



SUPPORTING THE POLICY EFFECT OF INTELLECTUAL CAPITAL ON LIQUEFIED NATURAL GAS COMPANIES' COMPETITIVE ADVANTAGE

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Abstract

The purpose of this study is to examine the effect of intellectual capital on achieving a competitive advantage in liquefied natural gas firms. The researchers conducted a review of the pertinent literature to accomplish the study's objectives. Moreover, the researchers define intellectual capital. Moreover, they denoted the dimensions of intellectual capital. The study classified different types of innovation and discovered that intellectual capital has a major impact on achieving competitive advantage. As a result, the study's principal objective is to demonstrate all the linkages effects of intellectual capital (Human capital, structural or organizational capital, and relational capital) on competitive advantage. The research focused on three of Malaysia's leading gas businesses and their 78 personnel throughout the divisions chosen for the study. Each division was sampled proportionately. Self-administered questionnaires were used to collect data. Correlation, Amos assist, and multiple regression analysis were used to analyze the data. Correlation analysis revealed a substantial correlation between intellectual capital and achieving a competitive advantage. Moreover, a summary of the findings revealed that all three hypotheses H1, H2, and H3 were found to be valid and significant. It will benefit Malaysian gas businesses. Employees' capacity to perform their duties



efficiently protects investors and fosters an investment-friendly climate, enhancing countries' potential to accomplish economic growth in diverse parts of the world.

Keywords: Intellectual Capital, Competitive Advantage, Liquefied Natural Gas Corporations, Data Analysis, Factors Effects.

Introduction

Recently, intellectual capital has received a lot of attention. It is made up of three types of capital: relational, human, and structural. Moreover, it influences economic growth (Abualoush et al., 2018). Intellectual capital contributes to knowledge organizations attaining competitive advantage (CA) (Chahal and Bakshi, 2014). Moreover, intellectual capital serves as a value generator by converting production resources into valuable assets (Kanaan et al., 2020). Organizations that efficiently employ their unique human resources and competencies have a greater chance of establishing a competitive position (Barney, 1991). There is a correlation between how effectively firms manage their resources and their success in obtaining Hunaiti et al., 2009; Abu Zayyad et al., 2020) define organizational resources as both tangible and intangible. Possessing intangible resources and competencies will bolster an organization's potential to capitalize on market possibilities (Al-Dhuhouri et al., 2020; Al Khayyal et al., 2020; Alameeri et al., 2020). This will result in and sustain CA (Chahal & Bakshi, 2015; Alkitbi et al., 2020; Alyammahi et al., 2020). According to Al Mehrez et al., 2020, intellectual capital is a resource that can aid in the acquisition of new knowledge. CA cannot be sustained unless and until assets are effectively and efficiently exploited (Porter, 2008; Al Suwaidi et al., 2020; Alshamsi et al., 2020). Saengon's 2020 study discovered that knowledge is a predictor of a variety of organizational outcomes. Subramaniam and Youndt (2005) discovered that the interplay of several facets of intellectual capital has a significant impact on organizational performance. Jung et al. (2014) remark that this can have a substantial impact on the CA's sustainability. Knowledge- and creativity-based organizations have a better chance of showing and retaining their CA. It will be beneficial to Malaysian gas companies. Effective employees safeguard investors and make it easier for businesses to invest in different parts of the world. This assists countries in various parts of the world



in achieving economic progress. (2012) (Grimaldi et al.). Chahal and Bakshi (2015) asserted that intellectual capital has a major impact in attaining CA. Moreover, they note that it influences the link between intellectual capital and CA attainment. The purpose of this study is to determine the relationship between CA and a company's intellectual capital. Moreover, it tries to investigate the consequences of the latter link. It's self-evident that the interconnection of many facets of intellectual capital has a sizable impact on organizational performance. Jung et al. (2014) remark that this can have a substantial impact on the CA's sustainability. Knowledge- and creativity-based organizations have a better chance of preserving their CA. (2012) (Grimaldi et al.). Chahal and Bakshi (2015) asserted that intellectual capital has a major impact in attaining CA. The purpose of this study is to examine the association between intellectual capital and CA attainment. It will be beneficial to Malaysian gas companies. Employees' ability to do their jobs efficiently protects investors and supports an investment-friendly climate, boosting governments' ability to achieve economic growth in a variety of regions around the world.

