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# The effect of sustainability management practice, enterprise risk management, and business strategies on integrated sustainability performance with intellectual capital as a moderating variable

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**Abstract.** This study aims to examine and analyze the effect of sustainability management practice, enterprise risk management, and business strategy on integrated sustainability performance, and to examine and analyze whether intellectual capital can moderate the effect of sustainability management practice, enterprise risk management, and business strategy towards integrated sustainability performance. The control variables in this study: company size, company age, and free cash flow. The moderated regression analysis with panel data is used to hypothesis testing in this study. The sample of this study was 316 observations consisting of 79 manufacturing companies listed on the Indonesia Stock Exchange in the periode 2016-2019. The results showed that sustainability management practice, enterprise risk management, and business strategy have no direct effect on integrated sustainability performance. Also, Intellectual capital strengthens the positive influence of sustainability management practice, enterprise risk management, and business strategy on integrated sustainability performance.

**Keywords.** Integrated sustainability performance, sustainability management practice, enterprise risk management, business strategy, intellectual capital

## 1. Introduction

The concept of integrated sustainability performance (ISP) is an important goal in business activities to anticipate and assess conditions that provide information in decision making [1]. However, ISP have not become an important concern in Indonesia. This can be seen from the number of cases related to the ISP aspect. In environmental and social aspects, such as cases related to toxic and hazardous waste including waste generated, toxic and hazardous waste management permits that are detrimental to the community [2]. There are many cases of corruption, miss use of organizational assets, and fraudulent financial statements, which are cases in the governance aspect [3]. In the aspect of ISP communication, the number of manufacturing companies in Indonesia is still limited in ISP reporting.

ISP is considered to be an important management task with the aim of integrating social and environmental issues into company management practices [4]. Companies need sustainability management practices (SMP) to overcome business-related problems, so that an

environmentally friendly and socially responsible business can be created in order to increase ISP [5]; [6].

The task of management is not only to create a socially responsible business, but also to hope that the business it runs can monitor and manage risks and opportunities, whether aspect of social, environmental, legal, political, technological and/or economics. In Indonesia, the number of companies that implement risk management is still limited, not all companies realize the importance of risk management. The level of risk management implementation in Indonesia is at the initiation stage and involves [7].

According to the 2019 Global Innovation Index (GII), Indonesia is ranked 85th out of 129 countries in innovation, which is the second lowest rank when compared to the position of ASEAN countries [8]. To compete and create added value from business activities, companies need intangible resources and capabilities [9]. Most of today's global wealth is based on intangible factors including the company's intellectual capital (IC) which is needed in the company's business practices and activities as a result and economic demands.

The novelties of this study are: (1) the development of integrated sustainability performance measurement from [41] namely from four elements (operational, social, environmental, and governance). The addition of 2 elements, namely technology sustainability and communication sustainability sustainability, (2) development of measurement indicators of sustainability management practice on economic, social, and environmental elements from [11], (3) the development of the content analysis method from [12] and [13], by combining quantitative and qualitative aspects of giving a numerical value of 0-7.

This study is divided into five parts, namely (1) introduction, (2) literature review and hypothesis development, (3) research methods, (4) discussion of research results, and (5) conclusions.

## **2. Literature Review and Hypotheses Development**

### **2.1 Sustainability Management Practice and Integrated Sustainability Performance**

Stakeholder theory has the main goal of helping managers understand the stakeholder environment and manage relationships within the company more effectively so as to increase value and minimize losses for stakeholders [14]. The motivation of the company's sustainability practices can improve performance through a positive influence on the stakeholders [15].

Specific practices and procedures that comply with international regulations and agreements regarding sustainable development as a symbol that the company acts rationally, stable and predictably on demands that create significant motivation to implement various SMP [11].

Companies listed on the stock exchange undertake SMP proactively for two reasons. First, certified public companies with sustainable management standards are useful for increasing shareholder confidence. Second, for a more careful examination, due to more pressure from stakeholders [11]. [16] suggested that SMP has a positive impact on organizational performance.

