

**Improving company value: the role of human capital, structural capital, capital employed, investment decisions, and manager's attitude to risk**

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**Abstract**

Various studies show that companies and organizations have realized that knowledge-based capital is an important company asset. Managing the company's knowledge-based capital is one of the important tasks to encourage companies to compete with other companies. This study aims to identify the knowledge-based capital in human capital, structural capital, and capital employed by companies and its effect on investment decisions that affect company value. Through literature review, this concept also incorporates managers' risk attitude, which is part of ERM (Enterprise Risk Management) to develop the concept of Knowledge-based Risk Management (KBRM). Based on path analysis using AMOS, the result shows direct influence of human capital and capital employed on investment decisions is not significant. Meanwhile, the direct influence is significant. Investment decision does not mediate the relationship between human capital, structural capital, and capital employed on company value. Furthermore, managers' attitude to risk as risk-averse weakens the relationship between investment decisions and company value. Based on that result, companies need to reconsider managers' behaviour in facing risks so that managers able to take risks when deciding on investments in the future and increase the value of the company.

**Keywords:** capital employed; human capital; investment decision; manager's attitude to risk; structural capital.

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## INTRODUCTION

Economic wealth comes from knowledge assets, namely knowledge-based capital, but the emphasis on industrial applications is still relatively new. Managing a company's knowledge-based capital is one of the main tasks on the executive agenda. However, this is not easy as it involves strategic identification, measurement, and assessment. In this situation, knowledge-based capital models become especially relevant, as they allow to understand the nature of these assets and make measurements of them (Teece, 1998).

Knowledge is currently considered the most strategic resource of a company as it is believed to be a resource that is difficult to imitate and socially complex. Efficient production with heterogeneous resources does not result from better resources but knowledge of these resources (Ngatno, 2014). The knowledge-based theory considers companies as organizations that produce, integrate, and distribute knowledge (Miller, 2002). Every individual in the company has a role in improving performance through their knowledge. At the top of the organizational hierarchy, a manager makes employees share knowledge through teamwork for product development (Grant, 1996).

The knowledge of each individual in the company also affects individual behaviour in making decisions, one of which is the manager's decision to face risk. Various studies have been conducted and have gone through a long process of incorporating knowledge into part of risk management (RM). One of the research results shows a strong relationship between knowledge management (KM) and RM (Lauria et al., 2014). Moreover, Yu & Yang (2018) stated that there is a collaboration between KM and RM, known as knowledge-based risk management (KBRM).

Bontis et al. (2000) categorise knowledge-based capital into human capital, structural capital, and capital employed. Many argue that human capital is the most critical company asset because it controls other assets. Human capital manages both tangible and intangible company assets to get profit and added value. Structural capital is an organization or company's ability to fulfil its routine processes and structures that support employees' efforts to produce optimal intellectual performance and overall business performance. Capital employed results from the organization's ability to interact positively with the environment (including suppliers, customers, competitors, shareholders, stakeholders, and community) to improve welfare by increasing human capital and structural capital (Gonzalez-Loureiro & Teixeira, 2011).

Companies with high performance in various countries have accommodated knowledge-based capital exploration programs by investing a fantastic amount of funds (Deep & Narwal, 2014; Feimianti & Anantadjaya, 2014; Pouraghajan et al., 2013). This is done hoping that their knowledge-based capital can increase the competitive advantage to improve performance and even company value (Gonzalez-Loureiro & Teixeira, 2011). Nevertheless, this concept has not been widely applied in Indonesia. Many Indonesian companies tend to operate their business conventionally. Manufacturing companies in Indonesia are always in contact with technology and knowledge, in which investment funds in knowledge infrastructure may improve human resources quality. The workforce quality depends on the knowledge-based capital that can create added value (Hashim et al., 2015; Nuryaman, 2015).

Knowledge-based intangible assets stimulate innovation, creativity, competitiveness, and value creation. It drives company performance, which impact on increased investor confidence and company value (Deep & Narwal, 2014; Feimianti & Anantadjaya, 2014; Pouraghajan et al., 2013). García-Meca & Martínez (2007) also found information and knowledge-based capital to work effectively for companies' investment decisions to improve company performance. Other studies found no role of knowledge-based assets on company performance and productivity (Morariu, 2014; Britto et al., 2014). Further, Kallapur & Trombley (2001) noted that investment decisions could not be observed because it is a latent variable, so a proxy is needed. This study used a combined approach to measuring investment opportunity set (IOS) with the common factor analysis technique to avoid measurement errors (Basu et al., 2022).

