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ANALYSIS OF RELATIONSHIP AMONG STAKEHOLDER PRESSURES, ENVIRONMENTAL MANAGEMENT ACCOUNTING USE, STRATEGY, AND INNOVATION: AN EMPIRICAL EVIDENCE FROM INDONESIA

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ABSTRACT

As an increased awareness of a global issue regarding the environmental impact of business activity; this study aims to examine the relationship among stakeholder pressures, environmental management accounting use, strategy, and innovation. This study is performed by conducting the survey to management accountants and environmental managers of companies in Indonesia. The convenience sampling technique was used and resulted in 34% response rate. The hypothesis testing was conducted by using Structural Equation Modeling (SEM) with SmartPLS 2.0 software. The results are: (1) the stakeholder pressures have a positive effect on EMA use, (2) the prospector strategy has no positive effect on EMA use, (3) EMA use has a positive effect on process innovation, but not with product innovation, (4) the prospector strategy has a positive effect on process innovation as well as on product innovation.

Keywords : Environmental management accounting, Miles and Snow strategy typology, innovation, stakeholder pressures

INTRODUCTION

Nowadays, as awareness of environmental issues, eco-efficiency[2], and sustainable development have been increasing, the external pressures towards organizations, besides from the internal ones, will challenge many corporations. Since there were government regulations and demand pressures from societies toward better environmental management by the organizations, the existence of institutional theory as a social system-based theory could be used in searching the meaning of social behavior (Meyer and Rowan, 1977; Qian *et al.*, 2011). In the other side, many prior researchers explained that previous conventional accounting can not handle anymore the environmental controlling in industries operational activities. They argued that conventional accounting system gives less data concerning environmental costs (Burrit *et al*., 2002; on Ferreira *et al*., 2009). Consequently, it impacts on management decision-making related to the environmental matter.

With many of critiques towards environmental impacts of business activities, most of companies decide to use Environmental Management Accounting (hereafter EMA). This statement is strengthen by the related researchers claim, Kader and Luther (2005), which said that over the last three decades a number of innovative management strategy such as accounting techniques have been rapidly grown across a line of industries.

Previous researches related to the environmental management show that there were many researches studied about environmental performance and environmental disclosure which associated with the external side of organizations. Nevertheless, there is limited study about the use

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[2] Eco-efficiency is reached by the delivery of competitively-price goods and services that satisfy human needs and bring quality life, while progressively reducing environmental impacts and resource intensity throughout the life cycle, to a level at least in line with the earth's estimated carrying capacity (on Jollands *et al.*, 2003).

of environmental accounting associated with the internal side of organizations (such as innovation activities). Ferreira *et al.* (2009) said that there are still limited evidences of researches that attempt to either explore EMA empirically or focus on its potential effect on internal process and outcomes within organization, such as development of innovation.

So, this study tried to examine the relationship among stakeholder pressures, EMA use, strategy, and innovation through conducting the survey of companies in Indonesia.

THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

As Qian, Burrit, and Monroe (2011, p. 97) stated that "there is no commonly used theoretical perspective on managerial motivations for environmental management accounting in organizations", this studies combined two side of different theoretical perspectives to help in understanding the research problems. The contingency theory is used in this study to explain the effect of organizational contextual to the organizational change in facing environmental uncertainty in environmental management, especially through environmental management accounting use. In the other side, this study also used institutional theory to explain the effect of social structure to the environmental management accounting use.

Prior researches and literatures explained that there is no single and universal appropriate management accounting system to be applied effectively to every organization in every circumstance (Kelly and Pratt, 1992; Islam and Hu, 2012). Luther and Longden (2001) found that referred to the contingency theory; contingent factors existed in influencing management accounting and identifying potential additional factors, such as changed stakeholder pressures (Kattan *et al.*, n.d.). Contingency theory also used in explaining the business strategy that significantly influences the management accounting system use in organizations (Cadez and Guilding, 2008, on Islam and Hu, 2012). Based on this theory, the variable used in this research, that is a strategy of the company, is a determinant of the environmental management accounting use. This is consistent with Otley (1980) that claimed the strategy is the one which influence the company to face in various situations, included the potential of future events.

According to Bouma and van der Veen (2002), the institutional theory could be useful for explaining motivations for adopting environmental management accounting (on Qian *et al.*, 2011). Through the institutional theory, the implication is that with the existence of the stakeholder demands for the corporate environmental management will pressure the corporation to do a good action in preserving the environment. With the need of corporate environmental management, managers will take more opportunities through business strategies such as getting an innovation way to manage environmental costs (IFAC, 2005, p. 10) that is through EMA use.

According to IFAC's Statement Management Accounting Concepts (2005), the definition of EMA is as follows:

> EMA is the management of environmental and economic performance through the development and implementation of appropriate environment-related accounting systems and practices. While this may include reporting and auditing in some companies, environmental management accounting typically involves lifecycle costing, full-cost accounting, benefit assessment, and strategic planning for environmental management.

Jasch *et al.* (2001) showed that the focus of EMA is not on disclosure of annual environmental costs, but for further internal calculation, annual expenditure is the first step in a top-down approach of environmental cost management. This is the problem solving of the conventional accounting lacks. The argument is like what explained by United Nations in Environmental Management Accounting Procedures and Principles Book (2001, p. 2), "In conventional cost accounting, the aggregation of environmental and non-environmental cost in overhead accounts results in their being hidden from management". So, it may impacts on management decision-making related to the environmental matter.

