SIJDEB, 3(3), 2019, 227-242 p-ISSN: 2581-2904, e-ISSN: 2581-2912 DOI: https://doi.org/10.29259/sijdeb.v3i3.227-242 Received: 27 August 2019 ; Accepted: 3 October 2019

SRIWIJAYA INTERNATIONAL JOURNAL OF DYNAMIC ECONOMICS AND BUSINESS

The Role of Green Intellectual Capital on Competitive Advantage: Evidence from Balinese Financial Institution

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Abstract: The purpose of this study is to analyze the role of green intellectual capital on competitive advantage of *Lembaga Perkreditan Desa* (Balinese Financial Institution). The study tested by using data collected from a sample of 120 respondents that were randomly picked from 35 *Lembaga Perkreditan Desa* in Denpasar. Findings suggested that green human capital, green relational capital, and green structural capital affect competitive advantage at 17.6%. This study has found that green human capital, green relational capital have an effect on competitive advantage. Furthermore, green human capital and green structural capital had positive effect on competitive advantage. Meanwhile, green relational capital had no effect on competitive advantage. The eco-friendly concept remains a critical factor to gain company's competitive advantage. This study provides insight into green innovation research field.

Keywords: competitive advantage; eco-friendly accounting; green intellectual capital; Lembaga Perkreditan Desa.

Introduction

The business competition requires each business practitioners to own not only as much working capital as possible but also being able to manage the human resource's knowledge. Each company is required to develop its capability, competence, and competitive advantage continuously by relying on experience and intellectual property.

The green intellectual capital, which is the development of intellectual capital is the critical component of the business model that focused on knowledge and human resource as the knowledge asset by concerns about the environment. The green intellectual capital is recognized as a new strategy in developing the company that is based on eco-friendly

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concept. Gogan, Artene, Sarca, and Draghici (2016), Berzkalne and Zelgalve (2014), and also Kianto, Ritala, Spender, and Vanhala (2014) confirmed the importance of green intellectual capital in affecting the company's performance.

It is not enough for the company to only control the comparative advantages but also the competitive advantages which are the root of the company's performance among the intense competitions (Pourmozafari, Heyrani, & Moeinadin, 2014). Hashima, Osman, and Alhabshi (2015), Kalkan, Bozkurt, and Arman (2014), and Y.-S. Chen (2008) suggested that the competitive advantage can be achieved if the management can manage the company's intellectual property.

Lembaga Perkreditan Desa is a local financial institution based on Balinese culture that is owned and ruled by Desa Adat (local government) and also fully integrated into Balinese culture. Unlike the other financial institutions, Lembaga Perkreditan Desa covers nearly all Desa Adat in Bali and most of the Balinese. This financial institution is served as an independent bank in village, but it is not authorized to call itself as a bank because it has no license and is not ruled by Bank Indonesia (Seibel, 2008). The various facilities Lembaga Perkreditan Desa offers and also the lack of supervision from the related authority make the Balinese especially people who live in village tend to choose Lembaga Perkreditan Desa as a place to save and lend the money. Sundarianingsih (2014) state that Lembaga Perkreditan Desa is the economic drive of people who live in village which is religious and social. In other side, the higher amount of the transaction in Lembaga Perkreditan Desa requires it to improve the quality to increase the stakeholder's welfare. That is why it is crucial to Lembaga Perkreditan Desa to manage its intellectual property for the sake of competitive advantage (Winata & Astana, 2016). The green intellectual capital that Lembaga Perkreditan Desa owned should be maximum managed to create a competitive advantage among Lembaga Perkreditan Desa and also other financial institutions which are based on ecofriendly concept. The green intellectual capital has three elements, according to Rezaei, Izadi, Jokar, and Rezaei (2016) and Y.-S. Chen (2008), those are green human capital, green structural capital, and green relational capital.