Various studies have mentioned the role of knowledge-based intangible assets on company investment decisions, especially company value. Still, not many have interpreted it into the basis of RM theory. The long process of knowledge becomes the concept of RM, and there is a strong relationship between KM and RM (Lauria et al., 2014). Ruzic-Dimitrijevic & Dakic (2014) refer to the RM process as enterprise risk management (ERM). The issues discussed in this case emphasize the conceptual relationship between knowledge-based theory (KBT) and risk management (RM), which is described in knowledge-based risk management (KBRM).

Meanwhile, Subhani & Osman (2011) and Stanton (2012), only focus on measurement and risk models in strategic decision-making and company performance influenced by knowledge. A different approach is proposed in this study by reflecting "response-resolution" in the KBRM process, as suggested by Lauria et al. (2014). Furthermore, the response is a form of feedback which is the manager's risk attitude in this study. A manager's information and knowledge will affect their attitudes in making strategic decisions. In the study conducted by Aistov & Kuzmicheva (2012), the company's premium risk is obtained from formulating several components, one of which is the manager's risk attitude. This study focuses on ERM support in conceptual KBRM which become the novelty of study.

### **Human capital, investment decisions, and company value**

Human capital is the skills and knowledge acquired from school, investment, on-the-job training, and other experiences that enhance human knowledge (Unger et al., 2011). Since companies cannot achieve innovation and change without employees, companies invest in human capital by increasing employee value through training and development which provide benefit to the company in the long run (Storey, 1989; Kianto et al., 2017). Human capital is often seen as a burden or cost that must be reduced, but it would be better if it is seen as an investment in which employees' potential can increase company value (Vithana et al., 2021).

Human capital can increase company value through the company's investment decisions (Unger et al., 2011; Vithana et al., 2021). The company's investment decision on the use of human capital will provide a strategic competitive advantage that contributes positively to company value and provides high returns to the company in the long term (Hashim et al., 2015; Nuryaman, 2015; Vithana et al., 2021). According to Deep & Narwal (2014), human capital has no effect on investment or firm value. Moreover, human capital, an intangible asset, is not taken

into account in decision making and has no impact on company value (Mehralian, et al, 2012).

H1: An increase in human capital will optimise investment decisions.

H5: An increase in human capital will increase company value through investment decisions.

### **Structural capital, investment decisions, and company value**

Structural capital is the knowledge that has been transformed into corporate rights, such as patents (Hsu & Wang, 2010). In addition, structural capital is a collection of mutually supportive knowledge, and infrastructure that will continue to exist in the company, even though there is employee rotation or resignation (Youndt & Snell, 2004; Yaseen et al., 2016).

Companies that optimize structural capital can increase company value (Chen et al., 2005). Due to high competition between companies, maximising structural capital is needed to increase the company's value (Hsu & Wang, 2010; Yaseen et al., 2016). However, in Indonesia, using structural capital as part of the investment to increase company value is still low (Welly et al., 2021). Several studies have also shown a negative influence between structural capital on firm performance and value (Mohammad et al., 2018; Forte et al., 2019). According to Deep & Narwal (2014), structural capital has no effect on investment or firm value. In addition, structural capital as an intangible asset, is not taken into account in decision making and has no impact on company value (Mehralian, et al, 2012).

H2: An increase in structural capital will optimise investment decisions.

H6: An increase in structural capital will increase company value through investment decisions.

### **Capital employed, investment decisions, and company value**

Capital employed will increase the company's ability to earn greater profits so that the increase in profits can improve the company's financial performance (García-Meca & Martínez, 2007; Feimianti & Anantadjaya, 2014; Ciptaningsih, 2013; Pouraghajan et al., 2013). Capital employed as part of investment in Indonesia to increase company value is still low although it is considered in financial reports about intangible assets (Welly et al., 2021). Several studies also show a negative effect of capital employed in firm performance and value (Mohammad et al., 2018; Forte et al., 2019). Based on research by Deep & Narwal (2014), capital employed which is part of intellectual capital, has no effect on investment and company value. The capital employed will affect profitability but will reduce the value of the company (Mehralian, et al, 2012).

H3: An increase in capital employed will optimise investment decisions.

H7: An increase in capital employed will increase company value through investment decisions.

