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HOW STARTUPS WERE AFFECTED BY THE COVİD-19 OUTBREAK? MEDIATING ROLE OF THE PERCEPTION OF ENVIRONMENTAL UNCERTAINTIES OF IMPACT ANALYSIS ON INTELLECTUAL CAPITAL AND CORE COMPETENCIES

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Abstract:
The point where intellectual capital turns into value and gains meaning and quality in the real world is expressed as core competencies, because the concept of core competencies is described as the area where the organization emphasizes its unique features or products in order to provide sustainable competitive advantage. Therefore, it is stated that intellectual capital affects core competencies and this approach is necessary for the motive of survival and competitive advantage of startups. In the relation between the two concepts, the mediating effect of environmental conditions and the perception of environmental uncertainty is quite determinant, especially under the pandemic (Covid-19) conditions. Modeling the relationship except perception of environmental uncertainty regarding to the situation may prevent accurate generalizations.

Based on the literature and similar empirical researches in this field, this study discusses the impact analysis between intellectual capital and core competencies within the mediating role of the perception of environmental uncertainty. Impact analysis and mediation role were analyzed using Hayes Process Macro and an online questionnaire was used as a data collection instrument. The Covid-19 global pandemic which took place while the study was in progress, did not allow to face-to-face questionnaire method during the data collection process of the study as a result of the pandemic affecting the whole world and people being quarantined at home. The sample of the research is entrepreneurs working in startups. Online surveys were sent to 2.762 entrepreneurs from 6.614 startups, which constitute the universe of the research, and data from 245 participants were included in the analysis of the research. In the data analysis of this research SPSS and LISREL software programs were preferred, and hypotheses created referring to hypothetical and empirical studies were tested with Hayes Process Macro technique. As a result of the study, it was determined that the perception of environmental uncertainty has a mediating role in the impact analysis on intellectual capital and core competencies of startups.

Keywords:
Intellectual capital, core competencies, perceived environmental uncertainty, startup, Covid-19

1. Introduction
The business world of the 21st century is shaped by increasing uncertainties, extreme competition and rapid technological developments. Therefore, these elements emphasize that the priority for businesses is "survival". It is stated that it is very difficult to achieve sustainable competitive advantage under these conditions especially Covid-19, and this can only be achieved by those who make innovations core competencies. Although innovation occupy the field literature, the intellectual capital and core competencies issues, which are the primary subjects in the management literature, take the lead in this value chain (Teece, 2007).

The growth rate and economic responses of businesses, nations and even the world were measured mostly by physical assets such as buildings, lands, machines, but the concept of intellectual capital began to become more evident as technological advances derive from new generation business models. Although intellectual capital is discussed as a type of intangible capital, its economic legitimacy seems to be dominated by intangible assets. While

focusing only on the processes of finding new customers, investors, developing and presenting new products with intellectual capital components, nowadays, it is observed that businesses have been put forward with a new methodology concept (Ibrahimy and Raman, 2019).
On one side; it is observed that businesses which want to go one step further in today's competitive world have applied to intellectual capital. On the other side; it is necessary for businesses targeting the highest value or economic volume, intellectual capital, expressed as the sole or primary asset. Developing countries, like businesses, also benefit from intellectual capital in order to take the lead in global competition and make their investments in these areas. The most important welfare creation mechanisms of recent times are realized as intellectual capital products (Bontis et al., 2000). In this context, companies define intellectual capital as the most important competitive element by producing value-added outputs, processes and management systems in new forms and using them commercially, and consequently see them as the core competencies as their most important output (Danish et al., 2016). In addition, in the conditions of today's "knowledge-based economy", firms' efforts to increase and maintain their competitiveness have focused on investing heavily in their intellectual capital, especially as it has been proven to play an important role in achieving an intellectual property capital (Guthrie and Dumay, 2015).
The strongest way to achieve success in the global competition arena remains uncertain. With the technology era that started in the 1980s, managers showed their abilities mostly on restructuring and participatory management techniques. In the 1990s, growth started to take shape in the focus of core competencies and conceptualization, development and implementation activities were applied for these competencies. On this occasion, management concepts started to take shape again and management theories have become a state to be reconsidered (Swift et al., 1995). The phenomenon of competition was fed from the terminology in question and gave birth to new techniques. The concept of core competencies represents the most important factor fed from this pool. Core competencies are mentioned as the main factor in providing competitive advantage. The type of capital required for the emergence or discovery of the core competencies is still controversial. However, when we look at the biggest businesses and brands of the world that shape today's business world, it can be said that the core competency is the product of intellectual capital.
In this study, impact analysis between intellectual capital and core competencies, which may be one of the effective techniques of global competition, are discussed in the mediating role of perception of environmental uncertainty. In terms of core competencies, it gives a narrow space to the comparison process in terms of being difficult to imitate by competitors, however, it is possible to come across examples where core competencies can be imitated in certain proportions in addition to being able to imitate all kinds of competencies (Prahalad & Hamel, 1990). The issue that allows this is shown as the intellectual capital becoming one of the most important asset parameters. One of the arguments of the organizational ecology theory is that environmental pressures force organizational structures and dynamics to resemble each other. Core competencies, like other competencies, are an output of intellectual capital, and this type of capital is necessary to survive rather than privilege factor for competition. Intellectual capital is now a form of capital that can be kept under observation by competitors, attempted to be captured, and very important investments are carried out to develop this arguments, but it cannot be held by hand. (Hannan and Freeman, 1977).
There are many studies on intellectual capital and core competencies. In these studies, the relationships and impact analysis of intellectual capital and core competencies of businesses are illustrated individually, but there is no study in the literature showing empirical approaches of the mediating role of environmental uncertainty in the relationship between the two factors. In this context, there are theoretical studies and analysis on conceptual grounds. In the individual studies in the literature, the fact that the relationship between core competencies and intellectual capital is considered hypothetical (hypothetical), but no research has been conducted on this relation. That's why, this reason constitutes the argument of the output and contribution to the literature.

