

Relational Capital to Revamp the Pink Side of Agri-food



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Abstract The current economic scenario has increasingly challenged Small and Medium-sized Enterprises (SMEs), threatened their competitiveness, and endorsed the gap with larger companies. To reduce this gap and foster the innovation process in SMEs, the Italian legislator regulated the “innovative start-up” (IS). He recognised some benefits in terms of tax advantages. The substantial requirements defining ISs confirm the critical role literature has attributed to Intellectual Capital (IC) in elaborating innovative elements. In particular, the research focuses on Relational Capital (RC), the IC’s component that encourages a precious knowledge-sharing process enriching collaborative innovation and reactive resilience. Its relevance is maximum in female enterprises, where all SMEs’ typical structural limits are amplified, especially the difficult access to credit, significantly affecting the firm’s innovative capability. Given this, the present research aims at investigating the RCs contribute to a reality that is innovative by definition, namely women-led innovative start-ups (WIS). In particular, the authors focus on the agri-food industry, a milestone of the Italian economy strictly anchored to the tradition and still recording a low research level.

In particular, the paper aims to answer the following Research Question (RQ).

RQ1: How does RC affect innovation and resilience in WIS operating in agri-food?

The present work uses an exploratory, descriptive qualitative approach, analysing a single case study. The research is performed during the pandemic emergency and applies the CAOS (an Italian acronym for “Caratteristiche personali, Ambiente, Organizzazione, Start-up”) model (Paoloni 2021). Data are acquired through a semi-structured interview (Yin, R. K., *Case Study Research*. SAGE Publications,

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Unites States of America, *Design and Methods*, 1984) directly placed by the company's owner.

The present work contributes to expanding literature on intangible resources and gender studies and confirms that RC can help female entrepreneurs overcome crises. Moreover, it offers a specific analysis of innovative female agro-startups.

Findings could be helpful to female agro-food start-ups to recognise the importance of investing in RC to overcome a challenging scenario and help WIS reduce the gender gap and, in general, the agro-startups entrepreneurial gap with larger companies.

Keywords Intellectual capital · Crisis · Female entrepreneurship · Innovative start-ups · CAOS model

1 Introduction

Small and medium-sized Italian enterprises (SMEs), which have always constituted the Italian entrepreneurial skeleton, have seen their competitiveness strongly threatened by the markets' evolution and multiplication in recent years (Capozza et al. 2020; Escribano et al. 2009). The Italian legislator has taken specific measures to reduce the entrepreneurial gap between SMEs and larger companies, including regulating a new entrepreneurial configuration: the Innovative Start-up (IS) (Law Decree 179/2012). The requirements established to identify IS confirm the role of Intellectual Capital (IC) in improving the innovative capacity, especially concerning Human Capital (HC) and Structural Capital (SC). Hence, the present research investigates the impact on innovation of the third IC component, Relational Capital (RC). Literature has already confirmed its crucial role in enriching companies' capacity of catching new business ideas, improving firms' innovative capability and resilience. RC's relevance is maximum in female entrepreneurship, where it mitigates financial and managerial lacks.

Although the gender gap has been widely debated, literature has not deepened Women Innovative Start-ups (WIS) as a potential means of empowerment. The present research explores RC's impact on the development of WIS, focusing on a sector that is highly relevant to the Italian economy and identity and is moving its first steps in innovation by combining it with tradition: Agri-food.

In light of this, the study aims at answering the following question.

RQ1: How does RC affect innovation and resilience in Women-led Innovative Start-ups operating in agri-food?

The research wants to contribute to gender studies focused on intangibles, highlighting their innovative value and the close correlation with the ability to adapt to the context, even the critical one. From a managerial point of view, the research shows how careful management of RC is essential to strengthening the business and opening new opportunities.

The work uses an exploratory, descriptive qualitative analysis performed during the pandemic emergency and applies the CAOS model (Paoloni 2021), an interpretative model used in SMEs' studies to analyse RC. The paper is structured as follows. In Sect. 2, the literature review is analysed. In Sect. 3, the methodology is defined. Section 4 applies the CAOS model to the case study. Finally, in Sect. 5, discussions and conclusions are exposed.

