Corporate Governance, Investment, Profitability and Insolvency Risk: Evidence from Italy

**Alessandra Amendola[1], Vincenzo Candila[2], Luca Sensini[3]
and Giuseppe Storti[4]**

Abstract

The research aims to study the structural and functional characteristics of food and beverage companies, focusing on corporate governance, investment and financing decisions, innovation, profitability, and risk of insolvency. The analysis is based on a mixed type investigation method carried out on a random stratified sample of 274 firms.

The empirical findings reveal that a large prevalence of companies is owned by a single person or by a limited number of partners (often of the same family). Owners and their families centralize decision-making power. The prevalence of companies made investment in innovation. The investments are mainly financed (78%) by the self-financing or by shareholders' capital. The investigation of the causal relationships that link corporate risk, profitability, and the propensity to invest and innovate with the other explanatory variables of business management highlighted further significant aspects.

Keywords: Corporate governance, Investment, Performance, Innovation, Risk Management.

---

[1] DiSES, University of Salerno, Italy.
[2] MEMOTEF Depart., Sapienza University of Rome, Italy.
[3] DISA-MIS, University of Salerno, Italy.
[4] DiSES, University of Salerno, Italy.

1. Introduction

The research aims to study the structural and functional characteristics of food and beverage companies, focusing on corporate governance, investment and financing decisions, innovation, profitability and the risk of insolvency. The sector was chosen based on its relevance in the national and local economy. The analyzed food and beverage companies are based in the province of Salerno in Italy.

The research required the availability of a large number of data and information, such as ownership, governance, technology and propensity for innovation, relationship with the research and training centers, import-export, financing decisions, relationship with the banking system.

Given that this information is generally not available through the use of pre-existing sources, the research used a mixed type of investigation method, divided into several stages.

Firstly, we have examined the data of all the companies present in the area being analyzed, comparing the data received from the Chamber of Commerce (Legal form, shareholders, age, financial statements, etc.) and the Revenue Agency (local ministerial tax office). This preliminary analysis was fundamental in identifying the actual number of active enterprises.

This approach made it possible to determine the universe of reference companies with higher precision to adequately construct the representative sample. To carry out the sampling, we used a stratified random methodology. In accordance with the literature (Cicchitelli et al, 1997; Cochran, 1977), this sampling strategies allows to improve the efficiency of the estimates and guarantee the representativeness of the sample. Regarding efficiency, as widely demonstrated by the literature, with the same sample size, a suitable stratification can allow us to obtain significant efficiency gains, measured in terms of reduction of the variability of the estimates, compared to simple random sampling. Regarding representativeness of the sample, we used two stratification criteria: a geographical one and an economic one. The geographical criterion was used to adequately consider the structural characteristics present in each of the different districts in which the province as vast as that analysed can be divided.

From the business economics point of view, starting from a strategic approach proposed by the literature (Porter, 1980; 1985; Coda, 1992), the main structural and functional characteristics of the companies were analyzed. This approach made it possible to adequately represent companies of different sizes, small, medium, and large in the sample.

In the second phase, a questionnaire was designed and administered through a face-to-face interview to collect all the relevant information that could not be obtained

from the database of the Chamber of Commerce and the Revenue Agency. The questionnaire was divided into 9 sections and concerned:

1. General information on the company and the entrepreneur.
2. Organizational models and decision making.
3. Investments and financing methods.
4. Relations with the banking system.
5. Employees, labor dynamics and labor costs.
6. Energy efficiency and environmental safety.
7. Procurement, production and sale.
8. Research, development and innovation.
9. Success factors and competition.

In addition to the sections just mentioned, a final section included any notes from the detector.

The total number of items was 166, mostly multiple choice. The face to face structured interview method allows for higher response rates and reduces distortion in responses. However, these positive elements can be affected by the so-called interviewer effect, or by the possibility that the intervention of the interviewer influences the originality of the information. To avoid this disadvantage, as suggested by the literature (Brasini et al. 2002; Bradburn et al., 2004), we have invested in advance in the training of detectors whose role is fundamental for the quality of the data collected. This circumstance has made it possible to improve the quality of the data. To facilitate the data entry phase, the layout of the questionnaire was designed and implemented with the SurveyMonkey program. This procedure allows an efficient imputation in terms of time and to minimize non-sampling errors. Finally, the information obtained from the processing of the questionnaire was supplemented by information available from the databases of the Chamber of Commerce and the Revenue Agency.

