

Determinants of Innovation in Small and Medium Enterprises in Jember, East Java, Indonesia

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Abstract

This study examines the effect of leadership, technological capabilities, learning, and industry competitive forces on the innovation of the Small and Medium Enterprises in the Jember Regency, East Java Province. The samples are the owner-managers of 113 SMEs engaged in five different sectors namely meubelair, food and beverage specialties, handicrafts; batik and embroidery. The hypotheses were tested using multiple linear regression. Results show that the technological capabilities and the industry competitive forces have positive and significant effect on the innovation of SMEs, while leadership and learning do have not significant effect.

Keywords: *Leadership, Technological Capabilities, Learning, Industry Competitive Forces, Innovation, Small and Medium Enterprises.*

1. INTRODUCTION

The Small and Medium Enterprises (SMEs) currently are facing significant challenges from globalization. Khaliq *et al.* (2014) revealed that globalization has given the competitive pressure on SMEs to improve its performance. As a profit oriented entity, SMEs should create a competitive advantage in order to survive the competition. An important element in creating a competitive advantage is through differentiation of products and services (Frybourg, 1997). This differentiation is not only related with variations or combinations and quick response to market, but also with creativity. Creativity is important in innovation.

According to Fontana (2011), innovation is a social and economic success for the introduction of a new way or a new combination of old way of transforming inputs into outputs such that generated major changes in the ratio between the value of the benefits and the price according to the perception of the buyers and/or users. This research focuses on the dimensions, most commonly used namely the product innovation and process innovation as advocated by Ar and Baki (2011), Suh and Kim (2012), and Ndubisi and Agarwal (2014). The description of both dimensions entails two key issues. Firstly, product innovation, that involves the creation of new products, to create a market, new customer or satisfying market/existing customers. Secondly, innovation process involves the creation or improvement of production methods that enable service or administrative operations to support the creation of new products, and to improve the process of technology or operational practice (Gopalakrishnan and Damanpour, 1997; Langley *et al.*, 2005; Okay *et al.*, 2007).

Innovation does not always involve the adoption of radical new technology and the introduction of major products, services or processes. SMEs may concentrate on incremental innovations based on the ideas adopted from customers, competitors and suppliers to improve product and process to be a more effective way to increase overall competitiveness (Jones and Tilley, 2003).

There are many factors that affect innovation in SMEs. These factors can be divided into two factors, namely the internal and external factors to the entity. *Internal factors* could be leadership (Aslan *et al.*, 2011; Iscan *et al.*, 2014), technological capabilities (Xie *et al.*, 2013; Zarco *et al.*, 2014), and learning (Salavou *et al.*, 2004; Kim *et al.*, 2011; Keskin, 2006; Zarco *et al.*, 2014). Whereas *external factors* could be industry competitive forces (Chang *et al.*, 2011; Salavou *et al.*, 2004).

Many studies have been carried out on the influence of factors of innovation of SMEs. Results of previous studies show that there are some aspects that could be related to improving innovation. This study focuses on examining leadership, technological capabilities, learning, and industry competitive forces that can help SMEs in Jember Regency of East Java Province in innovating.

Jember Regency is selected because it has the highest number of SMEs in East Java Province. Up to 2016, Jember has population of 2,529,967 people. By 2016, the number of SMEs in Jember Regency reached a total of 424,151 units and employed about 729,962 people (Department of Cooperatives and SMEs in East Java Province).

The selected sectors are meubelair, food and beverage specialties, handicrafts, batik and embroidery since these sectors produce goods and prioritize the elements of creativity. A total of 113 owners-managers of SMEs returned the questionnaires. Results show that the technological capabilities and the industry competitive forces have positive and significant effect on the innovation of SMEs, while leadership and learning do have not significant effect.

This paper is organized as follows. Section two presents the review of literature and the development of hypothesis. This is followed by the description of research methods. Section four provides results and discussion. Final section concludes the paper.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Leadership Effect on Innovation

Leadership plays an important role for the success or failure of a company. The leadership style applied within an organization determines the generation of innovation. Innovation is essentially determined by the ability of managers to motivate employees so that exploring all the potential they have (Ancok, 2012). Leaders ranging from CEO to the operational units those lead in the bottom line in the organizational structure who will determine the potential of the organization for many innovations. Prior studies have found that one of the factors that affect the SME innovation is leadership. Aslan *et al.* (2011) and Iscan *et al.* (2014) examine SMEs in Turkey and find that transformational leadership has a positive and significant impact on

organizational innovation. Referring to the description above, it is clear that the leadership affects innovation. Therefore, the study proposes the following hypothesis:

H₁: Leadership has positive effect on the innovation of SMEs.