[16] and [17] suggest that the adoption of sustainable practices has a positive impact on organizational performance. In line with [18] suggest that the relationship between sustainable practices and organizational performance is a positive part.

H<sub>1</sub>: SMP has a positive effect on ISP

### **2.2 Enterprise Risk Management (ERM) and Integrated Sustainability Performance**

Based on stakeholder theory, risk management is applied to reduce risk, reduce costs, identify opportunities and improve business reputation as well as to meet stakeholder interests

so that ERM that involves internal and external stakeholders appropriately can influence the company in managing sustainability risks to avoid consequences. negative [19] [20]

The company is under pressure from external parties to implement the same risk management in accordance with international risk management standards for a balance aimed at reducing costs and increasing value [21]. Proactively identifying to address risks and opportunities can protect and create value for stakeholders [22].

The principle of risk management provides added value and protects the organization's value by achieving and improving the company's objectives, including compliance with applicable regulations, environmental protection, human health and safety, financial performance, governance, product quality, operating efficiency and reputation which are summarized in corporate sustainability [23].

Previous research literature has focused on the effect of ERM on financial performance and market performance, such as [24] which states that ERM has a positive effect on both financial performance and market valuation. [25] stated that the implementation of ERM has an effect on increasing company performance.

H<sub>2</sub>: ERM has a positive effect on ISP

### **2.3 Business Strategy, and Integrated Sustainability Performance**

Sustainability development is a business that provides opportunities for "green consumers", "green suppliers" which focuses on the bottom line which is reflected in the company's mission and policies [26]. Stakeholder Theory is one of the important theories that supports the sustainability of the company because it takes into account different interests, rights and needs [27]. Managers must formulate and implement strategies for all groups that have business interests [28]. Once sustainable development goals have been established, management should compare its competitive and financial strategies with these targets. The company's business strategy will be consistent with sustainable development goals [26].

Business strategy allows an organization to initiate and carry out activities that can help provide control over the company itself to outperform competitors [16]; [30]; [31]. The Company's advantages are built with customer loyalty to enable long-term sustainable performance to be achieved [32]. Stakeholders hope that the business strategy implemented will not only generate profits for the company but also for the surrounding community and of course will not harm the environment through the configuration of resources and competencies with the aim of meeting stakeholder expectations [30].

Research on the relationship between corporate strategy and sustainability performance is very limited, [33] states that the prospector strategy has a higher CSR performance than the defender strategy.

H<sub>3</sub>: Business Strategy has a positive effect on ISP

### **2.4 Sustainability Management Practice, ERM, Strategi bisnis, Intellectual capital, dan Integrated Sustainability Performance**

SMP in management systems requires resources, knowledge and skills related to many stakeholders and includes efficiency in the production process and equality in the distribution process. [34] stated that IC is a promising starting point for the incorporation of environmental aspects into the general management system of companies in ISP.

The potential role of IC in the value creation process includes social and environmental values [35]; [36]. To manage ISP problems, IC components and structures are needed according

to needs. ISP are handled by compiling, managing, measuring or communicating information, processes and IC structures so as to describe SMP [4].

H<sub>4</sub>: IC strengthens the positive influence of SMP on ISP

Companies with a high IC are better positioned to be able to withstand the effects of unexpected changes in the economy and markets that can anticipate risk exposures and can handle them in a better way. Firms with higher IC adopt corporate ERM to positively influence the firm's operating and market performance [37].

Organizations that are able to develop new knowledge, innovate, and learn are likely to respond quickly to radical changes in markets and the challenges of maintaining their competitiveness in changing conditions [38]. The increasing ability of companies in implementing ERM because the right combination of IC will strengthen the influence of ERM on ISP.

H<sub>5</sub>: IC strengthens the positive influence of ERM on ISP

IC is used to create and manage a company's competitive advantage [36]. Availability of resources, knowledge and skills can generate a competitive advantage for the company resulting in several advantages for the organization, including environmental impact [39].