The paper is organized as follows. The next section illustrates the sample data set and drawing. Section 3 describes the characteristics of the companies, focusing on the different aspects under investigation. Section 4 analyzes the relationship between investment, innovation, profitability and default risk. Section 5 illustrates the concluding remarks.

2. Data Set and Sample Design

The sample design was based on a stratified sampling procedure, where the whole population is divided into strata or sub-groups and then a simple random sample is drawn from each group (Cicchitelli et al, 1997; Cochran, 1977). This kind of sampling methodology allow to have, for a fixed sample dimension, a more efficient estimate and to consider the main characteristics of the analyzed units. Namely, two different stratification variables have been used to take into account the geographical location of each firm within the area of interest and the economic

weights expressed in terms of turnover. From what concerns the geographical location the whole province of Salerno has been divided into four macro-areas to account for the structural and demographical difference within each area. The second stratification variable has been included to adequately represent companies of different economic sizes, small, medium, and large in the sample. Moreover, for letting all the universe of firms with a level of turnover greater than 20 million euro to be included in the sample, we have considered an additional stratum with full proportional weight. This strategy of inclusion in the sample self-representative groups is commonly used in the official statistical analysis such as in economic sample survey of the Italian Institute of Statistics among others and is supported by the increase of the finite sample property of the final estimates (Cochran, 1977).
The overall sample size, n=274, has been calculated to assure an error level of $|\varepsilon| \leq 0.05$ for the estimation of a proportion p with a probability $1 - \alpha = 0.095$ following:

$$n = \frac{n_0}{1 + \frac{n_0}{N}} \tag{1}$$

where N is the population size and n_0 is given by:

$$n_o = \frac{z^2(0.975)p(1-p)}{\varepsilon^2}. \tag{2}$$

The level of p has been fixed assuming a maximum level for the variability of any hypothetical dichotomous variable, reached for p=0.5. The sample units belong to each stratum have been selected according to the incidence of each sub-groups within the population.

3. Business characteristics

This section highlights the structural and functional characteristics of companies operating in the food and beverage sector, using an economic-business survey perspective. The data highlight the main results that emerged from the analysis of the questionnaires and are organized as follows. The first part describes the characteristics relating to ownership, governance systems and critical success factors. This perspective is important because of its substantial effect on the firm (Jensen and Meckling, 1973; Fama and Jensen, 1983). The second part shows the results relating to the dynamics of investments and financing, focusing attention also on research and development activities. In this perspective, investments are the basic driving force of business activity, representing the realization of the company's competitive strategy (Helfert, 2000). Likewise, financing methods are important for understanding how many and which (owner, lender, retention) resources it uses to finance investments.

3.1 Ownership, Corporate Governance and Profitability

The sector analyzed is characterized by a widespread presence of micro and small enterprises and by the presence of some industrial groups of international importance. In this paper, the company size was determined in agreement with the definition of SMEs given in European Commission recommendation 2003/361/EC of 6 May 2003. Table 1 summarizes the results of the observed variables.

Table 1: Ownership, Corporate Governance and Performance

Size	
Microenterprises	69,0%
Small Firms	18,0%
Medium Firms	11,2%
Larger Firms	1,8%
Founder of the Company	
Current owner	55,5%
Parents of the current owner	23,4%
Grandparents of the current owner	5,1%
Current owner group	5,1%
Other founders	5,0%
Other answers	5,9%
Company Members/Shareholders	
1	11,4%
2	45,7%
3-5	34,3%
6 or more	8,6%
Stakeholders involved in the decision-making process	
Company Members/Shareholders	48,3%
Company Members/Shareholders and Family	32,2%
Banks	6,3%
Consulting Firms	3,4%
Business Consultants	3,2%
Other factors (employees, trade unions, ets.)	6,6%
Average turnover	
<= 2 millions	69%
<= 10 millions	18%
<= 10 millions	11,2%
>50 millions	1,8%
Profitable Companies	
2007	58,1%
2008	62,3%
2009	54,1%
2010	55,1%
Critical success factors (more than one answer)	
Products quality	53,3%
Value for money	43,1%
Specialization level	39,4%
Punctuality of deliveries	20,4%
Brand	19,0%

The data show a large prevalence of first (55%) and second-generation entrepreneurs (23.4%).