2 Literature Review

SMEs represent more than 95% of the Italian enterprises contributing to most of Italian gross domestic product (GDP) (Cortesi, 2004). Nevertheless, they are characterised by undetectable structural limits that find their origin and consequence in a limited economic availability (difficult access to credit, which provokes undercapitalisation, uncertain short-term liquidity availability, insufficient working capital, and inability to attract high-skilled human capital) (Birley & Niktari, 1995). Together with a poor financial culture, all this discourages SMEs' growth and significantly undermines their competitiveness (Sena et al. 2012), provoking a larger and larger gap between big companies and SMEs. The Italian legislator elaborated specific measures to reduce it, including a new entrepreneurial configuration: the Innovative Start-up (IS) (Law Decree 179/2012). Indeed, if previously innovating was a prerogative of the most foresighted enterprises, the market opening and the constant technological progress have made innovation the only competitive advantage source to survive in a fluid and smart and demanding market (Adam and Alarifi 2021). The legislature's goal is to develop a dynamic and competitive innovation ecosystem, create new opportunities for doing business, and encourage employment; it is intended to promote a sustainable growth strategy. IS is a corporation, also established as a cooperative, which meets the following formal requirements (DL 179/2012, art. 25, comma 2): (i) it is a new company or one established no more than five years ago; (ii) is resident in Italy, or another country of the European Economic Area, but with production headquarters or branch in Italy; (iii) has an annual turnover of fewer than five million euros; (iv) is not listed on a regulated market or a multilateral trading platform; (v) has not distributed profits; (vi) has as its exclusive or main corporate purpose the development, production, and exchange of a product or service with high technological value; (vii) is not the result of a merger, demerger, or sale of a company branch. Finally, a start-up is innovative if it meets at least one of the following three substantial requirements: (i) it incurs expenses in R&D and innovation equal to at least 15% of the greater value between turnover and cost of production; (ii) employs highly qualified personnel (at least 1/3 PhD, PhD students or researchers, or at least 2/3 with a master's degree); (iii) is the owner, depositary, or licensee of at least one patent or owner of registered software. In addition, Decree-Law no. 34 of May 19, 2020 (the so-called Relaunch Decree) introduced measures to strengthen and support the ecosystem of innovative start-ups, including, for example, the possibility of raising capital through equity

crowdfunding campaigns; access to internationalisation services for businesses; tax incentives for investment in the capital of innovative start-ups; and free and simplified access to the Guarantee Fund for SMEs. Indeed, the three substantive requirements highlight the relevance of financial resource to be available for investment. In the first case, it is explicitly required to invest financial resources in R&D. In contrast; the other two requirements indirectly ask the company to invest a significant amount of money in enriching its Intellectual Capital (IC), namely the knowledge-based resources and capabilities that allow a company to create value (Bueno et al., 2016). According to some scholars, IC includes Human Capital (HC), referring to employees' capabilities (Andrikopoulos 2010) whose the second requirement requests a high-skilled compound; Structural Capital (SC) definable as the knowledge strictly connected to the business, namely patents and licences (Aramburu and Saenz 2011) as required by the third requirement; and RC, configured as the company's bonds set up to carry out the business activity (Paoloni 2021). Although RC may seem negligible for an innovative process compared to HC and SC, it represents the main access door to the needed financial sources in some scenarios. That happens especially in female enterprises, where the typical SMEs limits are emphasised. Indeed, according to national and international literature, female entrepreneurs are considered less appealing to investors mainly because of three reasons: structural characteristics (Alesina et al. 2013); personal choices (Watson 2006; Heilman & Chen, 2003); and a stricter attitude towards credit institute. Firstly, female enterprises are usually smaller, younger, and, consequently, have less capital stock (Cesaroni & Sentuti, 2014). Moreover, they are over-concentrated in sectors with low technological levels, hence less attractive to investors (Aernoudt & De San José, 2020). Secondly, women have a lower risk aversion which could impede their entrepreneurial spirit, hindering them from undertaking new businesses or innovating existing ones (Dohmen and Falk 2011). It can be due to poor financial literacy (Sena et al. 2012); the voluntary choice to keep the business small to preserve a work–life balance. Finally, banks' willingness to grant financing is more remarkable for bigger and older companies, having more work experience and can offer more guarantees (Cesaroni & Sentuti, 2014). Indeed, data shows that although female enterprises are not charged higher interest rates, they are more likely to be asked for collateral and face greater limitations in accessing credit (Bellucci 2010). Literature does not agree about a discriminatory attitude towards credits institutes (Cesaroni and Sentuti 2015). Still, it recognises banks' preference for credit applicants with older experience, high reliability, and a significant solidity. Male-led enterprises, which have been operating on the market for a longer time, have a higher risk aversion and are bigger and better correspond to these requirements. Therefore, women tend to rely more on personal loans—obtained mostly from family and friends (Coleman and Robb 2009). In other terms, they resort to RC. RC has a key role in female entrepreneurship in many guises, favouring a precious knowledge-sharing process. It covers financial needs (Cesaroni and Sentuti 2015); enriches the management competencies (Cosentino & Paoloni, 2021); increases the enterprise's creative ability, combines internal and external knowledge (Ali et al. 2021); and improves the company's stability (Prasad