2. Intellectual Capital

Nowadays, which is the age of information and technology, intangible resources and abilities come to the forefront in order to survive enterprises in dynamic environments. It is determined that the contribution of intangible resources related to information to the performance of a business is considerably higher than the financial resources (Bogner & Bansal, 2007). Intellectual capital is expressed as the sum of all information and data skills that will be crucial for companies to achieve a sustainable competitive advantage (Teece, 2000). Initially, the concept of

intellectual capital was used to represent the difference between an organization's book value and market value (Stewart, 1994).

Increased perception of environmental uncertainty, turbulence, change and hunger for information also increased the complexity within and outside the organization. The tendency to focus on intellectual capital stands out as a direct impact of these developments. Efforts are being made to deal with and manage intellectual capital, increased uncertainty perception, information requirements, and change requirements. Complexity is related to the number and associated types of variables in a system. Complexity is also linked to the setup, structure, and function of the system (Rescher, 1998). From this perspective, all systems have a certain degree of complexity. In the case of a high degree of complexity, system behavior will easily be perceived as chaotic. The emergence of the concept of intellectual capital is based on managing complexity at any level and preventing chaos.

Intellectual capital, a concept first introduced by economist John Kenneth Galbraith in 1969, refers to a difference between a market value and book value of organizations. Intellectual capital has been defined in many different ways, including: information assets that can be converted into value (Zhou and Fink, 2003); the total of a company's hidden assets that cannot be clearly seen on the balance sheet; intellectual materials such as knowledge and experience that form the competitive advantage of the business (Stewart & Ruckdeschel, 1998); and the sum of all information an organization can endure in the business process to gain competitive advantage (Youndt et al., 2004).

3. The Dimensions of Intellectual Capital

Edvinsson and Malone (1997) studied intellectual capital in two main components: human capital and structural capital. Then structural capital was studied in two categories: organizational capital and customer capital. Sveiby (1998) depicted intellectual capital as family tree: Individual competencies, internal competencies and external competencies. Based on these published studies and related discussions, it is stated that intellectual capital is the three most widely accepted main components: human capital, structural capital, and relational capital. (Chen, 2008; Chu etc., 2006; Herremans etc., 2011).

The human capital factor, which focuses on the employees of the organization, addresses the totality of the employees' competence, knowledge, skill, innovation, perception, attitude, commitment, wise / knowledge and experience. Human capital is also expressed as the sum of knowledge and accumulation within and outside the organization. Structural capital refers to intangible but highly valuable assets that employees cannot take with them when leaving the organization (Edvinsson & Malone, 1997). Structural capital must be embedded in organizations and combines of the best organizational skills which are organizational culture, routines, procedures, information systems, hardware, software, databases, company image, patents, copyrights, trademarks, etc. (Aramburu and Saenz, 2011). Relational capital refers to the existing knowledge and learning competencies that help organizations develop cooperation and build their relational processes with their external stakeholders (Bontis, 1998; Dewhurst & Navarro, 2004).

3. Core Competencies

In a business, core competencies can be revealed through an evaluation consisting of three stages. The first of these; core competency is to support the business in entering different markets. Second is the contribution of the resulting goods or services to meet with the current demands of customers. Finally; core competencies are evaluated in terms of being difficult to imitate by competitors (Prahalad & Hamel, 1990). The concept of core competencies is a concept that is highly concerned by researchers, managers and decision-makers.

The concept of core competency is not a new term. According to Bogner and Thomas (1994), core competencies are to achieve the highest possible level of customer satisfaction by using company-specific competencies (Bogner and 1994). Over time, various authors and researchers have developed the concept of core competency as well as analyzing the components that make up the core competencies (Prahalad & Hamel, 1990). As Hamel and Prahalad emphasized in 1994, core competencies mean collective learning for a business, and managers need to keep in mind that they have to consider core competencies as a collective learning in harmonizing different technologies, various marketing competencies and integrative technologies.

