

FACTORS INFLUENCING THE INNOVATION CAPABILITY IN SMALL-SCALE INDUSTRIAL ACTIVITIES IN WEST SUMATERA

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ABSTRACT

This study generally identifies the factors that influence the innovation carried out by food-based Small Industries in developing their business. In particular, this study aims to identify innovations that have been carried out by small industry players and the factors that influence innovation by small industries in West Sumatra. Descriptive qualitative and quantitative analysis were used. Quantitative analysis was done using the logit model. The results of the study showed that the number of small industrial entrepreneurs who innovate in the form of products, processes, technology, and packaging is still very low. Small industry entrepreneurs who innovated related to products were only 6.7%, while none of the small industry entrepreneurs did technological innovation. The most innovative innovation activity carried out by small-scale entrepreneurs was packaging innovation, 48.3%. Product innovation was influenced significantly by the age of the entrepreneur, business experience, and participation in the organization. Packaging innovation was influenced significantly by education, business experience, dummy training and turnover. Technological innovation was significantly influenced by business experience, turnover, training participation.

Keywords: *small food industry, innovation, products, packaging, technology*

BACKGROUND

The Small and Medium Scale Industry (SMIs) has significant contribution in Indonesian economic development. SMIs business orientation not only meets the local market but also the export market, so that the ability or power of innovation and creativity of SMIs is very important. Innovation and creativity will cause SMIs to be more able to develop by following market trends and can create new markets, so that businesses run not static and always develop. The power of innovation and creativity will lead to more developed SMIs both in terms of market reach and business turnover.

The innovations that can be done by SMIs actors can be in the form of product innovation, process innovation, organizational innovation, and business innovation. Rademakers (2005) states that product innovation is related to the creation of new products and services; process innovation related to new methods of carrying out better or cheaper value-added activities; organizational innovation relates to new methods of managing, coordinating, and overseeing employees, activities, and responsibilities; business innovation is related to the combination of new products, processes and organizational systems. Ismail (2013) states that innovation is significantly related to business performance and competitiveness of small industries. Nasution et al. (2011) suggested that innovation capability refers to the ability of an organization to adopt or implement new idea,

processes, or products successfully Potential SMIs in West Sumatra were great especially in the SME food and clothing SMIs. West Sumatra is famous for its various processed foods, and also its handicraft products which are expected to reach the export market. Tanah Datar District is one of the centers of SMIs in the Province of West Sumatra, namely the food center. Processed food product is a product that is very important to develop innovation and creativity, because the Province of West Sumatra is known for its regional food, and West Sumatra as a tourist destination. On the other hand, SMIS products in Tanah Datar District still have low competitiveness and innovation. Production that is produced from time to time is generally constant and does not change, as well as the production process carried out in the same way. While Ismail (2013) states that innovation is significantly related to business performance and competitiveness of small industries. This study aims to identify innovations that have been carried out by small industry players and the factors that influence innovation by small industries in West Sumatra. This study uses descriptive qualitative and quantitative analysis.

RESEARCH METHODS

This research was conducted at several SMI centers in Tanah Datar District, West Sumatra. The data consists of primary data and secondary data. Primary data were obtained using interview guides and questionnaires. Interview guides are used to obtain information from key informants, while questionnaires are used to obtain information from respondents. Data collected includes the characteristics of SMI owners, the development of innovations undertaken (product innovations, process innovations, and organizational innovations), SMIs human resources, SMIS institutions. The innovation variables observed in this study consisted of product innovation, process innovation, and institutional or management innovation. Product innovation is seen from the development of product form, product composition, product diversification, and product packaging over the past 5 years. Process innovation includes the product production process, the use of new technologies and new elements in the product production process. Institutional / organizational innovation, consisting of flexibility from the form of business organization (organizational management). Sampling was carried out in several districts that had the largest number of SMIs, then stratified by dividing the SMIs in advance to the small industry, and medium industry groups. Samples were taken of 60 samples were spread in several districts. To find out the form of innovation that has been carried out by SMIs, a descriptive analysis is used, whereas to find out the factors that influence the innovation a logit model is used. The factors that influence SMIS innovation can be divided into several equations:

$$Y_i = b_0 + \sum b_i X_i + E_i$$

As with the logit model, we look for the log odd values from the model first, with the equation:

$$\ln P/1-P = b_0 + \sum b_i X_i + E_i$$

To get the predicted value or presumption of the four probability of innovation, the equation becomes:

$$P_i = \frac{1}{1 + \exp Z_i}$$

Information:

P_i : Category of probability of innovation carried out by SMIs; product form innovation, technology innovation, packaging innovation

$b_i X_i$: Education, business experience, participation in training, participation in business organizations, power to take risks.