2.2 Technological Capabilities Effect on Innovation

Strategic use of information technology is one of the critical success factors of innovation for SMEs (DeHayes and Haerberle, 1990). Company with timely access to technical, industry knowledge and insight into the latest technological developments will be more successful in innovation. Prior studies have found that one of the factors that influences the innovation of SMEs is technological capabilities. Xie *et al.* (2013) found that information technology has a positive relationship with the innovation of SMEs in China. The use of Information and Communication Technology (ICT) in the Spanish's SMEs positively and significantly affects the results of innovation (Zarco *et al.*, 2014). From the aforementioned arguments, it is clear that innovation adopted by SMEs is determined by the technological capabilities. Therefore, the hypothesis of this study is as follows.

H₂: Technological capabilities have positive effect on the innovation of SMEs.

2.3 Learning Effect on Innovation

The learning process at the organizational level involves a key component that supports the productivity of knowledge, including the search for information, assimilate, develop and create new knowledge on products, processes and services (Gunsel *et al.*, 2011). Prior studies have found that one of the factors that affect the innovation of SMEs is learning. According to Salavou *et al.* (2004), learning positively and significantly impact on the innovation of SMEs in Greece. Similarly, SMEs in Korea show that learning has a positive and significant impact on innovation (Kim *et al.*, 2011). Learning orientation positively also affects the innovation of SMEs in Turkey (Keskin, 2006). In addition, learning cooperative in Spanish SMEs positively and significantly affect the results of innovation (Zarco *et al.*, 2014).

Referring to the description above, it is clear that the learning effect on innovation. Therefore, the hypothesis of this study is as follows.

H₃: Learning has positive effect on the innovation of SMEs.

2.4 Industry Competitive Forces Effect on Innovation

According to Zorgiebel (1983), suppression of competitiveness based on the identification of the needs of the environment so that each company is expected to answer the needs desired by the environment either through the creation of new products that are completely new or development of existing products, in order to create superior value to win the competition. Prior studies have found that one of the factors that influence the innovation of SMEs is industry competitive forces. According to Chang *et al.* (2011), environment with high dynamics and high competitiveness is positively related to innovation. Characteristics associated with an external competition such as concentration and barriers to new entrants have positive and significant effect on the innovation of SMEs in Greece (Salavou *et al.*, 2004). Thus, it is clear that innovation adopted by SMEs is determined by industry competitive forces. Therefore, the hypothesis of this study is as follows.

H₄: Industry competitive forces have positive effect on the innovation of SMEs.

3. RESEARCH METHODS

The population of this research is all SMEs in the meubelair, food and beverage specialties, handicrafts, batik and embroidery sectors in Jember Regency, East Java Province, Indonesia, of which there are 156 business units. Homogeneity of these five sectors can be seen from several aspects, namely (a) transforming raw materials into finished goods that have a high added value, (b) innovation is an important part because it emphasizes the element of creativity, (c) have the potential to offer goods via information and communication technologies, and (d) have the same adaptive response from the external environment.

The samples were determined using proportionate sampling method of each sector. The respondents are the owner-managers of the business. The total sample consists of 113 business units. Table 1 shows the process of determining the 113 respondents of the study.

Table 1. Population and Sample Research

Sector	Population		Sample		Sample Percentage of Population
	Total	Percentage	Total	Percentage	
Meubelair	46	29.49%	33	29.49%	71.74%
Food and beverage specialties	56	35.90%	41	35.90%	71.43%
Handicrafts	42	26.92%	30	26.92%	71.43%
Batik	7	4.49%	5	4.49%	71.43%
Embroidery	5	3.20%	4	3.20%	80.00%
Total	156	100%	113	100%	71.80%

This study uses a questionnaire with a 5-point Likert scale. The questionnaire is adapted from the literature. The questionnaires' measurement was adapted from previous studies, leadership (Aslan *et al.*, 2011), technological capabilities (Lin, 2007), learning (Mesa *et al.*, 2013; Mesa *et al.*, 2015), industry competitive forces (Metts, 2007), and innovation (Ar *et al.*, 2011).

