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RESOURCES AND COMPETENCIES IN THE FIELD OF R&D IN THE OPINION OF DAIRY COOPERATIVES FROM ŚWIĘTOKRZYSKIE AND MAŁOPOLSKIE VOIVODESHIPS

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Purpose: The aim of the paper is to identify the importance and the state of R&D resources and competencies of selected dairy cooperatives from Świętokrzyskie and Małopolskie voivodeships in comparison to their competitors.
Design/methodology/approach: Direct interviews using a questionnaire survey were conducted among representatives of cooperatives representing 41% of the population, which resulted from the willingness to participate in the survey.
Findings: Cooperatives are aware of the importance and the state of resources and competencies in the field of R&D in comparison with competition. The importance that cooperatives from two neighboring voivodeships, Świętokrzyskie and Małopolskie, place on the aforementioned resources and skills in the field of R&D, differs. Research and development strategic potential is in most indicated elements similar to that of competition.
Originality/value: The comparison of the importance and state of resources and competencies in the field of R&D of selected cooperatives from two different voivodships.
Keywords: resources, competencies, R&D, cooperatives.
Category of the paper: Research paper.

1. Introduction

The area of a business's activities known as research and development (R&D) looks for information to help it create, develop, and improve its technology, services, goods, or procedures. Investing in research and development not only creates new products but also enhances existing ones with new features, linking disparate aspects of a company's business plan and strategy. According to OECD research and experimental development (R&D) comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge (OECD, 2015, p. 44). R&D creates breakthroughs and improves the

company's capacity to recognize, absorb, and use knowledge from environment (Cohen, Levinthal, 1989, p. 569). Traditionally, R&D has been viewed as a single function that focuses the company's efforts on creating new products and technologies. However, as time has gone on, this function has taken on many functions within the company and has been managed in various ways (Piachaud, 2004, p. 87). As Pisano indicates decisions made in 4 strategic levels: architecture, processes, people, and portfolio constitute the R&D strategy. The decisions made on the organizational and geographic structure of R&D are referred to as architecture. The official and informal methods used to do R&D are called processes. One of the most crucial components of an R&D system is people and their competencies. The term "portfolio" describes the intended distribution of resources among various R&D project kinds as well as the standards by which initiatives are arranged, given priority, and chosen (Pisano, 2012, pp. 3-5).

As it is seen the crucial role in activities connected with R&D play resources and competencies since without them, it is impossible to work in this field. Building a portfolio of business resources and integrating them to develop capabilities that will be utilized to generate and maintain value for owners and consumers is the holistic process of resource management.

Building a portfolio of business resources and integrating them to develop capabilities that will be utilized to generate and maintain value for owners and consumers is the holistic process of resource management (Sirmon, Hitt, Ireland, 2007, p. 273). An organization's resources are its strengths that it can utilize to develop and carry out strategy (Barney, 1991, p. 101) and to establish a situation where its resource position either directly or indirectly hinders competitors' ability to catch up to it (Wernerfelt, 1984, p. 173). Resources and skills must be rare, valuable, non-replaceable, and non-imitable (Bowman, Ambrosini, 2003, p. 291) in order to be considered an organization's strategic advantage (Lichtarski, 2001, pp. 37-38). An organization with strategic resources can gain an advantage over others since they create economic value, and resource-based benefits can be realized over an extended period of time because strategic resources are difficult to duplicate (Crook, Ketchen Jr., Combs, Todd, 2008, p. 1144). They are also advantageous to the organization since they are non-substitutable, meaning that other resources that have the same effect cannot simply replace them (Bowman, Ambrosini, 2003, p. 292). Therefore, the key task lies with the research and development sphere of the enterprise. That is why executives need to understand the value and current condition of R&D resources and competencies, though, in order to properly manage them for the growth of the organization as companies can establish a (long-term) competitive advantage by efficiently developing, utilizing, and (re-) allocating their resources (Barney, 1991). A company may perform better if it can allocate resources to certain innovative endeavors. Firms' competitive advantages are derived from the way they use their resources as well as from their unique resources (or the resources made available to them through internationalization) (Luo, 2004). The learning process that distinguishes such innovative activities is significantly influenced by R&D activities (basic research, applied research, and development) (OECD, 2015) and a company's competitiveness is created and maintained in large part by the competencies of its R&D

