



# Confirmatory Factor Analysis of Innovation and Marketing Performance in Creating Sustainable Competitive Advantage Herbal Medicine-Based Pharmaceutical Industry

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## ABSTRACT

Herbal medicines usage in Indonesia tends to increase. Indonesia is a very attractive market for herbal medicine. About 61% of 255 million of Indonesia population use herbs known as herbal medicine. This creates opportunities for East Java to become the center of Indonesian herbal medicine because East Java has great potential in herbal medicine development. This study purpose was to determine the relationship of each indicator with innovation and marketing performance variables to affect and contribute to creation of sustainable competitive advantage. Maximum likelihood estimation (MLE) is used to estimate the model parameters. The analysis technique used is a confirmatory factor analysis (CFA), a multivariate analysis method that can be used to test or confirm whether the measurement model is consistent with hypotheses. The research results showed that most powerful indicator to measure innovation is the leadership orientation, while the weakest indicator is source of internal innovation. Most powerful indicator to measure marketing performance is sales volume, while the weakest indicator is rate of sales growth. Most powerful indicator to measure sustainable competitive advantage is imitability (difficulty level to be imitated), while the weakest indicator is ease level to emulate the strategic assets owned by company.

**KEYWORDS:** Innovation, Marketing Performance, Sustainable Competitive Advantage, Herbal Medicine-Based Pharmaceutical Industry

## INTRODUCTION

The use of herbal medicines in Indonesia tends to increase. This is because herbal remedies are safer and more affordable. More empirical evidence results of scientific research and modernization of production process also increase the popularity of herbal medicine.

Indonesia is a very attractive market to herbal medicine. About 61% of 255 million Indonesia populations are already use herbs known as herbal medicine. In 2003 through 2010, the growth of herbal medicine industry has increased on average 54.25% higher than the industry growth of modern synthetic drug which reaches 26.93%. Even in 2012, national herbal medicine industry turnover has reached 13 trillion [13]. The trade value of herbal medicine in Indonesia is estimated to reach more than Rp 4 trillion per year [32].

This certainly creates opportunities for East Java Province to become the center of Indonesian herbal medicine. East Java is the province with great potential in herbal medicine development. It is shown by many

herbal drug companies, including Small Business Traditional Medicine (UKOT) that can support the local economy and improve the society welfare [26]

Medicinal plants source of forest result for herbal industry, particularly herbal medicine in Java Island, is largely come from Meru Betiri National Park and Saradan forest - Madiun, East Java. The potential of medicinal plants in national park includes 239 species of medicinal plants which are divided into 78 families. Communities around Saradan forest - Madiun also has been used more than 44 kinds of medicinal plants [16].

Achievement and sustainability of competitive advantage is the fundamental basis for long-term success of a company. Therefore, the resources and understanding of company's behavior that can certainly encourage the creation of sustainable competitive advantage becomes a central issue in marketing strategy.

This study uses a confirmatory factor analysis to determine the relationship between indicator of variables (later written as indicator) with latent variables (later mentioned as variables) of innovation and marketing performance that affect on sustainable competitive advantage, by method of maximum likelihood estimation (MLE) to estimate the model parameters.

#### *Research Scope:*

This study analyzes and tests each indicator of innovation, marketing performance, and sustainable competitive advantage. This study is limited to application of confirmatory factor analysis.

#### *Literature Review:*

##### *Innovation:*

Innovation has become one focus attention because innovation has first strategic position to create sustainable competitive advantage. Thompson in Hurley and Hult [19] defines innovation classically as the implementation of new ideas. Meanwhile, Duncan and Holbek in Hurley and Hult [19] defines innovation as ideas, practices, and materials with new adoption of relevant unit. More broadly, Amabile *et al.* in Hurley and Hult [19] defines innovation as the successful implementation of a creative idea.

Innovation is one of two important things in business, as proposed by Drucker in Han *et al.* [15] that "... only marketing and innovation that are important for business, others are cost". Innovation can provide clear direction for company to improve the performance and sustainability of competitive advantage [15]. Barney in Menon *et al.* [24] adds that innovative companies generally more successful to create a sustainable competitive advantage because they able to improve other capabilities in a unique and superior way.