Kurniati *et al.* (2010) said that EMA provides tools and methods to help managers assess the impact of measures taken to improve environmental performance in the same time with an increasing of corporate financial. EMA is a tool that systematically integrates environmental of the corporation into management accounting and decision making process and helps management to collect, analyze, and communicate environmental-related monetary and physical information (Kurniati *et al.*, 2010). EMA is also beneficial for organizations to manage environmental

information to reach the goal of eco-efficiency (Schaltegger and Burrit, 2000, on Jin, 2008) and helps organizations to recognize the environmental effects of their operational activities (Ferreira *et al.*, 2009; IFAC, 2005). The use of EMA can be organized into three broad categories; they are: compliance, eco-efficiency, and strategic position (IFAC, 2005).

Effect of Stakeholder Pressures on EMA Use

In purpose of regulating the environmental corporate performance, there are incentives and pressures in running the businesses, such as the rules from the stricter regulator and the demands from societies. In every country, in line with growing concern of the civil society and the common public regarding companies' environmental impacts, each government has produced the law rules about environmental management for organizations. In the other side, through the institutional theory that was explained by Delmas and Toffel (2004) said that the stakeholder pressures will influence the environmental management practices.

In other words, an institutional theory indicates that with the existence of the demand pressures from the societies in having better life environment and the related regulations from the government, will pressure the organizations to do good actions in preserving the environment.

However, organizations will take more business strategies such as getting an innovation way to manage environmental costs in every business management lines. The same opinion is also stated by International Federation of Accountants—IFAC (2005, p. 10), "...environmental pressure is forcing many organizations to look for new, creative, and cost-efficient ways to manage and minimize environmental impacts". It seems that the corporation will take more business opportunities through conducting such innovation. With many of critization towards environmental impact of business activities, most of the companies decide to using EMA. Through using EMA, besides management can get the benefit of EMA use for internal business, this tool also assists managers in preparing the environmental disclosure for the external organizations.

There is no previous research that explored further the effect of stakeholder pressures on EMA use. The most related research was done by Luther and Longden (2001) that found a positive a relationship between pressure exerted by controlling shareholders and management accounting change (on Haldma and Laats, 2002). Since the preliminary research that was done by Ferreira *et al.* (2009) has not research the proposed hypothesis, therefore, Ferreira *et al*. (2009) as previous researchers, suggested the future researches to explore the determinant of EMA—that is stakeholder pressures. Hence, the hypothesis below is proposed:

H1: The stakeholder pressures have a positive effect on Environmental Management Accounting (EMA) use.

Effect of Prospector Strategy on EMA Use

EMA use in an organization is likely to be influenced by its business strategy (Ferreira *et al.*, 2009). This claim is strengthen by management control system (MCS) which ensure that managers use the available resources effectively and efficiently in the pursuit of the objectives of the organization (Anthony, 1965, on Ferreira *et al.*, 2009). Business strategies, which identify the means by which the organization intends to achieve organizational goals, are key determinants in the configuration of the MCS (Ferreira and Otley, 2009; Otley, 1999; Simons, 1995; on Ferreira *et al.*, 2009). On the other hand, EMA is a technique that emphasizes efficiency and effectiveness in the use of resources and it is a part of the broader MCS. The implication is that if strategy is a determinant of MCS, then it is likely to have an effect on the extent of EMA use (Ferreira *et al.*, 2009). It indicates that by using EMA, the organization can be effectively using the information from the report of management which include the environmental costs and analysis so that managers can make the strategy better.

The business strategy which is used by the enterprises in having innovation is supported by Miles and Snow strategy typologies (1978) that is one of the types of strategy, prospector strategy, which describe that the enterprises will use all their efforts in gaining more market segment. The prospector is also flexible to respond quickly to changing market conditions. This type of strategy from Miles and Snow (1978) explained that the extent to which the organization pursues innovation is likely to be related to their business strategies. Gosselin (1997) proposed the conclusion which if the type of strategy followed by an organization determines the need for innovation with regards to

activity management and observes that organization which pursues a prospector strategy tends to adopt accounting innovations, like EMA (Ferreira *et al.*, 2009). Thus, the use of EMA is likely to be greater in organization which pursues a prospector strategy since it may assist them with their aim of being innovative (Gosselin, 1997, on Ferreira *et al.*, 2009). Hence, the following hypothesis is proposed:

H2: The prospector strategy has a positive effect on Environmental Management Accounting (EMA) use.

Effect of EMA use on Innovation

Through EMA implementation is expected to achieve a sustainable development in organizations because by using this accounting management tool, managers can be assisted in reaching the eco-efficiency. In the other side, Hahn *et al.*, 2002, (quoted by Schaltegger, 2008) mentioned that one of the core drivers of the sustainable development is innovation. So, because of the benefits of EMA use, the organization is encouraged to pursue this tool in maintaining and enhancing their competitive advantage through conducting innovations. Moreover, IFAC (2005) also reported that organizations using EMA are likely to conduct more extensive research and development activities in producing more environmentally product, which finally the organizations likely to utilize the product-life cycle to searching more opportunities to obtain environmental improvements. Additionally, it will increase the profitability (Athey and Schmutzler, 1995, on Ferreira *et al.*, 2009). So, with the above arguments, the hypotheses below are proposed:

H3a: Environmental Management Accounting (EMA) use has a positive effect on process innovation.

H3b: Environmental Management Accounting (EMA) use has a positive effect on product innovation.