The questionnaire submitted to the respondents by direct visit. Submission of questionnaire was conducted from July 2016 to September 2016.

4. RESULTS AND DISCUSSION

Results of validity tests show that all variables satisfy the requirement of validity (correlation coefficients all are < 0.05). Results of reliability tests show the Cronbach Alpha coefficients of above 0.70. So, the variables meet the validity and reliability requirement.

Table 2 shows the general description of respondents by gender, age, marital status, lastest education, and the length of running the business.

Table 2. General Description of Respondents

No	Characteristics	Description	Distribution	
			Frequency	Percentage (%)
1.	Gender	Male	80	70.8
		Female	33	29.2
2.	Age (year)	21-30	1	0.9
		31-40	37	32.7
		41-50	57	50.4
		> 50	18	15.9
3.	Marital status	Married	111	98.2
		Single	2	1.8
4.	Lastest education	Junior high school	12	10.6
		Senior high school	73	64.6
		Diploma degree	9	8.0
		Bachelor degree	16	14.2
		Other	3	2.7
5.	The length of leading the business unit (year)	≤ 3	1	0.9
		4-5	7	6.2
		6-10	48	42.5
		11-15	37	32.7
		> 15	20	17.7

Most of the respondents were male (70.8%), most of them aged between 41 to 50 years (50.4%). Almost all of the respondents were married (98.2%). The majority of respondents were high school graduates (64.6%) and 42.5 percent of them were in the business for 6 to 10 years.

The results of the correlation coefficient calculation are shown in Table 3.

Table 3. Correlation Coefficient Calculation Results (r)

Variable	Leadership	Technological Capabilities	Learning	Industry Competitive Forces
Technological Capabilities	-0.0374			
Learning	0.3879**	0.2385*		
Industry Competitive Forces	0.6985**	-0.2226*	0.3537**	
Innovation	0.5008**	0.0006	0.2419**	0.6430**

** , * indicate significant at $\alpha = 1\%$ and $\alpha = 5\%$, respectively.

As shown in Table 3, almost all variables have a significant relationship, except leadership does not have significant relationship with technological capabilities and technological capabilities does not have significant relationship with innovation.

Table 4 provides the results of regression analysis. Two variables, i.e., technological capabilities and industry competitive forces positively and significantly affect the innovation of SMEs. Leadership and learning do not have significant effect; even the coefficient for learning is negative.

Table 4. t test Results

Variable	Coefficient	t	Sig.
Constants	335.31	1.720	0.088
Leadership	3.79	0.763	0.447
Technological Capabilities	4.72	2.012	0.047*
Learning	- 1.81	-0.648	0.518
Industry Competitive Forces	4.52	5.989	0.000**

** , * indicate significant at $\alpha = 1\%$ and $\alpha = 5\%$, respectively.

Leadership does not have significant effect on the innovation of SMEs, so ~~that~~ H_1 is rejected. It can be interpreted that the leadership as expressed in terms of charisma, intellectual stimulation, and individualized consideration owned by the owner-managers of SMEs have not been quite able to increase the SMEs innovation both for product innovation and process innovation. This finding is in contrast to previous statements regarding the leadership role as a determinant of innovation.

When observed from the characteristics of respondents, the age of most SMEs owner-managers was found to be more on the higher side that is to say 50.4% of respondents aged between 41 to 50 years, which indicates their innovation is not emerging as shown by no innovation of products and processes. Although most owner-managers of SMEs have the ability to make a much better product but in reality they do not bother applying their abilities. They are generally quite satisfied with what have been achieved. Different results would be evident if the owner-managers are of younger ages because young person is more likely to achieve higher innovation with their enthusiasm. Innovation show the positive effect of SMEs managed by young leader with age range of 21-40 years (Ndubisi and Agarwal, 2014; Aslan *et al.*, 2011).

