DOES THE NETWORK AFFECT FIRMS' PERFORMANCE? THE CASE OF ITALIAN AGRI-FOOD SECTOR

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Abstract

A flourishing literature recognizes the merits of improving the performance of participants to business networks. This effect can be particularly significant in sectors with high concentration of micro and small firms. This study considers the case of Italian agri-food networks with legal personality.

According to data from Italian Business Register, up to February 2020, we found 23 agri-food networks with legal personality, established in the period 2014-2017 by 172 firms. Using Orbis by BvD database, we collected balance sheet data, from 2011 to 2018, for 30 companies. Through non-parametric statistical analysis, we assessed the performance of these firms based on 12 balance sheet indicators, before and after the entry of companies into a business network.

Results show that the economic indicators of firms had a positive trend after joining the network, but out of the 12 analyzed indicators before and after entering the network, differences are statistically significant just for 4 indicatores (Turnover; Shareholders funds; Return on equity, ROE; Return on capital employed, ROCE).

Keywords

Business networks; Firms' performance; Agri-business.

JEL Classification

L14, L25, Q13

Introduction

Aggregations may allow smaller firms to overcome some major difficulties due to their size (Gronum, Verreynne and Tim Kastelle, 2012). Networked companies can, in fact, share resources, skills and know-how, thus increasing their competitiveness (Ratajczak-Mrozek, 2013). Benefits for firms joining a business network can be classified into three main categories: strategic and operational advantages; commercial advantages; financial advantages. The joint effect of these benefits should hopefully translate into a better performance of companies.

In Italy, in 2009 a special regulation was introduced for business networks. The legislation, which leaves the parties wide autonomy in defining forms and methods of collaboration, provides for two forms of aggregation: the network-contract (without legal personality) and the network-subject (with legal personality). Law 116/2014 subsequently introduced the particular type of the agricultural network, to encourage aggregation and cooperation between agricultural enterprises and promote processes of reorganization, modernization and development of the agricultural sector.

This study aims to analyze the phenomenon of business networks in the Italian agri-food sector. In particular, the reference is to networks with legal personality and their performances. Following a recent study (2017) by Confindustria (the Italian Association of Industries), Istat (Italian Institute of Statistics) and Retimpresa (Italian Confederal Agency for Business Networks), which highlights a positive 'network effect' on firms' performance, also in terms of turnover and employees, there is the idea of our research.

The paper is organized as follows: the first paragraph is for literature review; the second paragraph is for empirical analysis (methodology and results). The last section concludes by commenting main findings.

Literature review

Many contributions in literature firstly addressed the managerial and governance implications for firms participating in a business network (Hakansson and Ford, 2002; Ritter, Wilkinson and Wesley, 2004; Todeva, 2006; Boldureanu et al., 2016; 2017). However, over the time, academic and professional research has also been very focused on the impact of joining a business network on firms'performance.

Luo and Chen (1997) explore the systematic linkage between networking and firm performance from a business strategy perspective, for Chinese firms. Their findings show that network-based business variables have a profound and positive impact on firm efficiency and growth.

Along the same line, Watson (2007) highlights a significant positive relationship between networking (particularly with formal networks) and both firm survival and, to a lesser extent, growth, but not ROE.

Parker (2008) analyzes the issue of formal business networks, performing an economic analysis to show how formal business networks can improve efficiency and social welfare. The author also derives conditions for the existence and equilibrium size of formal business networks.

Gronum, Verreynne and Tim Kastelle (2012) analyzed the role of networks focusing on small and medium-sized enterprise innovation and performance. The authors show that strong, heterogeneous ties improve innovation in SMEs, while connections between network ties and firm performance are more complex as the positive association is mediated by innovation. Consequently, SMEs should only concentrate on cultivating and maintaining networks if they lead directly to improvements in innovation.

Mittal et al. (2019), exploring among different types of business networks, suggest that formal business networks are significantly and positively related to firms' performance.

Over the time, the theme of the business network has been increasingly linked to that one of business innovation and internationalization, as a driver of regional development. The vocation for innovation and internationalization of firms have established themselves as discriminating elements in determining the impact of joining a business network on firms' performance; the adoption of a counterfactual approach in these evaluations could, therefore, be useful to isolate the 'network effect' from the influence exerted by other factors (economic cycle, company size, business location, technology, internalization, access to finance, management skills, etc).