Effect of Prospector Strategy on Innovation

Miles and Snow (1978, p. 29) described the prospector which the organizations almost continually search for market opportunities, they also regularly experiment with potential responses to emerging environmental trends, thus, these organizations often are the creators of change and uncertainty to which their competitors must respond (Kulzick, 2008). Beside, this organizational strategy typically determines the different emphasis that organizations place on product and process innovations in achieving their competitive advantage (Etlie, 1983; Hull *et al.*, 1985; on Ferreira *et al.*, 2009). Cozzarin and Percival, 2006 (on Etlie, 1983; Hull *et al.*, 1985) found that innovation complements many organizational strategies, while others noted the strategy is an antecedent of the emphasis that organizations place on product and process innovation (Ferreira *et al.*, 2009). When the environment is largely driven by changing customer demands and level of market concentration there is greater pressure for firms to develop a strategy that places customer interests first, such as the provision of innovative products (Perera *et al.*, 1997; Sim and Killough, 1998; on Ferreira *et al.*, 2009).

As explained before that a prospector strategy aims to be the first in the market, even though not all efforts are ultimately successful (Miles and Snow, 1978, on Ferreira *et al.*, 2009). These organizations also aim to respond rapidly to early signals of market needs or opportunities. Therefore, the greater the emphasis on being the first in market, the higher the level of product innovations. Based on this step, the prospectors will seek to improve efficiency in product production and delivery. Ferreira *et al.* (2009) explained that in this process of seeking greater efficiency, it appears likely that resources will be committed to the development and improvement of processes. So, the following hypotheses are proposed:

H4a: The prospector strategy has a positive effect on process innovation.

H4b: The prospector strategy has a positive effect on product innovation.

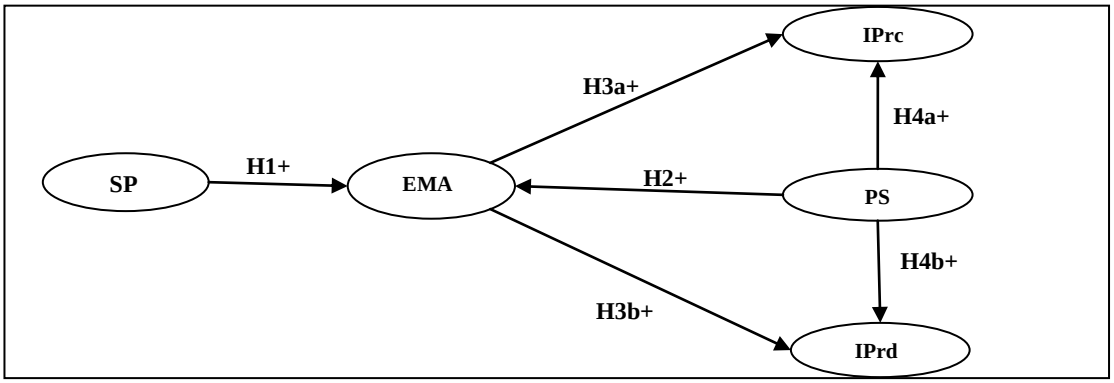
Above hypotheses are presented in a theoretical framework as shown in Figure 1.

RESEARCH METHOD

Research Variables

The measurement of the latent variables are summarized as shown in Table 1.

Figure 1
Theoretical Framework



Source: created for the research, 2012-2013.

Table 1
Summary of Measurement of the Latent Variables

No	Latent Variables	Indicator	Measure-ment Scale
1	EMA Use (*EMA*)	1. Identification of environment-related costs (*EMA1*) 2. Estimation of environment-related contingent liabilities (*EMA2*) 3. Classification of environmental-related costs (*EMA3*) 4. Allocation of environment-related costs to production processes (*EMA4*) 5. Allocation of environment-related costs to product (*EMA5*) 6. Introduction or improvement to environment-related cost management (*EMA6*) 7. Creation and use of environment-related cost accounts (*EMA7*) 8. Development and use of environment-related key performance indicators (*EMA8*) 9. Product lifecycle cost assessments (*EMA9*) 10. Product inventory analyses (*EMA10*) 11. Product impact analyses (*EMA11*) 12. Product improvement analyses (*EMA12*)	0-6
2	Stakeholder Pressures (*SP*)	1. Major shareholder pressure (*SP1*) 2. Minor shareholder pressure (*SP2*) 3. Major/ long-term creditor pressure (*SP3*) 4. Relevant government agency pressure (*SP4*) 5. Employees pressure (*SP5*) 6. Customers pressure (*SP6*) 7. Suppliers pressure (*SP7*) 8. Mass media pressure (*SP8*) 9. Special interest group (i.e. environmentalist) pressure (*SP9*)	0-6
3	Prospector Strategy (*PS*)	1. The strategy in three years ago (*PS1*) 2. The strategy at now (*PS2*) 3. The strategy for current three years (*PS3*)	1-7
4	Product Innovation (*IPrd*)	1. The company has launched new products (*IPrd1*) 2. The company has launched modifications to already existing products (*IPrd2*) 3. The company is the first-to-market regarding new products (*IPrd3*) 4. The percentage of new products in the company portfolio, compared by the industry average (*IPrd4*)	1-7

5	Process Innovation (*IPrc*)	1. The company has introduced new production processes (*IPrc1*) 2. The company has modifications to production processes (*IPrc2*) 3. The company is the first to introduce production processes (*IPrc3*) 4. The frequency of production process improvements in the company, compared by the industry average (*IPrc4*)	1-7

Source: summarized for the research 2012-2013

Population and Sample Determination

Population in this research is the companies in Indonesia. The sampling method is convenience sampling. The reason for the use of convenience sampling is the sampling design has the ease and flexibility for the researcher to conduct the research (Sekaran, 2003). The determination of the minimum sample amount that was used in this research is based from Roscoe (1975) on Sekaran (2006), "the size of the sample is more than 30 and less than 500 is appropriate for many researches". The survey was administered to the management accountants or financial controllers in the sample companies. The unit of survey is the most proper, as IFAC (2005) explained.