et al. 2015), empowering information that allows it to be more reactive to the possible changes in the market (Jia et al. 2020) and to create new ideas (Di Fatta et al. 2018). The literature recognises a material bond between RC, economic performance, and the company's susceptibility to disruptions since a well-developed RC plays a decisive role in preventing a crisis or in overcoming it (Sardo et al., 2018; Mansion and Bausch, 2020), improving its resilience (Jia et al. 2020), namely the ability of a system to maintain and adapt its essential structure and function in the face of disturbance.

The IS distribution significantly changes according to gender and the sector. Agro-food sector is nowadays moving its first steps in innovation, pursuing its new sustainable goals mainly counting on a trustful network that encourages a precious knowledge-sharing culture (Maizza et al., 2019; Matricano et al. 2021). In recent years, this sector has implemented attractive, innovative solutions resorting to a process of digitalisation: traceability and transparency in the supply chain (Rialti et al., 2022), prevention and enhancement of food surpluses (Secondi et al., 2019), the implementation of production or distribution's green solution. Nevertheless, the level of innovation and technology in the agri-food sector is still inferior. In Italy, the market growth potential of "Agriculture 4.0" and "Farming 4.0" solutions is very high, but the adoption of the related technological innovations is still low (Scuderi et al., 2022). The reason for this backwardness lies in the unawareness of most small agricultural producers (Scuderi et al., 2022), also due to their high average age, considering that the farms managed by over 64 years old give to the formation of the national standard production a more significant contribution than that provided by the farms managed by younger people (ISTAT, 2020). Nowadays, only 0.7% of innovative Italian start-ups operate in this sector (Paoloni and Modaffari, 2018; Modaffari and Della Corte 2021), whose 11% are WIS.

3 Research Method

The present work uses an exploratory, descriptive qualitative approach, analysing a single case study (Benbasat et al. 1987; Yin 2009). The research is performed during the pandemic emergency and applies the CAOS model (Paoloni 2021), an interpretative model used in SMEs' studies since it allows a deep analysis of RC. Data are acquired through a structured interview (Yin 1984) directly placed by the company's owners. It lasted two hours and was performed on an online platform (Zoom). The selected company is an innovative Italian start-up whose core business is microgreens cultivation through the aquaponics technique.

3.1 Methodological Background

The CAOS model (an Italian acronym for “Caratteristiche personali, Ambiente, Organizzazione, Start-up”) was born in 2011 to measure RC’s strategic role in female SMEs (Paoloni, 2011), which nowadays finds transversal application in the business world (Paoloni et al. 2021; Paoloni et al. 2021). It is based on four variables. The entrepreneur’s characteristics (C), namely the personal dimension, involve the entrepreneur’s ambition and role in the organisation, the leadership style, and the decision-making process.