Innovation in this study is a multidimensional concept that is measured by instrument developed by Thompson [34] and Ambrosio [2], namely leadership orientation, process innovation, product innovation, internal sources innovation, external sources innovation, and level of investment innovation.

Previous studies examine the innovation, especially the effect and contribution to creation of sustainable competitive advantage. Foxall [10], Wolfe [36], Rogers [31], and Gatignon and Xuereb [11] which is summarized by Hoffman [18] explain that a sustainable competitive advantage can be generated from innovation that consistent with company and provide some real value for customers. Consistent innovation become company's source of sustainable competitive advantage [22]. Mintzberg [25] explains that innovation significantly affect on sustainable competitive advantage. Innovative companies can differentiate their products from competitors. It is consistent with study of Drucker in Han *et al.* [15], Barney in Menon *et al.* [24], Hitt *et al.* [17], and Lengnick-Hall [21].

##### *Marketing Performance:*

Marketing Performance has also become a focus attention because Marketing Performance strategically has second position after innovation to create sustainable competitive advantage. Marketing performance can be measured from sales volume or by comparing actual sales results with sales target [12,29]. Kim and Lim (1988) explains that Marketing Performance can be measured from sales growth level. Marketing performance can also be constructed by dimensions of sales effectiveness and sales growth rate [23]; sales level, market share, ability to seize market share, and sales growth rate (Okoroafo and Russow, 1991); sales growth rate [5,33]; the level of sales, market share and sales growth rate [1]; sales effectiveness, sales growth and market share [29].

Marketing performance in this study is measured by an instrument developed by Voss and Voss [35], namely sales volume, sales growth, and customers growth rate, sourced from Gove and Gross [12], McKee *et al.*, [23], Okoroafo and Russow [28], Carpano *et al.*, [6], Slater and Narver [33], Adu [1], Pelham [29], and Chakravarthy in Pelham (2000). It can be seen the extent of Marketing Performance achievement to generate sustainable competitive advantage. Marketing Performance is an important instrument to create and developing a sustainable competitive advantage [7].

##### *Sustainable Competitive Advantage:*

Sustainable competitive advantage is still used as one focus attention and attractive to be studied further. It is described by Kohli and Jaworski [20], Narver and Slater [27], Pelham [30], Ferdinand [7,8] and Hoffman

[18], that a research standpoint that continues to attract attention of marketing researchers is how companies deal with a competitor to get customers, and dealing with customers to shift strategic positions held by competitors to generate a sustainable competitive advantage.

Sustainable competitive advantage is happened when other companies are not able to replicate the strategic advantages development [6,3,4]. Hoffman [18] says that company's competitive advantage or superiority will be sustained throughout a unique strategy to provide added value for customers, and as long as competitors are not able to find a way to emulate. The same view is also expressed by Hitt *et al.* [17] that company has a sustainable competitive advantage when implementing value-creation strategy and company's competitors are not continuously apply and/or not be able to emulate the strategy excellence. A company is believed to have a sustainable competitive advantage only after competitors fail to imitate its strategy [3]. Competitive advantage or competitive superiority will be sustained throughout a unique strategy to provide added value for customers, and as long as competitors are not able to find a way to emulate.

Sustainable competitive advantage in this study is measured by an instrument developed by Hall [14] and Hall in Ferdinand [9], which immitability (difficulty level to be emulated), durability (duration to keep away from competitors), and ease level to match company's strategic assets.

#### Research Methods:

The research location is selected intentionally in pharmaceutical industry of herbal-based medicine in East Java. The 21 companies are selected with the condition that: (1) the pharmaceutical companies have been incorporated in Indonesian Pharmaceutical Manufacturers Association (GPFI) East Java and also listed in spesialite drug information (ISO) Indonesia; and (2) the pharmaceutical industry generally has an advantage in their respective markets and there is no dominant or monopolistic markets.

