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## Sources of Competitive Advantage of Enterprises in Selected Sectors of the Polish Economy

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**Abstract:**

**Purpose:** Study impact of business activities on selection of sources of enterprises' competitive advantage. The research hypothesis is advanced as H1: scope of business objects (sector) is a factor differentiating selection of sources of competitive advantage by enterprises. The concept and essence of competitiveness are discussed, methods of building competitive advantage by enterprises are detailed.

**Design/Methodology/Approach:** The theoretical section follows a comprehensive review of leading specialist literature. The hypothesis is verified in the empirical section by means of position measures (arithmetic mean, median) and variability measures (standard deviation, coefficient of variability). Kruskal-Wallis test is also used to verify the research hypothesis.

**Findings:** The paper contains results of a survey of 253 large Polish enterprises. Kruskal-Wallis test serves to determine impact of a sector on selection of sources of enterprise competitive advantage. Sector has no effect on choice of such sources as: quality management system, cost reduction, advertising, public relations, enterprise image, highly qualified managerial staff, knowledge and skills of employees, new technologies, or customer trust.

**Practical Implications:** The results can be utilised by enterprises as guidelines for selection of sources of competitive advantage.

**Originality/Value:** The paper contains an original study of a representative group of large enterprises that can be generalised to the whole population assuming a confidence level  $\alpha=95\%$  and maximum error  $\beta=6\%$ .

**Keywords:** Competitiveness, enterprise, competitive advantage.

**JEL codes:** P12, M21.

**Paper type:** Research article.

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## 1. Introduction

In the market economy, competition is a basic requirement of business and a mechanism of allocation of economic resources. Competitiveness involves effective operation of businesses in a turbulent competitive environment. Competitiveness has always been an important condition for the success of companies (Kuźmiński *et al.*, 2020; Kuzhda and Vork, 2016). Ways of attaining this objective are a function of variability and dynamics of processes inside and in the external environment of a firm as existing models of competing are limited in time. *'The competitiveness of enterprises more and more depends on the factor of non-material resources and assets that have in their structure intellectual property and access rights to different resources'* (Vasylytsiv *et al.*, 2018). Challenges of the 21<sup>st</sup> century economy force businesses to search for new sources of competitive advantages.

The multiple dimensions of research into competitiveness (including economic, organisational, financial, social, legal) have driven evolution of sources of competitive advantages – from application of the so-called hard criteria (the positional school) to the so-called soft criteria (the resource school), where knowledge and intellectual capital are basic factors of enterprise's competitive potential. *'Implementation of innovations is becoming a necessary part of survival, development, gaining, and preservation of competitive advantage in the market'* (Sieradzka, 2021). Innovative activity and the ability to implement innovation fast and effectively are fundamental characteristics of a competitive enterprise in the contemporary economy *'Innovative activity of organisations significantly influences competitiveness which is based on inimitable skills and abilities. Achieving a higher competitiveness by means of innovations means producing less costly products or better quality compared to those manufactured by competitors'* (Urbancová, 2013). In the current knowledge-based economy, conditions related to time and space acquire a growing significance (Godlewska-Majkowska *et al.*, 2016).

The purpose of this article is to study the impact of business objects on selection of sources of enterprises' competitive advantage. The research hypothesis H1 is also advanced as, scope of business objects (sector) is a factor differentiating selection of sources of competitive advantage by enterprises.

The results of a survey of 253 enterprises active in the Polish economy and Kruskal-Wallis test serve to verify the hypothesis. Statistica 12 is employed as a tool of data analysis.

## 2. Theoretical Background

Competitiveness is defined as a process where participants rival to reach comparable goals (Stankiewicz, 2005). This is the ability to compete, and thus to act and survive in a competitive environment and to generate economic benefits with respect to competitors (Dzikowska and Gorynia, 2012; Milusheva, 2020). In addition,

competitiveness denotes the ability to attain and preserve competitive advantage and can, in this sense, be treated as synonymous with a firm's competitive capacity (Gorynia, 2010). An enterprise's competitiveness is a system that consists of four interconnected elements, that is, competitive potential (all tangible and intangible resources of an enterprise), competitive advantage (effective use of a configuration of competitive potential components), instruments of competing (tools and methods of customer acquisition and goodwill creation), and competitive standing (result of competing) (Stankiewicz, 2000). An analysis of links among the dimensions of competitiveness indicates that the achievement of a desired competitive standing is conditioned by the competitive advantage that is in place, which in turn depends on the competitive potential available to an enterprise. An entity's resources and skills influence reparation of a product range that is to be evaluated by the market and that allows for a competitive advantage (Duda *et al.*, 2021).

