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by Agus Wahyudi

THE CONTRIBUTION OF INTELLECTUAL CAPITAL ON

INDONESIAN BANKS' RISK MANAGEMENT

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Abstract

Risk management seeks to manage risks to secure firms' sustainability and to enhance performance. This study focuses on the impact of intellectual capital on Indonesian banks' risk management performance. Our research sample was 29 banks listed at the Indonesian Stock Exchange. By using the panel data regression technique with the Fixed Effect Model to analyze the data, this study demonstrates that intellectual capital affects risk management. In particular, structural capital and relational capital affect risk management, while human capital cannot predict risk management.

1. INTRODUCTION

Risk management has been recently under increasing attention because many firms cannot manage their risks sufficiently that leads to business failures (Zaleha et al.,2012; Lechner and Gatzert, 2017). Enterprise Risk Management (ERM) is a risk management model that identifies, evaluates, and controls risks that potentially threaten firms' survivability and activities. Beasley et al. (2005) suggest that ERM as a new paradigm in managing organizational risks and making decisions. Risk management allocates resources sustainably to increase organizational performance (Mohammed dan Knapkova, 2016).

Sällebrant et al. (2007) propose that risk management performance is associated with the increased performance of firms' intellectual capital. Intellectual capital is the key

to increase firms' competitive advantage (Chen et al., 2005; Goswami, 2016; Hejazi et al., 2016). In this respect, knowledge capital is an inimitable asset. Firms will continuously develop if they deploy their intellectual capital effectively. A more dynamically and complexly changing environment causes knowledge-based resources to be the main asset to preserve firms' sustainable advantage (Ting and Lean, 2009). Modified Value Added Intellectual Coefficient (MVAIC) measures intellectual capital performance (Ulum, Ghozali, and Purwanto, 2014; Nimtrakoon, 2015). MVAIC itself consists of four components, namely, Human Capital Efficiency, Structural Capital Efficiency, Relational Capital Efficiency, and Capital Employed Efficiency.

A study by (Rodriguez and Edwards, 2008) demonstrates that intellectual capital contributes to risk modeling. In particular, risk management positively contributes to firms' performance with greater intellectual capital (Andersen, 2008). (Sällebrant et al., 2007) find that intellectual capital is negatively related to idiosyncratic risk. The relationship implies that intellectual capital helps firms implement risk management that reduces their risks. Thus, this study seeks to investigate the role of intellectual capital in risk management.

2. LITERATURE REVIEW

2.1 Intellectual Capital

Based on the framework of Skandia Navigator, Pulic (2000) develops an approach to measure the efficiency of intellectual capital known as VAIC^{TM}. Skandia Navigator is one of the initial methods to measure and visualize the value of intangible capital. The approach is based on the idea that intellectual capital represents the difference between firms' market value and book value. Developed by Edvinsson and Malone, Skandia Navigator is an initial model to measure intellectual capital (Nazari and Herremans,

2007). Two key resources in value creation are capital employed and intellectual capital. Nazari and Herremans (2007) argue that the VAIC model can be developed further by including more intellectual capital constructs. In this respect, (Ulum et al., 2014) develop Modified VAIC (MVAIC) as the development of VAIC^{TM}. The model of Ulum, et al. (2014) develops the VAIC^{TM} formula by adding Relational Capital (RC) into the VAIC^{TM} formula.

2.2 Enterprise Risk Management

In September 2004, the Committee of Sponsoring Organization of The Tradeway Commission (COSO) issued the Enterprise Risk Management-Integrated Framework to provide the ERM implementation framework (Beasley et al., 2005). Beasle et al. (2005) explain that ERM is based on COSO. ERM is an organization-wide process that is affected by management, the board of directors, and other personnel within an organization that is applied in strategy formulation to identify events that potentially affect the organization to manage risks within an organization's tolerable level and to ensure that organizations goals are achieved.

Referring to COSO as mentioned by Gordon et al. (2009), an ERM organization system should aim to the followings: (1) Strategy: high-level objectives that are in line with organizational missions, (2) Operation: the efficient and effective deployment of organizational resources, (3) Reporting: the reliability of organizational reporting system, and (4) Compliance: organizational compliance with legal regulations.

3. HYPOTHESIS

Firms increasingly rely on risk management because of several fraud and bankruptcy cases of big firms such as Enron, Worldcom, dan Tyco. Market and regulators have responded to the conditions by implementing more aggressive control on corporate

governance and audit in facilitating risk management. Intellectual capital represents intangible assets that are closely related to risk management (Sallebrant et al., 2007). Sallebrant et al. (2007) describe that Structural Capital consists of supporting systems to support organizations, Human Capital includes competence, knowledge, and skills of managers and personnel, and Relational Capital consists of the ability to maintain valuable relationships with customers, suppliers, and other networks.