4. The Dimensions of Core Competencies

Technological competencies mean developing and designing new products and processes (Javidan, 1998). In addition, these competencies point to the ability to acquire information about the physical world in unique ways and thus transform this information into desired organizational outputs through designs and processes (Afuah, 2002). Technological competencies represent a composition that includes both practical and theoretical knowledge, method, procedures, experiences, and physical devices and equipment (Kumiko, 1994). Marketing competencies, which are one of the most important components of the core competencies, are defined as the abilities and processes designed to enable the organization's common knowledge, skills and resources to respond quickly to the expectations of the market, so that organizations can meet the competitive demands of the customers by adding value to their goods and services (Vorhies et al., 1999). For this reason, marketing competencies are based on a firm's ability to deeply understand customers 'current and future needs and preferences, and their ability to anticipate competitors' potential actions (Day 1994). As defined by Paul and Peter (1994), marketing competencies includes competencies such as the ability to conduct marketing research, anticipate customer demands, the ability to identify competitors' competitive strategies and to interfere with counter strategies, and easy access to potential customers.

5. Methodology

There are three factors that make up the core competencies; these are technological competencies, marketing competencies and integrative competencies. When talking about technological competencies in general, it is focused on which technologic product, process or service can be provided or produced. When dealing with marketing competencies, it is emphasized that which products or services requested by targeted customers can be identified. In integrative competencies, the harmony between the other two components of the core competencies is in the foreground; this reflects its effectiveness and efficiency in reaching competitive advantage and achieving superior customer value.

Intellectual capital is considered as one of the most important strategic assets for the success and sustainability of organizations in a competitive business environment (Longo & Mura, 2011). It is stated by many researchers that intellectual capital is the most important asset for the survival of knowledge-intensive organizations. The purpose of the study is to determine, analyze and interpret the mediating role of the perception of environmental uncertainty in impact analysis on intellectual capital and core competencies. There are two main factors that are the subject of the literature of the study: Intellectual capital and core competencies. In the literature, various empirical studies have been carried out within the scope of each factor. One of the most cited works in the field of intellectual capital; this book is titled "Intellectual Capital" by Edvinsson and Malone, published in 2010. The book can be accessed on the internet. The most reliable, valid and up-to-date sources for intellectual capital researchers are gathered in the journal "Journal of Intellectual Capital". In its third issue published in 2020, it is seen that it focuses on the transformation of intellectual capital into value, its protection, its effects on obtaining competitive advantage, its effects on financial performance and its relations with organizational behavior issues. Especially in the last three issues of the journal, security, protection, personal data, organizational information, process and competencies have come to the fore as frequently mentioned topics. Threats in the process of transformation of intellectual capital into value and concerns about the processing of customer data were included in these studies. In line with the content and suggestions of the studies in question, the effect of core competencies comes to the fore in the transformation of intellectual capital into value, because the roles of core competencies in providing competitive advantage in organizations and maintaining their existence are now discussed in the literature section where it offers an uniqueness and competition argument over data protection, processing and mining. Core competencies are the sustainability and competitive arguments of organizations that are vital in high competitive conditions. In the conjuncture competition systematics, the conditions of competition have begun to take shape through organizations focusing on the hegemony of traditional and complex structures, goods and services that have been disrupted (Harms et al., 2015).

6. Startups

Core competencies are the sustainability and competitive arguments of organizations that are vital in highly competitive conditions. In the conjuncture competition systematic, the conditions of competition have begun to take shape through organizations that focus on the intellectual capital (Harms et al., 2015). There are thirteen technology companies in the top twenty in the "Most Valuable Brands of the World" list, which is available on Forbes' website

and is constantly updated. As frequently mentioned in the literature section of the study; the capital approach adopted by technology companies is fed by the arguments put forward by intellectual capital (Paradkar et al., 2015). Therefore, it can be stated that today's world competition is among the core competencies of the companies working in the focus of intellectual capital. It is seen that new generation of innovative companies, known as "garage enterprises" in public terminology, known as "startup" in global terminology, are currently the most valuable brands and competition takes place in these areas. In the Turkish literature, word of "startup" is defined as technological enterprises or new firms which do not match with practice conceptually. The word of "startup" should be stated to be used for enterprises with fast growth potential based on innovative models and methods (Pirolo & Presutti, 2010). In order to examine the mediating role of the perception of environmental uncertainty in impact analysis on intellectual capital and core competencies, a survey was used as a data collection method for research on startups. The universe of the research in line with the mission and scope of study is startups in Turkey. The questionnaire was requested from the founders, co-founders, partners and executives who took an active role in startups. Universe of the research is calculated by focusing on the data that was obtained by startup.watch website. The number of startups in Turkey were calculated via sample requirements provided by startups.watch. That's why, founders and team members of startups in Turkey represents the universe of the study, which is 6614. The sample size is; n = N.t2.p.q / d2 (N-1) + t2. Based on the formula pq (N = 6614, p = 0.20 q = 0.80 t = α = 0.05 for 1.96 d = 0.05 n = 6614 for 95% confidence interval. (1.96) 2. 0.20. 0.80 / (0.05) 2. (6614-1) + (1.96) 2. 0.20. 0.80) The number of samples was found as 237 (Dilman et al., 2014).