This study were interested in analysis about the role of green intellectual capital which consists of green human capital, green structural capital, and green relational capital on competitive advantage of *Lembaga Perkreditan Desa*. This study is adopted from Rezaei et al. (2016) and Y.-S. Chen (2008), and also adjusted to *Lembaga Perkreditan Desa's* characteristics. Besides that, there was none of research about this topic, so it is considered to have a high level of urgency in order to develop *Lembaga Perkreditan Desa* which is based on local wisdom. This study was conducted in Denpasar City because Denpasar is a destination of urbanization that allows an intense competition among *Lembaga Perkreditan Desa*. The data used in this study was the primary data which was obtained by questionnaires to *Lembaga Perkreditan Desa*.

Literature Review

Resource-based Theory

Kangas (2011) stated that resource-based theory explains the company's performance will be increase if the firms has a competitive advantage to produce value for the company. Competitive advantages as part of the company's goal and it was difficult to be imitated by other firms. Competitive advantage is obtained by utilizing and managing its resources.

Resources are all owned and controlled by the company, either assets, individual employee capabilities, knowledge of technology, organizational processes, and information that is useful for implementing the company's strategy (Nason & Wiklund, 2018). Hart (1995) and (Roos & Whitehill, 1998) explore resources into three elements known as intellectual capital such as human capital, structural capital, and relational capital. Competitive advantage will be created if intellectual capital can be managed properly so as to create value added that is useful for the company and will affect the performance of the company itself (Januškaite & U) iene, 2018).

Corporate environmental management

Russo and Fouts (1997) argue that businesses that adopt environmental management strategies can integrate environmental protection objectives in companies to solve environmental problems by utilizing their resources. Another strength driving companies to engage in environmental management is consumer environmental awareness. (Y. S. Chen, 2008) state that consumer environmentalism is increasing in the world, and thus encouraging companies to do corporate environmental management, because consumers are willing to choose products that are environmentally friendly and even pay relatively high prices for environmentally friendly products.

According to Y.-S. Chen (2008), study on intellectual capital has been conducting in the early 1990s. Intellectual capital is defined as the total amount of knowledge, information, technology, intellectual right property, team communication system, relation with customers, and trademark that can create company's value (Ahlgren, 2011), (Choong, 2008), (Bontis, 2001). Intellectual capital includes all intangible asset which is considered in modern accounting (Ivashchenko, Dotsenko, & Petrenko, 2017).

The issue regarding green intellectual capital was firstly supported by Y.-S. Chen (2008) as the result of the increase of green politic trend. Y.-S. Chen (2008) proposed the definition of green intellectual capital as the total amount of all intangible asset owned by company, knowledge, capability, and relations regarding environmental protection and green innovation both on individual and also organizational level of a company. Green intellectual capital allows company to obey the strict international environmental rule and to increase the customers' environmental awareness, and also to create company's value. Erinos and Rahmawati (2017), Yahya, Arshad, and Kamaluddin (2015) and Y.-S. Chen (2008) categorize the green intellectual capital into green human capital, green structural capital, and green relational capital.

Competitive advantage refers to the quality of the company where an organization utilizes its expertise, competency, and resource efficiently that cannot be imitated by the competitors (Rezaei et al., 2016), (Chaudhry & Bilal, 2016). The success or failure of a company is determined by its competitive advantage so that competitive advantage allows company to gain its objective (Gogan et al., 2016).

Y.-S. Chen (2008) find the positive effect between green intellectual capital and competitive advantage. The result suggests that the three components of green intellectual capital, those are green human capital, green structural capital and green relational capital, had positive effect on competitive advantage. The company that invested its human resource and the attempt of green intellectual capital were not only able to obey the strict international environmental rule and accomplished the enhancement of costumer's ecological awareness,

but also eventually gained the competitive advantage. A study by Rezaei et al. (2016) found that there was significant positive effect between green structural capital and competitive advantage, and also there was insignificant positive effect between green relational capital and competitive advantage and between green human capital and competitive advantage.