Analysis Method

The non-response bias test was conducted with *the independent sample t test* to observe the mean of respondent's answer. Besides, the descriptive statistics was also conducted to illustrate about the demographic of research respondents and description of the variables. Then, hypothesis' testing was conducted by Structural Equation Modeling (SEM) using Partial Least Square (PLS).

Partial Least Square (PLS) is a Component Based SEM. According to Ghozali (2008), PLS is a powerful analysis method. This technique was chosen because its ability to cope with the small sample size, the lack of assumptions regarding the distribution of regression residuals and the minimal demands it places on measurement scales (Chin, 1998; Smith, 2003, on Ferreira *et al*., 2009).

RESULTS AND ANALYSIS

Description of the Research Object

Before the questionnaires were distributed to the sample of companies, the preliminary request had been conducted to 206 companies. However, the questionnaires were only distributed to 97 companies since only those who responded to the email (preliminary request). Among those responses ask regarding some which related to this research, including expressing willingness to process the questionnaires further. The 33 sample of companies which were taken through the convenience sampling technique, are described at the following tables.

Table 2
Sample Response and Rate Categorized through Industry

Industry	∑ Questionnaire was sent	∑ Response	Rate (%)
Manufacturing	79	26	33
Agribusiness	7	4	57
Transport	1	1	100
Construction	1	1	100
Infrastructure	2	0	0
Energy & Oil	3	0	0
Mining	2	0	0
Hospitality	1	0	0
Communication	1	0	0
Fund Service	1	1	100
Total	97	33	34

Source: primary data 2012-2013, processed.

Table 3
The Dissemination of Place of the Research Object

Island	∑ Unit of Analysis
Sumatera	4
Java	27
Kalimantan	1
Sulawesi	1
Total	33

Source: primary data 2012-2013, processed.

In total, only 33 responses to the survey (rate of 34%) were received and usable. As shown in Table 2, the majority of the unit of analysis was in manufacturing companies. Then from the Table 3, it is concluded that the majority company samples were located in Java, Indonesia. This could be understandable since the central of industries in Indonesia is in Java Island.

Table 4
Profile of Respondents of the Study—Job Position

Job Position	Total of the Respondent	Percentage
Management Accountant or Financial Controller	30	91%
Environmental Manager	3	9%
Total	33	100%

Source: primary data 2012-2013, processed.

Table 5
Profile of Respondents of the Study— the Length of Time Respondents Worked in the Current Job Position

The Length of Time (Year)	Total of the Respondent	Percentage
More than 5	23	70%
During 1-5	10	30%
Less than 1	0	0%
Total	33	100%

Source: primary data 2012-2013, processed.

The Table 4 and Table 5 indicated the profile of the respondents in this research. As shown in the table, the job positions which were the respondents worked are the management accountant or financial controller and environmental manager. Like what argued in the previous chapter, the management accountant or financial controller is the one that considered to be the most proper respondent that can assist in filling the survey because of his/her involvement in daily financing and operating activities of companies. However, during the research, it was found that environmental managers in some of the companies in Indonesia were also as good as management accountants in involvement of environmental cost management and other strategic management as well. Besides, they have enough comprehension in understanding how the companies process the decision making through the preferred strategy. So, through this argumentation, the use of survey data from the targeted respondents of both management accountant or financial controller and environmental manager were unlikely not to be a problem in evaluating the quality of the data. Meanwhile, 70% of the respondents have the length of time worked in their current job position more than five years. It means that the respondents have enough experience in their current job.

Non-response Bias Test

In this study, the non-response bias test was conducted through *the independent sample t test* by looking the variance of the population from the group before and after the cut-off date (using the group of after cut-off date as a proxy for non-respondents) on key variable of interest. *The independent sample t test* could be observed through the score of Levene's Test for Equality of Variance. The result shows that the answer's mean is the same for both of group. So, all of the survey could be collectively processed for further analysis.

Descriptive Analysis

Based on Table 6, *EMA* as an endogenous variable as well as exogenous variable in the model has an empirical mean score of 53,6364. It is higher than its theoretical mean score (36,00). This indicates that EMA use was high enough in the companies. Empirical mean score of *SP* as an exogenous variable in the model (36,5758) is higher than its theoretical mean score (27,00). This indicates that the stakeholder pressures in the companies were high enough. In the other side, empirical mean score of *PS* as an exogenous variable in the model is not higher than its theoretical mean score, those are 10,8788 < 12,00. It means that, generally, the companies were not used the prospector strategy in managing their business. Meanwhile, the same thing is also occured in *IPrd* and *IPrc*. Both of *IPrd* and *IPrc*, each empirical mean score is not higher than the theoretical mean score. For *IPrd*, 14,0909 is the score of empirical mean and 16,00 is the score of theoretical mean score. And for *IPrc*, the empirical and the theoretical mean score are 15,3636 and 16,00, respectively. This indicates that the companies have lower of either product innovation or process innovation.

