

## Does Pricing Strategy Increase the Competitive Advantage of Companies Implementing an ABC System?

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**Abstract.** *This study aims to investigate the extent to which pricing strategy creates an effective competitive advantage for companies implementing an activity-based costing (ABC) system in their production activities. The research data were obtained through a questionnaire-based survey of several manufacturing companies in Indonesia that implement ABC systems. This research used the Structural Equation Model with Partial Least Square statistical method. The results of this research indicate that those companies who apply an ABC system are capable of making their pricing strategy more effective and increasing their competitive advantage. The empirical results show that price competition is unavoidable among manufacturing industries. However, implementing an ABC system can increase manufacturing companies' competitive advantage. Thus, the implementation of an ABC System employs pricing strategy as a determinant factor of competitive advantage. This research supports the results of previous studies that also concluded that there is a strong relationship between ABC systems and competitive advantage. In addition, this research found that pricing strategy can improve competitive advantage with implementation of an ABC System.*

**Keywords:** *Activity-based costing system; competitive advantage; pricing strategy*

**Abstrak.** *Studi ini bertujuan untuk menginvestigasi sejauh mana Strategi Penetapan Harga mampu menciptakan Keunggulan Bersaing yang efektif bagi perusahaan yang menerapkan Sistem Activity Based Costing dalam kegiatan produksinya. Data dalam penelitian ini didapatkan menggunakan survei berbasis kuesioner dari perusahaan manufaktur di Indonesia yang menerapkan Sistem Activity Based Costing. Penelitian ini akan menggunakan Structural Equation Model (SEM) dengan metode statistik Partial Least Square. Hasil penelitian ini menunjukkan bahwa perusahaan yang menerapkan Sistem Activity Based Costing terbukti mampu membuat Strategi Penetapan Harga perusahaan lebih efektif dan sekaligus berdampak pada peningkatan Keunggulan Bersaing. Hasil empiris menunjukkan bahwa persaingan harga tidak dapat dihindari dalam industri manufaktur. Tetapi, dengan menerapkan Sistem Activity Based Costing, perusahaan manufaktur mampu meningkatkan Keunggulan Bersaing. Sehingga, kehadiran Sistem Activity Based Costing menjadi Strategi Penetapan Harga sebagai penentu Keunggulan Bersaing. Penelitian ini memperkuat hasil penelitian sebelumnya yang juga menyimpulkan bahwa ada hubungan yang kuat antara Sistem Activity Based Costing dan Keunggulan Bersaing. Dalam penelitian ini, juga menemukan kesimpulan bahwa Strategi Penetapan Harga mampu meningkatkan Keunggulan Bersaing melalui implementasi Sistem Activity Based Costing.*

**Kata kunci:** *Sistem activity based costing; keunggulan bersaing; strategi penetapan harga.*

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Received: September 12<sup>th</sup>, 2022; Revision: September 26<sup>th</sup>, 2022; Accepted: October 3<sup>rd</sup>, 2022

Print ISSN: 1412-1700; Online ISSN: 2089-7928. DOI: <http://dx.doi.org/10.12695/jmt.2022.21.3.4>

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## Introduction

The manufacturing sector is one of the sectors that drive Indonesian economic growth. The Ministry of Industry stated that manufacturing industry performance contributed up to 20.07% to the national gross domestic product (GDP) structure in the first quarter of 2019 (Ministry of Industry Website Management Team, 2019). Therefore, its development and growth have become a driving force of Indonesian economic growth. However, since the implementation of the ASEAN Economic Community (AEC), competition among ASEAN manufacturing industries has become fiercer due to the entry of foreign manufacturing industries.

Based on the 2016 Global Manufacturing Competitiveness Index (GMCI), the competitiveness of the Indonesian manufacturing industry in the ASEAN region is below that of Singapore, Thailand, Malaysia and Vietnam (Giffi, 2013). Indonesia, with an index score of 55.8, occupies ranking 19, below Singapore which is at ranking 10 with an index score of 68.4, followed by Thailand at ranking 14 with an index score of 60.4, then Malaysia at ranking 17 with index score of 59.0, and finally Vietnam at ranking 18 with an index score of 56.5. Therefore, Indonesian manufacturing companies must improve their competitive advantage in order to maintain their position among fierce business competition.

Competitive advantage is a company's ability to maintain its position against competitors by creating products or services that are superior to those of its competitors (Li et al., 2006). To survive and hold competitive advantage, companies must observe customer demands and be flexible, integrated, and automated in ways that increase their productivity and lower production costs (Özbayrak et al., 2004). A company is seen as holding competitive advantage when it can provide a product or service at a lower cost but higher quality than its competitors (Wanjiku, 2012).