Golshan and Rasid (2012) demonstrate the positive coefficient, albeit insignificant, of opacity assets on Enterprise Risk Management (ERM). Next, Hoyt and Liebenberg (2011) and Lechner and Gatzert (2017) find that opacity capital positively affects ERM. Opacity capital represents intangibles assets (Golshan and Rasid, 2012; Hoyt and Liebenberg, 2011; and Lechner and Gatzert, 2017). Hoyt and Liebenberg (2011) explain that highly opaque firms are more likely to implement ERM programs.

H1: Intellectual capital positively affects risk management

H2: Human Capital Efficiency positively affects risk management

H3: Structural Capital Efficiency positively affects risk management.

H4: Relational Capital Efficiency positively affects risk management.

H5: Capital Employed Efficiency positively affects risk management.

4. RESEARCH METHOD

4.1 Sample

Our research sample is 29 banking firms that were listed at the Indonesian Stock Exchange during 2013-2017. We select banks as the sample firms because the banking

industry is a sector that implements risk management relatively well (Rodriguez dan Edwards, 2008).

4.2 Research Variables

1) Enterprise Risk Management Index (ERMI)

This study uses Enterprise Risk Management Index (ERMI) as the proxy of risk management of banks that were listed at the Indonesian Stock Exchange in 2013-2017. Based on the ERM framework issued by COSO, Gordon et al. (2009) develop the ERM Index to measure firms' ERM implementation. ERMI consists of four main components, namely the ability to achieve objectives through strategy, operation, reporting, and compliance. The ERMI equation is developed through the following formula:

$$ERMI = \sum_{k=1}^{2} Strategy_k + \sum_{k=1}^{2} Operation_k + \sum_{k=1}^{2} Reporting_k + Compliance$$

a) Strategy

The first indicator of Strategy is the standard deviation of the firm's revenues relative to the standard deviation of the industry's revenues that is measured with the following formula:

$$Strategy_1 = \frac{Revenues_i - \mu_{Revenues}}{\sigma_{Revenues}}$$

The second indicator is measured by reducing the firm's beta. Further, we measure beta by using the market model. In particular, the second indicator is measured by the following specification:

$$Strategy_2 = \frac{\Delta\beta_i - \mu_{\Delta\beta}}{\sigma_{\Delta\beta}}$$

b) *Operation*

The first indicator of operation is measured by total asset turnover (total revenues divided by total assets). In particular, the following is the measurement of the first indicator of Operation:

$$Operation_1 = \frac{Revenues}{Total\ assets}$$

The second indicator of Operation is measured by dividing totals sales with total employees, as indicated by the following formula:

$$Operation_2 = \frac{Revenues}{Total\ employees}$$

c) *Reporting*

A method to measure less qualified financial reporting combines the following three variables, namely Material Weakness, Qualified Auditor Opinion, and Restatement. A firm that discloses its material weakness in their annual report will be scored -1 for Material Weakness and 0 otherwise. Auditors issue an opinion for each financial statement audit in which they engage. A firm that receives an unqualified auditor's opinion will be scored 0 for Auditor Opinion and -1 otherwise. A financial reporting restatement is considered less reliable reporting. A firm that restates its financial statement will be scored -1 for Restatement and 0 otherwise.

$Reporting_1$= *(Material Weakness)+(Auditor Opinion)+(Restatement)*

The following formula is the second measurement of *Reporting*:

$$Reporting_2 = \frac{|Normal\ Accrual|}{|Normal\ Accrual|+|Abnormal\ Accrual|}$$

Normal accrual is the difference between total accrual and abnormal accrual, while abnormal accrual is the error term of the regression of total accrual equation.

d) Compliance

Compliance is measured by dividing the auditor fee with a firm's total assets.

$$Compliance = \frac{Auditor\ fee}{Total\ assets}$$

2) Intellectual Capital

Intellectual capital is the sum of a firm's resources that help the firm to compete in the market that consists of knowledge, intellectual property, and experience. The study proxies intellectual capital with MVAIC of Indonesian banks that were listed at the Indonesian Stock Exchange in 2013-2017.