Most of the entrepreneurs are male (81.5%). Capital companies, in the majority of cases (96.8%), do not belong to groups and have little fractional share capital. This circumstance has various implications for the company's behavior, as evidenced by the literature (Demsetz and Lehn, 1985; Westhead and Howorth, 2006; McConnell and Servaes, 1990, Pedersen and Thomsen, 1997).

In addition, entrepreneurs are significantly tied to the territory and are not oriented to move the company's headquarters to other territories. In terms of corporate governance, the results are substantially uniform. Most of the companies are owned by a single person or by a limited number of partners (often of the same family). Owners and their families centralize decision-making power, delegating only the least relevant decisions to employees or external consultants. Non-strategic or support activities are instead delegated externally.

This characteristic is in line with the typical characteristics of the PMI (Marchini, 1995; Chen et al., 2014;). However, in larger companies, government decisions also involve professionals and consultancy firms.

Throughout the period examined, the operating results are mainly positive. Finally, quality and price represent the fundamental success factors to compete on the market.

3.2 Investments, Financing and Research and Development Activities

The table 2 summarizes the main variables under investigation.

In the period analyzed, the percentage of use of the plants was very high. 31% of companies have almost saturated production capacity (> 90.0%). Only 26.2% of companies used plant capacity equal to or less than 50%. The prevalence of companies made at least one investment, intangible and/or intangible (59.6%), in the period analyzed.

The main investments have been Plant, machinery, and equipment (39%), Vehicles and trucks (16,9%), and Infrastructure (16,4%). The investments were aimed at increasing production capacity (26,3%), product lines (16,8%), and market share (15,3%).

The companies in the nocerino-sarnese area, which have a larger size, have a higher percentage of investments (69.2%), compared to other areas.

Given the maturity of the food sector, the data analysis highlights a low propensity for innovation. The innovation mainly consists in the creation of new products for the reference market and/or in the investment in new machinery and/or new technologies.

Table 2: Investments and Research and Development Activities

Average use of the plants	
30,0-50,0%	13,5%
50,1-60,0%	12,7%
60,1-70,0%	12,7%
70,1-80,0%	19,8%
80,1-90,0%	10,3%
> 90,0%	31,0%
Type of investments	
Plant, machinery and equipment	39,0%
Vehicles and trucks	16,9%
Infrastructure	16,4%
Business information systems and software	7,9%
Research and development	4,0%
Others	15,8%
Purpose of investments	
Increase in production capacity	26,3%
Increase in product lines	16,8%
Market share increase / Entry into new markets	15,3%
Adaptation to regulations	10,2%
Others	31,4%
Average number of companies that have invested, by geographic area	
Agro Nocerino-Sarnese	69,2%
Cilento – Vallo di Diano	63,6%
Metropolitan Area	58,6%
Sele Area	42,3%
Innovation	
Product innovations	45,3%
Process innovations	34,6%
Factors driving innovations	
Internal know-how and resources	25,5%
Sources of information (conferences, fairs, trade magaz., etc.)	17,5%
Customer requests	16,1%
Suppliers	12,4%
Competitors	4,4%
Universities and research centers	2,9%

In the prevalence of cases, innovation derives from the implementation of internal know-how within the company (25.5%). Collaborations with research centers are residual (2,9%). The prevalence of companies carries out production both on their own and on behalf of third parties. The production process is programmed according to the orders and the trend in market demand. Production has high levels of flexibility. Table 3 shows the financing methods and the critical issues found in the relationship between businesses and the banking system.

Table 3: Financing

Method of financing investments	
Self-financing and capital increase subscribed by the current owners	78,0%
Bank loans	21,1%
Public contributions	0,9%
Critical issues in the relationship with the banking system	
Collateral required	29,1%
None	23,6%
Overall costs	22,7%
Accounting documentation required	13,6%
Excessively long delivery times	10,9%
Degree of difficulty for bank loans	
High	17,9
Medium	36,9
Low	45,2
Number of banking relationships	
1-2 Banks	81,1%
3-5 Banks	12,9%
6-10 Banks	4,5%
> 10 Banks	1,5%