7. Covid-19

The Covid-19 pandemic, a global epidemic during the research period of the study, has widespread the whole world. New Coronary Virus Disease (COVID-19) is a virus identified on January 13, 2020, as a result of research conducted in a group of patients who developed respiratory tract symptoms in late December in China. The outbreak was initially detected in those in the seafood and animal market in this region. Then it spread from person to person and spread to other cities in the province of Hubei, mainly Wuhan, and other provinces of the People's Republic of China and other countries of the world, according to World Health Organization (WHO) web site. Coronaviruses are a large family of viruses that can cause disease in animals or humans. In humans, several coronaviruses are known to cause respiratory infections, from the common cold to more severe diseases such as the Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The SAR-CoV-2 virus is caused by the new Coronavirus Disease, according to web site of Republic of Turkey Ministry of Health.

Turkey was affected by this situation, Covid-19 like other countries. Therefore, work from home has become an indispensable part of the ongoing life during quarantine period. Therefore, no data was collected through printed surveys, and the entire data collection part of the research process was carried out through online surveys. The questionnaire created with the help of the Google survey application was sent to 2954 entrepreneurs and 237 feedbacks were received. The questionnaire, which has 83 statements in four parts, consists of 6 demographic components, 17 intellectual capital dimensions, 25 core competencies dimensions, and 35 perception of environmental uncertainty dimensions. Hypothesis testing was carried out by means of multiple choice, likert type expressions. The research was carried out using the 7-point likert type with regarding to the scales, used in the study.

8. Research Model

The research model, which examines the relationship between intellectual capital and core competencies within the framework of perceived environmental uncertainty as a mediating variable and measures it using the Hayes Process Macro model, is presented in Figure 1.

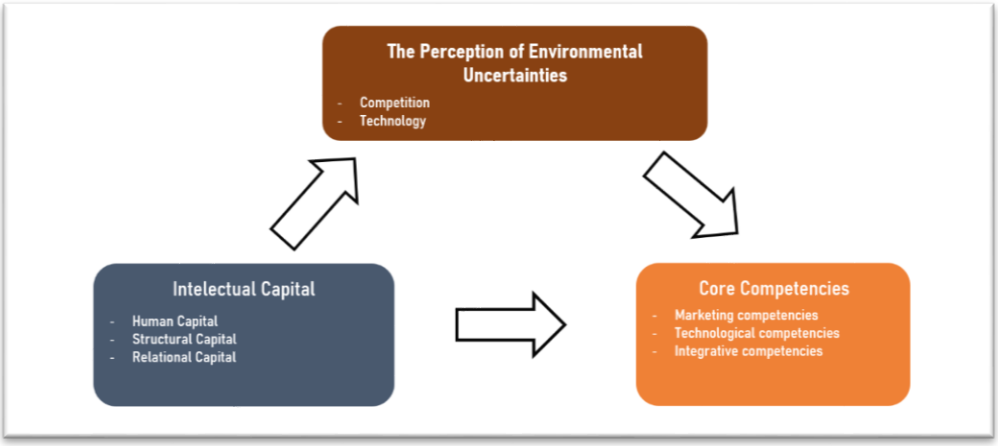

Figure 1. Modeling Study of the Research

The hypotheses of the mediation model, which investigates the mediating role of competition and technology factors—components of perceived environmental uncertainty—in the impact analyses of intellectual capital and core competencies, are presented in Table 2. These hypotheses consist of 18 dimensions under 2 main factors. Therefore, it is observed that the model used in this study is composed of 18 dimensions.

The impact of intellectual capital on innovative product development and innovative business performance through core competencies was tested by Han and Li (2015), who identified positive relationships among these variables. Similarly, Zhang et al. (2018) found a positive relationship between intellectual capital and both innovative product development performance and competitive advantage. However, they emphasized that environmental changes might be related to the proposed model and could influence the impact analyses accordingly. This study highlights the significance of environmental uncertainty factors in models involving intellectual capital.

In another study conducted by Seram et al., it was found that core competencies within organizations have a positive effect on innovation generation, thereby contributing to the establishment of competitive advantage. The results of measurements indicated that core competencies play a crucial role in the impact analyses between independent and dependent variables in achieving competitive advantage.

The positive relationships and effects of both key variables examined in this research—intellectual capital and core competencies—on competitive advantage stand out as a common finding agreed upon by many studies in the literature. Similar conclusions have been drawn by Han and Li (2015), Zhang et al. (2018), Hafeez et al. (2002), Byrd (2001), Agha et al. (2012), and Kabue and Kilika (2016). However, the position of the factors constituting the perception of environmental uncertainty within these relationships and analyses underscores a gap in the field. In previous studies, this gap has either been addressed through different variables or suggested as a direction for future research.

Liao and Gartner (2006) argued that environmental uncertainties are influential in the business model and business plan modeling processes of innovative ventures. They concluded that, rather than the age or size of ventures, environmental uncertainties play a more decisive role in their sustainability and market retention. In a related study by Nobre (2011), it was theoretically proposed—and attempted to be evidenced—that core competencies are affected by high levels of environmental uncertainties and complexities, particularly by the perception of technological uncertainty in competitive conditions and the market. However, this relationship was not empirically tested or analyzed.

