

TESTING VRIN FRAMEWORK: RESOURCE VALUE AND RARENESS AS SOURCES OF COMPETITIVE ADVANTAGE AND ABOVE AVERAGE PERFORMANCE

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In this study, structural equation model that analyzes the impact of resource and capability characteristics, more specifically value and rareness, on sustainable competitive advantage and above average performance is developed and empirically tested. According to the VRIN framework, if a company possesses and exploits valuable, rare, inimitable and non-substitutable resources and capabilities, it will achieve sustainable competitive advantage. Although the above mentioned statement is widely accepted in the strategy literature, there is a lack of research on characteristics of resources, especially at the conceptual level. An empirical analysis was conducted on 265 large and medium-sized Croatian companies from all industries. All relationships hypothesized by the model are statistically significant and in the expected direction. The findings suggest that the companies with more valuable and rare resources achieve higher levels of sustainable competitive advantage and performance. Since there is an interdependence between resource value and rareness, their impact on competitive advantage is both direct and indirect.

1. INTRODUCTION

According to the Resource-based view (RBV) of strategic management, competitive advantage is closely related to company's internal characteristics (Spanos and Lioukas, 2001). More specifically, if a company possesses and exploits valuable, rare, inimitable, and non-substitutable resources and capabilities, it will achieve sustainable competitive advantage and above-average performance (Barney, 1991). The above-mentioned statement is known

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in strategic literature and VRIN framework. Although the RBV is one of the most influential theories of strategic management, it has received only modest support that varies considerably with the independent variable and theoretical approach employed. There is a lack of research on characteristics of resources, particularly value and rareness Newbert (2007, 2008). As emphasized by Priem and Butler (2001), to infer that resources and capabilities are valuable and rare simply because they are related to competitive advantage is to assume that VRIN hypotheses that link resource characteristics to competitive advantage are factual and do not require any empirical confirmation. These hypotheses are in fact purely theoretical and for them to be supported an empirical investigation is necessary (Priem and Butler, 2001; Newbert, 2008).

Nevertheless, only few empirical studies examine VRIN resource characteristics at the conceptual level (Spanos and Lioukas, 2001; Newbert, 2007). Furthermore, the dependent variable of the RBV, competitive advantage, although widely mentioned in strategic management, is not precisely defined. Moreover, the terms performance and competitive advantage are often used as synonyms. The following section presents the theoretical background of the two concepts analyzed: competitive advantage and VRIN framework, as well as theoretical propositions and hypothesis. Subsequent sections present empirical analysis and results.

2. THE RESOURCE BASED THEORY OF COMPETITIVE ADVANTAGE

The term *competitive advantage* was first introduced by Michael Porter (1985) in his competitive strategies analysis. According to Porter (1985), competitive advantage stems from the company's ability to create value for its buyers that will exceed the cost of its creation. Value is what buyers are willing to pay, and superior value stems from offering lower prices than competitors for similar benefits or unique benefits at a higher price. According to Barney (1991), company has a competitive advantage when it is implementing a value creating strategy different from the strategies of its competitors. Peteraf (1993) defines competitive advantage as sustainable above-normal returns which can be achieved only if four prerequisites (resource heterogeneity, *ex post* limits to competition, imperfect mobility and *ex ante* limits to competition) are met. On the other hand, Grant (2002) believes that the company has a competitive advantage when it earns a higher level of profits than its competitors. Foss and Knudsen (2003) stress that the two main definitions of competitive advantage (Barney, 1991; Peteraf, 1993) are not related because a company can continuously implement a unique strategy based on the resource acquired in a

competitive market and thus, according to Barney, possess a sustainable competitive advantage, however, at the same time, it can generate only an average, normal profit, which means that, according to Peteraf (1993), there is no sustainable competitive advantage. As a response to Foss and Knudesen's (2003) critique, Peteraf and Barney (2003) provide definition of competitive advantage that is consistent with those by Porter (1985), Barney (1991) and Peteraf (1993). According to Peteraf and Barney (2003), a company has competitive advantage when it is able to create greater economic value. Economic value is defined as the difference between the perceived benefits gained by the buyers and the economic cost to the company. There are multiple ways of achieving competitive advantage, which means that, to achieve it, a company does not have to be the best in all dimensions, but it must be superior in value creation (Peteraf and Barney, 2003).