Attempts at gaining competitive advantage and its sources are the subject matter of strategic management studies (Porter and Kramer, 2006; King, 2007; Ismail *et al.*, 2010; Negulescu, 2019). Competitive advantage is the key part of enterprise development, *'the soul of firms' performance in competitive markets'* (Porter, 1985). It is described as *'a key determinant of competitiveness and selection of a competition strategy'* (Godlewska-Majkowska *et al.*, 2016).

The literature offers a great variety of definitions of competitive advantage (Sigalas, 2015; Urbancová, 2013). They point to those actions of an enterprise which are carried out better than by competitors and distinguish an enterprise in the eyes of customers (Wang, 2014; Grant, 2010; Isoraite, 2018), underscore the capacity for creating greater economic values than generated by rivals in the market (Barney and Clark, 2007; Hosseini *et al.*, 2018; Yuleva-Chuchulayna, 2019) and the ability to seize market opportunities and neutralise threats from competition (Sigalas *et al.*, 2013).

Internally, the advantage is understood as the ability to utilise the competitive potential in a way that allows for effective generation of a market offer and effective instruments of competing that produce added value that a firm is capable of generating for its customers. The value must be greater than the costs of its generation (Stankiewicz, 2005). In external terms, on the other hand, the advantage is defined as preference for product range of an enterprise by potential customers (Glabiszewski, 2004). It is pointed out competitive advantage is limited in time and conditioned by competitors' actions and changes in a sector's structure (Janiak *et al.*, 2017).

A variety of authors identify and analyse factors of competing in different sectors Ilinova *et al.* (2021) in fertilizer companies, Knudsen *et al.* (2021) in the High Technologies sector or particular countries, Mohammada and Wasiuzzaman (2021) in Malaysia or Wang and Gao (2021) in China. We have resolved to determine, therefore, whether business objects influence selection of sources of competitive advantage and have proposed H1 as, scope of business objects (sector) is a factor

differentiating selection of sources of competitive advantage by enterprises, thereby filling a gap in research.

The definitions of competitive advantage imply that an enterprise can achieve it if it has something its competitors do not, does something better than other enterprises or can do something others cannot (Wolak-Tuzimek and Duda, 2021). The ability to create and maintain competitive advantage in areas determined by internal and external conditions is a prerequisite to effective competing in the market (Isoraite, 2018; Negulescu, 2019). These conditions include political, economic, social, ecological, technological environment, strategy and rivalry, demand conditions, industry cluster. The internal sources of competitive advantage comprise, inherent characteristics of strength, radical innovation, knowledge management, competitive advantage sources customization, economies of scale, human resources, business management, organizational culture.

Two main approaches to building of competitive advantage are emphasised – from the market (the positional approach) and from the firm (the resource approach). In the former case, standing in the market is reached as a result of competitive advantages arising from economies of scale, specialisation or cost optimisation. The method of five competition forces and map of strategic groups (Porter, 2010) are highlighted among the analytical methods. Lack of reference to a firm's internal resources caused emergence of the research trend in the 1990s (Prahalad and Hamel, 1990) to compliment the positional approach. Analysis of competitive potential, that is, tangible and intangible resources of an enterprise, combined with an analysis of its competitive environment constituted a new approach to the strategy of competition.

Sources of competitive advantages were sought in the so-called *core competences*, that is, resources and skills of their processing, with knowledge and intellectual capital playing special roles. Importance of objective factors to building of competitive advantage and the need to make choices (the subjectivist trend), including communication system, customer orientation, personality, and subjective assessment of a situation by decision-makers in the process of interactions among groups and individuals with certain preferences and knowledge to fulfil them (Ansoff, 1985), are highlighted as well. Time, or the possibility of overtaking competitors with change management (Clark 1997), is of a growing importance. The major role of the space factor, understood as economic space and layout of an enterprise (Godlewska-Majkowska *et al.*, 2016), is also mentioned among the sources of competitive advantages. The best known concept of enterprise competitive advantages has been proposed by Porter (1985), who lists:

- The advantage resulting from cost leadership,
- The advantage resulting from differentiation,
- The advantage resulting from focus.