For these reasons, the following hypotheses were developed, focusing on the mediating role of perceived environmental uncertainty and the associated factors:

H1: Competition has a mediating role in the relationship between intellectual capital and core competencies.

H2: Technology in the industry has a mediating role in the relationship between intellectual capital and core competencies.

Hypothesis 1: Competition has a mediating role in the relationship between intellectual capital and core competencies.
H 1a: Competition has a mediating role in the effect of human capital on marketing competencies.
H 1b: Competition has a mediating role in the effect of structural capital on marketing competencies.
H1c: Competition has a mediating role in the effect of relational capital on marketing competencies.
H 1d: Competition has a mediating role in the effect of relational capital on technological competencies.
H 1e: Competition has a mediating role in the effect of structural capital on technological competencies.
H 1f: Competition has a mediating role in the effect of human capital on technological competencies.
H1g: Competition has a mediating role in the effect of human capital on integrative competencies.
H 1h: Competition has a mediating role in the effect of structural capital on integrative competencies.
H1i: Competition has a mediating role in the effect of relational capital on integrative competencies.

Hypothesis 2: Industry technology has a mediating role in the relationship between intellectual capital and core competencies.
H 2a: Industry technology has a mediating role in the effect of relational capital on integrative competencies.
H2b: Industry technology has a mediating role in the effect of structural capital on marketing competencies.
H 2c: Industry technology has a mediating role in the effect of human capital on marketing competencies.
H 2d: Industry technology has a mediating role in the effect of relational capital on technological competencies.
H2e: Industry technology has a mediating role in the effect of structural capital on technological competencies.
H 2f: Industry technology has a mediating role in the effect of human capital on technological competencies.
H2g: Competition has a mediating role in the effect of structural capital on integrative competencies.
H 2h: Industry technology has a mediating role in the effect of human capital on integrative competencies.
Hypothesis 2i: Competition has a mediating role in the effect of relational capital on integrative competencies.

9. Data Analysis

The personal and organizational information section consists of the first part of the questionnaire study created to collect data in the research. At this stage, answers were asked from the sample regarding the sector they were in, their title, their gender, their educational background, the number of employees in the organization and the age of the organization. It is determined that the startups that constitute the sample of the research are predominant in the IT sector, the number of employees of 5 and under is more common and the years of operation of startups are usually between 0 and 3 years. In personal characteristics; it is seen that the majority of the sample consists of men, the majority of them are university graduates and their titles are mostly formed as founding partners.

Kaiser-Meyer-Olkin (KMO) adequacy measurement and Bartlett's Sphericity test were used to measure the applicability of intellectual capital factor analysis. The closer the KMO measurement is to 1, the factor analysis is considered appropriate to the data group (Satake, 2014). The KMO value was calculated to be 0.914, and it was found appropriate to perform analysis on the data set. According to the exploratory factor analysis results, the items of the scale consist of 3 factors. The total variance rate was calculated as 71.466%. Core competencies' KMO value has been calculated as 0.942 and it has been found appropriate to analyze the data group. According to the exploratory factor analysis results, the items of the scale consist of 3 factors. The total variance rate was calculated as 65.976%. The KMO value of the perception of environmental uncertainties has been calculated as 0.945 and it has been seen that it is appropriate to analyze the data group. According to the exploratory factor analysis results, the items of the scale consist of 6 factors. Total variance rate was calculated as 75,159%.

Cronbach's alpha value of human capital is 0,802, structural capital is 0,871 and relational capital is 0,793. The Cronbach's alpha value of the marketing competencies is 0.907, technological competencies is 0.849 and integrative competencies is 0.917. The Cronbach's alpha value of the government and policies is 0.944, economy is 0.937, resources and services is 0.990, product market and demand is 0.919, competition is 0.913 and the technology was found 0.911. This calculations show that all the dimensions of scales are reliable.

10. Confirmatory Factor Analysis

According to indicators of the intellectual capital confirmatory factor analysis; since it is from $\chi 2$ / df <3 ($\chi 2$ / df = 1.78), the result is statistically significant. RMSEA, NFI, NNFI, SRMR and CFI measurements are included in goodness-of-fit indexes values. Accordingly, it shows that the data were good of fit and confirmatory factor analysis is statistically significant and valid (Schermelleh-Engel et al., 2003). In line with the confirmatory factor analysis applied to the core competencies scale; since it is from $\chi 2$ / df <3 ($\chi 2$ / df = 2.64), the result is statistically significant. Accordingly, it was determined that the data were good of fit and confirmatory factor analysis was statistically significant and valid. As the confirmatory factor analysis indicators applied to the perception of environmental uncertainty scale are from $\chi 2$ / df <3 ($\chi 2$ / df = 2.34), the result confirms statistical significance. Accordingly, it was determined that the data were good of fit and confirmatory factor analysis was statistically significant and valid.