The resource-based view (RBV), as one of the most widely accepted theories of competitive advantage, focuses on relationships between company's internal characteristics and competitive advantage (Spanos and Lioukas, 2001). It is based on the assumption that companies within an industry are heterogeneous in terms of resources they control. Since resources may not be perfectly mobile, heterogeneity can be long lasting (Barney, 1991). According to Barney (1992, 1995) resources and capabilities include financial, physical, human and organizational assets that a company uses to develop, manufacture and deliver products and services to customers. Financial resources include debt, equity, retained earnings, etc. Physical resources include machines, manufacturing plants and buildings. Human resources relate to the skills, knowledge, ability to make judgments, risk-taking propensity and wisdom of individuals associated with the company. Organizational resources are history, connections, confidence, organizational structure, formal reporting structure, management control systems and compensation policies (Barney, 1992, 1995).

Barney (1991) develops the so-called VRIN framework which defines characteristics resources need to possess in order to enable competitive advantage to be achieved. According to VRIN framework, valuable, rare, imperfectly imitable and not substitutable resources have the potential for creating sustainable competitive advantage. The value of resources lies in their ability to neutralize threats and enable company to exploit opportunities that arise in a business environment, i.e. resources are valuable if they enable a company to design and implement strategies that improve its efficiency and effectiveness. It is important to emphasize that the value of resources has to be estimated in the context of corporate strategy and the specific environment in which the company operates. Resource rareness implies that competitors do not

have access to the particular resource, or that they have only limited access. Valuable resources that are not rare cannot be the sources of the competitive advantage. To achieve the competitive advantage, resource must be valuable and rare. However, this does not mean that valuable resources that are not rare are irrelevant to a company. These resources ensure the survival of the company and enable it to achieve competitive parity in the industry in which it operates. If a company fails to exploit valuable resources, it will have the competitive disadvantage. If the resource that a company possesses is not valuable, then it will not allow the company to choose and implement strategies that exploit opportunities and neutralize threats from the environment. Such resources are considered as weaknesses. Valuable resources that are not rare are considered strengths (Barney and Clark, 2007). Resources are imperfectly imitable if competitors cannot obtain them on a particular market. If there is no other resource that could be used as an adequate and worthy replacement for the existing resource, existing resources are not substitutable. It is stressed that the value and rarity of resources are necessary conditions for achieving competitive advantage. However, for achieving sustainable competitive advantage, resources also have to be imperfectly imitable and not substitutable. Foss and Knudsen (2003) reflect on Barney's classification of VRIN conditions, and state that there are the only two necessary conditions for achieving sustainable competitive advantage: uncertainty and immobility.

Although the RBV is considered one of the most influential theories of strategic management (Powell, 2001; Priem and Butler, 2001; Newbert, 2008), its acceptance seems to be based more on the basis of logic and intuition than on the empirical evidence (Newbert, 2008). In most studies that examine the connection between company's resources and performance, resource heterogeneity approach is employed. By that approach, specific resource or capability is claimed to be valuable, rare, imperfectly imitable or non-substitutable, and then the amount of that resource or capability that a company owns is correlated with competitive advantage or performance (Newbert, 2007, 2008). This type of research provides evidence that a specific resource can help company to achieve competitive advantage, but does not verify the influence of resource characteristics (value, rareness, inimitability and non-substitutability) on competitive advantage (Newbert, 2008).

Results of studies using the resource heterogeneity approach suggest that company's asset influences market performance, but not profitability (Spanos and Lioukas, 2001), company-specific resources (corporate management capabilities, employee value-added and technological competence) enhance accounting-based and market-based measures of performance (Acquaah and

Chi, 2007) and that relationships between resource sustainability, capability dynamism and resource orientation (RO) are significant (Chmielewski and Paladino, 2007). Wu (2010) divided resources in two groups, VRIN and non-VRIN, and concluded that groups are positively correlated to competitive advantage in low and medium volatility environments, but in high volatility environments, only VRIN resources have influence on competitive advantage.

Only several studies test resource characteristics at the conceptual level. Such studies include Markman, Espina and Phan (2004), who came to the conclusion that competitive advantage is related to inimitability, but not substitutability of patents, and Newbert (2008), who found that value and rareness are related to competitive advantage. He also pointed that there is a paucity of conceptual-level studies, particularly with respect to characteristics of value and rareness. After testing the relationship between resource value and competitive advantage (Talaja, 2012a) and the relationship between resource rareness and company's performance (Talaja, 2012b), based on previous results, an integrated model of resource value, rareness, competitive advantage and performance (Figure 1) is presented with the aim of confirming proposed relationships, as well as testing resource value and rareness at the conceptual level.