The first type of the advantage relies on leadership in a sector in terms of total costs. In effect, products or services are at least as attractive as those offered by rivals, yet costs of their production are lower. The cost advantage is fostered by the effects of scale, business objects, and experience. The advantage based on differentiation consists in an original, unique offer, which relates to innovation, quality, manufacturing technology, method of delivery, and after-sales support. A differentiated offer acquires a greater value than that of competitors. The theory of the advantage arising from focus on a market segment (customer group, product line, geographical market) helps better satisfy needs of a given segment than potential competitors can.

Enterprises are looking for competitive advantages in different areas of business, marketing, production, research and development or business engagement. It becomes essential for efficient process engagement to implement new solutions to product, process, organisational and marketing methods. The place of creating and implementing innovations to a large extent determines a firm's competitive advantage (Sachpazidu-Wójcicka, 2016)

The following are commonly highlighted among the many classification criteria of competitive advantage, scale of competition arena, base of competitive advantage, and period of the advantage preservation (Godziszewski *et al.*, 2011). Local and global advantages are identified on the basis of the first criterion. Global advantage is realised in markets of global competition, while the local advantage means an enterprise is capable of competing in certain markets, possibly as a result of its production capacities, nature and scale of demand or local environment conditions. As far as the base is concerned, the competitive advantage can spring from cost leadership or differentiation.

Continuing and temporary competitive advantage can be identified with regard to the time of its preservation. The continuity denotes an offer that does not change in time yet brings profits. A continuing advantage means the longest existing period of market acceptance of an unchanging offer and instruments of competing. Its opposite is temporary advantage, which denotes a single market success (given specific product characteristics and instruments of competing). Enterprises strive for continuing competitive advantage as it provides for relatively best business results. As a competitive advantage grows, a firm enjoys greater independence in operation of instruments whose changes tend to enhance effects of market activities. Type and scale of competitive advantage decide the extent of its continuity (Wolak-Tuzimek, 2019).

The literature stresses difficulties with building of continuing competitive advantage in the face of growing competitive pressure, comparability of resources, skills, and abilities, as well as rising capacities for imitation (Goldsmith, 2013). This is connected to the turbulent environment, global economic crises, and changes inside

organisations. Permanence of competitive advantage with reference to the need for rapid adaptation to changes is a new line of research (Sołoducho-Pelc, 2016).

Competitive advantage grounded in traditional sources is increasingly short-lived. New, hard to replicate factors that are responses to changes in the environment play a key role in building of a continuing competitive advantage. These include, flexibility and speed of action, adaptability to changes, innovativeness, and technologies (Grimm *et al.*, 2006; Sołoducho-Pelc, 2017), as well as responsibility towards customers (Hosseini *et al.*, 2018).

Use of sources of a short-lasting advantage requires changes to a strategy with observation and experimentation gaining in significance. Focus on customers, building relations with them, and care for their satisfaction constitute a new source of competitive advantage that is hard to copy and poses a barrier to entry in a sector (Sołoducho-Pelc and Sulich, 2020). Corporate Social Responsibility, which assumes responsible and ethical business dealings with social groups and respect for the natural environment, is becoming another major factor in building a competitive advantage of an enterprise. Implementation of the CSR ideas improves attraction of an enterprise to customers and investors, market value of a firm, and transparency of its operations, and reduces investment risk. Corporate Social Responsibility is becoming a functional area of competitive potential. Owing to CSR, an enterprise builds strong and close ties with its environment, particularly its customers.

Corporate Social Responsibility must be connected with an enterprise's regular activities and the profile of its actions to improve its image and reputation. An improved reputation and image enhance customer satisfaction and consequently boost sales and profits of an enterprise, which is the goal of each action by means of enhancing competitiveness. In addition, CSR facilitates access to capital, cuts costs of cooperation with partners, improves the potential for attracting the best workers, reduces business risk as well as increases stability and development opportunities. As a result, enterprises attempt to build their positive reputation by various methods and instruments. Social commitment is a major determinant of a positive reputation, an asset distinguishing an enterprise from its competitors, and thus a source of competitive advantage (Maráková *et al.*, 2021).

### **3. Research Methodology**

As markets become more dynamic and unpredictable, choice of appropriate sources of market advantage is the crucial issue on which a firm's development depends. Enterprises may utilise specific sources of competitive advantage that are characteristic of their sector only or generally applied, like image or public relations. Therefore, research hypothesis H is advanced – scope of activities (sector) is a factor differentiating choice of sources of an enterprise's competitive advantage.