### **Investment decision, company value, and manager's attitudes to risk**

Various studies show the effect of investment decisions on company value. A sound investment decisions will increase company value (Nurhayati et al., 2021). In managing risk of each investment decision, managers are often influenced by their psychological conditions. The managers' risk attitudes types are risk-taker, risk-neutral, and risk-averse (Brigham & Houston, 2019; Ehrhardt & Brigham, 2016). Among those attitudes, various studies show that managers tend to be risk-

averse in dealing with risks despite the decision-makers for investment activities or other actions to improve company performance (Ross, 2004; Sauner-Leroy, 2004; Milidonis & Stathopoulos, 2014; Dupont, et.al, 2018).

The hypothesis based on the KBRM theory develops a concept that the manager's risk attitude is likely support the success of company investment decisions and increase company value. However, the moderation of managers' attitude to risk will weaken the relationship between investment decisions and firm value (Sauner-Leroy, 2004; Dupont, et.al, 2018).

H4: Investment decisions will affect the company value.

H8: Managers' attitude to risk will weaken the relationship of investment decisions to increase company value.

Based on each variable's research framework and literature review, the research model is presented in Figure 1. The research model that presented in Figure 1 shows the correlation of variables are human capital (HC), structural capital (SC), capital employed (CE), investment decisions (KI), managers' attitude to risk (SMTR) and firm values (FV).

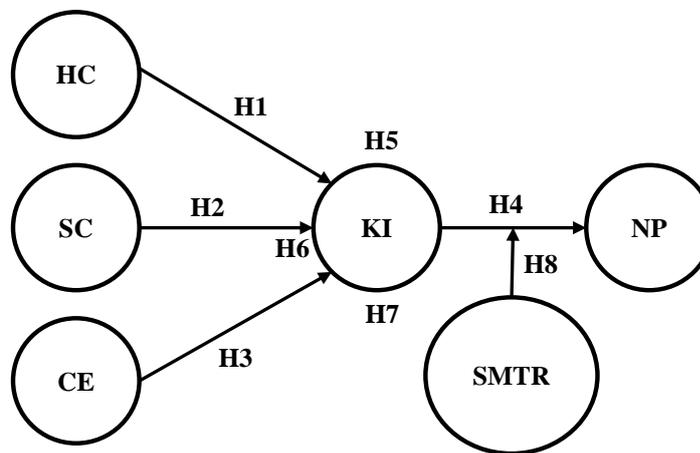


Figure 1. Conceptual Model

## METHODS

This study used secondary data sources from manufacturing companies' financial statements that listed on the Indonesia Stock Exchange (IDX). The data were selected with purposive sampling with several criteria, including: (1) manufacturing companies listed on the Indonesia Stock Exchange (IDX) website, (2) the complete company annual and quarterly financial reports from 2016 to 2019 are available, and (3) information on the company's share price from 2016 to 2019 is available.

After tabulating the data, 84 manufacturing companies were selected, with 32 manufacturing companies from category basic industry and chemicals, 24 manufacturing companies from category costumer goods industry, and 28 manufacturing companies from category miscellaneous industry. The number of samples chosen met the criteria for selecting the research sample. Finally, since this study used 2016-2019, the total data processed were 336.

Measurement of each research variable using a specific proxy based on previous relevant research as shown in Table 1. The path analysis was performed using AMOS 26 to test the hypotheses.

Table 1. Measurement of Variables

Variable	Proxy	Source
Human capital	Value added human capital coefficient (VAHU)	Bontis et al. (2000); Pulic (2004); Girma (2017)
Structural capital	Value added structural capital coefficient (STVA)	Pulic (2004); Girma (2017)
Capital employed	Value added capital employed coefficient (VACE)	Bontis et al. (2000); Pulic (2004); Girma (2017)
Investment decisions	Investment opportunity set (IOS)	Martati (2010)
Manager's attitude to risk	Risk premium	Aistov & Kuzmicheva (2012)
Company value	Tobin's Q	Potepa & Welch (2018)

## RESULT AND DISCUSSION

### Hypothesis testing results

Table 2. The Result of Direct Effect

Direct Effect	Estimate (Standardized DE)	P-value	Information
Med_IOS ← X1_VAHU	0,072	0,169	Not significant
Med_IOS ← X2_STVA	-0,366	0,000	Significant
Med_IOS ← X3_VACA	-0,087	0,127	Not significant
Y_TobinsQ ← Med_IOS	0,093	0,000	Significant
Y_TobinsQ ← X1_VAHU	-0,065	0,000	Significant
Y_TobinsQ ← X2_STVA	-1,142	0,000	Significant
Y_TobinsQ ← X3_VACA	0,038	0,000	Significant