specialists. This is because the skills of R&D professionals that improve the organization's efficiency and efficacy in creating new goods and processes are crucial to a company's ability to maintain a competitive edge over time. As it was noticed by Wu (2009) most businesses constantly need qualified technical personnel to handle the effects of technological progress and systematic development of competencies provides organizations with a strategic advantage. Competencies determine the uniqueness of the enterprise, are challenging for competitors to replicate, and stem from the organization's ongoing learning and growth (Kossowska, Sołtysińska, 2002, p. 12). Therefore, the aim of the paper is to identify the importance and the state of R&D resources and competencies in the opinion of head managers of selected dairy cooperatives from Świętokrzyskie and Małopolskie voivodeships in comparison to their competitors. To achieve the goal, research questions and hypotheses were formulated.

RQ1: Are cooperatives aware of the importance and the state of resources and competencies in the field of R&D in comparison with competition?

RQ2: Is there any difference in assessing the importance of indicated resources and competencies in the field of R&D between cooperative from two neighboring voivodeships, namely Świętokrzyskie and Małopolskie?

RQ3: What is the strategic potential in the field of R&D of dairy cooperatives claimed to be in comparison to the competition?

H1: Cooperatives are aware of the importance and the state of resources and competencies in the field of R&D in comparison with competition.

H2: There is difference in assessing the importance of indicated resources and competencies in the field of R&D between cooperatives from two neighboring voivodeships, namely Świętokrzyskie and Małopolskie.

H3: Cooperatives' strategic potential in the field of R&D is claimed to be better than that of their competitors.

In order to achieve the goals, answer research questions and respond to the hypotheses, an analysis was carried out based on the results of direct interviews conducted with the help of the questionnaire.

The organization of this paper is as follows. The following section the framework of R&D' resources and competencies are presented. Research findings on the significance and state of resources and competencies in the R&D field of specific dairy cooperatives from the regions of Świętokrzyskie and Małopolskie Voivodeships are highlighted in Section 3. The fourth section provides a summary and refers the hypotheses.

2. The framework of R&D' resources and competencies

Businesses must introduce innovations more quickly due to the increased turbulence in the environment, which is demonstrated among other things by the notable shortening of product and technology life cycles (Gajdzik, Wolniak, 2022, p. 2). Increasing R&D and innovation stimulation may undoubtedly serve as a foundation for strengthening businesses' competitiveness both domestically and globally. Companie need to anticipate the demands of their customers in advance and prioritize research and development (Szopik, 2007, p. 294). Decisions on how to conduct research and development (R&D) are influenced by the R&D strategy of businesses, which is influenced by the overall strategy of the organization and other functional strategies within the company. The R&D strategy involves developing and executing decisions regarding the fundamental operations of the R&D department. These choices pertain to the effectiveness of the R&D division and the operational, managerial, and supportive procedures, including the technology (consisting of personnel, tools, and machinery) needed to execute these procedures (Kerssens-van Drongelen, de Weerd-Nederhof, Fisscher, 1996, p. 214). Every business must strategically consider whether to outsource a particular R&D project to an outside party or conduct it "in house" using staff, facilities, and equipment owned by the company. The goal is to maximize the return on investment for the resources devoted to the business's technology portfolio (Gutterman, 2023, p. 3). Research and development work is incorporated into the intangible assets of the company and as an individual, unique action aimed at achieving better results as a result of their implementation, it is the company's own product. Intangible assets, and therefore research and development work, are perceived as key competencies of the company (Turek, 2015, p. 214).

Managers also play a critical role. Research results indicate that managers place greater emphasis on competitive factors when making strategic decisions about research and development, particularly when facing strong competition from current rivals or potential new entrants and when they have achieved a leading market share (Cheng, Huang, Wu, 2023).

The correct and well-directed implementation of R&D activities depends on the resources and competencies available in this area. Very crucial in this area are resources and competencies such as (Stankiewicz, 2002, p. 119):

- Possession of own B&R units.
- Amount of the budget for R&D activities.
- Modernity of technical equipment of R&D units.
- Knowledge of staff employed in R&D activities.
- Cooperation with scientific and/or scientific and research institutions.
- The ability to create new products.
- The ability to create new technologies.
- The ability to anticipate changes in technique and technology.
- Degree of computerization of R&D works.