Table 6
Descriptive Statistics of Variables

Variable	N	Theoretical Range		Empirical Range		Theoritical Mean	Empirical Mean	Standard Deviation
		Min	Max	Min	Max			
EMA	33	0,00	72,00	0,00	72,00	36,00	53,6364	17,68618
SP	33	0,00	54,00	0,00	54,00	27,00	36,5758	12,57982
PS	33	3,00	21,00	3,00	21,00	12,00	10,8788	6,52762
IPrd	33	4,00	28,00	4,00	28,00	16,00	14,0909	7,69482
IPrc	33	4,00	28,00	4,00	28,00	16,00	15,3636	6,99919

Source : primary data 2012-2013, processed.

Path Analysis

Before conducting the evaluation of the structural model, it is requisited to perform measurement model analysis to ensure that each variable is valid and reliable (Ghozali, 2008). The analysis of prior measurement model concluded that there was a need to revise the outer model. Identification of the revised outer model will be started from excluding the indicators of the latent constructs which were not meet the convergent validity, discriminant validity, and composite reliability. Table 7 summarized the indicators that were needed to be excluded from the outer model.

Table 7
Summary of the Potential Excluded Indicators

Indicator	Latent Construct	Not met the criterion of	Arguments
SP2	*SP*	Convergent validity; Discriminant validity	• The loading 0,4214 was below the minimum threshold 0,50. • AVE square root of *SP* (0,5256) is not higher than the correlation between *SP* and *EMA* (0,7003).
SP5	*SP*	Convergent validity; Discriminant validity	• The loading 0,3983 was below the minimum threshold 0,50. • AVE square root of *SP* (0,5256) is not higher than the correlation between *SP* and *EMA* (0,7003).
IPrc1	*IPrc*	Discriminant validity	• From the cross loading, the correlation of indicator *IPrc1* with its construct is not higher than the correlation of *IPrc1* to the other construct, that is *IPrd*. • AVE square root of *IPrc* (0,7663) is not higher than the correlation between *IPrc* and *IPrd* (0,7933).

Source: summarized for the research 2012-2013.

After above three indicators were excluded, all of the indicators' loadings had been above 0,50 (shown in Table 8) so that the convergent validity, finally, was not to be a problem.

Table 8
Outer Loadings—Bootstrapping Results (Revised Model)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (|O/STERR|)
EMA1 <- EMA	0,9240	0,9218	0,0323	0,0323	28,6289
EMA10 <- EMA	0,8603	0,8576	0,0825	0,0825	10,4299
EMA11 <- EMA	0,7943	0,7896	0,0807	0,0807	9,8470
EMA12 <- EMA	0,8564	0,8528	0,0667	0,0667	12,8392
EMA2 <- EMA	0,9451	0,9453	0,0174	0,0174	54,3437
EMA3 <- EMA	0,8878	0,8877	0,0473	0,0473	18,7678
EMA4 <- EMA	0,8538	0,8480	0,0844	0,0844	10,1199
EMA5 <- EMA	0,9004	0,8949	0,0480	0,0480	18,7607
EMA6 <- EMA	0,9496	0,9496	0,0219	0,0219	43,3744
EMA7 <- EMA	0,8236	0,8281	0,1108	0,1108	7,4311
EMA8 <- EMA	0,9188	0,9179	0,0338	0,0338	27,2064
EMA9 <- EMA	0,7600	0,7290	0,1327	0,1327	5,7267
IPrc2 <- IPrc	0,8530	0,8466	0,0996	0,0996	8,5612
IPrc3 <- IPrc	0,9304	0,9200	0,0516	0,0516	18,0437
IPrc4 <- IPrc	0,9215	0,9240	0,0391	0,0391	23,5744
IPrd1 <- IPrd	0,9496	0,9487	0,0311	0,0311	30,5731
IPrd2 <- IPrd	0,9067	0,9016	0,0766	0,0766	11,8339
IPrd3 <- IPrd	0,8952	0,8818	0,0978	0,0978	9,1485
IPrd4 <- IPrd	0,9035	0,8957	0,0762	0,0762	11,8638
PS1 <- PS	0,9485	0,9390	0,0854	0,0854	11,1067
PS2 <- PS	0,9767	0,9698	0,0343	0,0343	28,4702
PS3 <- PS	0,9684	0,9630	0,0320	0,0320	30,2678
SP1 <- SP	0,8138	0,7886	0,1400	0,1400	5,8117
SP3 <- SP	0,8395	0,8222	0,1098	0,1098	7,6477
SP4 <- SP	0,9119	0,9034	0,0526	0,0526	17,3509
SP6 <- SP	0,7768	0,7234	0,1824	0,1824	4,2596
SP7 <- SP	0,5648	0,5247	0,1818	0,1818	3,1058
SP8 <- SP	0,8230	0,8341	0,0691	0,0691	11,9171
SP9 <- SP	0,7399	0,7246	0,1169	0,1169	6,3290

Source: primary data 2012-2013, processed.

The Table 9 showed that the correlation of *EMA* construct with its indicators is higher than the correlation of *EMA* indicators with the other constructs (*IPrd*, *IPrc*, *PS*, *SP*). The correlation of *IPrc* with its indicators is also higher than the correlation of *IPrc* indicators with the other constructs (*EMA*, *IPrd*, *PS*, *SP*). The correlation of *IPrd* with its indicators is higher than the correlation of *IPrd* indicators with the other constructs (*EMA*, *IPrc*, *PS*, *SP*). The correlation of *PS* with its indicators is also higher than the correlation of *PS* indicators with the other constructs (*EMA*, *IPrc*, *IPrd*, *SP*). Meanwhile, the correlation of *SP* with its indicators is higher than the correlation of *SP* indicators with the other constructs (*EMA*, *IPrc*, *IPrd*, *PS*). Finally, it could be concluded that this outer model had been met the discriminant validity, or the latent constructs predicted their block better than the other block indicators.