Human capital refers to the intellectual characteristic and quality of the employees that have to be responsive to the market change and customers' needs. Erinos and Rahmawati (2017) and Chaudhry and Bilal (2016) defined green human capital as the final presentation of employees' knowledge, expertise, capability, experience, attitude, wisdom, creativity, and commitment on environmental protection and green innovation. Chaudhry and Bilal (2016) argue that human capital is attached in the employees not organization, that it can be lost if the employees left the company. Y.-S. Chen (2008) suggested that there was significant positive effect between green human capital and competitive advantage. According to Chen (2008), the employees' knowledge, expertise, capability, experience, attitude, wisdom, creativity, and commitment, etc. on environmental protection and green innovation would help the company to gain its competitive advantage. *Lembaga Perkreditan Desa* should manage its green human capital in order to be able to compete with other financial institutions. This explanation led to the following research hypothesis:

H1: Green human capital affects competitive advantage of Lembaga Perkreditan Desa.

Structural capital is organization component that can be described as an organization infrastructure and organizational process that is utilized to obtain products and services (Ivashchenko et al., 2017). Chaudhry and Bilal (2016), Yahya et al. (2015), and Y.-S. Chen (2008) define green structural capital as an organizational capability, organizational commitment, knowledge management system, managerial philosophy, organization culture, company's image, patent, copyright, and trademark on environmental protection and green innovation in a company. The research conducted by Chen (2008) suggested that there was significant positive effect between green structural capital and competitive advantage. Green structural capital is defined as the organizational capability, organization culture, company's image, patent, copyright, and trademark on environmental protection and green innovation in a company (Chen, 2008). Green structural capital is also important for *Lembaga Perkreditan Desa*. The well-managed green structural capital would be able to gain the competitive advantage of *Lembaga Perkreditan Desa*. This explanation led to the following research hypothesis:

H2: Green structural capital affects competitive advantage of Lembaga Perkreditan Desa.

According to Rezaei et al. (2016), relational capital refers to the ability to build relationships with stakeholders and market in a sustainable and stable environment, the ability to build interpersonal relation, and the ability to develop relationships that is based on trust. Chen (2008) defined green relational capital as the company's interactive relation with the customers, distributors, members of network, and partners on environmental protection and green innovation. The research conducted by Chen (2008) suggested that there was significant positive effect between green relational capital and competitive advantage. According to Chen (2008), green relational capital included company's interactive relation with the customers, distributors, members of network, and partners on environmental protection with the customers, distributors, members of network, and partners on environmental protection and green. Green relational capital should be well-managed by *Lembaga Perkreditan Desa* to be able to gain competitive advantage among financial institutions. This explanation led to the following research hypothesis:

H3: Green relational capital affects competitive advantage of Lembaga Perkreditan Desa.

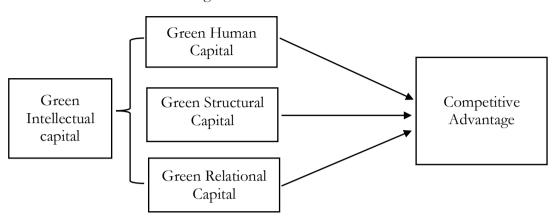


Figure 1. Research Framework

Methods

The purpose of this study is to find empirical evidence about the role of green intellectual capital on competitive advantage of *Lembaga Perkreditan Desa*. The population in this study were 35 *Lembaga Perkreditan Desa* located in Denpasar. This study uses questionnaires to collect the data. The samples were randomly selected from 35 *Lembaga Perkreditan Desa* which is located in Denpasar, and it consists of 12 sets of samples of *Lembaga Perkreditan Desa*. Thus, 120 respondents are collected. The samples were set by referring to 4 areas in Denpasar City those are The South Denpasar, North Denpasar, West Denpasar, and East Denpasar. The samples are the primary data obtained from the questionnaires spread. The respondents who filled in the polls are the walidity and reliability test. And then, the data analysis technique used in testing the research hypothesis is the regression method.