Resources that stimulate research and development are developed and acquired through the following processes (Walas-Trębacz, 2021, pp. 113-114):

- creating human capital (recruitment, training, self-training, and promotion),
- establishing the infrastructure for research and development, which includes design offices, patents, control and monitoring tools, research laboratories, R&D departments, etc.),
- creating IT systems with databases, expert systems, decision support systems, and information on rivals, suppliers, and customers, among other things,
- developing sets of internal and external standards, registers, process descriptions, instructions, and applicable laws for the business,
- forming task groups to complete both short- and long-term tasks (R&D work) and planning how they would operate,
- forming organizational structures, establishing lines of communication, gaining and disseminating information, enhancing expertise, etc., in order to shape the enterprise's structural capital,
- building a network of connections with outside organizations in order to collaborate on R&D projects,
- setting aside money for research and development.

Because they are vital to the processes of innovation, own R&D units and their activities are crucial to businesses. This is due to the following factors: 1. own ideas are implemented most successfully; 2. there is a direct correlation between an organization's research and development efforts and the innovations that emerge within it; and 3. when conducting R&D, businesses prioritize using their findings practically and tailoring them to the demands of the market (Jasiński, 2014, p. 66). The strength and availability of scientific cadres and talents that work in R&D units determines the potential to leverage new concepts to produce economically viable innovation. Therefore, developing talent's competence and expertise is vital to the ability to create and implement innovations widely (Sarpong, Boakye, Ofosu, Botchie, 2023, p. 3). However, R&D projects that are created in R&D units need the necessary funds to make any planned changes that will promote innovation (Jissink, Schweitzer, Rohrbeck, 2019) and extra care should be taken to provide sufficient funding for breakthrough innovation projects until they reach maturity and to allocate enough resources to defeat present and future competitors (de Jong, Marston, Roth, Biljon, 2013, p. 5). A company's innovation investments are positively affected by the level of diversification and the availability of internal funds. One of the most effective ways to encourage research and development efforts is by prioritizing the accumulation of internal funds instead of relying on debt instruments for capital. This involves taking a future-oriented approach to plan ahead for securing the funding needed to carry out a specific innovation strategy (Martínez-Ros, Tribo, 2005, p. 199). Firms that have ample internal financial resources can afford to take on riskier research projects with lower expected returns, as their financial reserves can provide a cushion in case these projects do not yield the

desired results. Having higher levels of internal financial resources can support extended investments in research activities, which can increase a company's intellectual breadth and improve its core capabilities. Ultimately, having ample internal financial resources can simplify the monitoring of a company's performance and allow research and development (R&D) employees to engage in non-core exploratory research initiatives (Perez-Alaniz, Lenihan, Doran, Hewitt-Dundas, 2022, pp. 193-194).

3. The Importance and State of Resources and Competencies in the Field of R&D – the research results

The study was conducted among dairy cooperative managers, who were asked to assess the importance and state of their R&D resources and competencies in comparison to their competitors. The research was conducted in dairy cooperatives from the Świętokrzyskie and Małopolskie voivodeships, representing 41% of the cooperatives in operation during the year of the study. A structured interview questionnaire was employed, with carefully selected questions in terms of number, content, form, and order. Tables 1 and 2, as well as Figures 1 and 2, were created based on the interview results.

Table 1.
The assessment of the validity of resources / competencies of dairy cooperatives in the field of R&D

Resources / competencies of cooperatives in the field of R&D	Cooperatives from Świętokrzyskie Voivodeship	Cooperatives from Małopolskie Voivodeship	Mean
Possession of own B&R units	4.3	4.5	**4.40**
Amount of the budget for R&D activities	4.3	4.0	**4.15**
Modernity of technical equipment of R&D units	4.0	4.0	**4.00**
Knowledge of staff employed in R&D activities	4.0	4.0	**4.00**
Cooperation with scientific and/or scientific and research institutions	4.3	4.0	**4.15**
The ability to create new products	4.7	4.5	**4.60**
The ability to create new technologies	4.7	4.0	**4.35**
The ability to anticipate changes in technique and technology	4.3	3.5	**3.90**
Degree of computerization of R&D works	4.0	3.8	**3.90**
Mean	**4.29**	**4.03**	

Rating scale: 5 – extremely important. 4 – very important, 3 – quite important, 2 – little important, and 1 – completely unimportant.