This study is a combination of exploratory and confirmatory studies. Exploratory research is conducted to get in-depth information related to indicators to measure the variables of innovation, marketing performance and sustainable competitive advantage. The confirmatory study was performed to determine the value of each indicator loading factor of innovation, marketing performance and sustainable competitive advantage variables.

Primary data is collected by direct interview with company's management of herbal medicine using valid and reliable questionnaires. The secondary data is collected from information or data owned by related agencies as well as literature books, journals or various forms of publications as listed in references.

The analysis technique used is a confirmatory factor analysis (CFA). It is a multivariate analysis method that can be used to test or confirm whether the measurement model is suitable with hypotheses.

## RESULTS AND DISCUSSION

Latent variable in this study is measured by several indicators. Data from each of latent variables are selected by confirmatory factor analysis. Results of confirmatory factor analysis shows that loading factor indicator of innovation variables are shown in Table 1 below.

Table 1. Indicator Loading Factor of Innovation Variable

Indicator	Loading Factor
Leadership orientation	0.886
Product innovation	0.833
Investment level in internal innovation	0.761
Innovation process	0.627
External sources of innovation	0.620
Internal sources of innovation	0.332

Table 1 shows that indicators with largest or most powerful contribution to measure innovation variable is leadership orientation with loading factor value of 0.886, while the indicator with smallest or weakest contribution to measure innovation variable is internal source of innovation with a loading factor value of 0.332. The leadership orientation is the most powerful indicator variable to measure innovation. This is because herbal-medicine based of pharmaceutical industry in East Java is formed from companies as a first-to-market, second to market and late entrant. It is consistent with studies of Thompson [34] and Ambrosio [2].

Confirmatory factor analysis shows that value of each indicator loading factor of marketing performance variable are shown in Table 2 below.

Table 2: Indicators Loading Factor of Marketing Performance Variable

Indicators	Loading Factor
Sales volume	0.841
Customer growth rate	0.821
Sales growth rate	0.674

Table 2 shows that indicators with largest contribution or most powerful to measure marketing performance variables is sales volume with loading factor value of 0.841. Indicators with smallest or weakest contribution to measure performance marketing variable is the sales growth rate with loading factor value of 0.674. The sales volume is the most powerful indicator to measure of performance marketing variables. It is consistent with studies of Gove and Gross [12] and Chakravarthy, in Pelham [30].

Results of confirmatory factor analysis show that the value of each loading factor indicator of sustainable competitive advantage variable are shown in Table 3 below.

**Table 3:** Indicators Loading Factor of Sustainable Competitive Advantage Variable

Indicators	Loading Factor
Immitability (difficulty level to be emulated)	0.836
Durability (duration to keep away from competitors)	0.816
Ease level to emulate the strategic assets owned by company	0.801

Table 3 shows that indicators with largest contribution or most powerful to measure sustainable competitive advantage variable is imitability (difficulty level to be imitated) with loading factor value of 0.836. Indicators with smallest or weakest contribution to measure sustainable competitive advantage variable is Ease level to emulate the strategic assets owned by company with loading factor value of 0.801. Immitability (difficulty level to be emulated) is the most powerful indicator to measure sustainable competitive advantage variable. It is consistent with studies of Coyne [6], Barney [3], Barney, in Bharadwaj *et al.*, [4], Morgan and Hunt (1994), Morgan and Hunt (1996), Hitt *et al.* [17], and Hoffman [18].

#### Conclusions And Suggestions:

##### Conclusion:

Most powerful indicator to measure innovation variable is leadership orientation, while the weakest indicator to measure innovation variable is source of internal innovation. Most powerful indicator to measure marketing performance variable is sales volume, while the weakest indicator to measure marketing performance variable is sales growth rate. Most powerful indicator to measure sustainable competitive advantage variable is immitability, while the weakest indicator to measure sustainable competitive advantage variable is ease level to emulate the strategic assets owned by company.

##### Suggestion:

It needs more detailed studies by adding or developing indicators to measure variables of innovation, marketing performance and sustainable competitive advantage. It is hoped the results of confirmatory factor analysis to determine the indicator loading factor value of each latent variables can become more valid and reliable.

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