Figure 1 shows that company's competitive advantage is determined by the value and rareness of its resources and capabilities. Considering that resource value and rareness are interdependent, they influence competitive advantage directly and indirectly.

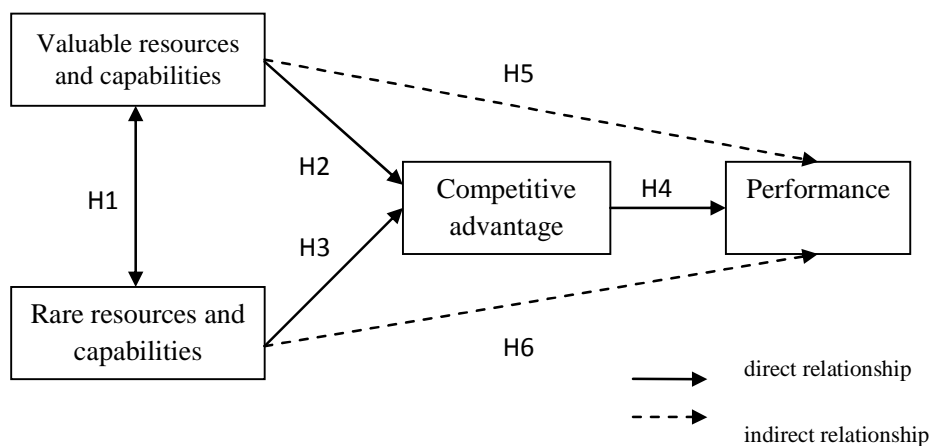


Figure 1. Value, rareness and company performance

Competitive advantage is operationalized separately from company's performance, and it is assumed that it determines company's performance levels and mediates the relationship between resource rareness and performance, as well as the relationship between resource value and performance.

Model from Figure 1 can be presented through the following hypotheses that will be tested in subsequent chapters:

- H1: Value and rareness of company's resources and capabilities are positively related.
- H2: If a company possesses valuable resources and capabilities, it will achieve sustainable competitive advantage.
- H3: If a company possesses rare resources and capabilities, it will achieve sustainable competitive advantage.
- H4: Sustainable competitive advantage leads to above average performance levels.
- H5: Companies with more valuable resources and capabilities will achieve higher performance levels.
- H6: Companies with rare resources and capabilities will achieve higher performance levels.

3. SAMPLE AND MEASURES

In this study, primary data collected from large and medium-sized Croatian companies with more than 100 employees is used. Such companies were identified using the data from the Croatian Chamber of Economy, resulting in a population of 1,017 companies. The study simultaneously employed online and mail survey. E-mail invitations containing a hyperlink to a web site with the online survey were sent to top managers in sample companies. A mail survey was sent at the same time, so respondents were able to choose the way they wanted to participate. A total of 265 usable surveys were collected, which resulted with the response rate of 26.06%, acceptable for this type of research (Drnevich and Kriauciunas, 2011; Protogerou, Caloghirou and Lioukas, 2008). From 265 usable questionnaires, 144 (54.3%) were collected through mail survey, while 121 (45.7%) were collected via online survey. In addition, there are 108 (40.8%) large, and 157 (59.2%) middle-sized companies in the sample,

of which 46 (17.4%) companies are in the foreign and 219 (82.6%) in the domestic ownership.

According to Makadok (2001), no matter how outstanding company's capabilities are, they do not generate economic profits if the company fails to acquire the resources which will enhance the productivity of these capabilities. Similarly, Newbert (2008) argues that even if a company possesses resources that have the potential to create competitive advantage, that potential will not be realized if the company does not possess capabilities for resource exploitation. Therefore, Newbert (2008) does not examine the characteristics of individual resources and capabilities, but the characteristics of relevant groups of resources and capabilities of enterprises. In the operationalization of valuable resources and capabilities, recommendations from Makadok (2001) and Newbert (2008) are adopted, as well as previously mentioned Barney's (1992, 1995) definition and classification of resources and capabilities.

