Green product innovation's effect on firm performance of managerial environmental concern and green communication

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Abstract. Recent years, environmental sustainability becomes an interesting issue in developing countries. Increasing attention on environmental problems gives opportunities for companies to develop new products, such as green product innovation. The aim of this research is analyze the effect of green product innovation on firm performance which moderated by managerial environmental concern and green communication. The sample of this research is 26 retails in Malang (hypermarkets and supermarkets categories) which sell organic products and use environmentally friendly packaging, by using total sampling and SEM-PLS analysis. According to statistical results, green product innovation has direct effect on firm performance ($p<0.001$, $\beta=0.50$). On the other hand, managerial environmental concern ($p=0.001$, $\beta=0.43$) and green communication ($p=0.048$, $\beta=0.25$) moderate the effect of green product innovation on firm performance. Green product innovation is an important deliberation in determining strategies and policies at retail sector. Communication and promotion related organic products are needed in increasing organic product's sales and encourage customer using environmentally friendly packaging (reusable bags or cardboard). Empirically, this research's results contribute as an idea for future research and literature, especially for strategic management's area. The results provide a practical contribution for companies in defining and designing strategies related to green product innovation to boost company's performance.

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INTRODUCTION

As the awareness on environmental sustainability, communities and organizations establishing "Gerakan Indonesia Diet Kantong Plastik" to encourage people using plastic bag wisely. "Gerakan Indonesia Diet Kantong Plastik" has 4 targets, such as retails (Dietkantongplastik, 2014). In the last six years period (from 2007 to 2012), the number of modern retails in Indonesia increase 17,57% on every years. As economic and lifestyles change, this modern retails have emerged. Retails have an important role in initiating green action, such as green product innovation (Fortunata, 2014). Green product innovation as new niche innovation which attract managerial and researcher's attention (Cheng & Shiu, 2012). The study conducted by (Ar, 2012) showed that green product innovation has a positive significant effect on firm

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performance (increasing sale, market share and return on investment). Green product innovation has a significant effect on environmental performance (Küçükoğlu & Pınar, 2015). Alhadid & Abu-Rumman (2014) states that green product innovation has a significant effect on corporate performance (financial, environmental, operational). Green product innovation in companies triggered by cost reduction, achievement of competitive advantage, increase market share, increasing sales, increasing profits, reputation's improvement and increased productivity (Dangelico, 2015). On the other hand (Lin, Chen & Ho, 2013) states that green product innovation doesn't have a significant effect on market share because the implementation of green manufacturing process and product development requires high costs that will boost product prices (Lin *et al.*, 2013).

Other studies conducted by (Dangelico, 2015) states that green product innovation's successfulness supported by top management's commitment, networking (both inside and outside company), cross-functional integration and resources development. This research supported by (Ar, 2012) green product innovation have significant effect on firm performance if moderated by manager commitment (managerial environmental concern). In green product innovation, companies conduct creative activities in developing product, such as the provision of organic's product and environmentally friendly packaging. However, consumers who have attention on environmental issues do not necessarily purchase organic product and choosing environmentally friendly packaging (Cronin, Smith, Gleim, Ramirez & Martinez, 2011). Studies conducted in United States showed that 20% consumers buy green products because of easiness to get information and identify green product (Schönberger, Martos & Styles, 2013). According to (Pilarczyk & Grzesiuk, 2015) there is a gap between activities undertaken by retails and customer's expectations showed the importance of green communication.

This reseach's newness is using managerial environmental concern and green communication as moderation variable. With the ability to provide information related green product strengthens the effect of green product innovation on increasing reputation. High attention on environmentally friendly products will boost the company's commitment on green product innovation, as well as the company's effort giving some information about the importance of green products to stakeholders. If customers receive and understand the information, customers will believe and purchase environmentally

friendly products. Thus, this study will answer whether green product innovation directly influence firm performance or needs to be strengthened by the managerial environmental concern and the ability to communicate information to stakeholders. The research's results are expected to contribute as an idea for future research and literature, especially for strategic management's area. Besides that, this research is expected to contribute as consideration in decision making related to green product innovation's planning and implementation as well as share a view that green product innovation needs to be done in improving company's performance.

LITERATURE REVIEW

Increasing attention on environmental issues becomes an opportunity for companies to develop new products in achieving competitive advantage. Green product innovation as important strategists tool for companies in minimizing environmental impact (Chang, 2012). The concept of green product innovation are different among companies, but have a common objective to be green companies, and take advantage from new business opportunities both economic and environmental (Eco-Innovation Observatory, 2013). Green product innovation is triggered by increasing sales and reputation improvement (Dangelico & Pujari, 2010). Research conducted by (Ar, 2012) showed that green product innovation have positive effect on firm performance (Ar, 2012).