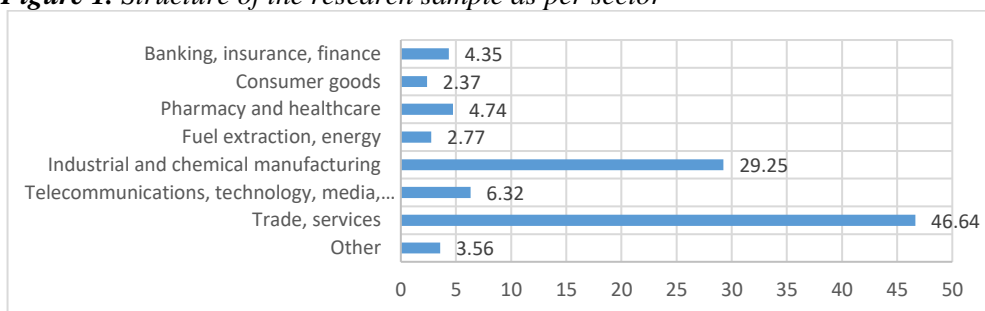
Results are presented of a national study conducted in March 2020 using the method of Computer-Assisted Telephone Interview (CATI) on a randomly selected sample of 1600 large enterprises. 253 surveys were filled correctly, which, assuming  $\alpha=95\%$  and  $\beta=6\%$ , means the results are representative for the general population.

The empirical study employed an original survey questionnaire that consisted of two parts: particulars and contents. The former characterised the sample using objective criteria: organisational form of enterprise, sector of enterprise, region where enterprise is based, implementation of the CSR concept to enterprise, and application of integrated information system. As far as the sample's characteristics are concerned, it can be noted:

1. Limited liability (174) and joint-stock companies (53) prevailed. They accounted for nearly 90% of all the businesses.
2. Most enterprises were based in mazowieckie (46) and śląskie regions (34). Their share reached ca. 32%.
3. 75% of the enterprises surveyed have implemented CSR and used ERP-type integrated information systems.

Trade and service enterprises constituted the largest group 47% (118). They were followed by industrial and chemical manufacturing enterprises approximately 29% (74 firms). The smallest grouping, on the other hand, comprised consumer goods enterprises (6). The detailed structure of the enterprises studied depending on scopes of their activities is illustrated in Figure 1.

**Figure 1.** Structure of the research sample as per sector



**Source:** Authors' own research.

Results are discussed concerning the request to determine significance of the particular sources of competitive advantage (observable variables) on a scale of 1 to 10 points, where 1 stands for low and 10 for high significance. The respondents were to assign the significance to the individual observable variables

Importance of the particular sources of competitive advantage is measured and evaluated by means of descriptive statistics. Position measures – arithmetic mean and median – and measures of variability – standard deviation and coefficient of

variability – are applied. The arithmetic mean is computed as a variable value divided by numbers of the test group, whereas the median divides the group in two in such a way that 50% units have values lower than or equal to the median and 50%, equal to or greater than the median. The number of responses is odd, which means the central value is the median. As for the measures of variability, the standard deviation is calculated as mean variation of a feature's variants in the test group from the arithmetic mean of the same feature. The coefficient of variability is the share of standard deviation in the arithmetic mean.

Kruskal-Wallis (1952) test serves to verify the hypothesis H, scope of business objects (sector) is a factor differentiating selection of sources of competitive advantage by enterprises. The test is non-parametric and designed to verify statistical hypotheses concerning differentiation of dimensions across groups. It is equivalent to the univariate analysis of variance (ANOVA). The zero hypothesis assumes the samples come from a population of the same distribution, whereas the alternative hypothesis says they come from different distributions.

H<sub>0</sub>: Variable distribution is identical for all codes of a grouping factor.

H<sub>1</sub>: Variable distributions for at least one code of a grouping factor are different.

Accepting the zero hypothesis implies levels of a tested factor (group) do not have a significant impact on results. This means a given factor differentiates the results. The analysis adopts the level of significance  $\alpha=0.05$ . This is the maximum acceptable likelihood of the so-called first type error, or rejection of a zero hypothesis which is correct. Based on the results processed by means of STATYSTYKA 12 software, the level of significance  $p$  is analysed. Its value helps to assess the probability of a given result assuming H<sub>0</sub> is true. Where there are no reasons for rejecting a hypothesis (which is accepted then),  $p$  should be greater than the adopted level of significance  $\alpha=0.05$ .