The direct effect test was carried out to test hypotheses 1-4. The results of the direct effect test are presented in Table 2. Based on the indirect effect test results in Table 2, hypothesis 1-3 is not accepted and hypothesis 4 is accepted. However, for hypothesis 2, the result is significant, but the effect is negative. Since the results for hypotheses 1 and 3 were not significant, this variable could not be tested for the impact of mediation, which means that hypotheses 5 and 6 were rejected.

Table 3. The Result of Indirect Effect

Parameter	Estimate	Lower	Upper	P-value
ie1 (HC → KI → NP)	0,001	0	0,002	0,223
ie2 (SC → KI → NP)	-0,014	-0,17	0,275	0,42
ie3 (CE → KI → NP)	-0,088	-0,452	0,514	0,379

Based on the indirect effect test results in Table 3, the conditions for the fulfilment of mediation were not achieved. That's why hypothesis 7 is rejected. This result is also supported in Table 3, where the indirect effect has a p-value >0.05 (0.379), insignificant. Therefore, the relationship between the capital used and company value (Tobin's Q proxy) is a direct effect without any mediation on investment decisions. These results are shown in Table 1.

Based on the results of the moderation test in Appendix 1, the effect of manager's risk attitude (RC proxy) on the impact of investment decisions (IOS proxy) on company value (Tobin's Q) yields a p-value of 0.000. The results of the moderator test (IOSxRC) showed that the p-value <0.05.

Considering that the effect of investment decisions (IOS proxy) on company value (Tobin's Q) moderated by managers' risk attitude (RC proxy) is significant,

hypothesis 8 is accepted. The test results show that the moderating variable can partially moderate, which means that the variable can also act as an independent variable and not only as a moderating variable. That is supported by a significant value (0.000) on the direct effect of manager risk attitude (RC proxy) on company value (Tobin's Q).

### **The impact of human capital and investment decisions on company value**

The analysis results for H1 show that human capital have no significant effect on investment decisions. This study backs up the findings of [Welly et al. \(2021\)](#). Even though it is included in the financial statements of intangible assets, the use of capital as part of investment in Indonesia to increase the value of the company is still low, and some companies have not considered this.

Moreover, the impact of human capital on company value is significant and negative. Although the effect of the human capital on the company value are significant, because H1 is not significant, the investment decision does not mediate the relationship (H5 is not proven). Human capital has an effect on company value without going through an investment decision. These results indicate that the company value will decrease along with the increase in human capital. Based on that, investors do not see the addition of human capital as an investment but as part of the cost incurred by the companies ([Mehralian, et al, 2012](#); [Deep & Narwal, 2014](#)). Therefore, the greater the value, the greater the deduction from sales and the smaller the companies' profits. Companies should pay attention to human capital expenses as a result of these findings. If the corporation increases costs in this area, they also need to increase their profits. Human capital is not considered in investment decisions and even has a negative effect on firm value. It shows that the intangible asset approach has not been the basis for consideration of decisions and valuations of companies in emerging and developing countries, the majority still use the tangible asset approach ([Malhotra, 2003](#); [Mehralian, et al, 2012](#))

### **The impact of capital employed and investment decisions on company value**

The analysis results for H2 show that capital employed have no significant effect on investment decisions. This study supports the research of [Welly et al., \(2021\)](#). Capital employed as part of investment in Indonesia to increase the value of the company is still low and even some companies have not considered this, even though it is included in the financial statements of intangible assets.

Furthermore, the impact of capital employed on the value of a company is significant and positive. Although the effect of capital employed on company value is significant, the investment decision does not mediate the relationship because H6 is not significant (H6 is not proven). Capital employed is not taken into account when making investment decisions, indicating that the intangible asset strategy has not been used as a basis for making judgments and valuing enterprises in emerging and developing countries, with the majority still relying on the tangible asset approach ([Malhotra, 2003](#); [Mehralian, et al, 2012](#)).

### **The impact of structural capital and investment decisions on company value**

The results of testing H3 indicate that structural capital has a significant and negative effect on investment decision making. Therefore, when structural capital decreases, the companies' chances of making investment decisions increase. These

results were consistent with [Welly et al. \(2021\)](#) and indicate that the companies cannot correctly utilize knowledge capital in structural capital to encourage investment decision-making in innovation activities.

