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The Influence of Risk Management on Financial Performance and Firm Value: A Case Study on Companies of Crude Petroleum and Natural Gas Production Sector Listed at the IDX 2016 – 2019

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Abstract
This study is explanatory research, the sample in this study is crude petroleum and natural gas production companies listed on the Indonesia Stock Exchange in the period 2016 – 2019. The empirical analysis uses time-series data of Dividend, Earning, ROA, NPM, Tobin's Q, and Closing Price in those periods. The latent variable in this study is risk management, financial performance, and firm value. The inferential statistical method used to analyze in this study is component-based using Generalized Structured Component Analysis (GSCA).This study finds that a decrease in risk by risk management will not significantly increase financial performance, and an increase in financial performance will not significantly decrease the risk by risk management. A decrease in risk by risk management will significantly increase firm value, and an increase in firm value will significantly decrease the risk by risk management, but the impact of the increase in firm value on risk is bigger than the impact of the decrease in risk on firm value.This study also finds that an increase in financial performance will significantly increase firm value, and an increase in firm value will significantly increase financial performance, but the impact of the increase in firm value on financial performance is bigger.
Keywords: Risk, Risk Management, Financial Performance, Firm Value.
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1. Introduction

Crude petroleum and natural gas production sector are one of the industry sectors that make a major contribution to the Gross Domestic Product (GDP) in Indonesia. This sector experienced its glory as of the main pillar of the Indonesian economy in the 1970s - 1980s. Business in the field of crude petroleum and natural gas production is a business that requires large investments and high technology, on the other hand, the crude petroleum and natural gas production business is a high-risk business.

Risk is defined as the combination of the two basic dimensions: (a) possible consequences and (b) associated uncertainties (Aven and Vinnem, 2007). Other definition, the risk is defined as the effect of uncertainty on objectives. An effect is a positive or negative deviation from the expected, so according to this ISO definition risk also includes uncertain positive outcomes. Risk management is defined as the set of activities to direct and control an organization with regard to risk (Burger et. Al., 2014).

The objective of risk management is to identify all the possible consequences of an event arising from one sector and find an optimal decision to minimize adverse effects in a cost-efficient manner (Verma, 2015). Good risk management is generally claimed to be productivity-enhancing, while the opposite is true of poorly designed schemes (Aven and Vinnem, 2007).

The risks faced by the company are market risk, legal risk, volume risk, operational risk, liquidity risk and credit risk (Burger et. Al., 2014). It is acknowledged that risk cannot be eliminated but must be managed (Aven and Vinnem, 2007), while investors like higher cash flow, but they don't like risk; so the greater the expected cash flow and the lower the perceived risk, and the higher the Stock Price (Brigham & Houston, 2019). Hedging strategies involving oil and stock assets make it possible to reduce portfolio risk (variance) considerably (Hamma et al., 2014).

The company's main goal is to maximize firm value. This goal is not only in the interest of the shareholders alone, but also will provide the best benefits for the community (Keown et al., 2014), an increase in firm value can be achieved if the company can achieve the targeted profit (Adi et al., 2013). Until now the results of research on the effect of risk on company financial performance and company value have not been conclusive, for this reason, feels the need to conduct an Influence of Risk Management study on Financial Performance and Firm Value on companies of crude petroleum and natural gas production sector listed at the IDX 2016 - 2019.

2. Literature Review and Hypothesis.

2.1. Risk Management, Financial Performance.

Risk management for energy production and trading affects short- and long-term decision making. A shorter-term decision is how to operate facilities and to trade energy. The decisions are linked: The expected profit of operation and trading influence the investment decision for a facility, and the uncertainty in operation and trading increases

the uncertainty of the return of the investment (Densing, 2013). Dividend payout, Growth, Leverage, Liquidity, Asset size, Variability of earnings, Covariability of earning it is believed as an accounting risk measure (Beaver, 1970), the association between earning price (E/P) and excess return may reflect E/P as a proxy for an unknown risk factor (Wiggins, 1991).