Companies must be able to manage and use resources including IC for balance among the parties involved. Increasing IC in business activities is an economic demand in global competition. As strategy shifts over time, the resources used to drive value and the emphasis placed on IC will change [40].

H<sub>6</sub>: IC strengthens the positive influence of Business Strategy on ISP

### **3. Research methods**

#### **3.1 Research design**

This study aims to determine the effect of SMP, ERM and business strategy on ISPs, as well as to determine the effect of IC as a moderating variable. Specifically, it aims to explain the influence between variables through hypothesis testing, which is called verification research. The horizon of this research is panel data with a research period of 2016-2019.

#### **3.2 Population and Research Sample**

By focusing on the manufacturing industry in Indonesia, the population of this study are manufacturing companies listed on the Indonesia Stock Exchange (IDX). The determination of the sample of this research is purposive sampling from manufacturing companies listed on the Indonesia Stock Exchange in the period 2016 to 2019 taking into account the latest data with relatively stable macroeconomic conditions. The sample of this research is 79 companies with 316 units of analysis.

#### **3.3 Method of collecting data**

The data collection method in this study used purposive sampling method. The criteria set for determining the sample are (1) manufacturing companies listed on the Indonesian stock exchange for the 2016-2019 period, (2) companies that publish annual reports whose data can be accessed through the IDX and each company. The research data is in the form of numbers that are statistically processed using the Eviews 9 program. This research data is secondary data obtained from the company's annual report, and or sustainability report.

### 3.4 Operational Definition and Measurement of Variables

#### 3.4.1 Integrated Sustainability Performance

ISP consists of elements of economic, social, environmental, governance [41]; [42], technology [43], and communication [44].

Economic sustainability is the company's ability to efficiently use resources efficiently to generate a return on investment and sustainable growth [42]. Social sustainability is a performance whose indicators are assessed from the company's activities for all its stakeholders [5]. Environmental Sustainability includes impacts related to the company's inputs and outputs [45]. Governance Sustainability is a system that directs and controls a company, with sustainability integrated into competitiveness, strategy, performance and operations in creating long-term corporate value for all stakeholders [41]. Technology Sustainability is one of the important solutions for achieving global sustainability [46]. Communication Sustainability is nothing more than a commitment that reflects all business environments related to community development and the vision of sustainability [47]. The ISP measurement in this study uses the total scoring method for all ISP indicators with a maximum score of 301 (total items 43).

Table 1. Measurement of Integrated Sustainability Performance

Indicator	Source
Economic sustainability	[6]; [42]
Environmental sustainability	[6]; [41]; [42]
Social sustainability	
Governance sustainability	[41]; [42]
Technology sustainability	[46]
Communication sustainability	[44]

#### 3.4.2 Sustainability Management Practice

SMP is defined as the adoption of best management principles, models and practices across operating systems for faster sustainable achievement [6]. A series of organizational ISO to address problems across divisions, managers can ensure that these standards are developed through a rigorous process with high quality content Measurement of SMP using ISO with content analysis. The index calculation in this study uses the scoring method with a score of 0-1.

Table 2. Measurement of Sustainability Management Practice

Indicator	Source
Economics	ISO 9001 [11]
	ISO 10002 [6]
Environment	ISO 14001 [11]; [39]
	ISO 14024 [35]
	ISO 50001 [35]
Social	ISO 14064 [35]
	OHSAS 18000 [11]; [22]; [39]
Corporate Governance	SMK3 [22]
	ISO 19600 [49]
	ISO 22301 [49]; [50]
Information & communication Technology	ISO 37001 [49]
	ISO 27001 [49]
	ISO 2000 [49]

### 3.4.3 Enterprise Risk Management

ERM is an integration of corporate strategy and performance that is embedded throughout the organization [51]. Calculation of enterprise risk management implementation based on ERM framework items using content analysis. For each company and period, the annual report is analyzed regarding the implementation of ERM. Quantitative score with a minimum score of 0, and a maximum of 140 with a ratio scale.