Technological capability has positive and significant effect on the innovation of SMEs, so that the results accept H_2 . That is, the increased of technological capabilities will increase the innovation of SMEs. The finding provides evidence that the technological capability which consists of an indicator of the usefulness of the technology and the ability to share knowledge through technological innovation has a significant effect on SMEs.

These findings support the theoretical considerations that companies with technological capabilities are more successful in innovation (DeHayes and Haeberle, 1990). This finding is consistent with Xie *et al.* (2013) and Zarco *et al.* (2014), who examine the relationship of technological capabilities with innovative technological capabilities of SMEs, in particular related to Information and Communication Technology (ICT).

Learning does not have significant effect on the innovation of SMEs, so that H_3 rejected. It can be interpreted that factors such as learning support experimentation, risk taking, interaction with the external environment, dialogue, and participatory decision-owned SMEs do not lead to encourage innovation in the SMEs both for product innovation and process innovation. This finding is contrast of previous statements regarding learning as a determinant of innovation.

When observed from the characteristics of respondents, most of the owner-managers of SMEs filling the questionnaires were holding senior high school (64.6%), which indicates that the respondents in this study is that they lead SMEs belonging to the category of low education. Different results possible will happen if those who led SMEs belonging to the category of higher education educational factors can affect the learning capacity of respondents to innovate.

Industry competitive forces have positive and significant effect on the innovation of SMEs (support H_4). That is, if the increased of industry competitive forces will also increase SMEs' innovation. The findings provide evidence that industry competitive forces consisting of indicator level of competition among the competitors, barriers to new entrants, the threat of substitute products, bargaining power of buyers, and the bargaining power of suppliers will significantly influence the SME innovation both product innovation and process innovation. The finding of this study confirms Zоргiebel (1983) who argues that the company is expected to win the competition through innovation. It also supports Chang *et al.* (2011) and Salavou *et al.* (2004), who examine the relationship of industry competitive forces with SMEs' innovation.

5. CONCLUSION

This study aimed to examine the effect of leadership, technological capabilities, learning, and industry competitive forces on the innovation of SMEs. The findings show that technological capabilities and industry competitive forces have positive and significant effect on the innovation of SMEs. The Other two variables, namely leadership and learning, do not have significant effect on the innovation of SMEs.

6. LIMITATIONS AND FURTHER RESEARCH

This study examined owner-managers of five sectors SMEs, namely meubelair, food and beverage specialties, handicrafts, batik and embroidery. These sectors produce goods and prioritize the elements of creativity, we might believe that *heterogeneity* could be the cause of problem. Thus, future studies may take more specific sectors, so that *heterogeneity* of data are more warranted.

The study employed three measures or dimensions of variable transformational leadership, namely charisma, intellectual stimulation, and individualized consideration. It did not include another aspect of dimensions of transformational leadership, namely inspirational motivation (Winkler, 2010). Subsequent researches may add another variable in the dimensions of transformational leadership i.e. inspirational motivation so that all dimensions of transformational leadership are used.

This study was conducted specifically in the local context of SMEs of Jember Regency in East Java Province and thus its generalizability is at minimum. Therefore, future studies are expected to use more samples and cover wider area so that the results can be more generalizable.

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APPENDIX

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	Kekuatan Kompetitif Industri, Kapabilitas Teknologi, Pembelajaran, Kepemimpinan	.	Enter

a. All requested variables entered.

b. Dependent Variable: Inovasi

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.663 ^a	.440	.419	64.001

a. Predictors: (Constant), Kekuatan Kompetitif Industri, Kapabilitas Teknologi, Pembelajaran, Kepemimpinan

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	347061.051	4	86765.263	21.182	.000 ^a
	Residual	442386.382	108	4096.170		
	Total	789447.434	112			

a. Predictors: (Constant), Kekuatan Kompetitif Industri, Kapabilitas Teknologi, Pembelajaran, Kepemimpinan

b. Dependent Variable: Inovasi

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	335.306	194.905		1.720	.088
	Kepemimpinan	3.790	4.967	.079	.763	.447
	Kapabilitas Teknologi	4.720	2.346	.159	2.012	.047
	Pembelajaran	-1.809	2.792	-.054	-.648	.518
	Kekuatan Kompetitif Industri	4.518	.000	.642	5.989	.000

a. Dependent Variable: Inovasi