RESULT AND DISCUSSION

From the results of the study, it found that only 6.67% of SMIs entrepreneurs who made product innovations changed the shape of products or diversified products, and entrepreneurs who varied products by 11.67%. Changes to product variations can be made in the form of variations in size, shape, and taste by making several variations of the taste of the original product. About 10% of SMIs entrepreneurs make changes in the composition of the product, but only 1.67% of SMIs entrepreneurs make changes or innovations in the production process. Aryanti & Utami (2022) also found that innovation strategy is still minimally applied in the creative industry in Bandung. Only the process innovation strategy is well implemented, while the product innovation strategy, marketing and organization have not been optimally implemented.

The number of SMIs entrepreneurs who make changes to machines or tools is 6.67%, while the number of SMIs entrepreneurs who use new technology is around 15%. The use of this new technology is related to the use of new machinery and equipment related to the production process of products, such as coffee grinding machines, packaging presses, and kneading machines. The use of new technology is not widely used because it will add to the cost of production and labor costs and lack of capital to buy new tools. In contrast, Makuwe (2021) found that the majority of SMEs in Durban surveyed invest in technology equipment. While, Bayarçelik et al. (2014) believe that some SMEs fail to develop new products/ services because of the cost associated with acquiring technologies.

Table 1. Types of Innovations Conducted by SMIS Respondents

Form of Innovation	Amount (SMIS)	Percentage (%)
Product form	4	6.67
Diversification	4	6.67
Product variations Changes in product composition	7	11.67
Changes to machines and tools	4	6.67
New technology	9	15.00
Changes to packaging Change in organizational form	29	48.33
Change in organizational management	0	0.00

SMIs entrepreneurs who innovated in product packaging amounted to 48.33%. This shows that SMIs are more inclined to change product packaging than to change product shape and product processing. Overall, none of the SMIs entrepreneurs have changed the form of organization and

management of business organizations. The form of business organization is still in the form of an individual business, and in general is still a household industry whose management overlaps with the household economy. In contrast, Rajapathirana & Hui (2018) state that effective management of innovation capability which helps to deliver more effective innovations outcomes to generate better performance and it would be benefits for management of the insurance companies.

The reasons for SMIs entrepreneurs who do not make changes or innovations in terms of both products and processes include: 1) Consumer demand or consumer tastes, consumers prefer original or original products, 2) To make changes or innovations requires greater costs, while entrepreneurs do not have enough capital to make changes, and 3) The quality of human resources or entrepreneurs themselves are still low, so they prefer the traditional way. The use of new technology, such as the use of new equipment and machinery is more complex and requires sufficient knowledge to operate it.

Characteristics of SMIs Entrepreneur in Tanah Datar District

The SMIs used as samples from this study are spread in several districts in Tanah Datar Regency. Respondent characteristics include age, gender, education, business experience, number of family members and business forms.

Table 2. Characteristics of Respondent

No	Type of Characteristics	Percentage (%)
1.	Age	
	15-39	30
	40-65	70
	> 65	0
2.	Gender	
	Male	81.67
	Female	18.33
3.	Business experience	
	< 5	11.67
	5-15	60
	> 15	28.33
4.	Education	
	Elementary School	13
	Junior High School	18
	Senior High School	57
	Bachelor	1.10
5.	Participation in training	
	Participate	61.67
	Not Participate	38.33
6.	Join The Organization	
	Join	11.67
	Not Join	88.33

This Table shows that SMIs entrepreneurs are in the productive age of adulthood. In general, SMIs entrepreneurs are male, which is around 81.67%. SMIs entrepreneurs are quite experienced in their businesses. the level of education of SMIs entrepreneurs is still relatively low. A low level of

education will affect the way of thinking and the way of entrepreneurs in absorbing innovation and new changes. The form of business undertaken by SMIs as a whole is still in the form of individual businesses. However, around 66.67% of businesses have been incorporated and only 33.33% have not been incorporated. Around 61.67% of SMIS entrepreneurs have participated in training that supports their business activities. However, around 88.33% of SMIs do not join an organization or association that is related to the business they are running. The training activities will add to the insights and knowledge of SMI entrepreneurs better about the business they are running.

Around 62% of SMIs entrepreneurs have had business development in the last 5 years, and only 13% of entrepreneurs have had a business decline in the last 5 years, while 25% have had static businesses. This shows that the SMIs business that is run has quite good prospects to be developed. However, in the implementation there are some weaknesses that are owned by SMIs in running their business. Recording of financial statements is not carried out so that the calculation of profit / loss is unclear. The recording of financial statements is not carried out because the profits obtained are reused for venture capital and minimal financial knowledge is available. Fluctuating / non-permanent raw material prices make entrepreneurs not too calculating business finances.

Factors Influencing the Ability of Innovation of Food SMIs in Tanah Datar District

Table 3 shows that the age of the entrepreneur, business experience, and participation in the organization have a significant effect on the innovation of product forms carried out by SMIs at a real level of 15%. Estimation results show that age is inversely proportional to product form innovation. The odds ratio value of 0.864 shows that the opportunity for older entrepreneurs to innovate in the form of products is 0.864 times that of younger SMIS entrepreneurs. This shows that young SMIS entrepreneurs have more opportunities to innovate product forms than older SMIS entrepreneurs.