Table 9
Cross Loadings—PLS Algorithm Results (Revised Model)

	EMA	IPrc	IPrd	PS	SP
EMA1	**0,9240**	0,2501	-0,0578	-0,1239	0,6468
EMA10	**0,8603**	0,3008	0,0986	0,0180	0,6940
EMA11	**0,7943**	0,4503	0,2163	-0,0467	0,6235
EMA12	**0,8564**	0,4166	0,0675	-0,1023	0,6059
EMA2	**0,9451**	0,3669	0,0342	-0,1364	0,6294
EMA3	**0,8878**	0,1784	-0,0360	-0,1276	0,6133
EMA4	**0,8538**	0,1263	0,0047	-0,1242	0,6940
EMA5	**0,9004**	0,2908	0,0034	-0,185	0,6251
EMA6	**0,9496**	0,3565	0,0098	-0,2107	0,6404

EMA7	**0,8236**	0,3442	-0,0163	-0,1563	0,5419
EMA8	**0,9188**	0,3008	-0,0108	-0,1688	0,5447
EMA9	**0,7600**	0,3968	0,0847	-0,0576	0,5378
IPrc2	0,2564	**0,8530**	0,6476	0,2558	0,1277
IPrc3	0,3246	**0,9304**	0,7024	0,2296	0,3013
IPrc4	0,3872	**0,9215**	0,5928	0,2790	0,3810
IPrd1	-0,0324	0,5743	**0,9496**	0,4225	0,1214
IPrd2	0,0256	0,6128	**0,9067**	0,4736	0,1265
IPrd3	0,1263	0,7695	**0,8952**	0,3100	0,1595
IPrd4	0,0492	0,6795	**0,9035**	0,3620	-0,0176
PS1	0,0485	0,3593	0,4820	**0,9485**	0,1687
PS2	-0,2291	0,2210	0,3738	**0,9767**	-0,0646
PS3	-0,2379	0,2251	0,3981	**0,9684**	0,0496
SP1	0,4903	0,1763	0,1416	0,0060	**0,8138**
SP3	0,5170	0,0413	-0,0315	-0,0806	**0,8395**
SP4	0,6760	0,2149	0,1100	0,0337	**0,9119**
SP6	0,3889	0,3483	0,3091	0,2097	**0,7768**
SP7	0,3624	0,2085	0,0894	0,0478	**0,5648**
SP8	0,6520	0,3873	0,1070	0,1971	**0,8230**
SP9	0,6624	0,3191	-0,0424	-0,0476	**0,7399**

Source: primary data 2012-2013, processed.

Through the Fornell-Larcker criterion, it was shown that most of all the constructs in the estimated model has been already met to the discriminant validity criteria. Based on Table 10, the AVE square root of *EMA* construct is 0,7651, still higher than the correlation between EMA with the other constructs—with *IPrc, IPrd, PS*, and *SP*: 0,3636; 0,0408; -0,1348; 0,7077; respectively. AVE square root of *IPrc* is 0,8141, higher than the correlation between *IPrc* with the other constructs—with *EMA, IPrd, PS*, and *SP*: 0,3636; 0,7122; 0,2835; 0,3111; orderly listed. AVE square root of *IPrd* is 0,8354, higher than the correlation between *IPrd* with the other constructs—with *EMA, IPrc, PS*, and *SP*: 0,0408; 0,7122; 0,4373; 0,1079. AVE square root of *PS* is 0,9304, higher than the correlation between *PS* with the other constructs—with *EMA, IPrc, IPrd*, and *SP*: -0,1348; 0,2835; 0,4373; 0,0603. AVE square root *SP* is 0,6208, generally higher than the correlation between *SP* with the other constructs—with *IPrc, IPrd*, and *PS*: 0,3111; 0,1079; 0,0603. However, the AVE square root of *SP* (0,6208) is not higher than the correlation between *SP* and *EMA* (0,7077). Based on Fornell-Larcker criterion, it seemed like the discriminant validity had not been met. However, since the cross loading supported to meet the discriminant validity, it was not a problem since the research had been developed in the exploratory stage. So, it could be said that the model had been already met the discriminant validity criteria.

Next, as shown in Table 11, the composite reliability values of 0,9749 (*EMA*); 0,9292 (*IPrc*); 0,9530 (*IPrd*); 0,9757 (*PS*), and 0,9185 (*SP*) demonstrate that *EMA, IPrc, IPrd, PS*, and *SP* have high levels of internal consistency reliability. The composite reliability for the constructs *EMA, IPrc*, and *SP* were slightly increased after the model had been revised through excluding the indicators *IPrc1, SP2*, and *SP5*. Because each composite reliability value was higher than 0,07, thus the discriminant validity had been established.

Table 10
Latent Variables Correlations and AVE (diagonal)—Revised Model

	EMA	***IPrc***	***IPrd***	***PS***	***SP***
EMA	0,7651	0	0	0	0
IPrc	0,3636	0,8141	0	0	0
IPrd	0,0408	0,7122	0,8354	0	0
PS	-0,1348	0,2835	0,4373	0,9304	0
SP	0,7077	0,3111	0,1079	0,0603	0,6208

Source: primary data 2012-2013, processed.