Then, the external environment (A) represents the macro-economic dimension. It clarifies what kind of exchanges within the domain is set, what needs emerge, and what development possibilities, ideas, or threats derive from them. The organisational aspect (O), the microeconomic dimension, describes the entrepreneur’s objectives, defines the profit position among them, and identifies how the responsibilities are shared. Finally, the variable S must be interpreted as the moment the company is observed, regardless of the specific phase in the company’s life (Paoloni and Modaffari 2021). Our research considers 2020, namely one year later the start-up’s birth, in the middle of the pandemic crisis due to COVID-19.

The C.A.O.S model investigates the relationship between these variables. Figure 1 shows the so-called cardinal bonds (Paoloni 2021), classified in:

- first-type bonds (S-C/C-S) involve all the relationships that the entrepreneur activates because of personality, needs, personal goals
- second-type bonds (S-O/O-S) are created to organise the company and clearly define the functions, roles, tasks, and responsibilities
- third-type bonds (S-A/A-S) concern the company’s relationships with the surrounding environment where it is inserted.

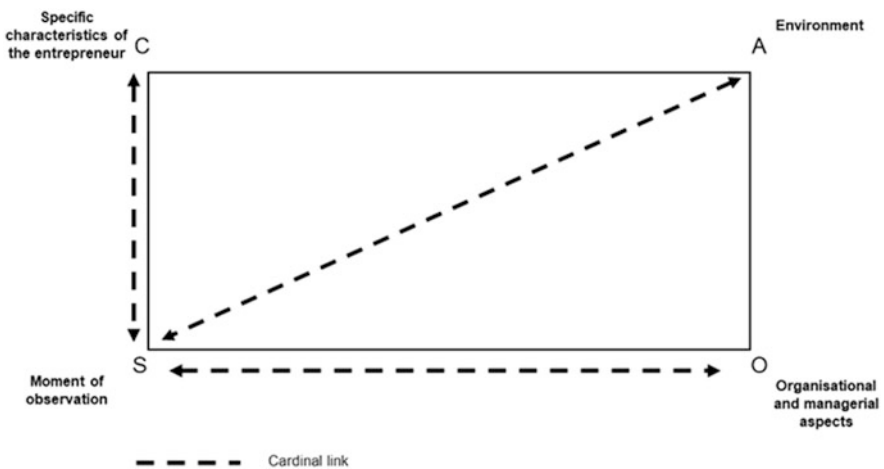


Fig. 1 C.A.O.S. model. Source: Paoloni (2021) p. 88

Furthermore, the CAOS model classifies relationships according to their nature and duration. As for their character, it distinguishes between formal and informal bonds. Traditional bonds are based on a legal, managerial, or economic obligation, whereas informal bonds originate from personal or family choices. Concerning the duration, permanent relationships are consolidated by trust and mutual financial benefit, making them lasting. Temporary relationships, instead, consist of occasional exchanges.

4 The Case Study

The innovative start-up authors considered operates in the agri-food. It was born in 2019, and it is composed of three partners: the company administrator, a 29-year-old woman who holds 20% of the shareholding, and her parents, controlling 80%. This start-up gained the “Innovative” status satisfying the first substantial requirement. The business idea consists of microgreens’ indoor cultivation. Microgreens are undeveloped vegetables containing 20% more nutrients than ordinary vegetables. Their cultivation is based on a technique known as aquaponics, a combination of aquaculture and hydroponic cultivation to achieve a symbiotic environment. The water in which the fish are reared is deprived of solid waste through a filtering system and transmitted to the tanks where the plants absorb the nutrients. It is a fascinating project of the circular economy. Indeed, there is no soil exploitation, and the water waste is zero without considering the dispersion by evaporation. It helps to reuse disused sheds where the tanks are placed and, due to the interdependence between plants and fish, the absence of antibiotics and pesticides in the products is guaranteed.

The following paragraph analyses the company’s RC by applying the CAOS model.