Measurement

Variables in this study were measured by questionnaires using a 5-scale Likert from strongly disagree to strongly agree. Variables measured and observed in this study were as follow:

1) Dependent Variable

Competitive advantage was the dependent variable in this study. The competitive advantage variable is the respondents' data from the questionnaires spread which was adopted from Rezaei et al. (2016), Chaudhry and Bilal (2016) and Y.-S. Chen (2008). The competitive advantages were measured using a 5-scale Likert from strongly disagree to strongly agree. Eleven question items are used which were adopted from Chen (2008) as shown in Appendix 1 Table 1.

2) Independent Variables

The independent variables in this study were as follow:

a) Green Human Capital

Green human capital was measured using a 5-scale Likert from strongly disagree to strongly agree from 5 question items (Rezaei et al., 2016) as shown in Appendix 1 Table 2.

b) Green Structural Capital

There were 9 question items in green structural capital measurement (Y.-S. Chen, 2008) using a 5-scale Likert from strongly disagree to strongly agree as shown in Appendix 1 Table 3

c) Green Relational Capital

Green relational capital indicators used 5 question items (Y.-S. Chen, 2008) and measured by a 5-scale Likert from strongly disagree to strongly agree as shown in Appendix 1 Table 4

Findings

Validity test is used to test the feasibility of items listed in the questionnaire and whether later the listed items can be used in this study. Validity level is generally accepted at 0.3 so that the instrument whose validity level is less than 0.3 declared invalid. The result of validity test is shown below:

No	Questions	Validity Test	Explanation
1	The cost that company spent is lower than the competitors (low cost)	0.398	Valid
2	The service quality that the company provided is better than the competitors	0.379	Valid
3	The company can conduct research and development and also innovation than the competitors	0.383	Valid
4	The company has better managerial capability than the competitors	0.431	Valid
5	The company's profitability rate is better	0.298	Invalid
6	The company's performance growth is higher than the competitors	0.471	Valid
7	The company becomes the first one in making changes in some services	0.429	Valid
8	The company's image is better than the competitors	0.328	Valid
9	The competitors are not able to imitate the service products we created	0.296	Invalid
10	The competitors are not able to imitate our company's creative ideas	0.458	Valid
11	The competitors are not able to take over our company's market share	0.433	Valid
12	The employees' productivity and contribution of environmental protection are better than the competitors	0.533	Valid
13	The employees' competence in environmental protection in the company are better than the competitors	0.442	Valid
14	The company's responsibility towards employees in environmental protection fields is better than the competitors	0.524	Valid
15	The employees' teamwork about environmental protection is better than the competitors	0.536	Valid
16	The company's management supports each employee who cares about the environment	0.525	Valid
17	The management system related to environmental protection is better than the competitors	0.425	Valid
18	The innovation related to environmental protection is better than the competitors	0.417	Valid
19	The profits gained from environmental protection activity	0.516	Valid

Table 5. Validity Test Result

	is better than the competitors		
20	The company's investment in environmental protection is higher than the competitors	0.508	Valid
21	The employees have better environmental protection awareness than the competitors	0.440	Valid
22	The amount of investment in eco-friendly facilities in the company are higher than the competitors	0.401	Valid
23	The development of competence related to eco-friendly services/products in the company is better than the competitors	0.367	Valid
24	The management process in the company is still be noticing about the environmental protection ethics	0.349	Valid
25	The company's environmental protection management is better than the competitors	0.254	Invalid
26	The services offered by the company is still be noticing the compassion towards the environment	0.528	Valid
27	The customers' satisfaction towards the eco-friendly activity that the company did is better than the competitors	0.516	Valid
28	The company is still be keeping and noticing the environment around	0.482	Valid
29	The relation between the company and customers in environmental protection goes harmonious	0.540	Valid
30	The company is opened to the third party's impulsive in environmental management fields	0.437	Valid

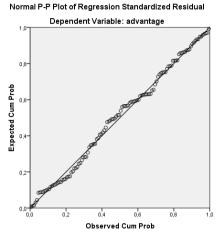
The instrument question number 5, 9, and 25 were scored less than 0.3 so that they were declared invalid and eliminated from the questionnaire.