Table 11
R Square and Composite Reliability—PLS Algorithm Results (Revised Model)

	R Square	Composite Reliability
EMA	0,5325	0,9749
IPrc	0,2448	0,9292
IPrd	0,2014	0,9530
PS	0	0,9757
SP	0	0,9185

Source: primary data 2012-2013, processed.

From the model, the construct *SP* and *PS* explain 53,25 percent of the variance of the endogenous latent construct *EMA* ($R^2 = 0,5325$). It means that 46,75 percent variance of *EMA* is explained by the other variables outside the model. The construct *EMA* and *PS* explain 20,14 percent of the variance the endogenous latent construct *IPrd* ($R^2 = 0,2014$), besides 79,86 percent variance of *IPrd* is explained by the other variables outside the model. Meanwhile, 24,48 percent of the variance of the latent construct *IPrc* is explained by the exogenous latent construct *EMA* and *PS*, besides the remained amount of *IPrc* variance is explained by the other variables outside the model. Higher the R-square value of the model; higher the ability of independent variables (exogenous constructs) in explaining its dependent variables (endogenous constructs).

Next, reviewed from the T statistics in Table 12, not all of the path coefficients were statistically significant. Although the model had been revised, there were still the ones that not met the significant level (*T* statistics below 1,96). *EMA -> IPrd* and *PS -> EMA* are the paths which are not significant in the revised model.

Table 12
Path Coefficients—Bootstrapping Results (Revised Model)

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (|O/STERR|)
EMA -> IPrc	0,4093	0,386	0,1649	0,1649	2,4825
EMA -> IPrd	0,1016	0,077	0,1947	0,1947	0,5221
PS -> EMA	-0,1782	-0,18	0,1244	0,1244	1,4327
PS -> IPrc	0,3386	0,374	0,1678	0,1678	2,0182
PS -> IPrd	0,451	0,455	0,1921	0,1921	2,3484
SP -> EMA	0,7185	0,724	0,0976	0,0976	7,3611

Source: primary data 2012-2013, processed.

Discussion

Hypothesis 1 stated that the stakeholder pressures have a positive effect on environmental management accounting (EMA) use. The test results on the paramater coefficient between stakeholder pressures (*SP*) and environmental management accounting use (*EMA*) showed that there was a positive effect (0,724), with the *T-Statistics* score 7,3611 and significant at 0,05. The *T-Statistics* was placed further above the critical value ± 1,96. Thus, the hypothesis 1 could be accepted. It means that the company which faces more stakeholder pressures regarding the corporate environmental management will implement EMA more thoroughly.

As previously explained, concluded that the institutional theory contributes to help the understanding of EMA use since the theory is used by some prior researchers in searching the meaning of social structure influences. Qian *et al.* (2011) found that one of main motivations encouraging the development of EMA in local government is from the social structural influences. Related to the findings of current research, the social structural influences are reflected and measured as the stakeholder pressures variable. Of which has been reflected through nine stakeholder's category. The implication is that with the existence of the stakeholder demands for the corporate environmental management will pressure the corporation to do a good action in preserving the environment. Managers will take more opportunities through business strategies

such as getting an innovation way to manage environmental costs (IFAC, 2005, p. 10), that is through EMA use.

Hypothesis 2 stated that the prospector strategy has a positive effect on environmental management accounting (EMA) use. The test results on the paramater coefficient between prospector strategy (*PS*) and environmental management accounting use (*EMA*) showed that there was no positive effect (-0,1782), with the *T-Statistics* score 1,4327 and not significant at 0,05. The *T-Statistics* was placed below the critical value ± 1,96. Consequently, the hypothesis 2 could not be accepted. It means that the companies which have been adopted the prospector strategy will not use EMA, as the null hypothesis stated.

This hypothesis finding is consistent with Ferreira *et al.* (2009) which also found that positively and statistically, the prospector strategy has no effect on EMA use. Nevertheless, the finding is not consistent with Rustika (2011) which also researched the companies in Indonesia, but limited to Central Java's province. Rustika (2011) concluded that the prospector strategy, statistically, has a positive effect on EMA use. The difference of findings might be caused by the characteristics' dissimilarity among the companies in Indonesia, generally, in Central Java, specifically, and in outside Indonesia.

In the other side, contingency theory which had been used in explaining the business strategy that significantly influences the management accounting system use in organizations (Cadez and Guilding, 2008, on Islam and Hu, 2012), could not be furtherly supported by current research finding. Besides, Luther and Longden (2001) found that referred to the contingency theory; contingent factors existed in influencing management accounting and identifying potential additional factors, such as changed stakeholder pressures (Kattan *et al.*, n.d.). Since the organizations faced such as changed stakeholder pressure; the company strategies as arms of management control system within organization would be used. So, through the contingency theory the strategy will affect on management control system of organizations, including environmental management system and environmental management accounting use within the organization. However, the current research finding, seemingly, does not support these claims.

Next, hypothesis 3a stated that environmental management accounting (EMA) use has a positive effect on process innovation. The test results on the parameter coefficient between environmental management accounting use (*EMA*) and process innovation (*IPrc*) showed that there was positive effect (0,386), with the *T-Statistics* score 2,4825 and significant at 0,05. The *T-Statistics* was placed above the critical value ± 1,96. Therefore, the hypothesis 3a could be accepted. The finding indicates that the companies with the greater use of EMA will conduct the process innovation to reduce environmental costs, wastes, and the related negative impacts.