The financial performance of a firm matter to a lot of groups the company's management, its employees, and its investors. Financial ratios provide a popular way to evaluate a firm's financial performance, if two companies have the same financial performance, their financial statements can be different (Keown et al., 2014).

Lehar (2005) found that firm size has a negative insignificant effect on systematic risk, and financial performance as measured by ROA has a negative significant effect on systematic risk, while solvency, as measured by ratio of long term debt over total debt, has a positive insignificant effect on systematic risk. Eckles et al. (2014) found that operating profits per unit of risk (ROA/return volatility) increase post-ERM adoption. Eckles et al. (2014) found that firms adopting ERM experience a reduction in stock return volatility, and the reduction in return volatility for ERM-adopting firms becomes stronger over time.

Alarussi and Alhaderi (2018) found risk measured by the current ratio has a positive insignificant effect on financial performance measured by ROE but negative insignificant effect on EPS. Risk measured by leverage and debt to equity ratio has a negative significant effect on financial performance measured by ROE, and risk measured by leverage has a negative significant effect on financial performance measured by EPS, while debt to equity ratio has a negative not significant effect on EPS. Hoyt and Liebenberg (2011) found a financial performance that measured by ROA has a positive correlation with enterprise risk management. Based on the evidence, the hypothesis in this study is risks managed through risk management are as follows:

H1a : Risk has a significant negative effect on financial performance.
H1b : Financial performance has a significant negative effect on risk.

2.2. Risk Management, Firm Value.

Total firm value is equal to the market value of equity plus the market value of debt. Firm value is also a function of the firm's cost of capital (Feldman, 2005). Hoyt and Liebenberg (2011) found the risk measured by Beta has a negative significant correlation with the firm value measured by Tobin's Q. Allayannis and Weston (2001) found the risk measured by size and dividend payout has a negative significant effect on the firm value measured by Tobin's Q (both ln and adjusted), while the risk measured by debt to equity and growth have a positive significant effect on the firm value measured by Tobin's Q, but the risk measured by debt to equity has a negative significant effect on the firm value measured by adjusted Tobin's Q. While Carter et al. (2006) found the firm value measured by Tobin's Q has a positive significant effect on the risk management measured by heading fuel price.

For public companies, value at any time is reflected in the stock price. Therefore, management should act only on those opportunities that are expected to create value for owners by increasing the stock price. Doing so requires management to consider the returns (magnitude and timing of cash flows), the risk of each proposed action, and their combined effect on value (Gitman and Zutter, 2015). The volatility of a company's stock returns is a function of the level of stock prices which is itself a function of Firm Value and is not considered constant (Rogers, 2013).

Lehar (2005) found that firm value measured by book value capitalization has a positive not significant effect on systematic risk. Allayannis and Weston (2001) that hedging as a measurement of risk management causes an increase in firm value. While Jin and Jorion (2006) found that there is generally no difference in firm values between firms that hedge and firms that do not hedge. Based on the evidence, the hypothesis in this study is risks managed through risk management are as follows:

H2a : Risk has a significant negative effect on firm value.
H2b : Firm value has a significant negative effect on risk.

2.3. Financial Performance and Firm Value.

MM Theory mentioned the level of profits and business risks affects firm value, and value of the company with debts is higher than that of the company without debt. Adi et al. (2013) the better financial performance will improve firm value. Hoyt and Liebenberg (2011) found the financial performance measured by ROA has a positive significant correlation with the firm value measured by Tobin's Q.

Allayannis and Weston (2001) found a financial performance that measured by foreign sales/total sales and ROA has a positive significant effect on the firm value that measured by Tobin's Q. Adi et al. (2013) found financial performance has a positive significant effect on firm value. Outa and Waweru (2016) found financial performance measured by ROA has a positive significant effect on the firm value measured by Tobin's Q. Based on the evidence, the hypothesis in this study is as follows:

H3a : Firm performance has a significant positive effect on firm value.
H3b : Firm value has a significant positive effect on financial performance.