### 3.4.4 Business strategy

The company's business strategy is an important decision-making factor in the objectives, marketing, production, finance, recruitment, human resources, and investment activities, thus affecting the overall performance [52].

The measurement of business strategy in this study is based on calculations developed by [53] and [54]. four proxies are used, namely: (1) MERS: marketing costs to sales ratio, (2) COGSR: Cost of Goods Sold Ratio to Sales, (3) CASGR: Annual Sales Growth Rate, and (4) CIR: Capital Intensity Ratio: Net PPE to total assets. The calculation of these four proxies every year and the company is carried out with the average for the previous five years to see the strategy implemented by the company. Scores from the four proxies were combined and calculated using quantiles.

To calculate the composite score, the highest quintile is assigned a score of 4 while the observations in the lowest quintile are assigned a score of 0. The opposite score is calculated for CIR. Scores are summed up with a maximum score of 16 and a minimum score of 0. Strategy determination of the combined quintile number: Pure Defender (0–3) is assigned a score of 1; Defender Analyzer (4-6) is numbered 2; Pure Analyzer (7-9) is numbered 3; Analyzer Prospector (10-11) is numbered 4; and Pure Prospector (13–16) is numbered 5.

### 3.4.5 Intellectual Capital (IC)

IC is a multidimensional construct that exists at many levels and which includes both individual knowledge and knowledge stored in organizational databases, business processes, systems and relationships [55].

Table 3 Measurement of Intellectual Capital

Description	Source
Human Capital	[56]; [57]; [58]
Structural Capital	
Social Capital	
Customer capital	[56]; [57]; [58]; [59]
Technological Capital	[56]; [57]
Spiritual Capital	[56]; [60]; [61]

For each company and period, the annual report is analyzed to obtain information related to IC. The quantitative score uses criteria with a minimum score of 0, and a maximum score of 301, using a Likert scale of 0-7 for each indicator. The more and more detailed the disclosure, the higher the IC value.

### 3.4.6 Control Variables

The control variables consist of (1) company size, which is related to the ownership of company resources [62]. Asset size is used as a proxy for firm size [63], (2) Firm age, [63] states that the age of the company is measured by the length of time the company operates in

the market, (3) Free Cash Flow is cash from operational activities minus cash from investment activities [64].

### 3.5 Research Model

This research model is a panel data regression equation, is as follows:

$$1SP_{i,t} = \alpha + \beta_1 SMP_{i,t} + \beta_2 ERM_{i,t} + \beta_3 STRG_{i,t} + \beta_4 SMP_{i,t} * IC_{i,t} + \beta_5 ERM_{i,t} * IC_{i,t} + \beta_6 STRG_{i,t} * IC_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 AGE_{i,t} + \beta_9 FCF_{i,t} + \varepsilon$$

Where:

ISP <sub>i,t</sub>	= Integrated Sustainability Performance
$\alpha$	= Constant
$\beta$	= Regression Coefficient of Independent Variables
SMP <sub>i,t</sub>	= Sustainability Management Practice
ERM <sub>i,t</sub>	= Enterprise Risk Management
STRG <sub>i,t</sub>	= Business strategy
IC <sub>i,t</sub>	= Intellectual Capital
SIZE <sub>i,t</sub>	= Firm Size
AGE <sub>i,t</sub>	= Firm Age
FCF <sub>i,t</sub>	= Free Cash Flow
$\varepsilon$	= residual error

## 4. Results of Research and Discussion

### 4.1 Descriptive Statistics of Research Variables

The variables of this research are Integrated Sustainability Performance (ISP), Sustainability Management Practice (SMP), Enterprise Risk Management (ERM), Business Strategy (STGR), Intellectual Capital (IC), Firm Size (SIZE), Firm Age (AGE) and Free Cash Flow (FCF). The results of descriptive statistical analysis of research variables are presented in table 4.