The investments are mainly financed (78%) by the self-financing or by shareholders' capital. The remaining part is financed mainly by bank debt (21,1%). This circumstance highlights two specific features typical of SMEs. On the one hand, the difficulty of finding sources of financing from the banking system, in consideration of the critical points highlighted by the literature (Ricci and Colombini, 1987; Chen et al., 2014). On the other hand, a tendency reluctance to access external capital to the ownership structure. The close integration between ownership and management seems to entail widespread prevention of financial solutions that may call into question the control and/or composition of the property. This circumstance involves the subordination of investments to the self-financing capacity (Chen et al., 2014; Sensini, 2017). Overall, 81,1% of businesses interact with a maximum of 2 credit institutions. However, the figure is significantly influenced by the strong presence of micro-enterprises and small enterprises.

Indeed, corporations have a more pronounced trend towards multi banking (at least 3 banks). Companies believe that guarantees and costs are the main problems related to the relationship with the banking system.

4. Investments, Innovation, Profitability and Insolvency Risks

This section examines the causal relationships that link corporate risk, profitability, and the propensity to invest and innovate with the other explanatory variables of business management that emerged in the previous section. The description of the variables is shown in table 4.

Table 4: Variables analysed

Variables	Description	Type
var1	Insolvency Risk class (1=high risk)	Binary
var2	Dummy (1 = Loss or Bud. Balance)	Binary
var3	Sector (1=Food)	Binary
var4	Agro Nocerino (1=true)	Binary
var5	Metropolitan Area (1=true)	Binary
var6	Cilento Vallo di Diano (1=true)	Binary
var7	Legal Nature (1=capital company)	Binary
var8	Age	Discrete
var9	Turnover	Continous
var10	Average Exports (last 4 years)	Continous
var11	Age of the owner	Discrete
var12	Gender (1=male)	Binary
var13	Owner Education Level (1= graduate)	Binary
var14	Partecipant in the decision making process (1	Binary
var15	Average difficulty in accessing credit	Continous
var16	Average Labor Costs/Total Costs	Continous
var17	Percentages third party works	Continous
var18	Product or process innovations (≥1)	Binary
var19	Investments in the past 4 years (≥1)	Binary

In the analysis, the four variables (var1, var2, var18, var19) were used as dependent variables while the others were used as explanatory variables.

As regards investments, the dependent variable assumes value 1 if in the last 4 years the company has made investments and 0 in the absence of investments (var 19). As a profitability proxy, the variable takes value 0 in the case of profit and 1 in the remaining cases (var. 2).

The propensity for innovation assumes a value of 1 in the case of process and/or product innovations in the last four years and a value of 0 otherwise (var 18). This approach is in line with that adopted by ISTAT.

The default risk (var1) was measured based on the risk classes identified by CERVED. Classes are shown in table 5.

The variables highlighted in the table have been aggregated into a binary variable that assumes a value of 1 in the case of high risk and 0 in the case of low risk. Mode 0 corresponds to the classes without defaults and low risk of the Cerved classification.

In the Cerved classification, "With insolvencies – A" (var. 7) means a company with insolvencies or bankruptcy procedures that could adversely affect the assessment of corporate reliability. "With insolvencies – B" (var. 8) means a company with insolvencies or financial imbalances that do not necessarily adversely affect the assessment of corporate reliability.

Table 5: Risk Classes CERVED and Frequency in the Sample

Class	Description	Frequency	Relative Frequency
0	Updating	0	0.131
1	High risk	29	0.027
2	Medium risk	6	0.023
3	Without insolvencies	5	0.000
4	Low Risk	164	0.742
5	Without monitoring	0	0.000
6	Inactive	4	0.018
7	With insolvencies - A	0	0.000
8	With insolvencies - B	13	0.059

Binary variables are considered dependent variables as the analysis intends to identify the probabilities of insolvencies, innovations, investments, and profitability.

Given that the dependent variable is binary, the linear regression model cannot be applied. Therefore, this study uses a logistic regression model using the following function which can take values from zero to 1 (Dobson and Barnett, 2008; Hosmer and Lemeshow, 2000; McCullagh and Nelder, 1989).