3. Research Method.

This study is explanatory research, which is to explain the effect of variable X on Y through testing the structural model. In general, the data presented is in the form of numbers that will be calculated through a statistical test. The empirical analysis uses time-series data of Dividend, Earning, ROA, NPM, Tobin's Q, and Closing Price in the period 2016 – 2019.

The sample in this study is crude petroleum and natural gas production companies listed on the Indonesia Stock Exchange in the period 2016 - 2019, which were represented by audited company financial statement data and stock price historical data on the Indonesia Stock Exchange. The population of crude petroleum and natural gas production companies listed on the Indonesia Stock Exchange 13 companies (www.idnfinancials.com, 2020), listed in the period 2016 - 2019 is 11 companies, and the companies that have published financial reports for the period quarterly and ending December 31 during the period 2016 - 2019 is 10 companies.

3.1 Research Variables.

The problem in this study is formulated into a simultaneous model, which is a model formed through more than one dependent variable that is explained by one or several independent variables, where the dependent variable will at the same time act as an independent variable for other tiered relationships.

3.1.1 Exogenous Variables.

Exogenous variables in this study consisted of Risk Management (X1) with the following indicators:

1. Risk Management, a dummy taking the value of 1 if the company has ever adopted the Risk Management methodology during the investigated period, and 0 otherwise, in accordance with the exposure contained in the annual financial statements (Allayannis and Weston, 2001; Hoyt and Liebenberg, 2011; Battaglia et al., 2016), measured using reflective indicators as follows:
   (1) Dividend Payout (X1.1), It is often asserted that ceteris paribus firms with low payout ratios (i.e., cash dividends/earnings available for common stockholders) are riskier (Beaver, 1970), this indicator refers to Allayannis and Weston, 2001; Jin and Jorion, 2006; Hoyt and Liebenberg, 2011.
   (2) Covariability Earning (X1.2) is calculated from a time series regression with the firm's earnings-pries ratio as the dependent variable and some economy-wide average of earnings-price as the independent variable (Beaver, 1970), this indicator refer to Wiggins, 1991; Hoyt and Liebenberg, 2011.

3.1.2 Endogenous Variables.

Endogenous variables are variables that are influenced by other variables in the research model, endogenous variables in this study consist of Financial Performance (Y1) and Firm Value (Y2) with the following indicators:

1. Financial Performance (Y1), measured using formative indicators as follows:
   (1) ROA (Y1.1) or return on assets is to measure how much net income is generated per dollar of assets. Return on assets calculated by dividing net income by total assets (Brigham and Daves, 2019), this indicator refers to Allayannis and Weston, 2001; Hoyt and Liebenberg, 2011.
   (2) NPM (Y1.2) or net profit margin Calculated by dividing net income by sales (Brigham and Daves, 2019), this indicator refers to Adi et al., 2013; Michaelides et al., 2019.
2. Firm Value (Y2), measured using formative indicators as follows:
   (1) Tobin's Q (Y2.1) of each firm is calculated as the ratio of the sum of total assets with the difference between the firms stock valuation and the firm's equity and differed taxes over the firm's total assets, this indicator refers to Allayannis and Weston, 2001; Hoyt and Liebenberg, 2011; Adi et al., 2013; Michaelides et al., 2019.
   (2) Closing Price (Y2.2) is the price of shares traded on the capital market at the time of closing trading activities, this indicator refers to Patell, 1976; Adi et al., 2013.