With reference to the specific objective of this research, two interesting studies deserve to be mentioned: the first one is by Cantele, Vernizzi and Ricciardi (2016), the second one is by Compagnucci, Cavicchi and Spigarelli (2019). Cantele, Vernizi and Ricciardi (2016), through a comparative study, focus precisely on the effect of business network contract, as introduced in Italy from a specific legislation in 2009. The authors outline under what conditions the network contract can be leveraged to improve the ability of the participating firms to face the new global competitive environment.

Compagnucci, Cavicchi and Spigarelli (2019) examine the network contract in the Italian agri-food industry: through a multiple case study approach, the authors highligh that the network contract can bring benefits for companies, while triggering competitiveness, innovation and sustainability at local level.

Furthermore, other studies were conducted on business networks in Italy, with reference to specific sub-sectors of the agri-food, such as the wine sector (La Sala, Silvestri and Contò, 2017).

Empirical analysis

Methodology

The research is based on comparing the financial results of the companies before and after joining the business network, in order to identify whether entering the network positively influences the economic indicators of the firms and to find out which of the economic indicators (12) had a positive, statistically significant evolution.

A number of 30 companies from different regions in Italy were analyzed. Table 1 shows the breakdown of firms by region, while Table 2 presents the distribution of companies according to the year they joined a network.

Table no. 1 The distribution of companies by region

Region	Frequency	Percent
Puglia	9	30.0
Umbria	7	23.3
Veneto	4	13.3
Liguria	3	10.0
Campania	2	6.7
Basilicata	1	3.3
Marche	1	3.3

Sicilia	1	3.3
Toscana	1	3.3
Trentino Alto Adige	1	3.3
Total	30	100.0

Source: Own calculation using Orbis by BvD database.

It is noted that over 50 percent of companies come from two regions: Puglia and Umbria. About the year of joining the business network, the years in which most companies joined the network are 2017 (53.3% of companies) and 2015 (40%).

Table no. 2 The distribution of companies by year of joining the network

Network year	Frequency	Percent
2014	1	3.3
2015	12	40.0
2016	1	3.3
2017	16	53.3
Total	30	100.0

Source: Own calculation using Orbis by BvD database.

The economic indicators analyzed were: Operating revenue (turnover), P/L before tax, P/L for period (Net income), Cash flow, Total assets, Shareholders funds, Current ratio (x), Profit margin (%), ROE using P/L before tax , ROCE using P/L before tax , Solvency ratio (Asset based) (%), Number of employees.

Results

Due to the limited number of firms with available data on Orbis database (30 companies), we perform some non-parametric statistical analysis (Chi square test and ANOVA Friedman test). The companies were divided into two categories, according to the year they joined a business network: the first group, with 2017 as the joining year; the second one with the joining year before 2017 (2014, 2015 and 2016). It was tested whether there are statistically significant differences in the following economic indicators before and after the date of entry into the business network.

The statistical analysis was done on each indicator as follow:

1. Turnover - although between the analyzed years (2014-2018) in the turnover there are statistically significant differences (chi-square value $\chi 2 = 10.895$, $p = 0.028$), a normal thing considering the diversity of the analyzed economic activities, the differences of the turnover are not statistically significant by the network joining year ($p = 0.312$). In conclusion, although the average turnover of the analyzed companies has slightly increased during this period (from 9.568 in 2014 to 9.738 in 2018), this result is not caused by joining the network.