The reliability test is performed to find out how reliable measurement is if it is done over and over. The reliability test can be seen from its Cronbach's Alpha score. The higher the score, it is declared more reliable. The reliability level is generally accepted at 0.60. The instrument which reliability level is less than 0.60 said not reliable. The analysis result suggested that the Cronbach's Alpha score was 0.647 so that the instrument of questionnaire in this study is reliable.

Classical Assumption Test

The normality test is used to test whether the regression model between the independent variable and dependent variable has got normal distribution or not. The normality test can be done by observing the Normal Probability Plot graphic generated by SPSS. The result is shown below:

Figure 2. Normality Test Result



Based on the result, the data used in this study is normal.

The multicollinearity test result generated by SPSS is shown below:

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Variables	Collinearity Statistics		
variables	Tolerance	VIF	
Human	0.899	1.112	
Structural	0.923	1.084	
Relational	0.954	1.048	

Source: data processed (2019)

If the VIF score is less than 10 and or the Tolerance is higher than 0.01 so that it is concluded that there is no multicollinearity problem. Based on the result of the test done in this study, there was no multicollinearity problem among variables.

The autocorrelation test result generated by SPSS is shown below:

Tabel 7. Autocorrelation Test Result

Model	Durbin-Watson
1	1.858

Source: data processed (2019)

The Durbin Watson (DW) score was at 1.858. It is indicated that there was no correlation in the regression model.

Hypothesis Testing

There were three hypotheses tested in this study by using the multiple linear regression analysis. Before the hypothesis testing, the authors examined the regression model, and the result is shown below:

	Tabel 8. Re	gression Model Test	Result	
R	R Square	Adjusted R Square	Sig.	

0.443 0.196	0.176	0.000
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Source: data processed (2019)

The Adjusted R Square score was at 0.176 with the significance level at 0,000 which was less than 0.05 which indicated that the regression model was valid with 17.6% of independent variables in this study allowed to explain the dependent variable. It is also showed that the testing simultaneously generated a significance score at 0.000. The hypothesis testing was conducted by including all the independent variables those were green human capital, green structural capital, and green relational capital. The dependent variable was competitive advantage of *Lembaga Perkreditan Desa*. The result is shown below:

	Table 9	. Hypothesis Tes	sting Result		
Model	Unstandard	Unstandardized Coefficients		Sig.	
	В	Std. Error		C	
Constant)	16.451	3.928	4.188	0.000	
Human	0.305	0.125	2.433	0.016	
Structural	0.297	0.094	3.170	0.002	
Relational	0.218	0.128	1.707	0.090	

Source: data processed (2019)

Green Human Capital

The Beta score was +0.305, which indicated that green human capital had positive effect. The green human capital variable had t score at 2.433 with the significance level at 0.016 <0.005. This suggested that green human capital had a positive effect on competitive advantage of Lembaga Perkreditan Desa. So that the H1 is accepted, green human capital affects competitive advantage of Lembaga Perkreditan Desa. This study is in line with the study by Rezaei et al. (2016) and also Ahmadi, Ahmadi, and Shakeri (2013). Lembaga Perkreditan Desa which has high green human capital level tends to gain better competitive advantage compared to other Lembaga Perkreditan Desa. Companies or financial institutions that have competitive advantages tend to manage and develop employes's ability to achieve higher levels of performance. Knowledge is enhanced through interactions with other individuals so that it can produce knowledge to support organizational development. The institution is not only about hiring staff to complete specific delegation tasks but also encouraging them to be innovative. As many new technologies are entering so quickly, training must continue if employees want to be ahead of competitors. There is a responsibility to company create and develop their human capital in order to increase their competitive advantage (Y. S. Chen, 2008).