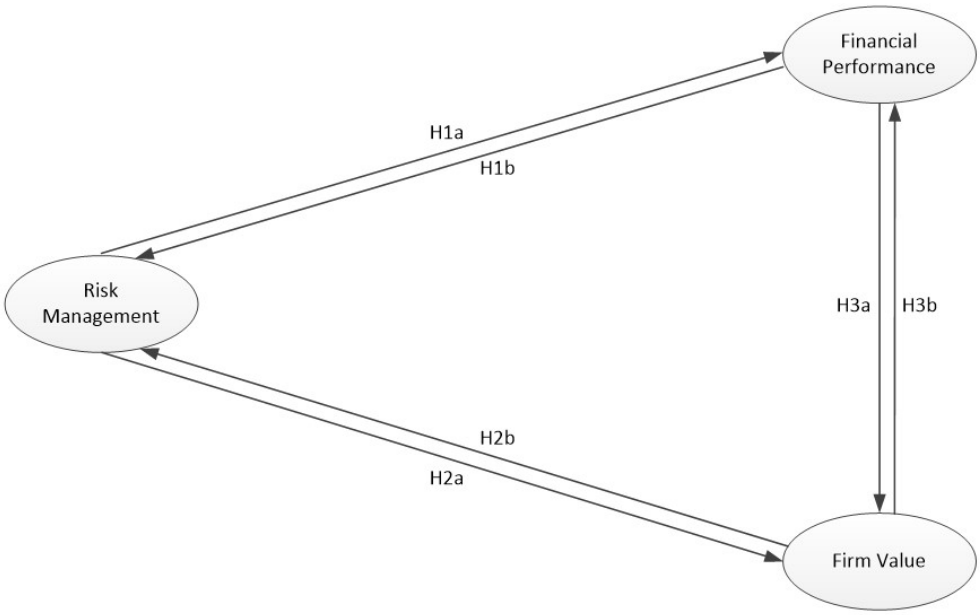
3.2 Inferential Statistical Analysis.

Inferential statistical analysis is an analysis that focuses on the field of analysis and interpretation of data to conclude. The inferential statistical method used to analyze in this study is component-based using Generalized Structured Component Analysis (GSCA) online software (www.sem-gesca.com). The method is versatile enough to capture complex relationships among variables, including higher-order components and multi-group comparisons (Hwang and Takane, 2004).

3.3 Development of Structural Charts.

The structural model analyzed is presented in the flowchart as in Figure 1.

Picture 1. Structural Research Model.



4. Results and Discussions.

4.1 Evaluation of Model Measurement.

The generalized structured component analysis (GSCA) defines a latent variable as a component or weighted composite of indicators (Hwang and Takane, 2015). GSCA converged even when the sample size is 10, the mean congruence coefficient between parameters and estimates (0.908) is greater than 0.90. Therefore, the simulation results suggest that GSCA performs acceptably well in small samples in terms of recovery of parameters (Hwang and Takane, 2004). GSCA is free from improper solutions, which lead to interpretational difficulties and tend to occur frequently in combination with small sample sizes (Kim *et al.*, 2016).

The weighted relation model is used to explicitly express such a relationship between indicators and a latent variable. GSCA involves the specification of three sub-models to specify a structural equation model namely measurement, structural, and weighted relation models. An indicator is considered reflective if it is influenced by the corresponding latent variable, whereas it is considered formative if it forms its latent variable. Formative indicator entails no loading in the measurement model, while its weight denotes how the indicator contributes to forming the corresponding latent variable. FIT shows the proportion of the total variance of all indicators and latent variables explained by a given particular model specification. The values of FIT range from 0 to 1. The larger this value, the more variance in the variables is accounted for by the model specification (Hwang and Takane, 2015). Then the data is processed using the GSCA online software and the results are as follows in Table 1.