#### 4. Results

Results are presented for 253 large enterprises classified as per their business objects, or sectors. In order to determine significance of the particular sources of competitive advantage, position measures (arithmetic mean and median), which indicate around what values distribution of the variables centre, and measures of variability (standard deviation and coefficient of variability), which measure dispersion of the variables, are employed. Analysis of data in Table 1 concerning significance the respondents attribute to the individual variables (sources of competitive advantage) signals certain regularities:

1. The respondents most often assign maximum values to *new technologies* in the following sectors: Consumer goods (8.5), Fuel extraction, energy (9.4), Industrial and chemical manufacturing (8.4), Telecommunications, technology, media, entertainment (8.6), Trade, services (8.7), Other (8.4).



2. The variable *quality management system* is assigned the greatest significance in the sectors Consumer goods (8.2) and Pharmacy and healthcare (8.4).
3. The respondents from the sector of Banking, insurance, finance award a high significance (8.7) to *highly qualified managerial staff*.
4. Firms operating in four sectors awarded a great significance to the variable of *innovation activities*, namely: Banking, insurance, finance (8.9), Fuel extraction, energy (9.1), Industrial and chemical manufacturing (8.4), Trade, services (8.6)
5. Respondents from the sector of Pharmacy and health care assign maximum significance (8.8) to *implementation of Corporate Social Responsibility*.

**Table 1.** Position measures for sources of competitive advantage as per scopes of activities (sectors).

| Enterprise sector Variables              | Banking, insurance, finance |    | Consumer goods |    | Pharmacy and healthcare |    | Fuel extraction, energy |    | Industrial and chemical manufacturing |    | Telecommunications, technology, media, entertainment |    | Trade, services |    | Other |    |
|--|-----------------------------|----|----------------|----|-------------------------|----|-------------------------|----|---------------------------------------|----|--|----|-----------------|----|-------|----|
|  | I                           | II | I              | II | I                       | II | I                       | II | I                                     | II | I  | II | I               | II | I     | II |
| V1-Quality management system             | 8.1                         | 8  | 8.2            | 8  | 8.4                     | 8  | 7.4                     | 7  | 7.9                                   | 8  | 7.9  | 9  | 7.9             | 8  | 7.1   | 7  |
| V2-Creation of unique products/ services | 7.9                         | 8  | 5.0            | 6  | 7.4                     | 7  | 6.6                     | 7  | 6.6                                   | 6  | 6.0  | 7  | 6.7             | 7  | 6.4   | 7  |
| V3-Cost reduction                        | 7.5                         | 8  | 6.7            | 7  | 6.8                     | 8  | 7.3                     | 6  | 7.8                                   | 8  | 7.3  | 8  | 7.6             | 8  | 6.1   | 6  |
| V4-Advertising                           | 6.9                         | 8  | 5.5            | 6  | 6.8                     | 7  | 6.3                     | 7  | 6.5                                   | 6  | 7.0  | 8  | 6.6             | 7  | 5.6   | 5  |
| V5-Public relations                      | 7.0                         | 8  | 6.3            | 7  | 6.9                     | 8  | 6.0                     | 6  | 6.2                                   | 6  | 6.3  | 7  | 6.3             | 7  | 6.3   | 7  |
| V6-Enterprise image                      | 8.4                         | 9  | 7.3            | 9  | 7.0                     | 7  | 7.6                     | 8  | 7.7                                   | 8  | 7.4  | 8  | 7.5             | 8  | 6.8   | 7  |
| V7-Highly qualified managerial staff     | 8.7                         | 9  | 7.7            | 8  | 7.5                     | 8  | 8.4                     | 8  | 7.9                                   | 8  | 8.1  | 8  | 8.2             | 8  | 8.0   | 8  |
| V8-Knowledge and skills of employees     | 8.6                         | 9  | 8.0            | 8  | 8.3                     | 8  | 7.1                     | 8  | 8.0                                   | 8  | 7.7  | 8  | 7.9             | 8  | 7.1   | 7  |
| V9-Investment activities                 | 7.4                         | 8  | 6.7            | 7  | 6.8                     | 7  | 6.7                     | 7  | 7.4                                   | 7  | 6.9  | 7  | 6.6             | 7  | 5.7   | 5  |
| V10-Innovation activities                | 8.9                         | 9  | 8.0            | 8  | 7.5                     | 7  | 9.1                     | 10 | 8.4                                   | 8  | 8.1  | 8  | 8.6             | 9  | 7.6   | 8  |
| V11-New technologies                     | 8.4                         | 8  | 8.5            | 9  | 7.8                     | 8  | 9.4                     | 9  | 8.4                                   | 8  | 8.6  | 9  | 8.7             | 9  | 8.4   | 9  |
| V12-Customer trust                       | 8.4                         | 9  | 7.2            | 7  | 8.1                     | 9  | 7.0                     | 7  | 8.2                                   | 8  | 8.4  | 8  | 8.1             | 8  | 7.0   | 8  |
| V13-Integrated IT system                 | 6.2                         | 6  | 4.7            | 4  | 6.8                     | 7  | 7.6                     | 8  | 6.8                                   | 7  | 7.0  | 7  | 7.1             | 7  | 5.1   | 5  |
| V14-Implementation of CSR                | 8.5                         | 8  | 6.7            | 7  | 8.8                     | 9  | 7.3                     | 7  | 8.2                                   | 8  | 7.9  | 8  | 8.4             | 8  | 7.4   | 7  |