Source: own work and (Konieczna, 2017).

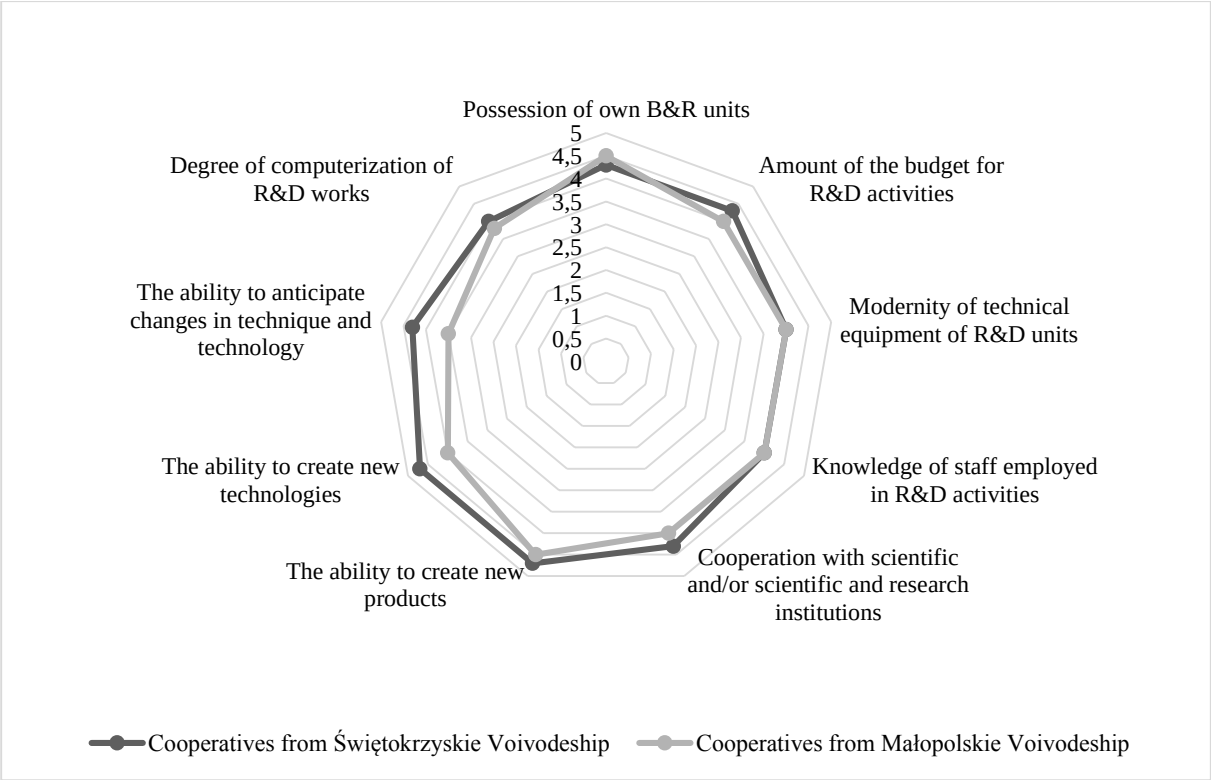

Figure 1. The assessment of the validity of resources / competencies of dairy cooperatives in the field of R&D.

Source: own work.