Let $Y_i = \{0,1\}$ be a dichotomic variable that assume the following Bernoulli distribution, conditioned to a set of covariates X_{ij} with j=1,…,p and i=1,…,n,

$$(Y_i|X_{1,i}, …, X_{p,i}) \sim B(1, \pi_i) \tag{3}$$

where the conditional distribution function is given by:

$$p(Y_i|X_{1,i}, …, X_{p,i}) = \pi_i^{Y_i}(1 - \pi_i)^{1-Y_i} \tag{4}$$

and

$$\pi_i = \frac{1}{1+e^{-(\beta_0+\sum_{j=1}^{p}\beta_i X_{i,j})}} = \frac{1}{1+e^{-X_i'\beta}} \qquad (5)$$

with $X_i = (1, X_{1,i}, \dots, X_{p,i})'$ and $\beta = (\beta_0, \beta_1 \dots, \beta_p)'$ is a vector of regression parameters that can be estimated by means of maximum likelihood estimators (MLE). The estimates have been reported in Table 6.

Table 6: Logistic regression var1 (insolvency risk): estimates (βi) e p-values (p(βi))

Variables	$\beta0$	$\beta1$	$p(\beta0)$	$p(\beta1)$
var2	-1.9459	1.1097	0.0000	0.0430
var4	-1.1827	-1.0686	0.0000	0.1752
var5	-1.4191	0.2664	0.0000	0.6279
var6	-1.6094	0.5733	0.0000	0.2450
var7	-1.2879	-0.2382	0.0000	0.6752
var8	-0.8174	-0.0334	0.0499	0.1520
var9	-1.3064	0.0000	0.0000	0.3811
var10	-1.2547	0.0000	0.0000	0.5836
var11	-1.2790	-0.0007	0.1870	0.9718
var12	-1.0729	-0.2683	0.1987	0.6969
var13	-1.2238	-16.3423	0.0000	0.9891
var14	-1.5805	0.3168	0.0001	0.5428
var15	-1.9344	0.3003	0.0033	0.2423
var16	-1.0409	-0.0093	0.0859	0.6191
var17	-1.5627	0.0048	0.0000	0.5280
var18	-1.4404	0.0771	0.0001	0.8779
var19	-1.4469	0.1617	0.0002	0.7476

The results show that the risk of insolvency presents a high probability for companies that have a loss (0.302) and a low probability for companies that have a profitable balance (0.125). Table 7 shows the estimates relating to innovation. The dependent variable is represented by the innovation dummy (var 18).
Firms that have made investments in the past four years are more likely to innovate (0.672) than firms that have not made investments (0.333). From a statistical point of view, these results confirm the consistency of the results obtained with the questionnaire.

Table 7: Logistic regression var18 (innovation): estimates (βi) e p-values (p(βi))

Variables	β0	β1	p(β0)	p(β1)
var1	0.1236	0.0771	0.5788	0.8779
var2	0.1671	0.0561	0.5642	0.8930
var4	0.1957	-0.2911	0.3778	0.5526
var5	0.0513	0.3542	0.8209	0.4481
var6	0.0000	0.3285	1.0000	0.4147
var7	-0.0267	0.6145	0.9081	0.1788
var8	-0.1940	0.0185	0.5511	0.2095
var9	-0.0481	0.0000	0.8215	0.2712
var10	0.0398	0.0000	0.8454	0.3515
var11	0.6801	-0.0108	0.3990	0.5052
var12	0.2413	-0.1206	0.7083	0.8166
var13	0.0674	0.9134	0.7505	0.1979
var14	0.3285	-0.3624	0.2879	0.3699
var15	0.1047	0.1458	0.8358	0.5043
var16	0.7676	-0.0195	0.1373	0.1988
var17	0.2424	-0.0036	0.3586	0.5648
var19	-0.6931	1.4110	0.0342	0.0009

Furthermore, the results show that the investments are mainly aimed at the realization of process or product innovations. Table 8 shows the estimates relating to investments. The dependent variable is represented by the investments dummy (var 19).