This means that value, or contribution in neutralizing threats and exploiting opportunities that arise in a business environment of physical (VA_PH), human (VA_HU), organizational (VA_OR) intellectual (VA_IN) and financial (VA_FI) resources and capabilities is examined. In addition, rareness of physical (RA_PH), human (RA_HU), organizational (RA_OR), intellectual (RA_IN) and financial (RA_FI) resources and capabilities is analyzed. Both, value and rareness, were assessed on a five-point scale ranging from 1 = not at all to 5 = entirely.

Competitive advantage is operationalized through manager's perceptions of the company's success in comparison to major competitors, according to the following elements: a general advantage (or disadvantage) over competitors (CA1); sustainability of acquired advantage (CA2); the product/service quality and image (CA3); price of products/services (CA4); the production cost of product or cost of service delivery (CA5) and customer satisfaction with product/service (CA6), that are in accordance with the definition of competitive advantage given by Peteraf and Barney (2003). The scale was assessed on a five-point Likert-type scale ranging from 1 (much worse than competitors) to 5 (much better than competitors).

Performance is operationalized through managers' perceptions of main performance categories: sales (PERF1); sales growth (PERF2); profitability (PERF3); market share (PERF4), increase in market share (PERF5) and sustainability of achieved performance (PERF6), given that the perceptual measures of performance correlate with objective measures (Powell, 1992).

4. RESULTS

For statistical analysis, Lisrel 8.80 structural modeling program with Sattora-Bentler robust Maximum Likelihood approach (RML) was used. The RML method was chosen because it provides an overall model fit test statistics and parameter standard errors that are robust to mild deviations from normality (Raykov and Marcoulides, 2006). SEM analysis of proposed recursive structural model was conducted in one step. The model consists of two exogenous latent constructs: resource value and resource rareness, two endogenous latent constructs: competitive advantage and performance, and 22 manifest variables, which serve as indicators of latent variables. From t-values of factor loadings and path coefficients presented in Figure 2, it can be seen that all relationships are statistically significant.

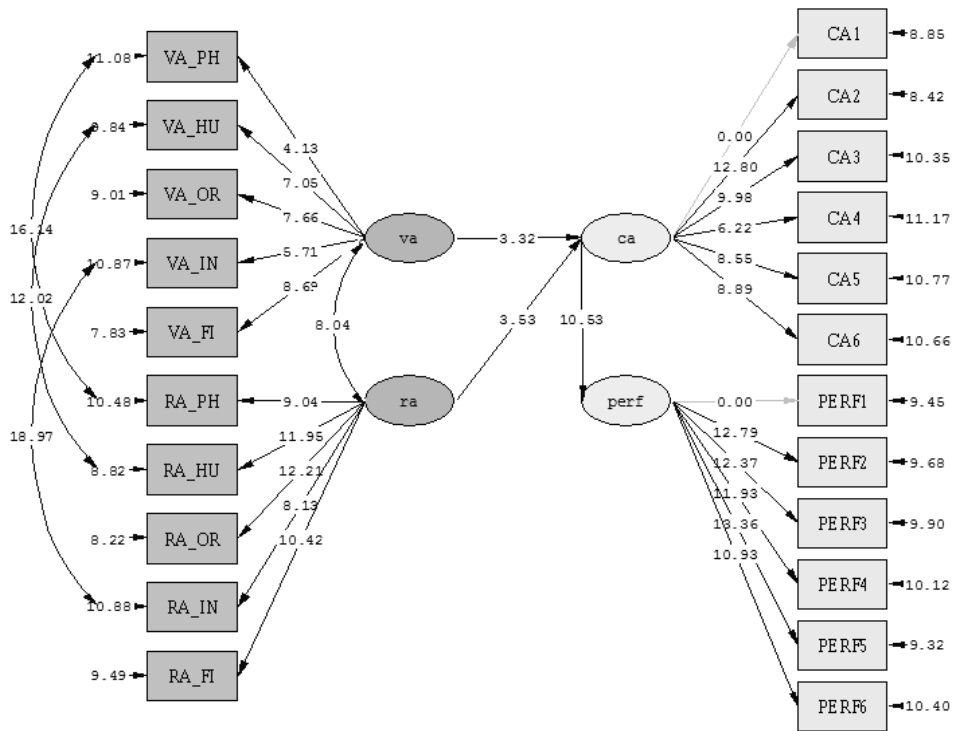


Figure 2. Structural equation model - t-values

Source: Empirical analysis results (Lisrel output).