Taking into account the assessment of the validity of resources/competencies of dairy cooperatives in the field of R&D (Table 1 and Figure 1) it is seen that:

- extremely important for cooperatives from both voivodeships is the ability to create new products (mean – 4.60). However, cooperatives from Świętokrzyskie Voivodeship a little bit higher assessed this feature as there is a mean of 4.7 while in case of cooperatives from Małopolskie Voivodeship a mean is 4.5. For cooperatives from Świętokrzyskie Voivodeship extremely important is also the ability to create new technologies (mean – 4.7), while cooperatives from Małopolskie Voivodeship assess the possession of own B&R units as extremely important (mean – 4.5),
- most of indicated resources/competencies are assessed to be very important. Either of cooperatives from Świętokrzyskie and Małopolskie voivodeships assess as very important: amount of the budget for R&D activities, and cooperation with scientific and/or scientific and research institutions (mean – 4.15), modernity of technical equipment of R&D units, and knowledge of staff employed in R&D activities (mean – 4.00), degree of computerization of R&D works, and the ability to anticipate changes in technique and technology (mean 3.90). It is worth to indicate that cooperatives from Świętokrzyskie Voivodeship higher assessed amount of the budget for R&D activities, cooperation with scientific and/or scientific and research institutions, degree of computerization of R&D works, and the ability to anticipate changes in technique and

technology than cooperatives from Małopolskie Voivodeship. The possession of own B&R units is also assessed as very important by cooperatives from Świętokrzyskie Voivodeship.

Neither of cooperatives from both voivodeships assessed the validity of resources / competencies in the field of R&D as little important or completely unimportant.

Table 2.
The assessment of the state of resources/competencies of dairy cooperatives in the field of R&D in comparison to competition

Resources/competencies of cooperatives in the field of R&D	Cooperatives from Świętokrzyskie Voivodeship	Cooperatives from Małopolskie Voivodeship	Mean
Possession of own B&R units	2.0	1.8	**1.90**
Amount of the budget for R&D activities	2.3	2.0	**2.15**
Modernity of technical equipment of R&D units	2.0	2.0	**2.00**
Knowledge of staff employed in R&D activities	2.0	2.0	**2.00**
Cooperation with scientific and/or scientific and research institutions	2.0	2.0	**2.00**
The ability to create new products	2.0	1.8	**1.90**
The ability to create new technologies	2.0	1.8	**1.90**
The ability to anticipate changes in technique and technology	2.0	1.8	**1.90**
Degree of computerization of R&D works	2.3	1.5	**1.90**
Mean	**2.07**	**1.86**	

Rating scale: 3 – better, 2 – similar, 1 – worse state of resources/competences in comparison to competitors.

Source: own work and (Konieczna, 2017).