Literature Review

Intellectual Capital

Today, sustainable CA is gaining a lot of attention. A strong competitive position can be achieved by successfully leveraging the firm's tangible and intangible resources. Possessing significant intellectual capital enables a business to accomplish CA (Bakshi, 2015). Employees' intellectual capital is comprised of their knowledge, experience, and abilities. The organization's intellectual capital is comprised of databases, culture, philosophy, and system. In general, intellectual capital refers to knowledge assets that can generate revenues and enhance. (Marr, 2004). Moreover, it encompasses technology capabilities, competencies, and professional knowledge (Liu et al., 2020). Moreover, intellectual capital offers value to the business and contributes to its achievement of CA Ahmed, M. Y. (2021). Moreover, intellectual capital is the most effective competitive weapon for influencing an organization's innovation performance (Alrowwad et al., 2020). The financial crisis of 2007 and the shortened product life cycle have prompted organizations to place a higher premium on the efficient use of intellectual capital to fulfill market needs. The latter capital consists of human capital (such as skills, experience,



competencies, and knowledge), structural capital (such as organizational processes, business processes, software, and databases), and relational capital (such as customers, suppliers, creditors, investors, and other stakeholders), and it adds value to the organization (Rodrigues et al., 2017). Moreover, it improves organizational performance (Ode and Ayavoo, 2020).

Factors of Intellectual Capital

Human Capital. An entrepreneur's intellectual capital is tied to their education level, their knowledge of how to establish a business, and any prior entrepreneurial experience (Montaés and Medina-Garrido, 2020). Moreover, human capital refers to the organizational knowledge that employees possess. It influences the attainment of CA (Mehralian et al., 2013). It refers to the skills, expertise, and experience that individuals offer to the organization. Moreover, human capital is linked to an employee's characteristics, such as motivation, dedication, and skill (Lo and Chen, 2020).

Structural (or organization) Capital. Structural capital refers to the systems and structures inside an organization that contribute to the organization's inventive capabilities. It remains within the organization even if the employees' employment is ended (Edvinsson & Malone, 1997). It refers to warehouses that are not manned by humans (e.g., databases, organizational structure, work manuals, strategies, and procedures). Moreover, structural capital encompasses culture, legislation, databases, information systems, patents, and copyright protection, among other things (Sharabati et al., 2013).

Relational Capital. According to a previous study, relational capital is defined as the knowledge gained through communication between employees and external stakeholders (Al-Khalil et al., 2014; Al Kurdi et al., 2020; AlShehhi et al., 2020; Kurdi et al., 2020). It entails a collection of social resources (e.g., connections, values, and conventions) that contribute to the organization's value (Alshurideh, 2019; Almazrouei et al., 2020; Alshurideh et al., 2020).

Competitive Advantage (CA). The literature on CA gives less attention to providing a comprehensive definition. Barney (1991) defines it as the process of developing a strategy that offers value that competitors have not. He continues by stating that sustained CA is attained when an organization creates value that cannot be replicated or reproduced by competitors. Ma (2004) describes CA as a collection of efficiently exploited financial and physical resources. Cravens and Piercy (2009) define CA as the weapon that enables a



corporation to compete effectively. CA is defined as the organizational performance that distinguishes it from competitors in the same industry. Sudrajat (2015) adds that CA entails developing and implementing a value-adding approach that competitors cannot duplicate. The organization will achieve CA if it owns scarce, valuable, and imperfectly imitable resources (Johnson et al., 2016). The ability of an organization to attain CA is ascribed to the uniqueness of its capabilities. Capabilities — in this sense – allude to an organization's ability to continuously enhance its CA (Winter, 2014). Competence and resources are the two primary components of strategic capabilities (Wheelen et al., 2015). The term "resources" refers to an organization's assets, whereas "competence" refers to an organization's successful use of its resources Younus, A. (2021). When a firm outperforms its competitors in a particular area of expertise, this is referred to as distinctive competences (Brady and Capell, 2004).

Value. Competencies are valuable when they enable an organization to generate products or services that provide value to the client. They are valuable if they assist the firm to increase revenue or decrease expenditures (Johnson et al., 2016). Thus, important competences have multiple characteristics. The first is that they enable a business to take advantage of opportunities and prevent hazards. Second, valuable competencies should be viewed as valuable from the standpoint of the consumer. Thirdly, they should assist the firm to increase income while decreasing expenditures (Barney, 2010). Each organization should assess the worth of its competencies. This is because valuable competencies enable a firm to attain CA and provide additional value to its consumers (Abuhashesh et al., 2019b).

Rarity. It is improbable that other competitors' competencies will supply the business with CA (Johnson et al., 2016). As a result, the business must possess uncommon competencies. Szymaniec-Mlicka (2014) defines rare skills as those that are possessed by a single organization or a small number of organizations. If a competence is held by a small number of firms, it will be highly valued by customers (Barney, 1991).