Table 8:   Logistic regression var19 (investiments): estimates (β_i) e p-values ($p(\beta_i)$)

Variables	β_0	β_1	$p(\beta_0)$	$p(\beta_1)$
var1	0.3238	0.1617	0.1504	0.7476
var2	1.0986	-1.2321	0.0010	0.0059
var4	0.2666	0.4265	0.2287	0.4059
var5	0.3844	-0.1432	0.0935	0.7573
var6	0.3365	0.0313	0.1988	0.9382
var7	0.2113	0.5359	0.3597	0.2499
var8	0.5114	-0.0089	0.1099	0.5159
var9	0.1779	0.0000	0.4242	0.1833
var10	0.1945	0.0000	0.3487	0.3409
var11	0.2480	0.0027	0.7575	0.8645
var12	-0.1178	0.4055	0.8598	0.4581
var13	0.3594	-0.1771	0.0934	0.7828
var14	0.6242	-0.4543	0.0511	0.2715
var15	0.6347	0.0575	0.2309	0.8006
var16	0.8171	-0.0026	0.1268	0.8698
var17	0.5403	-0.0050	0.0462	0.4240
var18	-0.3365	1.4110	0.2504	0.0009

The probability of making investments is closely linked to profitability. Therefore, companies that have a profit tend to make more investments than other companies. Table 9 shows the estimates relating to profitability. The dependent variable is represented by the profitability dummy (var 2).

Profitability analysis highlights the following. The probability of having an operating loss is higher for companies classified at risk by the CERVED (with a probability of 0.417 against 0.684). The probability of having an operating loss is significantly lower in limited companies (with a probability of 0.308 against 0.552). Finally, companies that have a high turnover and have made innovation investments in the latter 4 years have a significantly lower probability (with a probability of 0.368 compared to 0.667) of having an operating loss.

Table 9: Logistic regression var 2 (profitability): estimates (βi) and p-values (p(βi))

Variables	β0	β1	p(β0)	p(β1)
var1	-0.3365	1.1097	0.1593	0.0430
var4	0.1054	-0.9808	0.6465	0.0907
var5	-0.1769	0.4181	0.4674	0.3745
var6	-0.4520	0.9220	0.1054	0.0327
var7	0.2097	-1.0207	0.3933	0.0376
var8	0.0636	-0.0071	0.8493	0.6268
var9	0.0991	0.0000	0.6729	0.0911
var10	0.0916	0.0000	0.6742	0.3581
var11	0.3471	-0.0073	0.6806	0.6707
var12	0.0096	-0.0637	0.9886	0.9058
var13	0.0253	-0.5849	0.9104	0.3798
var14	-0.2451	0.3221	0.4360	0.4427
var15	-0.9606	0.2788	0.0691	0.2026
var16	0.1949	-0.0161	0.7151	0.3141
var17	0.0377	-0.0014	0.8908	0.8275
var18	-0.0953	0.0561	0.7577	0.8930
var19	0.6931	-1.2321	0.0499	0.0059

5. Concluding remarks

The research aims to study the structural and functional characteristics of food and beverage companies, focusing on corporate governance, investment and financing decisions, innovation, profitability and the risk of insolvency.

The research required the availability of a lot of data and information, using a mixed type of investigation method. The data were collected through a structured questionnaire and through the information available in the databases of the Chamber of Commerce and the Revenue Agency.

To carry out the sampling, we used a stratified random methodology. 274 firms are included in the sample. To sum up, the analysis of the data collected from the different information sources used has shown the following results.

In the context analyzed, there is a large prevalence of first (55%) and second-generation entrepreneurs (23.4%), significantly tied to the territory.

Most of the companies are owned by a single person or by a limited number of partners (often of the same family). Owners and their families centralize decision-making power, delegating only the least relevant decisions to employees or external consultants. Non-strategic or support activities are instead delegated externally. This characteristic is in line with the typical characteristics of the PMI.

The percentage of use of the plants was very high. 31% of companies have almost saturated production capacity (> 90.0%). The prevalence of companies made at

least one investment aimed at increasing production capacity (26,3%), product lines (16,8%), and market share (15,3%).

Given the maturity of the food sector, the data analysis highlights a low propensity for innovation. The innovation mainly consists in the creation of new products for the reference market and / or in the investment in new machinery and / or new technologies. In the prevalence of cases, innovation derives from the implementation of internal know-how within the company (25.5%). Collaborations with research centers are residual (2,9%). Production has high levels of flexibility. The investments are mainly financed (78%) by the self-financing or by shareholders' capital. This circumstance highlights two specific features typical of SMEs. Firstly, the difficulty of finding sources of financing from the banking system. Secondly, a tendential reluctance to access external capital to the ownership structure. This circumstance involves the subordination of investments to the self-financing capacity. Companies believe that guarantees and costs are the main problems related to the relationship with the banking system. During the analysis period, the number of employees remained mainly constant. Quality and price represent a fundamental element to compete on the market.