Table 3. Logit Estimation Results from Factors that Influence Product Form innovation

Parameter	Estimation	Odds ratio	Pr> Chisq
Age of the entrepreneur	-0.1463	0.864	0.1178
Business experience dummy	0.1058	1.112	0.1464
Organizational participation	1.9275	6.873	0.1229

Business experience has a positive and significant influence on product innovation. Odds ratio value of 1.112 shows that if business experience increases 1 year, then the opportunity to innovate product form is 1.112 times than the opportunity to remain in the existing product form. This shows that entrepreneurs who are more experienced in their businesses already have sufficient knowledge about demand, risk, and product opportunities, so that the possibility to innovate product forms is greater. The participation of SMIs entrepreneurs in organizations positively and significantly influences the opportunities for product form innovation. The odds ratio value of 6.873 indicates that SMIs who join organizations that are related to their business activities will have the opportunity to innovate product forms by 6.873 times rather than remain in the existing product form. Related to Adelekan (2016) wich stated that there is a meaningful relationship between organizational culture and innovation capability of the SMEs.

Table 4. Logit Estimation Results of Factors Influencing SMI Repondent Packaging Innovations

Parameter	Estimation	Odds ratio	Pr > Chisq
Education	-0.268	0.765	0.097
Dummy organizational participation	1.256	3.512	0.331
Business experience	0.076	1.080	0.124
Dummy training participation	2.688	14.703	0.001
Omzet	3.42E-08	1.000	0.187

Table 4 shows that education, business experience, dummy participating in training and turnover significantly influence packaging innovation with up to 20% significance level, while dummy participation in organizations does not influence product packaging innovation. The education and participation of SMI entrepreneurs in training activities related to the development of their businesses will increase entrepreneur's knowledge and insight, and will encourage entrepreneurs to innovate their products, especially packaging. SME entrepreneurs are starting to realize that packaging is an important factor in marketing a product. The odds ratio for the training dummy is quite high, i.e. 14.703 which means that if employers take part in the training, the chance to innovate packaging is 14.703 times rather than remaining on the existing packaging. Research by Khoiruddin and Aslichah (2017) also shows that education and training and exhibition of production results have a significant contribution to the development of SMIs in the food and beverage production sector in Jombang.

Business experience is also a factor that influencing packaging innovation. Entrepreneurs who have longer business experience tend to have more courageous decision making in changing and improving products in a new direction. The odds ratio value of 1.08 means that if business experience increases by 1 year, then the opportunity to innovate packaging is 1.08 times rather than remaining on the old packaging.

Business turnover or sales value also affects packaging innovation, but an odds ratio of 1,000 indicates that if the sales volume increases Rp 1, then entrepreneurs have the same opportunity to innovate packaging without packaging innovation. That is, although business turnover increases, but it does not really affect the form of packaging that is done. This is also in accordance with the findings in the field, that sometimes these SME entrepreneurs sell in large quantities without making attractive packages. This bias is done for sale to retailers who then make their own packaging.

Table 5. Logit Estimation Results Factors that Influence Technology Innovation

Parameter	Estimation	Odds ratio	Pr> Chisq
Dummy organizational participation	0.9806	2.6666	0.3668
Business experience	0.0539	1.055	0.1713
Dummy training participation	1.2467	3.479	0.2905
Omzet	2.01E-08	1.000	0.1583

Table 5 shows that business experience and turnover influence technological innovation to a real level of 20%, while dummy training only affects technological innovation to a real level of 30%. Dummy joined the organization does not affect technological innovation entrepreneurs SMI respondents. The dummy odds ratio value of 3.479 shows that if SMIs enter training related to their business, the opportunity to innovate in technology is 3.479 times rather than using existing technology. This means that if training activities are given to SMI entrepreneurs, the SMI's knowledge

of product production and technology will increase, entrepreneurs will be encouraged to make technological changes. Sales turnover also affects technological innovation, a larger turnover will increase the ability of entrepreneurs to cultivate capital, so entrepreneurs have the ability to use new technology, both in the form of newer equipment and machinery or better technology. This is also in line with information provided by the Tanah Datar Regency Industry and Trade Office, that in order to bring in new technology, it is complemented by conducting training in advance to SMIs.

CONCLUSION AND SUGGESTION

The number of SME entrepreneurs who innovate in the form of products, processes, technology, packaging is still very small. The most innovation activities carried out by SMIs are packaging innovation, which is around 48.33%. Product form innovation is significantly influenced by the age of the entrepreneur, business experience, and participation in the organization. Packaging innovation is significantly affected by education, business experience, dummy training and turnover significantly influence packaging innovation with up to a significant level of 20%. Technological innovation is significantly influenced by business experience, and turnover reaches a real level of 20%, while dummy training only affects technological innovation to a real level of 30%. Training activities for SMIs should be done more by both agencies and existing SME associations, so that SMIs are more motivated to innovate in production.

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