11. Mediation Analysis Findings

This section presents the findings of this research, examining how intellectual capital shapes its influence on core competencies through the mediating roles of perceived environmental uncertainty—specifically the sub-dimensions of competition and industry technology. The impact analyses of the study reveal the total, direct, and indirect effects between the independent and dependent variables, allowing for a comprehensive discussion of both theoretical and practical contributions.

To determine whether competition has a mediating effect on the relationship between structural capital and marketing competencies, Bootstrapping test results were examined. For the indirect effect to be considered statistically significant, its 95% bootstrap confidence interval must differ from zero and lie above zero (Hayes, 2013). In our study, the indirect effect falls within the interval BootLLCI = 0.079 and BootULCI = 0.194, indicating statistical significance. The total effect was calculated as 0.636, and the direct effect as 0.501. The difference between the total and direct effects represents the magnitude of the indirect (mediated) effect (Hayes, 2013). The mediating effect of competition was found to be positive at the level of 0.135.

Hypothesis 1b: Competition has a mediating role in the effect of structural capital on marketing competencies.

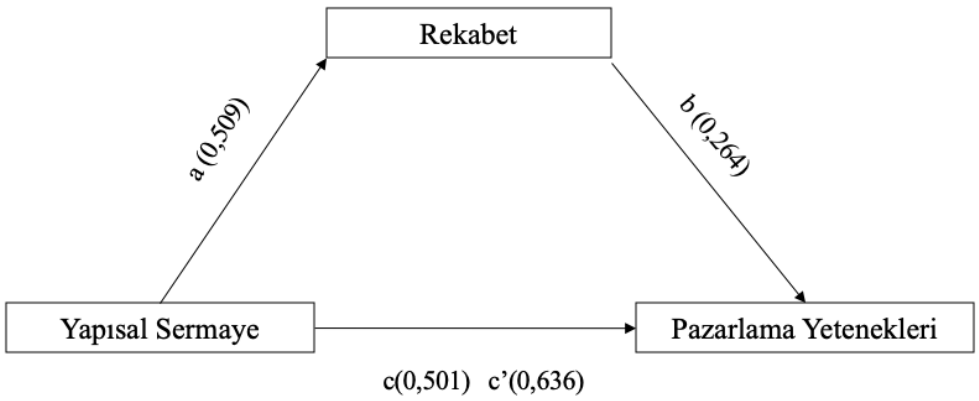

Figure 2: Mediation Levels of Competition in the Effect of Structural Capital on Marketing Competencies

To determine whether technology has a mediating effect on the relationship between structural capital and marketing competencies, Bootstrapping test results were examined. For the indirect effect to be considered statistically significant, its 95% bootstrap confidence interval must differ from zero and fall above zero (Hayes, 2013). In our study, the indirect effect was found within the interval BootLLCI = 0.072 and BootULCI = 0.196, indicating statistical significance. The total effect was calculated as 0.636, and the direct effect as 0.505. The difference between the total and direct effects represents the magnitude of the indirect (mediated) effect (Hayes, 2013). The mediating effect of technology was found to be positive at the level of 0.130.

Hypothesis 2b: Technology has a mediating role in the effect of structural capital on marketing competencies.

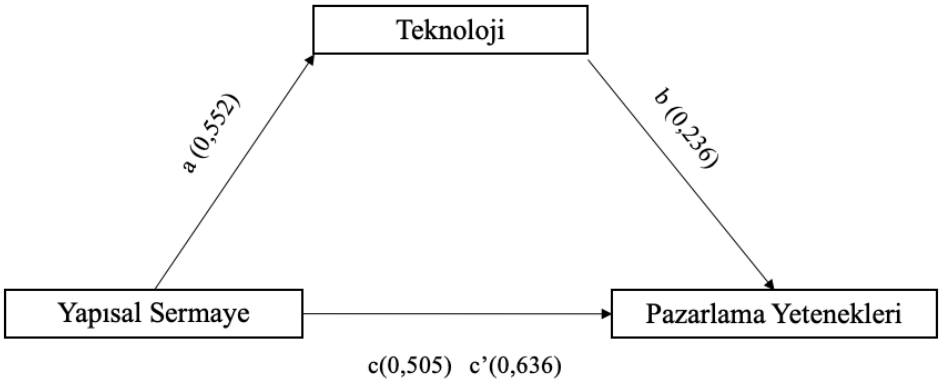

Figure 3: Mediation Levels of Technology in the Effect of Structural Capital on Marketing Competencies

12. Result and Recommendations

When formulating the research hypotheses, both similar studies in the field and the hypothetical role of the mediating variables in the effect analyses were considered. In this context, two sub-components of environmental uncertainty perception, namely competition and industry technology, were identified as important mediating variables in the relationship between intellectual capital and core competencies.

The analysis conducted using Hayes (2013) PROCESS macro revealed that both sub-components of environmental uncertainty perception significantly mediate the relationship between intellectual capital and core competencies, and substantially alter the total effect.

The results indicate that the relationship between structural capital and marketing competencies shows the highest indirect effect mediated by both competition (H1b) and industry technology (H2b). Specifically, the mediating effect of competition was found to be 0.135, while that of industry technology was 0.130. These findings highlight the deepening influence of these variables on marketing competencies through the lens of environmental uncertainty perception.