Green Structural Capital

The Beta score is showed at +0.297 indicated that green structural capital had a positive effect with t score at 3.170 with the significance level at 0.002 < 0.05. This result meant that green structural capital had a positive impact on competitive advantage of *Lembaga Perkreditan Desa. H2* is accepted, green structural capital affects competitive advantage of *Lembaga Perkreditan Desa*. This study is in line with the study by Rezaei et al. (2016). The

decisive score suggested that the higher the structural capital of *Lembaga Perkreditan Desa* shows that *Lembaga Perkreditan Desa* tends to gain competitive advantage compared to other *Lembaga Perkreditan Desa*. Structural capital is a knowledge that is fully-owned by the organization such as technology, inventions, data, publications, strategies and culture, structures and systems, organizational routines and procedures (Chen, Cheng, & Hwang, 2005). Nason and Wiklund (2018) argue that organizations must be able to meet the company's routine processes and structures that support the efforts of employees to produce optimal intellectual performance and overall business performance for example: the company's operational systems, manufacturing processes, organizational culture, management philosophy and all forms of intellectual property owned by the company. Strong organizational structure makes the company able to compete and has a good market value because of its ability to produce effective, efficient outputs so that the outcome of the company becomes better as indicated by the increasing competitive advantage of the organization.

Green Relational Capital

The Beta score is showed at +0.218 indicated that green relational capital had a positive effect with t score at 1.707 with the significance level at 0.090>0.05. This indicates that green relational capital did not affect competitive advantage of *Lembaga Perkreditan Desa*. So that H3 is not accepted. Green relational capital does not affect the competitive advantage of *Lembaga Perkreditan Desa* to the other. This result also found in study by Hussinksi, Ritala, Vanhala, and Kianto (2018), Thiagarajan, UtpalBaul, and Sekkizhar (2017) and Ozkan, Cakan, and Kayacan (2017). It imply that the company does not pay attention to the relationship with the customer as a capital asset. This is because the majority of customers come from the location of the company. Relational capital is not a factor of competitive advantage because companies are based in the local area. The company has difficulty expanding its organization because of collisions with regulations that do not allow people from other regions to become customers.

Conclusion

This study aimed to analyze the role of green intellectual capital on the competitive advantage of Lembaga Perkreditan Desa in Denpasar City. The result suggests that green human capital, green relational capital, and green structural capital had effect on competitive advantage at 17.6%. This study indicated that green human capital and green structural capital had positive impact on competitive advantage of Lembaga Perkreditan Desa in Denpasar City. Meanwhile, green relational capital did not affect competitive advantage of Lembaga Perkreditan Desa. The more compassionate care in environment, the more positive effect gained on competitive advantage of the company itself. Competitive advantage is not only obtained from the financial numbers but also it is needed to protect the resources. This is encouraging companies to invest in environment for the sake of the competitive advantage of the company itself. Environment and company cannot be separated. There have been many companies which are not only focusing on financial performance but also focusing on the environment. The eco-friendly concept becomes one of determinant of competitive advantage of a company. Hence, this study suggested that green intellectual as the key element of competitive advantage of a company. This result is expected to be a contribution to green innovation research fields. The next research is expected to combine the non-financial variable to financial variable. The total amount of

population in village also becomes variable that moderates the relation between green intellectual capital and competitive advantage of *Lembaga Perkreditan Desa* in Denpasar City considering that the customers of *Lembaga Perkreditan Desa* mostly come from where the *Lembaga Perkreditan Desa* is located.