Table 4. Descriptive Statistics of Research Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviasi
ISP	316	0,0242	0,5260	0,1566	0,0724
SMP	316	0,0000	0,7273	0,2068	0,1665
ERM	316	0,0286	0,5429	0,1559	0,0821
STGR	316	1,0000	5,0000	2,9903	0,7170
IC	316	0,0199	0,3355	0,1111	0,0597
SIZE	316	10,5027	13,9847	12,4015	0,6777
AGE	316	8,0000	89,0000	41,394	15,567
FCF	316	-1,9143	1,2707	0,0220	0,1746

Based on the table above, the company's ISP shows the average value is 15.66%. This shows that the ISP of manufacturing companies is still below 50%, meaning that the ISP value is still low. SMP shows an average score of 20.68%, it can be said that the SMP scores are still



low. ERM with an average value of 15.59% indicates that ERM is still low. The minimum value shows 2.86% and the maximum value is 54.29%. The business strategy carried out by manufacturing companies in Indonesia shows an average value of 2.98. The business strategy that is being carried out is approaching a pure analyzer. IC shows an average value of 11.11% which means that the IC components are low. The minimum IC value shows 1.99% and the maximum value is 33.55% which means the company has not paid attention to IC.

#### 4.2 Research Model Selection

Before testing the hypothesis, the Chow Test, Hausman Test and Langrage Multiplier Test are first performed. These three tests are needed to determine the panel data regression model used. The panel data regression research model consists of three models, namely the common effect model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). Based on the results of the 3 tests, it is concluded that the research model used is REM which is an equation with the GLS method, so that the classical assumption test is not carried out [65].

Table 5. Hypothesis test results

Variable	Prediction	Coefisien	t-statistic	P-Value
Constant		-0.013319	-0.165200	0.4345
SMP	+	-0.104778	-2.608885	0.0048
ERM	+	0.062094	1.009372	0.1568
STGR	+	-0.009509	-1.629871	0.0521
SMP_IC	+	0.965508	3.572708	0.0002***
ERM_IC	+	0.678529	1.838370	0.0335**
STGR_IC	+	0.081594	2.265705	0.0121**
SIZE	+	0.008618	1.305310	0.0964*
AGE	+	0.000865	3.182911	0.0008***
FCF	+	0.061374	3.901133	0.0000***
R-Squared		0.507134		
Adjusted R-Squared		0.492638		
F-Statistic		34.98428		
Prob (F-Statistic)		0.000000		
Total Observasion		316		
*** Significant at level 1%; ** Significant at level 5%; * Significant at level 10%				

From the value above, the probability F statistic shows that the value is less than 0.05, which is 0.000 so that this research model is feasible to see the effect of SMP, ERM and business strategy with IC as a moderating variable. The value of adjusted R2 shows 49.26% so that ISP is influenced by SMP, ERM, and business strategy with IC as moderation of 49.26%, while the rest is influenced by other variables not examined.

### 4.3 Discussion of Research Results

Hypothesis 1 states that SMP has a positive effect on ISP. The result of statistical test shows that the value is  $0.0048 < 0.01$  and the t statistic is  $-2.6089$ . Thus, hypothesis 1 in this study was rejected. SMP based on ISO standards and national standards depend on top-level management because certification does not guarantee a process and product to reach the maximum level of quality [66]. ISO is a strategic step to respond to stakeholder pressure and not to improve ISP [11]. Implementation of sustainability management practices based on ISO and nationally depends on top-level management because certification does not guarantee a process and product reaches the maximum level of quality, but only states that the entity has a certified management system (Kartikasari et al., 2018). The decision to comply depends on a consideration of the costs compared to the potential benefits of the certification (Krieger et al., 2007).