Factor loadings and estimated path coefficients for the structural relationships hypothesized by the model are presented in Figure 3. The results show that all paths are in the expected direction.

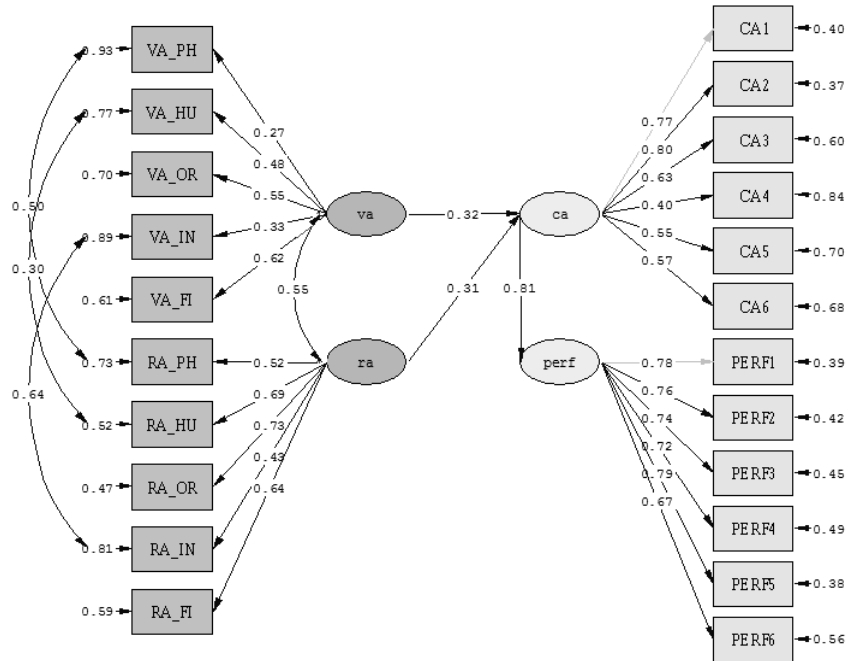


Figure 3: Structural equation model - standardized solution

Source: Empirical analysis results (Lisrel output).

Direct effects of resource value and rareness on company's competitive advantage, as well as direct effect of competitive advantage on performance, are all shown in Figure 1, while indirect and total effects, which are a function of direct effects that make them up, are shown in Table 1.

Table 1. Direct, indirect and total effects from the proposed model

	Direct influence on competitive advantage	Indirect influence on competitive advantage	Overall influence on competitive advantage	Influence on performance
Value	0.32	0.171	0.491	0.397
Rareness	0.31	0.176	0.486	0.394

Source: Empirical analysis results.

From Figure 2 and 3, it can be seen that hypotheses *H1, H2, H3 and H4* are all supported since relationships between latent variables are statistically significant (Figure 2), in the expected direction, i.e. positive (Figure 3) and nontrivial. The direct effect of resource value on competitive advantage equals 0.32, while the direct effect of resource rareness on competitive advantage is 0.31. The interdependence between resource value and rareness equals 0.55, while the effect of competitive advantage on company's performance is 0.81. In Table 1, the strengths of indirect relationships hypothesized by H5 and H6 are calculated.

From Table 1, it can be seen that the indirect effect of resource value on competitive advantage equals 0.171, which means that the total effect is 0.491. The indirect effect of resource rareness on competitive advantage is 0.176, and the total effect equals 0.486. Resource value has an indirect influence on performance that equals 0.397. Resource rareness has an indirect impact on company's performance (through competitive advantage) that equals 0.394. Since the effect of resource value and rareness on performance is statistically significant (since all including paths are statistically significant), positive as predicted, and nontrivial, it can be concluded that *hypotheses H5 and H6 are confirmed*.

Since the asymptotic covariance matrix that is necessary for RML estimation is calculated under listwise deletion, only Root Mean Square Error of Approximation (RMSEA) for overall model fit is given. With RMSEA = 0.0892, the model has acceptable fit. Convergent validity of the proposed measurement theory is also examined. The manifest variables that are the indicators of a specific construct should have a high proportion of variance in common, known as convergent validity. The relative amount of convergent validity among item measures is estimated through analyzing construct reliability (CR). In the case of high convergent validity, CR should be higher than 0.6 (Hair, 2005). Construct reliability for latent variables is presented in Table 2.

