that comply with the definition of the European Commission Recommendation 361/2003 about small and medium enterprises and meet the following requirements: be incorporated as companies with shared capital (i.e. limited companies), including cooperatives; have their headquarter in Italy or in another EU country, but with at least one production site or branch in Italy; have the last balance sheet certified by an auditor or by a company of auditors registered in the auditors' register; have the shares of the company not listed in a regulated market; be not registered as innovative startup or certified incubator in the special section of the Business Register; do not distribute profits; be of innovative character, as identified by at least two of the following criteria: at least 3% of either the company's expenses or its turnover (the largest value is considered) can be attributed to R&D activities; at least 1/5 of the total workforce are PhD students, PhD holders or researchers; alternatively, 1/3 of the total workforce must hold a Master's degree; the enterprise is the holder, depositary or licensee of a registered patent (industrial property) or the owner of a program for original registered computers.

According to last available data<sup>1</sup>, the innovative SMEs enrolled in the Italian Business Register are 1,024 (whole population). To deepen the demography of the sample, we have considered the following specifications: sectoral distribution; territorial reference area; legal form; female, foreign and youth prevalence in the corporate structure.

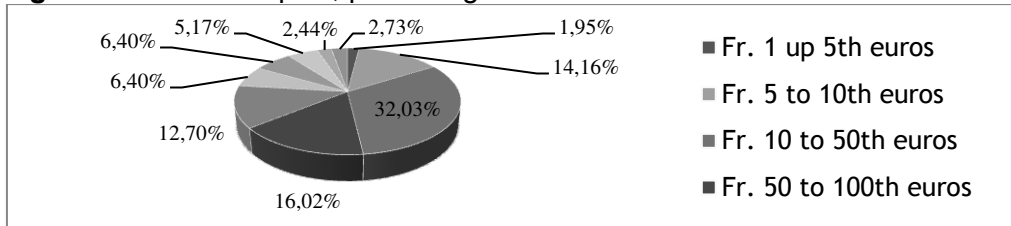
By the sectoral distribution, 66.02% of these ones is in the service sector, 26.37% in industry and 6.54% in trade. From a geographical point of view, 61.62% is in the North area, with the Lombardy region which, alone, accounts for 28.03% of the total; among the regions of central Italy (20.11% as a whole), Lazio is the one with the largest number of innovative SMEs (9.28%), while in the South (18.27%) the most relevant one is Campania, with 6.25% of the total. By juridical nature, the most widespread type is the limited liability company (77.83%), followed by the joint-stock company (19.63%). Simplified limited liability company counts for 1.17%; only 1.16% of the total is represented by cooperative companies. Looking at the composition of corporate groups, the innovative SMEs with a female prevalence are just 7.91% of the total, those with a youth prevalence 8.50% and those with a foreign prevalence 0.98%. The analysis can be deepened on the basis of the intensity of the three phenomena (exclusive, strong or majority presence, respecting the qualifications of the Italian Business Register about female, youth and foreign presence), as defined by the Italian Business Register. Overall, the three phenomena are therefore not significant for the innovative SMEs in Italy.

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<sup>1</sup> Last available data is March 25, 2019.

From the list of innovative SMEs available on the website of Italian Business Register, it is also possible to have three main values that define the size and the economic and financial capacity of innovative SMEs: these ones are class of capital, class of production value and class of employee, last year. Referring to the class of capital (Figure 1), approximately 77% of the companies have a capital between 1 and 250 th. Euros.

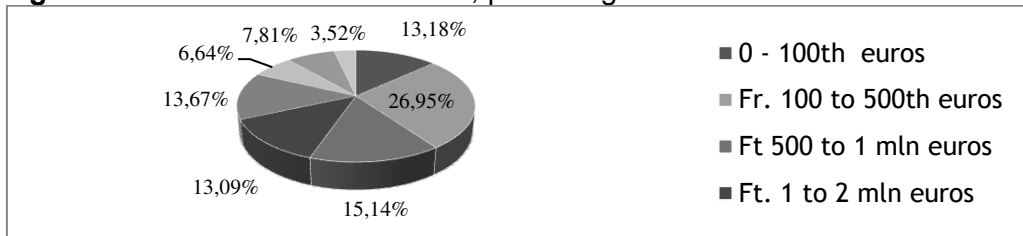
**Figure 1.** Class of capital, percentages



Source: Author's elaboration on Italian Business Register, March 25, 2019.