Theoretical Framework and Hypothesis Testing

Scholars have devoted much time and effort to researching the relationship between CA and intellectual capital. Chen (2008) sought to elucidate the relationship between intellectual capital and financial adequacy in businesses. He continues by stating that the occurrence of concurrent changes in the market will significantly boost industrial competition. Chen (2008) continued by stating that businesses must strive to improve their image, productivity, and reputation. Moreover, he stated that reaching CA requires the development of unique green intellectual capital. Green intellectual capital is composed of environmentally friendly relational, human, and structural capital. In terms of green human capital, it refers to employees' knowledge, skills, attitudes, ethics, and commitments that exemplify green behavior. Green innovation enables businesses to achieve CA (Chen, 2008). A survey was conducted. We did a regression analysis. The three elements of green intellectual capital were proven to have a favorable effect on the attainment of CA in businesses. However, the green relational capital demonstrates the greatest influence (Chen, 2008). Several researchers sought to understand the relationship between CA and intellectual capital. For example, Kamukama et al. (2011) sought to understand the relationship between intellectual capital and financial success. Moreover, they sought to determine the CA's mediating effect on the latter association. They targeted microfinance institutions in Uganda. The conclusion reached was that intellectual capital has the potential to improve financial performance. They discovered that firms must have intellectual capital to achieve CA. They discovered that obtaining a sustainable CA enables a business to improve its financial performance (Hwang et al., 2020). It was concluded that intellectual capital has a beneficial effect on achieving CA. The latter capital was quantified as follows: (structural, human, and relational capital). They urge that comparable studies be conducted with a longitudinal design to increase the reliability of the results. They advocate for performing comparable research using alternative approaches, such as the interview method (Kamukama et al., 2011). Chahal and Bakshi (2015) sought to elucidate the relationship between intellectual capital and attainment of CA. Moreover, they sought to determine the moderating effect of innovation and organizational learning on the link between intellectual capital and CA accomplishment. They applied the appropriate statistical techniques. It was discovered that there is a considerable positive correlation between intellectual

capital and CA achievement. Innovation and organizational learning were found to have a strong mediation effect on the relationship between intellectual capital and obtaining CA (Chahal & Bakshi, 2015). Yaseen et al. (2016) sought to determine the effect of intellectual capital on the attainment of CA in the Jordanian telecommunications sector (Abuhashesh, 2019a, b). They gathered pertinent data through the use of a questionnaire. They targeted Jordan's telecommunications sector Muayad, Y. (2021). The multiple regression analysis was carried out by them. It was discovered that relational and structural capital have a beneficial effect on achieving CA. They discovered that human capital has no discernible effect in achieving CA. The following Figure 1. And hypotheses were developed for the aims of this study:

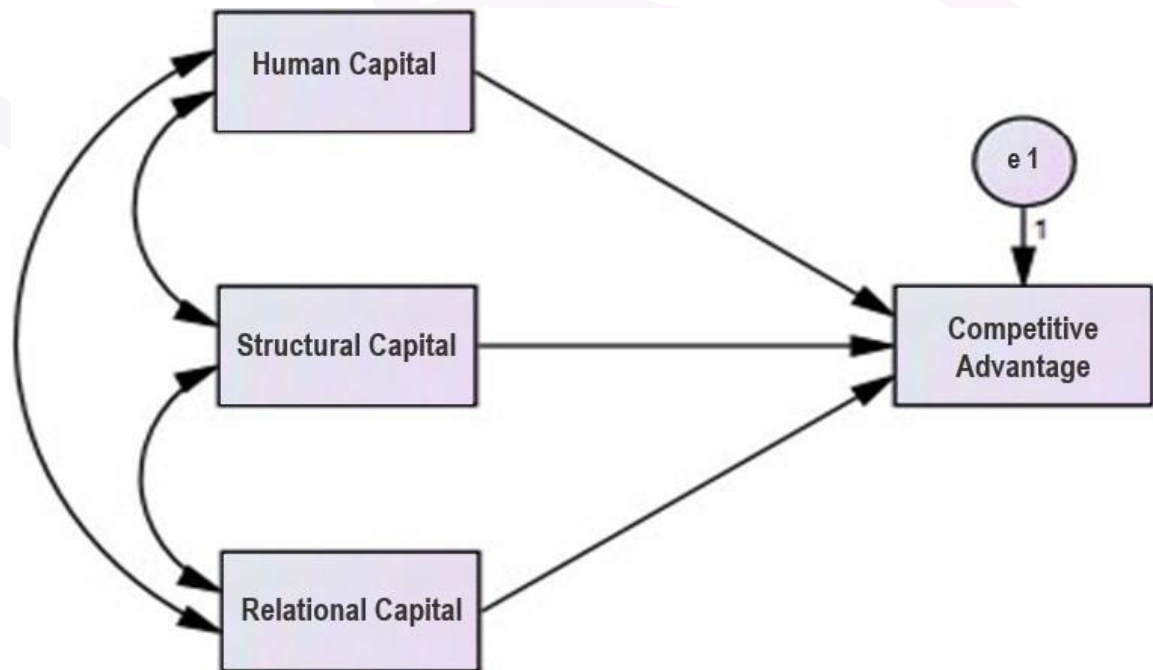


Figure 2. Influencing intellectual of capital Factors on Competitive Advantage

Research Hypothesis

The research will evaluate the Effect of intellectual capital (Human capital, structural or organizational capital, and relational capital) on competitive advantage in liquefied natural gas corporations. In accordance with the previous review and research objective, the research hypothesis proposed as follows.



H1: Human Capital has no statistical effect on Competitive Advantage in liquefied natural gas corporations.

H2: Structural Capital has no statistical effect on Competitive Advantage in liquefied natural gas corporations.

H3: Relational Capital has no statistical effect on Competitive Advantage in liquefied natural gas corporations.

Research Methods

Population, Samples and Sampling Techniques

Rather than referring to specific characteristics of a complete and unique collection of items, "population" refers to the aggregate of all possible values, including counting results and quantitative and qualitative measurements (Sudjana, 2008: 164). According to another definition, a population is a group of objects, whether they are individuals, symptoms, test scores, objects, or events (Arikunto, 2009). This poll surveyed 140 employees from three of Malaysia's leading liquefied natural gas companies. The Sloven formula is used to determine the sample size for this study, which results in a total sample size of 78 respondents.

Instruments

To minimize bias and misinterpretation of the questionnaire, we collected the data necessary to test our model using a self-administered questionnaire. The questionnaire was developed in accordance with established ideas for each variable. A five-point Likert scale was employed to assess respondents' perceptions of the questionnaire's statements.

Data Analysis

The results of the survey questionnaire are evaluated using two types of statistics: descriptive and inferential.

utilizes a graphic to illustrate the result of descriptive statistics. Multiple regression analysis was used to assess the given data statistically (MRA). AMOS aided in our analysis.



Results and Discussion

The qualities of our sample circumstance may allow us to gain a better understanding of it and conduct an appropriate analysis of it. The gender, age range, and educational achievement of the sample were all analyzed, as well as their overall health. A large proportion of the sample is made up of men between the ages of 25 and 50. They also completed their bachelor's degrees in most cases.

Descriptive Statistics

On average, our research sample showed that they had highly competitive advantage level (Mean = 4.36; Max = 5; Min = 4). The role conflict also highly perceived (Mean = 4.45; Max = 5; Min = 3.6). Uniquely, on the given situation, the employees were very satisfied with their work, even though the range perception was quite higher (Mean = 4.18; Max = 5; Min = 3.3). Lastly, their organizational commitment was also quite high (Mean = 4.39; Max = 5; Min = 3.2).

Regression Analysis

Table 2: Multiple Regression Analysis Result

Dependent Variable	Independent Variable	Estimate	S.E.	C.R.	P	Hypothesis Testing
Competitive Advantage	Human Capital	.398	.074	5.185	***	Accepted
Competitive Advantage	Structural Capital	.397	.078	5.182	***	Accepted
Competitive Advantage	Relational Capital	.313	.062	-2.245	***	Accepted

In accordance with Table 2, the model of competitive advantage level can be written on the following equation.

$$Y = -0.398X_1 + 0.397X_2 - 0.313X_3 + e \quad (1)$$

Where, Y= Competitive Advantage; X1 = Human Capital; X2 = Structural Capital; X3 = Relational Capitally, e

In the case of PT Pelindo, I Medan, a model based on equation 1 can explain 64 percent of the variance in employees' degrees of workplace stress. Employees' levels of workplace stress are greatly influenced by their perceptions of role



conflict and organizational commitment (p-value 0.05). Human capital, on the other hand, has a statistically insignificant influence on competitive advantage (p-value = 0.397). The relationship between structural capital and competitive advantage is positive, with a regression coefficient of = 0.399. We agree with the research premise that the amount of competitive advantage is significant. According to the results of the study, Relational Capital has a beneficial impact on competitive advantage (= -0.313), which may operate as a buffer for the degree of competitive advantage. According to our findings, human capital, structural capital, and relational capital can all act as competitive advantage buffers (= -0.398), and we accept this research hypothesis. However, because the result is statistically significant, we decided to accept the research hypothesis.