Table 2. Construct reliability of latent variables

	Value (va)	Rareness (ra)	Competitive advantage (ca)	Performance (perf)
Construct reliability (CR)	0.565	0.744	0.794	0.881

Source: Empirical analysis results.

From Table 2, it can be seen that construct reliability (CR) for resource rareness, competitive advantage and performance is acceptable, i.e. higher than 0.6, while CR for resource value is slightly under 0.6 (CR=0.565).

5. CONCLUSION

This study provides an empirical test of main resource-based view propositions. The results show that valuable and rare resources significantly affect company's competitive advantage and performance. The model is tested using sample of 265 large and medium Croatian companies from all industries. The results of structural equation modeling show that all paths are significant and in the expected direction, which means that all hypotheses proposed by the model are confirmed. The convergent validity of a proposed measurement theory is also confirmed and the overall model fit is acceptable. These findings have implications for resource-based view and strategic management theory and research, as well as for the management profession.

VRIN framework, as one of the basic concepts from the resource-based view, although much mentioned in the strategic management literature, is not enough empirically tested. The hypotheses that link valuable, rare, inimitable and non-substitutable resources and capabilities to company's competitive advantage are purely theoretical. This study tests some of the VRIN hypotheses at the conceptual level, and provides evidence that valuable and rare resources and capabilities can help company in achieving competitive advantage and above average performance. It also models and empirically confirms the interdependence between the two main resource characteristics, value and rareness. By empirically confirming one of the basic hypotheses from VRIN framework, this study significantly contributes to the resource-based view. In addition, by confirming the importance of company's physical, human, organizational, intellectual and financial resources for company's success, this study makes a contribution to strategic management theory by emphasizing the importance of company's internal environment and its influence on company's ability to compete on different markets.

Possible implications for the management profession include emphasizing the importance of not only developing and accumulating different types of resources, i.e. physical, human, organizational, intellectual and financial, but also having capabilities for using them. Companies ought to give particular attention to characteristics of their asset in order to enhance their competitive advantage and develop strategies based on their resources and capabilities. That means that they should accumulate and develop resources and capabilities that

are different from competitors and that help them in exploiting opportunities and neutralizing threats that arise from the business environment.

This study has several limitations. The data is entirely based on self-assessment of managers, i.e. their opinion on investigated variables, which can often be biased. The sample is made of medium and large companies, which can limit the generalization of findings since small companies are omitted from the sample. Also, replicating this study in another context or companies from another country could lead to broader generalization of results.

Future research should include empirical research of imitable and non substitutable resources and capabilities, as well as its connection to company's success in terms of competitive advantage and performance. In that way, whole VRIN framework, as one of the basic propositions from the resource-based view, could be assessed.

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**TESTIRANJE TEORIJSKOG OKVIRA VRIN: VRIJEDNOST I RIJETKOST
RESURSA KAO IZVORI KONKURENTSKE PREDNOSTI I
NATPROSJEČNIH PERFORMANSI**

Sažetak

U ovom se radu razvija model strukturnih jednadžbi, uz pomoć kojeg se kreira i empirijski testira utjecaj karakteristika resursa i sposobnosti – i to vrijednosti i rijetkosti – na održivu konkurentsku prednost i iznadprosječne performanse. Na temelju teorijskog okvira VRIN, poduzeće koje posjeduje i koristi vrijedne, rijetke, neimitabilne i nesupstitabilne resurse i sposobnosti, postići će održivu konkurentsku prednost. Iako je prethodna tvrdnja široko prihvaćena u literaturi iz područja poslovne strategije, nema dovoljno empirijskih istraživanja karakteristika resursa, posebno na konceptualnoj razini. Stoga je provedena empirijska analiza 265 srednjih i velikih hrvatskih poduzeća, koja pripadaju u sve industrije. Sve pretpostavljene veze između varijabli su statistički značajne i usmjerene u predviđenom smjeru. Rezultati istraživanja ukazuju da poduzeća s vrednijim i rjeđim resursima postižu više razine konkurentске prednosti i performansi. S obzirom da postoji međuovisnost između vrijednosti i rijetkosti resursa, njihov je utjecaj na konkurentsku prednost ujedno i direktan i indirektan.