The analysis of the causal relationships that link corporate risk, profitability, and the propensity to invest and innovate with the other explanatory variables of business management highlighted further significant aspects.

The risk of insolvency presents a high probability for companies that have a loss (0.302) and a low probability for companies that have a profitable balance (0.125). Firms that have made investments in the past four years are more likely to innovate (0.672) than firms that have not made investments (0.333). The probability of making investments is closely linked to profitability. Therefore, companies that have a profit tend to make more investments than other companies. Profitability analysis highlights that the probability of having an operating loss is higher for companies classified at risk by the CERVED (with a probability of 0.417 against 0.684). The probability of having an operating loss is significantly lower in limited companies (with a probability of 0.308 against 0.552). Finally, companies that have a high turnover and have made innovation investments in the latter 4 years have a significantly lower probability (with a probability of 0.368 compared to 0.667) of having an operating loss.

References

[1]   Bradburn, N.M., Sudman, S., Wansik, B. (2004). Asking Questions: The Definitive Guide to Questionnaire Design – For Market Research, Political Polls, and Social and Health Questionnaires, John Wiley and Sons.

[2]   Brasini, S., Freo, M., Tassinari, F., Tassinari, G. (2002). Statistica aziendale e analisi di mercato, Il Mulino, Bologna.

[3]   Chen, J., Hughes C., Sensini, L. (2014). Credit risk measurement of SMEs, ICEFR, pp. 139-163.

[4]   Chen, J., Sanchez J.A., Sensini, L. (2014). Growth opportunities and ownership structure as determinants of italian firms leverage, ACRMC, pp. 365-386.

[5]   Cicchitelli, G., Herzel, A., Montanari, G.E. (1997). Il campionamento statistico, Il Mulino, Bologna.

[6]   Cochran, W.G. (1977). Sampling Techniques, Wiley, New York.

[7]   Coda V. (1992), L'orientamento strategico di fondo, Utet, Torino.

[8]   Demsetz, H., Lehn K. (1985). The structure of corporate ownership: causes and consequences, Journal of Political Economy, 93 (6) (1985). pp. 1155-1177

[9]   Dobson, A.J., Barnett, A.G. (2008). An introduction to Generalized Linear Models, Third Edition, Chapman & Hall/CRC Text in Statistical Science.

[10] Fama, E.F., Jensen, M.C. (1983). Separation of ownership and control, The Journal of Law and Economics, 26 (2) (1983), pp. 301-325.

[11] Frosini, B., Montinaro, M., Nicolini, G. (1994). Il campionamento da popolazioni finite, Il Mulino, Bologna.

[12] Helfert, E.A. (2000). Techniques of Financial Analysis, Tenth Edition, Irwin Mc-Graw-Hill.

[13] Hosmer, D.W., Lemeshow, S. (2000). Applied Logistic Regression, John Wiley and Sons.

[14] Jensen, M.C., Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure, Journal of Financial Economics, 3 (4) (1976). pp. 305-360

[15] Marchini I. (1995). Il governo della piccola impresa. Le basi delle conoscenze, Vol. I, Ins-Edit, Genova.

[16] McConnell J.J., Servaes H. (1990). Additional evidence in equity ownership and corporate value

[17] Journal of Financial Economic, 27, pp. 595-612

[18] McCullagh P., Nelder, J.A. (1989). Generalized Linear Models, Second Edition, Chapman & Hall/CRC.

[19] Pedersen, T., Thomsen S. (1997). European patterns of corporate ownership Journal of International Business Studies, 28 (4) (1997). pp. 759-778.

[20] Porter M.E. (1980). Competitive Strategy, The Free Press, New York.

[21] Porter M.E. (1985). Competitive Advantage, The Free Press, New York.

[22] Ricci, R., Colombini, F. (1987). La finanza delle piccole e medie aziende, Giuffrè, Milano.

[23] Sensini L., (2017). Capital Structure Determinants in Italian Sme's: An Empirical Study, ICAFR, 124-144.
[24] Westhead, P., Howorth C. (2006). Ownership and management issues associated with family firm performance and company objectives, Family Business Review, 19 (4) (2006), pp. 301-316.