4.1 Personal Characteristics (C)

The young entrepreneur created her company in 2019 to take advantage of her degree in environmental science, supported by her father’s entrepreneurial experience. Her parents co-participate in the business with a majority stake and support it financially, operationally, and strategically. Indeed, they are the leading investors in the industry, but they also operatively work for the start-up and participate in the decision process.

4.2 *Enterprise Environment (A)*

The business was founded in a small village in Northern Italy. The activity occurs in a two-storey warehouse: the lower part is used for aquaculture, i.e., fish breeding, while the upper floor houses the tanks with the plants. The city environment is perfect for aquaponics, which does not need fields. Indeed, in the city it is easier to find convertible warehouses where placing tanks and restaurants interested in buying fish and microgreens. Concerning the socio-economic context, Italy has not developed a demanding microgreen market. Indeed, they are still almost unknown. This unconsciousness translates into detached, limited, and inexperienced support from category associations, which only pushed the start-up to participate in the European call for funding for innovative start-ups. On the other hand, relevant cooperation involves the start-up and another microgreen producer located in the South of Italy, which has become a helpful consultant and a friend. External experts, like nutritionists or biologists, also make an essential contribution, who helping the entrepreneur comprehend the microgreens' peculiarities and future potential uses. Potential customers also represent an important relationships to cultivate; they involve new restaurants and new companies interested in introducing microgreens in their production process.

4.3 *Organisational Aspects (O)*

The selected start-up is a family business. Indeed, the entrepreneur's parents have managerial, financial, and operational roles; there are no employees except for them. The company's primary purpose is to minimise the environmental impact of its production process and differentiate itself as a sustainable, non-polluting, and circular activity that ensures high product quality. No pesticides can be used on the plants; otherwise, they would harm the fish and, vice versa, no antibiotics or hormones can be used on the fish as they would break the plants; this contributes to industrial warehouses' recovery tanks being placed.

4.4 *Temporal Element (S)*

The enterprise is observed during the current pandemic crisis, when the business development is severely hampered, especially for SMEs. Agri-food is among the most affected by the restrictive measures to limit the virus spread. This observation moment consists of the company's start-up phase when it has tested the aquaponics' efficacy and is looking for new clients.

4.5 Analysis of Relationships

The first cardinal links (S-C) involve the founder and her parents, who supported her by investing the first capital injection and investing in R&D even during a crisis. Moreover, they take part in the decision process and act in the operative role. These bonds are informal and permanent.

Because of the organisational simplicity, these links coincide with the second cardinal ones (S-O). The three members have a specific role assignment: the founder manages the relationships with stakeholders; her father takes care of economic clichés, and her mother takes care of microgreen’s technical aspects. However, the organisation is flexible and fluid. These bonds are informal and permanent.

The third cardinal links (S-A) concern the relationships with the institutional environment, external experts, and potential clients. The former refer to universities, trade associations, and European public entities, whose support is defined as “marginal and disappointing” by the entrepreneur. Instead, the external experts are relevant for the current and future business development. Potential clients are indistinctly restaurants or other companies. They all represent formal and temporary relationships. Instead, the consulting and friendship ties established with the other producer represent an informal and permanent relationship because it is not regulated by any contract, but a mutual need for knowledge-sharing supports it (Fig. 2).