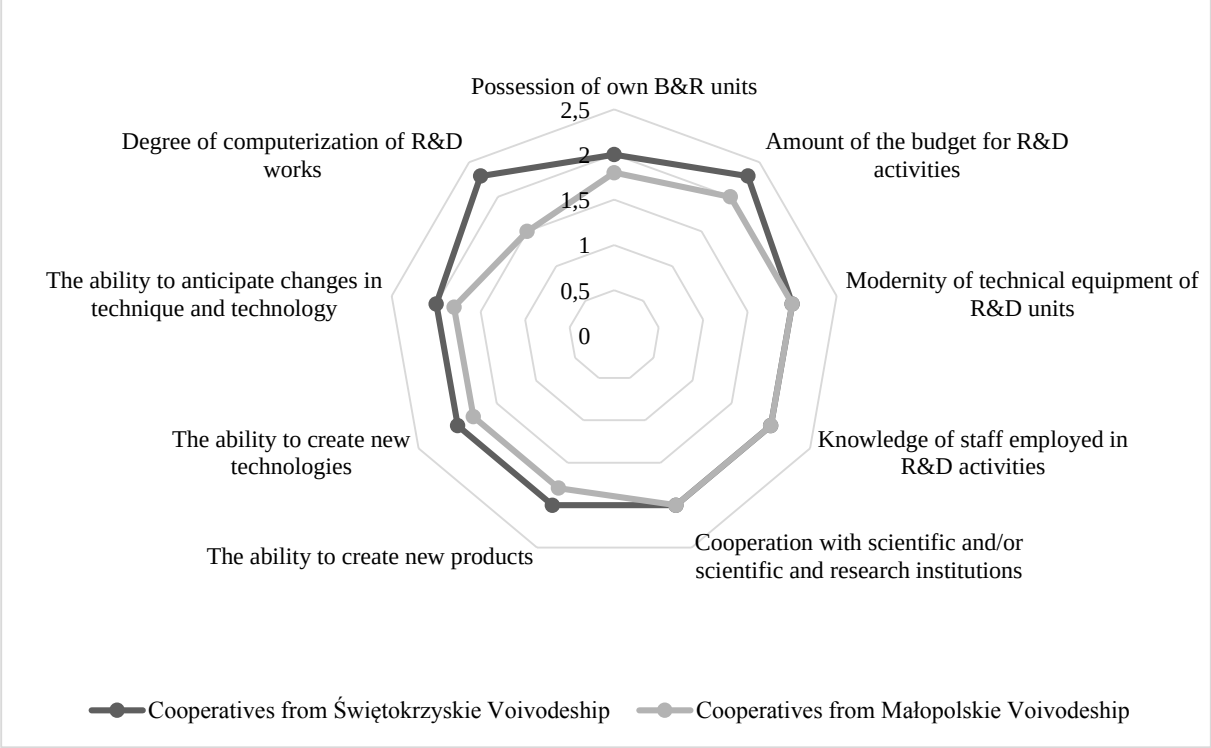

Figure 2. The assessment of the state of resources/competencies of dairy cooperatives in the field of R&D in comparison to competition.

Source: own work.

While taking into account the assessment of the state of resources/competencies of dairy cooperatives in the field of R&D in comparison to competition it is seen that it is rather similar. However, there is a difference in assessing it. For cooperatives from Świętokrzyskie Voivodeship the state of resources/competencies is similar or a little bit better than competitors. On the other hand, the state of resources/competencies is similar or lower than competitors in case of cooperatives from Małopolskie Voivodeship. For cooperatives from Świętokrzyskie Voivodeship the strategic potential in the form of the amount of the budget for R&D activities, and degree of computerization of R&D works is a little bit better than competition. It is worth to indicate that there is a difference in assessing the degree of computerization of R&D works, as cooperatives from Świętokrzyskie Voivodeship claim that is a little bit better than competitors, the cooperatives from Małopolskie Voivodeship assessed it as rather worse than competitors. The cooperatives from Świętokrzyskie Voivodeship found their resources and competencies in research and development to be similar to or better than their competitors. On the other hand, the cooperatives from Małopolskie Voivodeship found some of their resources and competencies to be similar to their competitors, while others were deemed to be worse.

4. Discussion and Conclusion

R&D enables a company to maintain a competitive edge by addressing emerging market demands and needs. Therefore, companies need to recognize the significance of resources and competencies in the R&D field and understand how they stack up against their competitors.

Quélin (2000, p. 477) reached similar conclusions indicating technological competencies. He stated that there are two difficulties in managing technology competencies. Therefore, it is necessary to first identify and assess competencies both internally and/or in their product or service manifestations. Second, when businesses compete, they need to be more exposed to the outside world because they wish to acquire the complimentary competencies that their competitors possess. As claim Carrick (2016) basing on conducted research the development of R&D resources is the result of a distinct combination of past choices, upcoming prospects, assets, competencies, and practices. Taking into account the analysis of the research results and taking into account the formulated questions and hypotheses it can be seen that cooperatives are aware of the importance and the state of resources and competencies in the field of R&D in comparison with competition. Representatives of the cooperatives evaluated the resources and competencies of their organizations and assigned a value to each of the provided response choices. In this approach, hypothesis H1 was confirmed. Similarly, hypothesis 2 (H2) was also confirmed. Cooperatives from two nearby voivodeships, Świętokrzyskie and Małopolskie, vary in how important they see the mentioned resources and abilities in the sphere of R&D.

Research findings indicate that cooperatives from Świętokrzyskie Voivodeship have slightly higher ratings for the importance of the identified resources and competencies. In this instance, the average is 4.29, which is higher than the cooperatives from Małopolskie Voivodeship, where the average is slightly lower at 4.03. The third hypothesis (H3) was not confirmed because it was argued that dairy cooperatives do not have a stronger strategic potential in research and development compared to their competitors. Based on the research findings, the strategic capabilities closely resemble those in competition. Nevertheless, the evaluation of cooperatives varies depending on the voivodeships they are located in.

The limitation of the research which results were showed here is the quantity of cooperatives and the territorial research area. Suggestions for future research could involve exploring the constraints of this study by conducting research on cooperatives in different regions to determine their understanding of the significance and condition of R&D resources and competencies.

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