According to the class of Value of Production (Figure 2), approximately 82% of the companies have a value between 0 and 5 million euros, with a fairly uniform distribution among the classes, except for the "100 to 500 thousand euro" class, which has the greatest weight (about 27% of the total).

**Figure 2.** Class of Production Value, percentages



Source: Author's elaboration on Italian Business Register, March 25, 2019.

Finally, about the class of employees<sup>2</sup>, 82% of companies has up to 49 employees, with about half of the companies having a maximum of 9 employees (49.18%) and just 9.48% of firms employing over 50 human resources. Overall, these analyzes underline a low capitalization of firms, which also corresponds in the value of production.

**Financial analysis of Innovative SMEs in Italy**

The analysis focus on firms in the special section of the Italian Innovative SMEs Register, with financial available data for the period 2010-2017. Data are from Orbis database by Bureau van Dijk, that offers comprehensive and detailed business data and financials across countries.

<sup>2</sup> Firms are categorized into the following six classes according the number of employees: from 0 to 4; from 5 to 9; from 10 to 19; from 20 to 49; from 50 to 249; over 250.



The number of Innovative SMEs companies with available unconsolidated data is 433 in 2017, last available year. Financial data are organised in main indicators of performance with the aim to analyse firms' profitability and financial structure, on their average values, in the period 2010-2017. The average Operating revenue (turnover) in 2017 is equal to 5'947 th euros; the average number of employees is 30. These values substantially follow the trend outlined with the analysis on the population as a whole. There is no high heterogeneity among firms in the sample.

To analyze the financial dynamics of the firms, we use the following ratios: current ratio; liquidity ratio, gearing; interest cover. Current and liquidity ratios are calculated on the values of the short-term assets and liabilities, respectively including and excluding the value of inventories; gearing is obtained as the ratio between the sum of non-current liabilities and loans and shareholder funds. Interest cover is calculated as the ratio between EBIT (Earnings Before Interest and Tax) and interest paid.

For the profitability analysis, we use the following two ratios: ROA using Net Income; ROE using Net Income. The value of ROA (Return On Assets) is calculated as the ratio between the firm's Net Income and its Total Asset; ROE is equal to the ratio of Net Income and Equity. For the same purpose, we also consider the following two margins: EBITDA Margin; EBIT Margin. EBITDA Margin is the ratio between EBIT plus Depreciation and Operating revenue (turnover); EBIT Margin is the ratio between Operating P/L (that is EBIT) and Operating revenue. Finally, we include also the ratio Cash flow/Operating revenue to focus on the financial relevance of economic values. Cash flow is calculated as the sum of Net Income and Depreciation. The table in Figure 3 presents the main results of our analysis.

**Figure 3.** Ratios, percentages

<i>Ratio, Percentages, average/year</i>	2017	2016	2015	2014	2013	2012	2011	2010
Current ratio	2,01	1,97	1,81	1,98	1,93	1,91	2,11	2,26
Liquidity ratio	1,81	1,75	1,64	1,80	1,74	1,69	1,94	2,01
Gearing	142,63	136,99	144,13	153,37	142,18	140,62	153,08	157,14
ROE using Net Income	(7,46)	(11,13)	(18,44)	(13,97)	(20,93)	(8,38)	(3,73)	0,16
ROA using Net Income	0,41	(1,95)	(1,30)	(2,41)	(2,68)	(1,88)	0,10	(0,31)
EBITDA Margin	8,13	6,50	6,62	5,80	7,66	8,18	11,50	10,11
EBIT Margin	1,61	0,62	1,21	0,24	2,43	2,94	6,14	2,92
Cash flow/Operating Revenue	6,40	4,34	4,85	2,54	4,79	5,90	7,51	7,05
Interest cover	37,01	24,68	29,32	20,07	24,14	35,35	40,51	34,37

Source: Author's elaboration on Orbis by Bureau van Dijk data.