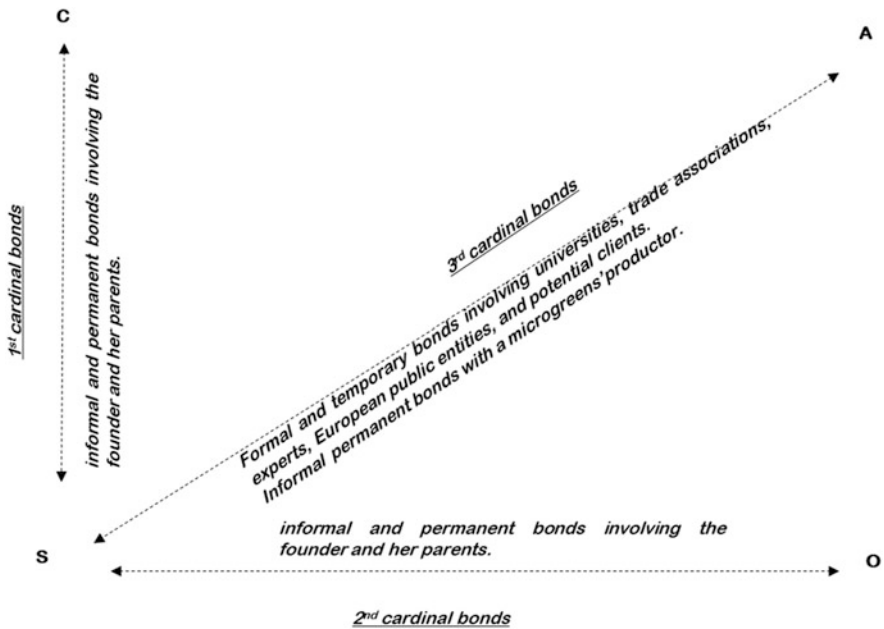


Fig. 2 The C.A.O.S. model framework. Source: Authors

5 Discussion and Conclusion

The innovative start-up is a reality born to strengthen the foundations on which the Italian economy rests: the SMEs (Law Decree 179/2012). Innovating is the only winning strategy to obtain a competitive advantage that the company can exploit to be recognised on the market and offer a product or service that meets needs (Adam and Alarifi 2021). The literature recognises Innovation as a strategic element, especially in crises, affecting the SMEs' resilience making them more open to new business opportunities and more able to catch them (Ciasullo et al., 2022; Al-Hakimi et al., 2021; Anggadwita et al., 2021).

However, this legislative support for entrepreneurship has been received differently based on the entrepreneur's gender and the sector in which they operate. Firstly, WIS deals with severe constraints that hinder its growth, including financial constraints. The difficult access to credit significantly affects their innovative attitude and, consequently, their ability to resist and overcome crises. The gender literature agrees on RC's non-negligible role in supporting female entrepreneurship by mitigating its limitations. On the other hand, concerning the sector where WIS operates, agri-food is firmly rooted in tradition. Still, it registers a low rate of innovation, despite the considerable progress made in recent years.

This analysis wants to verify the RC's role in stimulating the development of a legally recognised reality as innovative but operating in a sector with a low propensity for innovation. The work answers the RQ: How does RC affect innovation and resilience in WIS operating in agri-food?

The case study analysed confirmed the RC's relevance in developing its innovative capabilities during COVID, preserving its resilience. In particular, informal permanent bonds are essential, as is typical of SMEs and start-ups (Paoloni 2021). In this case, the cardinal bond of the first and second type, coinciding with the relationship between the entrepreneur and her parents, constitutes the primary support to the operational activity of the company, through directly working, and to R&D, through financial investments. Indeed, her parents offered the company resources and time to invest in R&D. During the crisis period when the company's main clients (the restaurant) were closed; the start-up was able to focus on the study of new uses of microgreens to expand the pool of clients in the function of benefits of the products offered. With this purpose, the start-up established temporary and formal bonds with a new company studying with it a new product incorporating microgreens. Therefore, the permanent and informal bonds allowed the company to establish new temporary and formal ones, which would represent new opportunities for profit through the development of innovative solutions concerning new outlet markets. This allowed the start-up to emerge from the period of crisis and come out of it in a new, versatile garb, strengthened by the diversification of the outlet market.

In conclusion, the analysis confirms the irreplaceable role of relational capital in supporting the development of innovative solutions, which fosters business resilience.

The research wants to contribute to gender studies focused on intangibles, highlighting their innovative value and the close correlation with the ability to adapt to the context, even the critical one. From a managerial point of view, the research shows how careful management of RC is essential to strengthen the business and, at the same time, open to new opportunities.

The application of a single case study could represent a research's limit. Thus, in the future, the authors aim at replicating the analysis by considering a more comprehensive sample.

Future research perspectives could focus on the study of other firms to acquire more data on the topic of innovation in the agri-food sector and how intangible resources could contribute to start-up resilience. Focusing on gender studies, the authors will compare any differences between start-ups run by female and by male entrepreneurs.

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