Table 1. Measurement Model of Variables

Variable	Loading			Weight			SMC		
	Estimate	SE	CR	Estimate	SE	CR	Estimate	SE	CR
Y1	**AVE = 0.000, Alpha =0.007**								
Y.1.1	0	0	0	0.994	0.115	8.66*	0	0	0
Y.1.2	0	0	0	0.057	0.345	0.17	0	0	0
Y2	**AVE = 0.000, Alpha =0.002**								
Y2.1	0	0	0	1.169	0.144	8.14*	0	0	0
Y2.2	0	0	0	-0.66	0.155	4.27*	0	0	0
X1	**AVE = 0.000, Alpha =-0.882**								
X1.1	0	0	0	0.94	0.232	4.05*	0	0	0
X1.2	0	0	0	0.737	0.261	2.82*	0	0	0

CR* = significant at .05 level

Indicators Y1.1 (NPM) is not significant and should be dropped from the model, then data processing was run

again using the GSCA online software and the results are as in Table 2.

Table 2. Measurement Model of Variables

Variable	Loading			Weight			SMC		
	Estimate	SE	CR	Estimate	SE	CR	Estimate	SE	CR
Y1	**AVE = 0.000, Alpha =0.000**								
Y.1.1	0	0	0	1	0	-	0	0	0
Y2	**AVE = 0.000, Alpha =0.002**								
Y2.1	0	0	0	1.17	0.203	5.76*	0	0	0
Y2.2	0	0	0	-0.656	0.172	3.82*	0	0	0
X1	**AVE = 0.000, Alpha =-0.882**								
X1.1	0	0	0	0.934	0.219	4.26*	0	0	0
X1.2	0	0	0	0.747	0.219	3.41*	0	0	0

CR* = significant at .05 level

4.2 Structural Model Results.

Evaluation of structural models resulting from GSCA output is as follows as presented in Table 3.

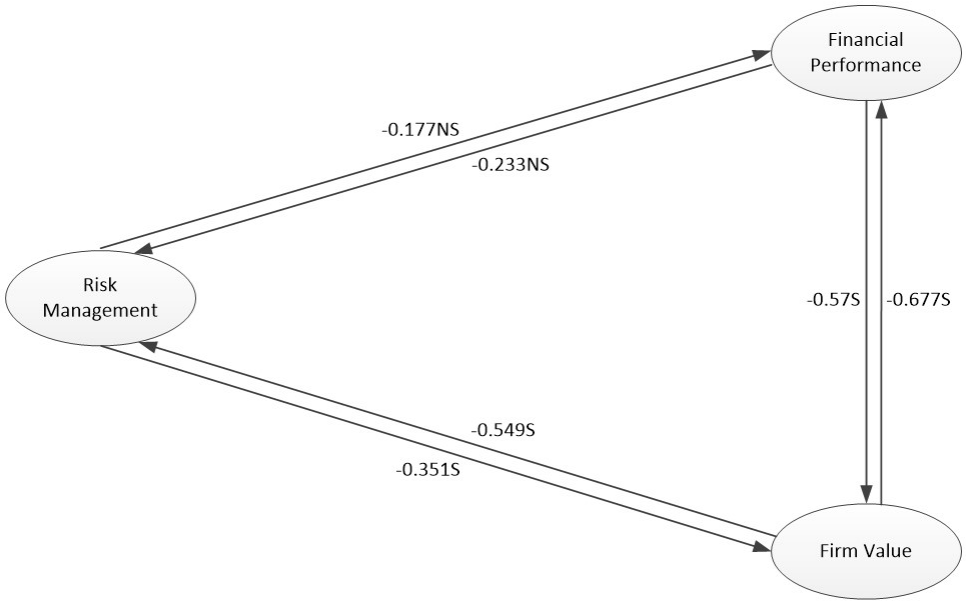
Table 3. Path Coefficient of Structural Model

Path Coefficients			
	Estimate	SE	CR
X1->Y1	-0.177	0.263	0.68
X1->Y2	-0.351	0.118	2.98*
Y1->X1	-0.233	0.352	0.66
Y1->Y2	-0.57	0.244	2.33*
Y2->X1	-0.549	0.199	2.76*
Y2->Y1	-0.677	0.283	2.39*

CR* = significant at .05 level

The results of the Path Coefficient Structural Model above are presented in the form of a path diagram as follows.