Moreover, the effect of structural capital on company value is significant and negative. This result is consistent with the research by [Mohammad et al. \(2018\)](#) and [Forte et al. \(2019\)](#). Although the structural capital test results have an impact on investment decisions and company value, the mediation test results show that investment decisions do not mediate the relationship between structural capital and company value (H7 is not proven). When utilized properly, structural capital will be one of the companies' competitive advantages in taking investment opportunities ([Jafaridehkordi & Rahim, 2014](#)). However, because the companies have not been able to optimize the benefits of competitive advantage through structural capital, the relationship between the two is not unidirectional ([Mehralian, et al, 2012](#)). It is because the company seeks capital outside, so it does not optimise the capital already owned within the companies. Structural capital is not considered in investment decisions and even has a negative effect on firm value ([Deep & Narwal, 2014](#)).

#### **The impact of investment decision and company value on manager's attitudes to risk**

The results of testing H4 indicate that investment decision has a significant and positive effect on company value. This study backs up the findings of [Nurhayati et al., \(2021\)](#). [Kallapur & Trombley \(2001\)](#) stated that companies with a high IOS value would have a greater opportunity to develop in the future than companies with a low IOS. Company value will be increased by optimising investment decisions, but the intended investment decisions are not determined by human capital, structural capital, and capital employment. Making investment decisions is essential because these activities affect company value ([Tyastari et al., 2017](#)). The company's success in optimising investment decisions will increase the company's value. Various studies also support these results that prove that the relationship between investment decisions and company value is positive ([Handriani & Robiyanto, 2018](#)).

Interesting results are also seen from the moderating variable of managers' attitude to risk on the relationship between investment decisions and company value. This study indicates that the risk aversion coefficient moderates the relationship between investment decisions and company value. Since the coefficient shows a negative value, the risk aversion coefficient's moderating effect will weaken the relationship between investment decisions and company value (H8 is accepted). These results support various studies showing that managers tend to be averse to risk ([Sauner-Leroy, 2004](#); [Milidonis & Stathopoulos, 2014](#); [Dupont, et.al, 2018](#)). The manager will hesitate to make investment decisions because the proxy for the managers' risk attitude is the risk aversion coefficient, someone who does not like risk or avoids risk. However, various studies show that managers' attitudes in dealing with risk tend to be averse literature ([Brigham & Houston, 2019](#); [Ehrhardt & Brigham, 2016](#)). Meanwhile, a manager is a decision-maker for investment activities and other actions to improve company performance. Therefore, the effect of risk aversion coefficient weakens the relationship between investment decisions on company value because the managers do not dare to take

investment decisions, resulting in lost opportunities to increase company value. Based on these results, company managers need to be aware of their financial behavior, whether as risk aversion or not. If the manager is risk averse, he or she must collaborate with other departments within the company to make bolder and better financial decisions.

## CONCLUSION

The test results show no mediation effect of investment decisions between human capital, structural capital, and capital employed on company value. Investment decisions do not mediate the relationship between human capital, structural capital, and capital employment on company value, also indicate that these three variables are not considered in investment decisions. Thus, intangible asset approach has not been the basis for consideration of decisions and valuations of companies in emerging and developing countries, the majority still use the tangible asset approach.

However, these variables have a direct impact on company value. Structural capital is the only variable that impacts the investment decision. Moreover, managers' attitude to risk (risk-averse) weakens the relationship between investment decisions and company value.

Based on the result, investment decisions have a good influence in increasing the company's value. However, this relationship will decrease when managers have a risk-aversion nature. The research imply that companies need to reconsider the behaviour of managers in facing risks. Hence, the company should encourage managers to take risks when deciding on investments in the future so that the company value might be increased.

This study limits the analysis of intellectual capital elements through human capital, structural capital and capital employed. For further research, another intellectual capital factors such as relational capital, intellectual property, know-how, copyrights, patents or any other information or resources that give a competitive advantage, can be measured as determiners of company's investment decision.

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Appendix 1. The Moderation Test Results

Direct Effect			Estimate (Standardized DE)	P-value	Information
Y_TobinsQ	←	Med_IOS	0,093	0,000	Significant
Y_TobinsQ	←	Z_RC	-0,357	0,000	Significant
Y_TobinsQ	←	IOSxRC	-0,116	0,000	Significant