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Appendix 1. Questionnaire Items

	Table 1. Question Items for the Competitive Advantage Variable
1	The cost that company spent is lower than the competitors (low cost)
2	The service quality that the company provided is better than the competitors
3	The company can conduct research and development and also innovation than the
	competitors
4	The company has better managerial capability than the competitors
5	The company's profitability rate is better
6	The company's performance growth is higher than the competitors
7	The company becomes the first one in making changes in some services
8	The company's image is better than the competitors
9	The competitors are not able to imitate the service products we created
10	The competitors are not able to imitate our company's creative ideas
11	The competitors are not able to take over our company's market share

Table 2. Question Items for the Green Human Capital Variable

1	The employees' productivity and contribution of environmental protection are better
	than the competitors
2	The employees' competence in environmental protection in the company are better than
	the competitors
3	The company's responsibility towards employees in environmental protection fields is
	better than the competitors
4	The employees' teamwork about environmental protection is better than the competitors

5 The company's management supports each employee who cares about the environment

Table 3. Question Items for the Green Structural Capital Variable

	Table 5. Question riems for the oreen structural Capital Vallable
1	The management system related to environmental protection is better than the
	competitors
2	The innovation related to environmental protection is better than the competitors
3	The profits gained from environmental protection activity is better than the competitors
4	The company's investment in environmental protection is higher than the competitors
5	The employees have better environmental protection awareness than the competitors
6	The amount of investment in eco-friendly facilities in the company are higher than the competitors
7	The development of competence related to eco-friendly services/products in the company is better than the competitors
8	The management process in the company is still be noticing about the environmental protection ethics
9	The company's environmental protection management is better than the competitors

Table 4. Question Items for the Green Relational Capital Variable

	Table 4. Question nems for the oreen Kelational Capital Vallable
1	The services offered by the company is still be noticing the compassion towards the
	environment
2	The customers' satisfaction towards the eco-friendly activity that the company did is
	better than the competitors
3	The company is still be keeping and noticing the environment around
4	The relation between the company and customers in environmental protection goes
	harmonious
5	The company is opened to the third party's impulsive in environmental management
	fields

Appendix 2. Regression Test

Descriptive Statistics							
	Mean	Std. Deviation	Ν				
advantage	36,87	2,996	120				
human	20,29	2,096	120				
structural	32,72	2,775	120				
relational	20,75	2,001	120				

Model Summary ^b								
Model	R	R Square	Adjusted R Std. Error of the		Durbin-Watson			
			Square	Estimate				
1	,443 ^a	,196	,176	2,720	1,858			

a. Predictors: (Constant), relational, structural, human

b. Dependent Variable: advantage

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	209,619	3	69,873	9,444	,000 ^b
1	Residual	858,248	116	7,399		
	Total	1067,867	119			

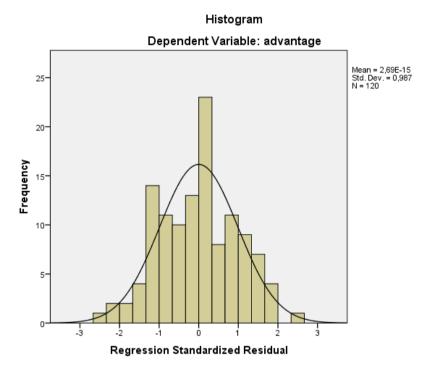
a. Dependent Variable: advantage

b. Predictors: (Constant), relational, structural, human

	Coefficients ^a								
Model		Unstandardized		Standardized	t	Sig.	Collinearity Statistics		
		Coefficients		Coefficients					
		В	Std. Error	Beta			Tolerance	VIF	
	(Constant)	16,451	3,928		4,188	,000			
	human	,305	,125	,214	2,433	,016	,899	1,112	
1	structural	,297	,094	,275	3,170	,002	,923	1,084	
	relational	,218	,128	,145	1,707	,090	,954	1,048	

a. Dependent Variable: advantage

Charts



Normal P-P Plot of Regression Standardized Residual