Picture 2. Path Coefficients of Structural Model.



Remarks:

S = Significant

NS = Not Significant

4.3 Empirical Results.

According to Table 3 and Figure 2, the empirical results as follows:

1. Hypothesis H1a, Risk has a significant negative effect on financial performance is rejected because the path coefficient from risk management (X1) to financial performance (Y1) is -0.177 and CR = 0.68, it means that risk has a not significant negative effect on financial performance. A decrease in risk by risk management will not significantly increase financial performance.
   Hypothesis H1b, Financial performance has a significant negative effect on risk is rejected because the path coefficient from financial performance (Y1) to risk management (X1) is -0.233 and CR = 0.66, it means that financial performance has a not significant negative effect on risk. An increase in financial performance will not significantly decrease the risk by risk management. This hypothesis is one of the novelties of this study.
2. Hypothesis H2a, Risk has a significant negative effect on firm value is accepted because the path coefficient from risk (X1) to firm value (Y2) is -0.351 and CR = 2.98, it means that risk has a significant negative effect on firm value. A decrease in risk by risk management will significantly increase firm value.
   Hypothesis H2b, Firm value has a significant negative effect on risk is accepted because the path coefficient from the firm value (Y2) to risk (X1) is -0.549 and CR = 2.76, it means that firm value has a significant negative effect on risk. An increase in firm value will significantly decrease the risk by risk management, but the impact of the increase in firm value on risk is bigger than the impact of the decrease in risk on firm value. This hypothesis is one of the novelties of this study.
3. Hypothesis H3a, Financial performance has a significant positive effect on firm value is accepted because the path coefficient from financial performance (Y1) to firm value (Y2) is -0.57 and CR = 2.33, it means that financial performance has a significant positive effect on firm value. An increase in financial performance will significantly increase firm value.
   Hypothesis H3b, Firm value has a significant positive effect on financial performance is accepted because the path coefficient from the firm value (Y2) to financial performance (Y1) is -0.677 and CR = 2.39, it means that firm value has a significant positive effect on financial performance. An increase in firm value will significantly increase financial performance, but the impact of the increase in firm value on financial performance is bigger than the impact of the increase in financial performance on firm value. This hypothesis is one of the novelties of this study.

Table 4. Measurement Model of Goodness FIT.

Model Fit	
FIT	0.36
AFIT	0.323
NPAR	11

Based on Table 4, The goodness-fit value of the regression model is 0.36 which means that the total variation of all variables that can be explained by the model is 36% and the rest is explained by other variables that are not yet in the model. The adjusted FIT value is 0.323. NPAR is the estimated number of parameters 11.

5. Conclusions, Implications, Limitations and Suggestions.

Conclusions

This study finds that risk has a not significant negative effect on financial performance, a decrease in risk by risk management will not significantly increase financial performance, and financial performance has a not significant negative effect on risk, an increase in financial performance will not significantly decrease the risk by risk management.

This study also found that risk has a significant negative effect on firm value, a decrease in risk by risk management will significantly increase firm value, and firm value has a significant negative effect on risk. An increase in firm value will significantly decrease the risk by risk management, but the impact of the increase in firm value on risk is bigger than the impact of the decrease in risk on firm value.

This study also found that financial performance has a significant positive effect on firm value, an increase in financial performance will significantly increase firm value, and firm value has a significant positive effect on financial performance. An increase in firm value will significantly increase financial performance, but the impact of the increase in firm value on financial performance is bigger than the impact of the increase in financial performance on firm value. This finding supports the MM theory.

Implications

Findings of the study are useful for the investors or companies who want to invest in the IDX.

Limitations

1. The number of crude petroleum and natural gas production companies listed on the Indonesia Stock Exchange

is very small.
2. There are still few indicators used to form latent variables

Suggestions
Future research is suggested to use more indicators to form latent variables.

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