H1: Green product innovation has direct effect on firm performance.

H2: Managerial environmental concern moderates the effect of green product innovation o firm performance.

H3: Green communication moderates the effect of green product innovation on firm performance.

Green product innovation does not have a significant effect on market share (Lin, Chen & Ho, 2013). Managerial environmental concern moderates the effect of green product innovation on firm performance (Ar, 2012). Managerial environmental concern is manager's emotional level and commitment on environmental issue which show their interest in green product innovation (Pradeep, 2012). Manager's perception on environmental issue affects the adoption of environmental strategies. Managers also have opportunities to influence the organizational commitment (Padilla, 2012). Organizational's support is important for achieving green

product innovation's successfulness (Chang, 2012).

Green communication becomes an important marketing tools to get better position. Green product innovation need to be supported by great communication with stakeholders both internal and external (Cavallo, Degli Esposti & Kostantinou, 2012). Green innovation's starting point must be done by retailers to influence customers and suppliers. Retails have an important role in conveying information to consumers (Malhotra, 2012). The gap between activities undertaken by retails and customer's expectations showed the importance of green communication (Pilarczyk & Grzesiuk, 2016). Communication in store is potential for increasing the green product's sales (Schönberger *et al*., 2013). Retailers involved in various aactivities to increase customer's sensitivity on environment, such as green product's promotion, financial incentives related to green product and educate customer about the impact of products on environment. Green label also support the provision of information related to environmental benefits of a product (Evans & Denney, 2009).

METHODOLOGY
This research is explanatory research which aims to explain variable's position and analyze relationship between variable. Independent variable in this research is green product innovation, while firm performance as the dependent variable. The study also involved managerial environmental concerns and green managerial communication as moderating variables. The population in this research is all modern retails in Malang (hypermarket and supermarket categories). By using total sampling, all modern retails both hypermarket and supermarket that involved in green product innovation (selling organic products and using environmentally friendly packaging) and feel disposed to be research's object becomes research's sample. From 33 retails, only 26 retails become research's sample, while 7 retails rejected due to respondent's busyness and long procedures. Respondents in this research were all managers who involved in green product innovation. Each retailer has different number of managers because of discrepancy scales. Questionnaires' distribution depends on number of managers in every retails. If the number of questionnaires which filled out more than one, the result that will be analyzed is the average of each retail. Interview with one of the managers that involved in selling organic products and (ARS), average path coefficient (APC) and average variance inflation factor (AVIF). In this research, the aim is

environmentally friendly packaging aim to obtain the completeness of the information. Validity test using Pearson's correlation aims to determine validity of the instrument (Arikunto, 2010). Item in questionnaire valid if r value more than 0.3 (Sugiyono, 2013). Reliability test using SPSS software aims to determine instrument's consistency (Arikunto, 2010). If the Cronbach Alpha's coefficients more than 0.7, the instrument is reliable (Johnson & Christensen, 2012). Data analysis in this research is using SEM-PLS (WarpPLS 5.0 software). SEM-PLS works efficiently on small sample sizes, complex models and able to produce parameter's estimates for moderating effects. Although it's relatively new, SEM-PLS's development is significant (Hair, 2013; Kock, 2013; Sholihin & Ratmono, 2013). Most of variable's relationship on social phenomena, behavior and nature is non-linear, so WarpPLS software is the right choice because it can analyze linear and non-linear relationship.

RESULTS
This research was conducted at 26 retails in Malang (hypermarkets and supermarkets categories) which implement green product innovation (selling organic products and using environmentally friendly packaging).
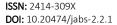
Validity and Reliability
The result of validity and reliability test showed that all items in questionnaire are valid (r>0,3) and reliable (Cronbach Alpha ≥0,7).

Descriptive Analysis
Table 2 showed that according to manager's perception, retail's involvement in green product innovation is high and the level of sales is high. On the other hand, managerial concern on environment and communication related to green products still on average. Green communication has the lowest mean value which showed that retails in Malang are not maximised in giving information related to green product. Overall, the majority of retailers in Malang have been providing organic products in their store, but most retailers are not maximized in offering green product's selection (such as offering a cardboard for shopping goods).

SEM-PLS Analysis
Model fit indicator's function is compare the best model from a various different model, such as average R-squared determine the feasibility of "the effect of green product innovation on firm performance, moderated by managerial

environmental concern and green communication" model. The p value of APC and ARS should be less than 0,05, whereas AVIF as multicolinearity indicator must be smaller than 5. Model fit indicator are presented in table 3.