Companies present a satisfactory profile in terms of liquidity: the value of current and liquidity ratios are positive in all of the period 2010-2017, demonstrating the ability of firms to efficiently manage their short-term financials, as to be able to face their short-term commitments. The

analysis of liquidity can be appreciated also considering the average credit and collection period of firms: Credit period is the ratio between Creditors and Operating revenue; Collection period is the ratio between Debtors and Turnover. The first one is equal to 72 days on average in 2017, considerably reduced compared to the average value at the beginning of the period (102 days); the second one is equal to 103 days on average in 2017, even falling down by the initial value (122 days). These results could be interpreted in an ambivalent and contrasting way, respectively as a sign of the growing contractual strength of firms or as tensions in the management of payments. Considering the values of liquidity ratios, the first interpretation is suitable for the case. Gearing ratio is high in all the years, highlighting an unbalanced financial structure of firms' debt. This result is consistent with the empirical evidence relating to the financial structure of Italian companies, typically undercapitalized and strongly dependent on bank loans. However, the ratio has quite mixed values: it goes from the maximum value of 157.14 at the beginning of the period to the average value of 142.63 in 2017, rising compared to 2016. This dynamic can also be explained by considering exogenous factors, in particular referring to the willingness of banks to grant credit, influenced by supervisory regulations, central bank's monetary policy and interbank market. Despite the weight of bank loans on the financial structure of firms, the level of financial charges is sustainable, as represented by the Interest cover values in the period. This result is also attributable to the favorable dynamic of market interest rates.

About profitability, ROA has negative values in six of the eight years analyzed; in the last year, the value is positive. These results can be interpreted taking into account the difficulties of small and medium-sized enterprises in closing their balance sheets with a net profit, due to the economic relevance of the financial and extraordinary costs. Such values also highlight an important issue related to an ineffective use of assets by firms. Even the value of ROE is negative; the values confirm the critical aspects already represented in the ROA results, mainly due to the dynamics of net income of companies.

This result has very significant strategic implications, since it indicates a negative return on equity; values are primarily influenced by the net income dynamics of firms: 30.25% of the sample has a negative net income, with a negative average of 55,594 th. Euros. Instead, net income calculated only for firms with positive values is equal to 2,854 th Euros. Furthermore, the high values of negative ROE are due to the low level of firms' capitalization. Discrepancies in the signs of ROA and ROE in three of the years (2010, 2011 e 2017) can be attributed to the fact that the ROE is calculated just for companies with a positive shareholder value, reducing the number of firms for which the average value of ROE is finally calculated. EBITDA and EBIT margin are rising, after the fall in the previous years.

## **CONCLUSIONS**

Issues related to innovation financing, including the difficulty of attributing a reliable value to innovation itself, can be amplified by the size of the company: small and medium-sized innovative companies can heavily suffer from raising capital, and this is a brake on the development of the company. Problems related to the financing of innovative companies should be mitigated by specific regulatory measures aimed at favouring investments in these companies: in Italy, in 2015, it was introduced a specific entity that is the innovative SME, which benefit from particular facilitations, also about their access to financing and credit market.

The paper intended to study the Italian innovative SMEs, starting from main available statistics by the Italian Innovative Business Register. Data show that these companies are mainly limited liability companies, active in the service sector, based in Northern Italy. Firms are characterized by a low level of capitalization and value of production.

This evidence have been deepened through the financial ratio analysis of firms with available data in Orbis database by Bureau van Dijk for the period 2010-2017. The focus was on the financial structure and profitability of these companies. The results show a high level of indebtedness, confirming the literature that has long highlighted the strong dependence on credit from small and medium sized enterprises. This result is therefore explained by the dimensional factor not by the innovativeness of the company. Liquidity ratios are satisfactory, while profitability is not good. This last aspect can be explained by the macroeconomic context and also by the fact that innovation represents a medium-long term investment, which requires time to translate itself into profitable results for the firm. This paper contributes to the advancement of business and business-related science because it deepens the analysis on the effectiveness of specific measures for companies with a strong orientation towards innovation: both profitability and financial ratios are improving in the years following the introduction of incentives dedicated to innovative SMEs in Italy.

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