This finding supports Ferreira *et al.* (2009) research which suggested that EMA use has a positive association with process innovation. Although in Ferreira *et al.* (2009) was not found a significant path regarding the association of both variables in the PLS structural model, in the correlation analysis suggests that it is likely that EMA use has a positive effect on innovation. Besides that, the finding of this research is also consistent with Rustika *et al.* (2011) which concluded that there is a positive effect of EMA use on process innovation.

Next, hypothesis 3b stated that environmental management accounting (EMA) use has a positive effect on product innovation. The test results on the parameter coefficient between environmental management accounting use (*EMA*) and product innovation (*IPrd*) showed that there was positive effect (0,077), with the *T-Statistics* score 0,5221 and not significant at 0,05. The *T-Statistics* was placed below the critical value ± 1,96. Hence, the hypothesis 3b could not be accepted.

Above hypothesis results showed that EMA use does not affect product innovation. This result is contrary to the suggesstion of Hansen and Mowen (2006) that EMA use will encourage the organizations to innovate the product. However, this finding is consistent with Ferreira *et al.* (2009), but not with Rustika (2011). Since the EMA is the the tool to achieve a sustainable development in organizations (IFAC, 2005), it will encourage the companies to innovate. As what explained by Hahn *et al.* (2002), the core drivers of the sustainable development is innovation (on Schaltegger, 2008). It was concluded that these claims are not supported by the statistical and empirical analysis conducted.

Hypothesis 4a stated that the prospector strategy has a positive effect on process innovation. The test results on the parameter coefficient between prospector strategy (*PS*) and process innovation (*IPrc*) showed that there was positive effect (0,386), with the *T-Statistics* score 2,4825 and significant at 0,05. The *T-Statistics* was placed above the critical value ± 1,96. Thus, the hypothesis 4a could be accepted.

Above finding is consistently support the proposed hypothesis that the prospector strategy has a positive effect on process innovation. The finding consistently supports the conclusion of Rustika (2011) which stated the prospector strategy has a positive effect on process innovation. In the other side, the finding also supports the weak PLS result of Ferreira *et al.* (2009). In Ferreira *et al.* (2009) research, the prospector strategy is not significantly associated with process innovation. However, they found a significant indirect effect of prospector strategy on process innovation through the commitment of resources to research and development (R&D) activities. According to Miles *et al.* (1978), prospector strategy which aims to be the first in the market, will rapidly to early signals of market needs or opportunities. Therefore, as Ferreira *et al.* (2009) stated that the the greater the emphasis on being the first in market, the higher the level of innovations. So, it appears that resources will be commited to the development and improvement of processes. This claim is proved by the statistically results, apparently.

Next, hypothesis 4b stated that the prospector strategy has a positive effect on product innovation. The test results on the parameter coefficient between prospector strategy (*PS*) and product innovation (*IPrd*) showed that there was positive effect (0,455), with the *T-Statistics* score 2,3484 and significant at 0,05. The *T-Statistics* was placed above the critical value ± 1,96. So, the hypothesis 4b could be accepted. This finding showed that the companies which adopted the prospector strategy will encourage them to innovate the companies products. This result is not consistent with Ferreira *et al.* (2009), but consistently supports Rustika (2011). The result also supports the claims of Perera *et al.* (1997) and Sim and Killough (1998) on Ferreira *et al.* (2009). They claimed that when the environment is largely driven by changing customer demands and level of market concentration there is greater pressure for firms to develop a strategy with customer orientation, such as the provision of innovative products (Perera *et al.*, 1997; Sim and Killough, 1998; on Ferreira *et al.*, 2009). Besides, the pressure toward the product innovation may be not only come from the customer, but it could be from the government's regulation of product.

CONCLUSION

According to data analysis and the discussion of the research, from six of hypotheses, the two of them are rejected. First, stakeholder pressures (*SP*) have positive effect on environmental management accounting use (*EMA*). It means that the company which faces more stakeholder pressures regarding the corporate environmental management will implement EMA more thoroughly. Second, the prospector strategy (*PS*) has no positive effect on environmental management accounting use (*EMA*). It means that the companies which have been adopted the prospector strategy will not use EMA. Third, environmental management accounting use (*EMA*) has a positive effect on process innovation (*IPrc*), but not with product innovation (*IPrd*). The finding indicates that the companies with the greater use of EMA will conduct the process innovation to reduce environmental costs, wastes, and the related negative impacts. In the other side, the result showed that EMA use does not affect product innovation. This result is contrary to the suggesstion of Hansen and Mowen (2006) that EMA use will encourage the organizations to innovate the product. Fourth, the prospector strategy (*PS*) has a positive effect on process innovation (*IPrc*) and on product innovation (*IPrd*). This finding showed that the companies which adopted the prospector strategy will encourage them to innovate the process of products and its products as well.

However, some limitations are acknowledged regarding the research findings. The sample determination was not use the probability sampling. The sampling that was used is convenience sampling. So, it may affect the external validity of the findings. The small sample size may also affect the statistical power of the analysis conducted. Besides, some of the participants are not management accountants or financial controllers, they are environmental managers. It is possible that there was bias regarding the interpretation and evaluation of EMA in the participants' responses.

So, further researches could conduct this research through probability sampling, such as stratified random sampling, to increase the generalizability of the empirical research findings. Within stratified random sampling could be done through industrial type-based stratification, such as manufacturing, agribusiness, transport, construction, infrastructure, energy, mining, hospitality, communication, other service, etc. Alternatively, the stratified random sampling could be based on the region of country, such as in Indonesia, province or island-based stratification. Besides, further researches are needed to conduct the pilot test to ensure that the survey's items are truly understood by the participants.

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