**Note:** I-Arithmetic mean, II-Median

**Source:** Authors' own research.

The values of standard deviation help to determine average differences between significances of the particular sources of competitive advantage in the individual sectors and the mean value.

The lowest standard deviation is noted for *implementation of Corporate Social Responsibility* in five sectors: Banking, insurance, finance (1.0), Consumer goods (1.0), Pharmacy and healthcare (0.8), Fuel extraction, energy (0.5), Industrial and chemical manufacturing (1.0). The coefficient of variability is minimum for this variable in the above sectors as well, namely: 12.3%, 15.5%, 8.6%, 6.7%, 12.0%. The values of standard deviation (0.5) and coefficient of variability (6.3%) are low for the variables of highly qualified managerial staff in the sector of Fuel extraction, energy, too. This is evidence of the minimum variety of responses concerning these variables in these industries.

The highest standard deviation, on the other hand, is recorded for *cost reduction in the sector of Consumer goods* (3.10) and for the variable of *public relations* (2.7) in Banking, insurance, finance. The coefficient of variability is also maximum for these sectors, that is, 47.1% and 38.9%, respectively. The high values of standard deviation and coefficient of variability demonstrate a great variety of responses when determining significance of these variables as sources of competitive advantage for enterprises in these industries.

Fuel extraction, energy enterprises give the least differentiated responses: the standard deviation is in the range <1.5;1.8>, while the coefficient of variability is lowest, 6.7%, for *implementation of Corporate Social Responsibility*. Details of the standard deviation for the individual variables, i.e. sources of competitive advantage, in the industries studied are provided in Table 2.