TABLE 1. Validity and reliability test

Variables	Items	r value	Validity	Cronbach Alpha	Reliability
Green Product Innovation	Reusable bag's sale	0,585	Valid	0,907	Reliable
	Plastic bags or styrofoam's restriction	0,460	Valid	0,903	Reliable
	Using biodegradable plastic bags	0,590	Valid	0,904	Reliable
	Using recycled products	0,706	Valid	0,896	Reliable
	Using eco-labelling	0,330	Valid	0,906	Reliable
Firm Performance	Organic product's provision	0,552	Valid	0,901	Reliable
	Green product's sales improvement	0,479	Valid	0,902	Reliable
	Reputation improvement	0,463	Valid	0,903	Reliable
	Collaboration with organic product's supplier	0,770	Valid	0,895	Reliable
Managerial Environmental Concern	Collaboration with environmentally friendly packaging's supplier	0,804	Valid	0,894	Reliable
	Collaboration with local communities	0,479	Valid	0,906	Reliable
	Plastic bag's monitoring and reporting	0,788	Valid	0,894	Reliable
	Manager or team's involvement	0,635	Valid	0,898	Reliable
	Organic product's promotion (written)	0,794	Valid	0,894	Reliable
Green Communication	Environmentally friendly packaging's promotion (verbal/written)	0,735	Valid	0,897	Reliable
	Organic product's promotion trough label	0,714	Valid	0,898	Reliable
	Environmentally friendly packaging's information trough label	0,757	Valid	0,895	Reliable
	Offering environmentally friendly packaging's selection	0,668	Valid	0,897	Reliable
	Product's waste disposal	0,768	Valid	0,895	Reliable

TABLE 2. Variable and Indicator's Mean

Variable	Mean
Green Product Innovation	4,13
Using environmentally friendly packaging	3,65
Using recycled products	4,00
Using eco-labelling	4,38
Organic product's availability	4,50
Firm Performance	4,17
The level of green product's sales	4,15
Reputation's level	4,19
Managerial Environmental Concern	3,80
External's relation	3,78
Management's involvement in organization	4,81
Green Communication	3,78
Green product's promotion	3,92
Providing green product's information	3,69
Offering green product's selection	3,54
Product disposal	3,96

This research aims to analyze the effect of green product innovation on firm performance by involving the managerial environmental concern and green communication as moderating variable.

TABLE 3. Model fit indicator

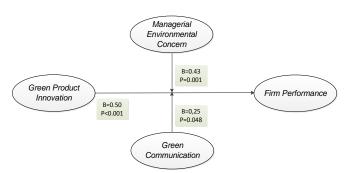| Model Fit Indicator	Value
Average R-Squared (ARS)	0,033 (p=0,210)
Average Path Coefficient (APC)	0,395 (p=0,002)
Average variance inflation factor (AVIF)	1,609

FIGURE 1. SEM-PLS Moderation Model

Figure 1. showed that green product innovation has directly effect on firm performance (p < 0.001; β = 0.50) , as well as managerial environmental concern (p = 0.001; β
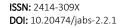
= 0.43) and green communication (p = 0.048; β = 0.25) as moderating variable

Hypothesis Testing

TABLE 4. Hypothesis testing

No	Hypothesis	Significance and Correlation's Coefficient	Information
1.	Green product innovation has direct impact on firm performance	p<0,001 β=0,50	Significant
2.	Managerial environmental concern moderates the effect of green product innovation on firm performance	p=0,001 β=0,43	Significant
3.	Green communication moderates the effect of green product innovation on firm performance	p=0,048 β=0,25	Significant

Hypothesis testing results indicate that green product innovation have direct effect on firm performance

(H1accepted), managerial environmental concern moderates the effect of green product innovation on firm

performance (H2 accepted) and green communication moderates the effect of green product innovation on firm performance (H3 accepted).

DISCUSSION AND CONCLUSION
The Effect of Green Product Innovation on Firm Performance

The result showed that green product innovation have direct effect on firm performance. The stronger behavior in developing environmentally friendly products will boost green product's sales and reputation's improvement as a retail which sell environmentally friendly product. Most retail in Malang is providing organic products (fruits, vegetables, rice and eggs). In addition, retailers also undertaken the development of environmentally friendly packaging in a various ways. However, in practice, customers prefer using plastic bags compared with cardboard and environmentally friendly shopping bags for a variety consideration, such as practicality. The development of environmentally friendly packaging should be accompanied by the provision of information to customers. Most retailers have done well on the labeling of environmentally friendly packaging (such as images or specific statements) as well as organic products. For customers who care about health, labeling would help customers to recognize the organic products and encourages customers to purchase organic products. Specific statement in packaging will encourage customer to use environmentally friendly packaging and limiting plastic bags. Organic product's sales increase gradually because customers not only consider the price, but also safety and health. On the other hand, the environmentally friendly products and packaging development have also boost the reputation's improvement. Empirically, this research supports (Ar, 2012) as well as (Alhadid & Abu-Rumman, 2014) which states that green product innovation have effect on firm performance.