Findings and Discussion

Per the findings of the study, structural capital has a significant impact on increasing the competitive position at a level of (0.05) or higher. This discovery lends credibility to the conclusion reached by such scholars (e.g., Kavida and Sivakoumar 2009). The tacit knowledge or codified knowledge items that make up structural capital are included. It is seen as a pool of knowledge as well as the supportive infrastructure that supports the utilization of human and relational capital. It is true that firms that have effective structural capital are more likely to achieve better harmonization between the various components of intellectual capital. To achieve a lasting competitive advantage, it is possible to hypothesize that increasing structural capital is beneficial to the organization. Moreover, it has been discovered that relational capital has a statistically significant impact on attaining a competitive advantage at the level of (0.05). Relational capital is the most favorable and influential component of intellectual capital, according to the findings of scholars such as (Chen 2008; Jaradat et al., 2012), who have argued that it is the most favorable and influential component of intellectual capital in achieving a competitive advantage among the various components of intellectual capital. At its most fundamental level, relational capital is concerned with the mobilization of resources and knowledge using a social framework Younus, D., & Muayad, A. (2021). Building solid relationships with all stakeholders, it might be argued, assists in achieving a competitive advantage. Based on our prior study, we concluded that maintaining employees' Human Capital levels was a crucial



factor in ensuring that employees' competitive advantage levels were not eroded. The greater the number of employees who are content with their jobs, the less probable it is that they would feel stressed. Employees who are unsatisfied with their jobs would have greater stress resistance than those who are satisfied with their jobs. Nonetheless, once we added the role conflict, we discovered that effectively managing this conflict was a more important factor in lowering employees' stress levels. The more their perception of Structural Capital, the greater the likelihood that they would be stressed. Relational Capital proved to be a more effective competitive advantage buffer than Human Capital. As a result, it was critical to instill a sense of dedication in each employee. According to the findings of this study, human capital was a non-significant aspect in competitive advantage, but it should be taken into consideration to maintain a high degree of competitive advantage. As per our findings, we might conclude that there was insufficient evidence to conclude that Human Capital had an impact on the amount of competitive advantage enjoyed by employees. Relational Capital, on the other hand, would have a major impact on their level of competitive advantage. The influence of Relational Capital, on the other hand, was not as significant as their perceived work-family conflict. Human Capital played a relatively minor impact in determining the level of competitive advantage enjoyed by employees, which was a first. In accordance with the findings of the research, we recommended that the organization place greater emphasis on controlling employees' role conflict in the future. It was preferable to keep employees satisfied with a healthy work-life balance and a family life than to keep them happy with their jobs. It is also important for businesses to instill a sense of Relational Capital among their personnel. This would be beneficial in reducing job stress. We hoped that by keeping stress levels low, it would have little impact on the personnel and, consequently, on the organization's performance. The most significant source of structural capital was time-related conflict since they were unable to find enough time to spend with their families. The employees were forced to work overtime, which meant that they had to sacrifice time spent with their families and friends. This should be avoided at all costs. As a result, the overtime policy should be more maintenance oriented. As previously said, according to our preliminary findings, the workload could snowball at times and be appraised in accordance with the capacities of individual personnel. In our research, we discovered that one source of work-family conflict was the



employees' tendency to suspend their work until the deadline had passed. As a result, they were compelled to work more hours and sacrifice valuable family time because of the situation. As a result, it was strongly urged that we establish a certain culture to avoid halts. It would be much better if we could finish the job as quickly as possible and avoided working overtime unless we were in an emergency scenario, which we were not. Because we discovered that Relational Capital considerably buffered and lowered employees' competitive advantage level, we recommended that each firm cultivate Relational Capital inside each employee. Relational Capital may result in a better human component, such as employees who perform better for the benefit of the organization.

Conclusions

The research was focused on how the effects of intellectual capital (Human capital, structural or organizational capital, and relational capital) on competitive advantage of liquefied natural gas corporations in Malaysia there must be additional research to evaluate the performance as the organizational main goal is performance which is related to their productivity. Moreover, the research was focused on a common level of Competitive Advantage, Human Capital, Structural Capital, and Relational Capital. Even though we understood that there were several dimensions on each variable, we could not conclude each dimension's effect as we were limited on. Thus, the future research must evaluate it on a more specific level so that we can make a better decision to Competitive Advantage.

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