**Table 2.** Measures of variability for sources of competitive advantage depending on the scope of activities (sector).

| Enterprise Sector<br>Variables | Banking, insurance,<br>finance |      | Consumer goods |      | Pharmacy and<br>healthcare |      | Fuel extraction,<br>energy |      | Industrial and<br>chemical<br>manufacturing |      | Telecommunication<br>s, technology,<br>media,<br>entertainment |      | Trade, services |      | Other |      |
|--------------------------------|--------------------------------|------|----------------|------|----------------------------|------|----------------------------|------|---|------|--|------|-----------------|------|-------|------|
|                                | I                              | II   | I              | II   | I                          | II   | I                          | II   | I   | II   | I  | II   | I               | II   | I     | II   |
|                                | V1                             | 1.5  | 18.7           | 1.2  | 14.3                       | 0.9  | 10.7                       | 1.0  | 13.1  | 1.0  | 13.2   | 1.2  | 14.9            | 1.1  | 14.1  | 1.5  |
| V2                             | 2.2                            | 28.0 | 1.5            | 31.0 | 1.2                        | 16.7 | 0.5                        | 8.1  | 1.5   | 22.0 | 1.9  | 31.6 | 1.7             | 25.7 | 1.2   | 19.2 |
| V3                             | 2.3                            | 30.8 | 3.1            | 47.1 | 1.8                        | 26.4 | 1.6                        | 22.0 | 1.3   | 16.7 | 2.0  | 27.8 | 1.6             | 21.0 | 1.4   | 22.3 |
| V4                             | 2.0                            | 28.5 | 2.1            | 37.7 | 1.5                        | 22.4 | 1.3                        | 19.9 | 1.4   | 21.8 | 1.5  | 20.9 | 1.8             | 26.4 | 1.7   | 30.0 |
| V5                             | 2.7                            | 38.9 | 2.2            | 34.1 | 1.7                        | 24.2 | 1.2                        | 19.2 | 1.7   | 27.3 | 1.3  | 20.6 | 1.7             | 26.2 | 1.7   | 27.3 |
| V6                             | 1.7                            | 20.9 | 3.4            | 47.0 | 1.5                        | 22.0 | 1.1                        | 15.0 | 1.3   | 16.6 | 0.8  | 10.9 | 1.4             | 18.6 | 2.2   | 32.8 |
| V7                             | 1.3                            | 15.5 | 2.4            | 31.6 | 1.0                        | 13.3 | 0.5                        | 6.3  | 1.4   | 17.1 | 0.9  | 11.5 | 1.2             | 14.8 | 1.2   | 15.3 |
| V8                             | 1.6                            | 18.9 | 0.6            | 7.9  | 1.2                        | 14.8 | 1.6                        | 22.0 | 1.2   | 15.3 | 1.1  | 14.8 | 1.3             | 16.3 | 0.9   | 13.0 |
| V9                             | 2.5                            | 34.5 | 2.3            | 35.1 | 1.7                        | 25.4 | 1.4                        | 20.6 | 1.5   | 19.9 | 1.1  | 16.2 | 1.8             | 27.7 | 1.7   | 30.6 |
| V10                            | 1.0                            | 11.7 | 1.8            | 22.4 | 1.0                        | 13.3 | 1.5                        | 16.0 | 1.1   | 12.6 | 0.8  | 9.6  | 1.0             | 12.2 | 1.8   | 24.0 |
| V11                            | 1.2                            | 14.4 | 1.5            | 17.8 | 0.8                        | 10.7 | 0.5                        | 5.7  | 1.2   | 13.7 | 1.0  | 12.0 | 0.9             | 10.7 | 1.1   | 13.4 |
| V12                            | 1.2                            | 14.4 | 1.9            | 27.1 | 1.3                        | 16.2 | 1.0                        | 14.3 | 1.3   | 15.3 | 1.0  | 11.4 | 1.4             | 16.8 | 1.5   | 21.4 |
| V13                            | 1.3                            | 20.2 | 1.8            | 37.5 | 1.2                        | 18.0 | 1.1                        | 15.0 | 1.8   | 26.2 | 1.4  | 19.5 | 1.5             | 21.2 | 1.1   | 20.6 |
| V14                            | 1.0                            | 12.3 | 1.0            | 15.5 | 0.8                        | 8.6  | 0.5                        | 6.7  | 1.0   | 12.0 | 1.4  | 18.1 | 1.4             | 16.5 | 1.3   | 17.9 |

**Note:** I-Standard deviation, II-Coefficient of variability (%)

**Source:** Authors' own research.

In order to verify the research hypothesis about the scope of business activities (sector) as a factor differentiating choice of sources of competitive advantage by enterprises

(14 codes of the grouping variable), Kruskal-Wallis test is applied (Table 3). Two hypotheses are formulated:

$H_0$ -sources of competitive advantage are the same for each sector,

$H_1$ -at least one sector (population) differentiates sources of competitive advantage.

The value of  $p$  is compared to the level of significance  $\alpha$ . The research hypotheses are then verified in line with the following dependence:

If  $p \leq \alpha$ ,  $H_0$  is rejected and  $H_1$  is accepted,

If  $p > \alpha$ , there are no grounds for rejecting  $H_0$

In line with the foregoing dependences, the resultant level of significance is compared to the assumed significance of  $\alpha = 0.05$ .

**Table 3.** Results of Kruskal-Wallis test for impact of business objects (sector) on selection of sources of competitive advantage.