Conversely, the weakest mediating role of competition was observed in the relationship between human capital and technological competencies, while the least impact of technological uncertainty was found in the same relationship. In both cases, the difference between the total effect and the direct effect was relatively low.

The results suggest that structural capital plays a decisive role in influencing marketing competencies, but this effect is compromised by technological uncertainty perception. This highlights that rapid changes in technological infrastructure can hinder the transformation of projects, patents, and information systems developed by firms into core competencies, thus directly affecting the development of marketing competencies.

Another significant finding in this research is that effect analyses conducted without considering environmental uncertainty perception may lead to misleading generalizations. Indeed, the indirect effect analyses involving competition and industry technology components show that the total effect significantly changes, and these changes represent a more rational effect generalization.

Although there are limited studies in the literature directly examining the effect of intellectual capital on core competencies, for example, in Han and Li's (2015) study, it was shown that intellectual capital positively affects innovative performance through core competencies. Similarly, Zhang et al. (2018) identified a positive relationship between intellectual capital, innovative product development performance, and competitive advantage. However, both studies emphasized that environmental changes could play an effective role in these relationships and potentially alter the results of the models. In this context, this study contributes to the literature in three fundamental ways.

The concepts of intellectual capital and core competencies, which have been the subject of both academic research and real-world applications for a long time, have attracted wide interest. However, they also contain significant gaps. Specifically, the interaction between these two concepts, with environmental uncertainty perception as an intermediary variable, has not been sufficiently explored. The lack of empirical studies on innovative ventures (startups) deepens this gap. The insufficient representation of these ventures, which are seen as the pioneers of the new generation economy and are at the focus of smart investments, in scientific studies highlights another deficiency pointed out by this research. Therefore, this study aims to address these gaps in the literature and research area by focusing on them.

The study's results indicate that intellectual capital has an effect on core competencies, and the alignment model encompassing effect analyses has been addressed with good fit. However, the key finding of this study is that the perception of environmental uncertainty as a mediating variable has facilitated the acquisition of more accurate, valid, and reliable results in this context, particularly with its mediation of competition and technology dimensions within the industry. The results section examines the prominent findings for each hypothesis, among which measurements attributed to structural capital and marketing competencies are more prominent than others, as the greatest impact in the analyses conducted under the mediation of environmental uncertainty perception occurred between these two subcomponents.

It was determined that innovative ventures in Turkey place emphasis on structural capital, but in the process of developing their core competencies, they emphasize relational capital. This indicates that innovative ventures focus on structural capital to implement their initial business models, but the commercialization phase is of vital importance to them, making relational capital particularly influential on core competencies, especially marketing competencies. Marketing competencies are the abilities that help innovative ventures connect the value they have developed with the market and stakeholders, enabling them to understand market conditions and competitors in depth. The majority of research participants focus on marketing competencies, considering this as a period-specific issue. Innovative ventures address the gaps in sectors by proposing marginal solutions designed innovatively to fill those gaps. Therefore, before moving to the action phase, business model development processes and market analysis work have significant effects on their presence and the life cycles of the products they introduce. Given that the entrepreneurial ecosystem in Turkey is in a developing phase, it has been observed that innovative ventures of similar levels are concentrated. In this period and context, it is stated that innovative ventures focusing on marketing competencies are dominant, and the key capital for this focus is structural capital. In the generalization of the research results, it has been determined that structural capital is the most emphasized component of intellectual capital, and in terms of effect analyses, the structural capital subcomponent, especially its effect on integrative competencies, has a significant impact.

In the effect analyses conducted in this study, when the components of intellectual capital, the independent variable, are examined without the mediating components of competition and industry technology perception, the results differ. When the mediating variable is removed and direct relationships are examined, the strongest effect relationship identified by businesses is between structural capital and integrative competencies. Structural capital is one of the components of intellectual capital, encompassing a business's institutional structure, processes, systems, software products, and organizational culture. Integrative competencies, on the other hand, are abilities that allow the business to effectively combine its internal knowledge, skills, and resources to generate innovative and competitive solutions. Since innovative ventures mainly develop processes with a product focus, especially software-based, they may encounter limitations in emphasizing other competencies such as sales, marketing, or quality. Therefore, highlighting integrative core competencies contains critical, encompassing, and facilitating effects for scaling the business model. These are discussed as primary elements for ensuring sustainable competitive advantage for innovative ventures. However, the perception of environmental uncertainty regarding competition and industry technology affects this effect analysis, making it necessary to take additional measures.

The literature, research findings, analyses, and hypothetical generalizations regarding the research question discussed in this study find relevance both with researchers and managers. Therefore, the suggestions formed based on the research results are of importance to both groups of researchers and practitioners. In light of the suggestions, certain outcomes are expected in both the business world and the academic community. The emphasis on the importance of the research underlines the value of practical application of the relevant suggestions. The suggestions gain meaning and transform into value by the reflections on both organizational and individual experiences.