The Effect of Green Product Innovation on Firm Performance Moderated by Managerial Environmental Concern

The results showed that managerial environmental concern moderates the effect of green product innovation on firm performance. The existence of innovative behavior in developing environmentally friendly products reinforced by partnership with organic product's suppliers, environmentally friendly packaging suppliers and local communities coupled with the management's involvement in organization will strengthen the increasing

of organic product's sales and reputation as a retail which sells environmentally friendly products. However, most retailers in Malang have not cooperated with the local communities related to the environment. Cooperation has been done with regard to support the activities undertaken by local communities (such as RT event). On the other hand, retail's manager involved in monitoring the use of plastic bags that have been sent from head office to every store and ordering organic products (type and quantity). Organic product's availability depend on location, needs, customer purchase's potential and sales trends. Empirically, this research supports (Ar, 2012) which states that managerial environmental concern moderates the effect of green product innovation on firm performance.

The Effect of Green Product Innovation on Firm Performance Moderated by Green Communication

The results showed that green communication moderates the effect of green product innovation on firm performance. Innovative behavior in developing environmentally friendly products reinforced with communication related to environmentally friendly packaging and organic products will boost the increasing of organic product's sales and reputation as a retail which sells environmentally friendly products. Retails provide information related to environmentally friendly products, such as labeling on packaging. Some retail includes a special statement in packaging related to the importance of using environmentally friendly packaging.

Promotion (verbal and written) also needs to encourage customer using environmentally friendly packaging and purchase organic products. However, in practice, customers prefer using plastic bags compared with cardboard or reusable bags and purchase organic products when promo rebates. As awareness to environment, retails in Malang have implemented waste management system, especially for organic products. Products will be chopped before discharge to avoid abuse by the various parties. Some retailers also treat waste in the form of compost. Empirically, this research fills a gap in (Pilarczyk & Grzesiuk, 2016) which states that there is a gap between the activities undertaken by the retail sector with the expectations of customers, thus retail become the initiator in green communication and engage consumers to participate and support these activities. The conclusion of this research are green product innovation has direct effect on firm performance. The stronger behavior in developing environmentally friendly products will boost

green product's sales and reputation's improvement as a retail which sell environmentally friendly product. Managerial environmental concern moderates the effect of green product innovation on firm performance. The existence of innovative behavior in developing environmentally friendly products reinforced by partnership with organic product's suppliers, environmentally friendly packaging suppliers and local communities coupled with the management's involvement in organization will strengthen the increasing of organic product's sales and reputation as a retail which sells environmentally friendly products. Green communication moderates the effect of green product innovation on firm performance. Innovative behavior in developing environmentally friendly products reinforced with communication related to environmentally friendly packaging and organic products will boost the increasing of organic product's sales and reputation as a retail which sells environmentally friendly products.

Empirically, this research's results contribute as an idea for future research and literature, especially for strategic management's area and fill research's gap in (Pilarczyk & Grzesiuk, 2016) which states that there is a gap between activities undertaken by retail sector with customer's expectations, thus retail become the initiator of green communication and engage consumers to participate and support these activities. The results provide a practical contribution for companies in defining and designing strategies related to green product innovation to boost company's performance. Retail need to understand the customer, so innovation undertaken by the company in line with customer expectations in order to achieve better performance. Customer purchase decision is influenced by the price, so product's price becomes important

consideration. Innovation must be balanced with the provision of information. The information isn't just the product's attributes (logo, drawings and claims), but also the benefits derived from green product. Various innovations would be better if supported by managerial attention and commitment to environment. In addition, company also needs to collaborate with various parties (such as suppliers and society) and continuous improvement of the internal organization's systems.

This research has limitation related to small sample because only few retails that involve in green product innovation and some retail didn't want to be research's sample. Beside that, the result of this research only generalize in retail sector. Future research is expected to involve different variables and indicators because there are several factors that have impact on firm performance. In addition, further research is expected to have a broader scope and applied to different sectors. For the company, it's important to give attention on several factors that support the success of green product innovation in achieving better performance, such as managerial environmental concern and green communication as consideration in determining the policies and strategies of the company. Green communication strategies need to be applied in order to increase customer's knowledge about green product and boost green product's sales. In addition, the manager's concern to the environment issues also needs to be improved to support the success of green product innovation. Beside that, companies should improve the giving of information and green product's promotion to encourage customer in purchasing organic products and using environmentally friendly packaging (such as using reusable bags or cardboard).

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— This article does not have any appendix. —