| No. | Zero hypothesis   | Test                | Significance | Decision                   |
|-----|---|---------------------|--------------|----------------------------|
| 1.  | Distribution of <i>quality management system</i> variable is the same for the sector category             | Kruskal-Wallis test | 0.4446       | Accept the zero hypothesis |
| 2.  | Distribution of creation of <i>unique products/ services</i> variable is the same for the sector category |                     | 0.0317       | Reject the zero hypothesis |
| 3.  | Distribution of <i>cost reduction</i> variable is the same for the sector category                        |                     | 0.1279       | Accept the zero hypothesis |
| 4.  | Distribution of <i>advertising</i> variable is the same for the sector category                           |                     | 0.1685       | Accept the zero hypothesis |
| 5.  | Distribution of <i>public relations</i> variable is the same for the sector category                      |                     | 0.6989       | Accept the zero hypothesis |
| 6.  | Distribution of <i>enterprise image</i> variable is the same for the sector category                      |                     | 0.1797       | Accept the zero hypothesis |
| 7.  | Distribution of <i>highly qualified managerial staff</i> variable is the same for the sector category     |                     | 0.1218       | Accept the zero hypothesis |
| 8.  | Distribution of <i>knowledge and skills of employees</i> variable is the same for the sector category     |                     | 0.2977       | Accept the zero hypothesis |
| 9   | Distribution of <i>investment activities</i> variable is the same for the sector category                 |                     | 0.0278       | Reject the zero hypothesis |
| 10  | Distribution of <i>innovation activities</i> variable is the same for the sector category                 |                     | 0.0042       | Reject the zero hypothesis |
| 11  | Distribution of <i>new technologies</i> variables is the same for the sector category                     |                     | 0.0679       | Accept the zero hypothesis |
| 12  | Distribution of <i>customer trust</i> variable is the same for the sector category                        |                     | 0.0810       | Accept the zero hypothesis |

|    |   |  |        |                            |
|----|---|--|--------|----------------------------|
| 13 | Distribution of <i>integrated IT system</i> variable is the same for the sector category                              |  | 0.0015 | Reject the zero hypothesis |
| 14 | Distribution of <i>implementation of Corporate Social Responsibility</i> variable is the same for the sector category |  | 0.0016 | Reject the zero hypothesis |

*Source: Authors' own research.*

Analysis of data in Table 3 shows the values of boundary probabilities for the fourteen variables are in the range of 0.0016–0.6989. They are greater than the assumed significance level ( $\alpha=0.05$ ) for nine variables. This means there are no statistically significant differences with regard to scope of activities and choice of sources of competitive advantage in the cases of quality management system, cost reduction, advertising, public relations, enterprise image, highly qualified managerial staff, knowledge and skills of employees, new technologies, and customer trust. This implies the sector is not a factor differentiating selection of sources of competitive advantage for these nine variables. In respect of the remaining five variables, unique products/services, investment activities, innovation activities, integrated IT system, and implementation of Corporate Social Responsibility, on the other hand,  $p$  is lower than the assumed level of significance ( $\alpha=0.05$ ), which means there are statistically significant differences in choice of sources of competitive advantage as far as the scope of activities (sector) is concerned.

Factors employed by enterprises to gain competitive advantage in the market are the subject of many studies (Antczak *et al.*, 2021; Maráková *et al.*, 2021; Kuźmiński *et al.*, 2020; Dědina and Šánová, 2013). The literature fails to offer detailed analyses of measures that differentiate choice of enterprise competitiveness sectors.

## 6. Conclusion

Special literature presents a diversity of views regarding sources of competitive advantage. This may be due to the fact a number of concepts of enterprise competitiveness coexist and specific methods of research are adopted. It seems, however, the multiplicity of trends in studies of enterprise competitiveness is the fundamental factor affecting different perceptions of the competitive advantage itself. Competitive advantage denotes an original offer to customers that is impossible, at least at a given moment in time, to copy by competitors. In the event, an enterprise offers a value which is a function of benefits and price the consumer is willing to pay for such benefits at a given time. Each enterprise strives for the advantage as it either generates more demand or leads to reduced costs. Either way, it produces above-average profits.

Existing research suggests a number of factors (product quality, innovation, CSR) that affect competitive advantage, yet studies to define measures differentiating choice of factors used to gain the advantage are absent.

The results of our survey of 253 large enterprises operating in the Polish economy fill a gap in research into effects of business sector on choice of factors building competitive advantage of an enterprise. Our analysis applying Kruskal-Wallis test does not offer grounds for declaring that scope of activities (sector) is a factor differentiating selection of sources of competitive advantage.

This is because, for nine factors (quality management system, cost reduction, advertising, public relations, enterprise image, highly qualified managerial staff, knowledge and skills of employees, new technologies, customer trust), there are no statistically significant differences with regard to scope of activities and choice of sources of competitive advantage. As far as the remaining five factors (unique products/services, investment activities, innovation activities, integrated IT system and implementation of Corporate Social Responsibility) are concerned, the sector does differentiate sources of competitive advantage in enterprises.

The results and the statistical analysis fail to uphold in full the research hypothesis H1, scope of business objects (sector) is a factor differentiating selection of sources of competitive advantage by enterprises.

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