The following formula measures MVAIC™ :

$$MVAIC = HCE + SCE + RCE + CEE$$

a) Human Capital Efficiency (HCE) is the contribution of human resources investment to create value-added. The following formula measures HCE:

$$HCE = VA/HC$$

b) Structural Capital Efficiency (SCE) indicates the ability of structural capital in creating value and is measured by the following formula:

$$SCE = SC/VA$$

SC is the difference between value-added and employee costs.

c) Relational Capital Efficiency (RCE) represents the contribution of each unit of RC to value-added. The following formula measures RCE:

$$RCE = RC/VA$$

RC is measured by marketing expenses.

e) Physical Capital (Capital Employed) is a firm's invested assets. Capital Employed Efficiency indicates the contribution of each unit of CE to value-added. The following formula measures CEE:

$$CEE = VA/CE$$

CE is measured with total equity.

e) Value Added (VA) is the difference between total revenues and total expenses except for employee cost.

4.3 Data Analysis Technique

The study uses panel data regression with Fixed Effect Model. Two regression equations test the hypotheses. The first test investigates the impact of intellectual capital (MVAIC) on risk management as specified by the following equation:

$$ERMI = a + b_1 MVAIC \qquad (1)$$

The second test analyzes the effects of each component of intellectual capital (Human Capital, Structural Capital, Relational Capital, and Capital Employed) on risk management as indicated by the following specification:

$$ERMI = a + b_1 HCE + b_2 SCE + b_3 RCE + b_4 CEE \qquad (2)$$

5. RESULTS AND DISCUSSION

Our normality test suggests that the first equation is normally distributed, as indicated by the Jarque-Bera probability value of 0.216.

Figure 1. The Normality Test of the First Equation

The regression test demonstrates that MVAIC positively affects risk management performance, as indicated by the coefficient value of 143.6481 ($p = 0.0152$). Thus, the first hypothesis is supported.

Table 1. The Results of the Panel Data Regression of the First Equation

The second test that examines the impacts of each MVAIC component on risk management also is free from the normality problem, as indicated by the Jaque-Bera probability value of 0.856.

Figure 2. The Normality Test of the Second Equation

The panel data regression with Fixed Effect Model indicates that not all components of intellectual capital affect Indonesian banks' risk management. Table 2 informs that Human Capital does not affect risk management ($p = 0.8593$). Thus hypothesis 2 is rejected. However, hypothesis 3 is empirically supported, implying that Structural Capital positively affects risk management, as indicated by the coefficient value of 2329.923 ($p = 0.0001$). The third component of intellectual capital, Relational Capital, positively affects risk management as indicated by the coefficient value of 6806.670 ($p = 0.0391$). Thus, the fourth hypothesis is supported. The fifth hypothesis testing that investigates the positive impact of Capital Employed on risk management is not supported, as indicated by the negative coefficient value of -2654.685.

Table 2. The Results of the Panel Data Regression of the First Equation

This study shows that intellectual capital positively affects Indonesian banks' risk management. In particular, MVAIC, SCE, and RCE positively affect ERM. Sällebrant et al. (2007) suggest that intellectual capital is closely related to risk management, as indicated by the negative correlation between intellectual capital and business risk. The

result implies that intellectual capital contributes to enhanced risk management performance in minimizing business risk.

This study also reveals several results that do not support our hypotheses. Specifically, HCE does not significantly affect ERM. The finding is not in line with the COSO statement that suggests that risk management is affected by management, the board of directors, and personnel within an organization. This study shows that SCE affects ERM, implying that organizational support plays a more significant role in risk management.

The positive effect of SCE on ERM indicates that risk management largely needs organizational supports, such as organizational structure. Organizations need to have a risk committee to manage risks or a CRO. Gordon et al. (2009) hold that the organizational system is instrumental in stabilizing risk management. Further, Stulz (2008) suggests that a factor that leads to risk management failure is the failure to communicate outputs of risk management to top management. Risk systems have to help top management understand information or organizations' risk conditions.

The positive impact of RCE on REM implies that the increased efficiency of relational capital enhances banks' ERM implementation. When banks increase their relationships with their stakeholders, they need to improve their risk management. Stakeholders understandably expect banks to manage risks efficiently to protect them from losses when they transact with the banks.

This study also demonstrates that CEE negatively affects ERM. The result does not support our hypothesis that predicts that CEE positively affects ERM. ERM requires significant costs (Hoyt and Liebenberg, 2011; Lin *et al.*, 2012; Lechner and Gatzert,

2017). Consequently, when banks need to increase their capital efficiency, then their risk control will be affected in the opposite direction.

6. Conclusion

Intellectual capital positively affects Indonesian banks' risk management as indicated by the significantly positive effect of Modified Value Added Intellectual Coefficient on Enterprise Risk Management. Also, the components of Modified Value Added Intellectual Coefficient, i.e., Structural Capital Efficiency and Relational Capital Efficiency, positively affect Enterprise Risk Management. The results suggest that intellectual capital contributes to banks' enhanced risk management implementation. Banks will implement their risk management when they are more aware of risks, and awareness will increase when organizational knowledge improves.

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