2. P/L before Tax - for this indicator, there are no statistically significant differences bin the observation period 2014-2018 (chi square value $\chi 2 = 4.686$, $p = 0.321$). Also, the year of business network entry does not significantly influences the value of P / L before Tax ($p = 0.261$).
3. P / L for period [= Net income] - the differences recorded between 2014-2018 years are low and are not statistically significant (chi square value $\chi 2 = 4.648$, $p = 0.325$). The year of joining the business network did not in any way influence the evolution of this indicator ($p = 0.261$).
4. Cash flow - the differences in the period 2014-2018 year are not statistically significant (chi square value $\chi 2 = 3.733$, $p = 0.443$). Also, the year of network entry does not influence the evolution of this indicator ($p = 0.687$).
5. Total assests - the differences recorded between 2014-2018 year are not statistically significant (chi square value $\chi 2 = 5.676$, $p = 0.225$). Also, the year of joining the network does not influence the evolution of this indicator ($p = 0.455$).
6. Shareholders funds - for this indicator, the differences recorded over 2014-2018 years are statistically significant (chi square value $\chi 2 = 23.581$, $p = 0.000$). In this case, the lower values of Shareholders funds are associated with 2014, 2015 and 2016 year and higher values of Shareholders funds with 2017 year ($p = 0.028$). It could beargued that after joining the business network, the shareholders funds had increased, so the shareholders had to bring more capital into the business.
7. Current ratio - in the case of this indicator, there are no statistically significant differences between the years analyzed 2014-2018 (chi square value $\chi 2 = 1.333$, $p = 0.856$). Also, the year of joining the business network does not significantly influence the current ratio ($p = 0.261$).
8. Profit margin - the differences between 2014-2018 years are not statistically significant (chi square value $\chi 2 = 4.152$, $p = 0.238$). Also, the year of network entry does not influence the evolution of this indicator ($p = 0.397$).
9. Return on equity (ROE) ¬- the differences in these years are statistically significant for this satio (chi square value $\chi 2 = 9.420$, $p = 0.024$). In this case lower ROE values are associated with 2014, 2015 and 2016 years and higher ROE values with 2017 year ($p = 0.028$).
10. Return on capital employed (ROCE) ¬- in the case of this indicator, the differences in these years are statistically significant (chi square value $\chi 2 = 14.779$, $p = 0.005$). In this case lower ROCE values are associated with 2014, 2015 and 2016 years and higher ROCE values with 2017 year ($p = 0.015$).
11. Solvency ratio - the differences in the period 2014-2018 are very small and not statistically significant (chi square $\chi 2 = 1.129$, $p = 0.875$). The joining year of business network does not influence the solvency ratio ($p = 0.395$).
12. Number of employees - the differences over 2014-2018 years are not statistically significant (chi square $\chi 2 = 1.973$, $p = 0.741$) for number of employees. Also, the year of joining the business network does not influence the evolution of this indicator ($p = 0.285$).
Table 3 summarizes results of Chi square analysis

Table no. 3 The value of chi square test

Indicator	Chi square value ($\chi 2$)	p value
Turnover	10.895	p=0.028
P/L before Tax	4.686	p=0.321

P/L for period	4.648	p=0.325
Cash flow	3.733	p=0.443
Total assests	5.676	p=0.225
Shareholders funds	23.581	p=0.000
Current ratio	1.333	p=0.856
Profit margin	4.152	p=0.238
ROE	9.420	p=0.024
ROCE	14.779	p=0.005
Solvency ratio	1.129	p=0.875
Number of employees	1.973	p=0.741

Source: Own calculation using Orbis by BvD database.

Conclusions

Based on our analysis, we found that the year in which the companies joined the business network did not significantly influence the economic indicators considered. However, we tried to highlight the differences existing in the economic indicators before and after entering the business network. For this purpose, we reported the economic indicators from the joining business network year to the next year of joining business network and obtained new relative indicators. These economic indicators were summed and a global average of new indicators was calculated. Thus, we found that out of the 30 companies, 12 companies (40 %) had better values of the economic indicators after joining the business network, 6 companies (20 %) had worse values of the indicators and for the other 12 companies (40 %), this evolution could not be quantified due to lack of data (table 4).

Table no. 4 The distribution of companies by year of joining the network

The type of company	Frequency	Percentage
Companies with better indicators after joining the network	12	40.0
Companies with worse indicators after joining the network	6	20.0
Companies with no possible data to calculate	12	40.0
Total	30	100.0

Source: Own calculation using Orbis by BvD database.

As the number of companies with better results is double (40%) compared to the companies with worse results (20%), we can conclude that joining the business network can bring better results for firms, although this result is not significant in terms of statistics.

Despite the fact that the economical indicators had a positive evolution after joining the network, out of the 12 indicators analyzed before and after entering the network, only for 4 indicators this difference is statistically significant: Turnover, Shareholders funds, Return on equity (ROE) and Return on capital employed (ROCE).

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