Hypothesis 2 states that ERM has a positive effect on ISPs. The results of statistical tests show that the value is  $0.1568 > 0.10$  and the t statistic is  $1.0093$ . Thus, hypothesis 2 in this study was rejected. ERM is applied to reduce the risk of financial loss that only affects shareholders and investors, does not minimize negative impacts on the environment and contributions to society [48]. The implementation of ERM is still relatively low in making decisions regarding the management of risks and opportunities both internally and externally [67]. In contrast to financial service institutions in Indonesia, which already have regulations governing the application of risk management, manufacturing companies do not yet have regulations regarding risk management. This is another reason why ERM most likely has no effect on ISPs. Thus, the elements of ERM COSO 2017 related to achieving and improving compliance with applicable regulations, environmental protection, human health and safety, financial performance, governance, product quality, operating efficiency and company reputation are not proven to improve ISP.

Hypothesis 3 states that business strategy has a positive effect on ISPs. The results of statistical tests show that the value is  $0.0521 < 0.10$  and the t statistic is  $-1.6299$ . Thus, hypothesis 3 is rejected. Indonesian manufacturing companies are included in the oligopoly market [68]. This type of market allows the company's business strategy to produce different products according to consumer demands [69]. The oligopoly market carries out its business strategy towards a pure analyzer, which means the company with the most successful corporate strategy in the industry on innovation without incurring large R&D costs [70]. Business strategies that are only imitating those of other companies, the company's business strategy has no influence on ISP because the strategies pursued by manufacturing companies in Indonesia have not paid attention to ISPs, while there are still limited numbers of companies that carry out prospector strategies, which is this strategy that is more willing to do corporate social activities. responsibility that will provide long-term benefits by developing intangible resources by promoting innovation [33].

Hypothesis 4 states that IC strengthens the positive influence of SMP on ISP. The statistical test results show that the value is  $0.0002 < 0.01$  and the t statistic is  $3.5727$  so that H4 is accepted. Resources based theory makes resources as the main focus as performance achievement in implementing sustainability management practice as proven in this study [71]. [34] stated that IC is the starting point for incorporating environmental aspects into the company's general management system. Although the IC used is at a low level, it can strengthen the SMP thereby increasing the ISP. These results prove that SMP requires IC components to improve ISP [4]; [35].

Hypothesis 5 states that IC strengthens the positive effect of ERM on ISPs. The results of statistical tests show that the value is  $0.0335 < 0.05$  and the t statistic is  $3.5727$  so that

H5 is accepted. Resources based theory states that companies have the resources to compete so that they can improve company performance [14]. Human capital in ERM is related to the capability of the board, which is a party that interacts directly on risk issues, ensuring an optimal ERM model by reporting, evaluating, and deciding the appropriate risk response [72]. In facing challenges in the manufacturing industry, technology becomes a valuable weapon for companies [73]. Companies with higher IC adopt ERM to positively influence the company's operating and market performance especially those related to ISP [37]. Strengthened ERM implementation with the right IC combination will have an impact on increasing ISP.

Hypothesis 6 states that IC strengthens the positive influence of business strategy on ISPs. The results of statistical tests show that the value is  $0.0121 < 0.05$  and the t statistic is 2.2657 so that H6 is accepted. RBT which focuses on the company's ability to provide a combination of valuable, rare, and imperfectly replicable resources, namely IC, has been proven to strengthen the positive influence of business strategy on ISP [74]. The combination of IC is needed to create products according to consumer demand without changing business strategies. In the pure analyzer strategy, companies are required to create products without having to spend R&D costs.

## 5. Conclusion

The results of this study prove that SMP, ERM, and business strategy do not directly affect the ISP. This study proves that intellectual capital strengthens the positive influence of SMP, ERM, and business strategy on ISP.

The limitation of this study is that there is an element of subjectivity in the assessment of the ISP, ERM, and IC variables. The use of the Eviews program cannot show each indicator that influences the independent variable on the dependent variable even though the objectives of this study have been achieved.

The research implication is that the ISP measurement developed can be an alternative for analyzing ISP. The measurement of SMP that has been developed is still based on economic, social and environmental elements. The development of content analysis using a score of 0-7 becomes an alternative measurement in providing understanding, completeness, and accuracy of ISP, ERM, and IC scores.

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