Like every scientific study, this research has certain limitations, and it is clear that more investigation is required in specific areas. Primarily, focusing on innovative ventures (startups) and other businesses in Turkey shows that the results obtained may not be directly adaptable to other ecosystems, markets, or countries. However, geographical-focused studies can contribute to the literature by offering different perspectives, dimensions, and impact analyses, making generalizations more objective, accurate, and comprehensive.

On the other hand, the hypothetical relationships discussed in this study and the concepts of intellectual capital and core competencies are increasingly gaining space in organizational theories and business contexts, which also deserve further examination in different contexts. The rapid developments in the real sector require academic research to keep pace with this momentum, thereby improving the coordination between theoretical and applied studies and offering stronger contributions to the field.

Although the factors measured with a seven-point Likert scale, the evaluations of dimensions, and the effect analyses in this study are consistent with one another, qualitative research that measures subjective evaluations in detail could be developed. Future studies might reconsider the hypotheses proposed in this study and use different scales. Additionally, the hypotheses listed in this study have only been tested with a survey providing cross-sectional and snapshot data, so future studies should focus on different research methods, either individually or in combination (hybrid), to further develop the field.

Finally, future studies could examine other mediators and moderators in the relationship between intellectual capital and core competencies, critically evaluating, strengthening, and diversifying our conclusions regarding how intellectual capital influences core competencies. This study has addressed the mediating role of environmental uncertainty perception within the unique conditions of the geography where the research was conducted. However, continuing research focused on environmental uncertainty perception in different conditions and periods is extremely important. Testing the situational context of impact analyses of the same dimensions or factors in light of geographical and socio-cultural contexts will allow for more comprehensive and accurate results.

In the section of this study where environmental uncertainty perception was addressed, it was emphasized that attributing the sole responsibility for this perception to certain environmental conditions may be misleading. The study focuses on how individuals perceive their environment as uncertain. While it is possible to take various actions to eliminate uncertainties within an organization, the majority of participants, being co-founders in the sample of innovative ventures (startups) and other businesses, find that the source of uncertainty lies in environmental components such as market conditions, government policies, technological changes, resource distribution, and competitive conditions. In this context, it is expected that managers of innovative ventures will develop specific models and methods to address the issues causing uncertainties, in addition to evaluating gaps in the sector or market. Increasing the predictability level of variables associated with environmental uncertainty is believed to reduce the negative impacts of these uncertainties. Furthermore, when it was observed that structural capital was predominant among the majority of participants, it was seen that there was a dominant focus on marketing competencies among core competencies. Reducing arguments related to environmental uncertainty perception, especially regarding competition and industry technology, may enable a healthier interpretation of this relationship and allow managers to shape their business models with more predictable data.

On the other hand, another topic that managers must closely monitor is intellectual capital. Proper measurement and reporting of this capital will guide managers in determining and developing core competencies. Therefore, the emphasis on core competencies in the transformation of intellectual capital into value is one of the most critical elements of both internal and external strategic formulations within the organization. Managers should align the steps they take with the goal of institutionalization and standardization. Instead of relying on random or momentary solutions, an analytical and disciplined approach should be adopted for sustainable competitive advantage. Considering the rapid development and change phases of innovative ventures, it is observed that they initially adopt a human capital-oriented attitude in line with the shared motivation and common goals during the establishment

process, and then transition to structural capital for lean product or prototype production. However, one of the key factors shaping competition is relational capital, particularly marketing competencies. The main reason for this is that entrepreneurs believe they cannot commercialize their products without agreements, protocols, or strategic partnerships, thus making it difficult to scale the venture.

Additionally, benefiting from government incentives and grants, making pre-sale agreements, and establishing communication with industry leaders are also determining factors for many entrepreneurs' future plans. However, being highly dependent on such resources can lead to negative outcomes when environmental uncertainty fluctuates unpredictably. Therefore, entrepreneurs must develop measures to reduce external resource dependency in both business models and feasibility studies and invest in integrative competencies. If abandoning the focus on relational capital harms the model, motivational applications focusing on the employees' drives, needs, behaviors, personalities, attitudes, and morale can be used within the organization to reduce environmental uncertainty perception. These applications can be carried out through both economic and non-economic, psychosocial, and organizational tools. Among the economic motivational tools, profit sharing and reward systems are the two main techniques that stand out in this regard. Specifically, the economic reward approach can also be measured through factors independent of the bonus system, such as innovative business performance and strong dialogue establishment, and can be implemented with necessary evaluations.

In environmental uncertainty perception, the most prominent motivational applications are likely to be psychosocial tools. Independent work structures and interesting work approaches, among the tools mentioned, play an effective role in creating different attitudes toward innovation absorption and overcoming uncertainties, contributing to the development of innovative and valuable solutions. Among the organizational tools considered in motivational applications, strengthening intra-organizational communication, expanding the scope of work, implementing flexible work arrangements, encouraging participation in decisions, and breaking resistance to changes through job rotation can help eliminate the negative effects of environmental uncertainty perception.

Outside of all these motivational applications, measures regarding internal resource management and financial assets can be created and implemented, and internal entrepreneurship activities can allow team members to select, analyze, and solve issues that reduce uncertainty themselves.

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