Price can be used by a business to differentiate itself over its competitors and is also a major determinant of a company's profitability (Simon et al., 2008). The price set by a company will determine whether the company holds competitive advantage compared to its competitors (Dutta et al., 2003). In line with this statement, Tuncel et al. (2005) adds that without proper cost calculations, companies will not have competitive advantage. Therefore, to achieve competitive advantage, the company must well regulate its pricing strategy in order to manage market control, profitability, and cost effectiveness because customers will choose affordable goods with the same or even better quality (Bregman, 1995; T. Nagle & Hogan, 2007).

Pricing strategy is one of the most important management decisions because it affects the company's profitability and returns along with its market competitiveness (Monroe, 2003). In choosing an appropriate pricing strategy, companies must understand customer perceptions of prices, how to develop customer-perceived value, pricing objectives, and the company's competitive position in the market (De Toni et al., 2017; Hinterhuber & Liozu, 2014; Monroe, 2003). A study conducted by Cardinaels et al. (2004) found that market information would not credibly reflect customer demand and cost factors. Cardinales proved that the activity-based costing system model provided more accurate pricing information.

An activity-based costing (ABC) system is a cost planning system that tracks costs to calculate a product price based on the activities that consume resources and products or services (Chongruksut & Brooks, 2005). With ABC system information, the calculation of production costs will be more accurate, and this increases the effectiveness of decision making by management (Fatma, 2013). Various studies (Bhimani & Pigott, 1992; Innes & Mitchell, 1995; Krumwiede & Roth, 1997; Turney, 1996) support this statement, agreeing that ABC systems provide accurate calculation of production costs.

ABC systems can be utilized by manufacturing companies to improve manufacturing competitiveness, allowing companies to make better decisions based on a better understanding of the companies' cost structure (Raz & Elnathan, 1999). ABC systems are developed to analyze the determinants of activity in terms of product and process design features, to provide information on the cost implications of alternative design options. An ABC system can isolate various factors under the company's control which can be used to influence manufacturing costs (Banker et al., 2008).

An ABC system will provide accurate and reliable cost information to company managers, enabling them to identify indirect cost components more precisely. This contributes to a better understanding of how these product costs affect company performance (Azubike, 2017). Research conducted by Pierce & Brown (2004) reports that the highest percentage of companies adopting ABC systems are in the manufacturing sector (34.9%), followed by the financial services sector (28.6%), and the service sector (17.8%). Banker et al. (2008) found a positive impact of ABC systems on factory performance in world-class manufacturing practices.

Some previous research studies on ABC systems associate activity-based costing with companies' financial and operational performance (Kennedy & Affleck-Graves, 2001; Krumwiede & Charles, 2014; Maiga & Jacobs, 2003; Rendy & Devie, 2013), business strategy (Elhamma & Fei, 2013; Mahesa et al., 2019) and also competitive advantage (Beheshti, 2004). However, research on the relationship between ABC systems and competitive advantage has not been widely discussed, especially regarding the relationship between the two with respect to pricing strategy. Previous studies have already argued and examined the importance of ABC for determining pricing strategy (Coskun & Yilmaz, 2013; Lu et al., 2017; Raucci et al., 2020).

Some other studies have also highlighted the importance of pricing strategy in pursuing competitive advantage (Agbaeze et al., 2020; BAČÍK et al., 2014; Cressman, 2012; Jun & Lee, 2020; Nair, 2019). Therefore, it can be concluded that most previous studies only examine these relationships separately. However, a very limited number of studies look in combination at the relationships among ABC, pricing strategy, and competitive advantage.

ABC systems, pricing strategy, and competitive advantage are closely related. Implementing an ABC system in calculating costs of production can help companies and managers to take proper decisions, especially in considering pricing strategy as the basis for the company to reach competitive advantage.

The results show that pricing strategy is able to mediate the relationship between ABC and competitive advantage. In relation to resource-based theory, ABC will better inform decision makers to employ more precise pricing strategies. This internal competency could be seen as a unique knowledge resource. (Arasa & Achuora, 2020). Since implementing an ABC system involves significant investment, the findings of this study have some important implications for management, especially in manufacturing companies.

This study contributes to the literature as one of the few studies that identify the combined impact of ABC and pricing strategy on competitive advantage. Furthermore, this study focuses on competitive advantage of manufacturing companies in Indonesia that already implement ABC, and how pricing strategy can mediate the influence of ABC on competitive advantage.

#### *Resource-based View Theory*

Jay Barney (1991) developed the resource-based view concept which states that an organization will reach sustainable competitive advantage if it has valuable, unique, rare resources which are difficult to imitate. Those particular resources will help the company

exploit opportunities and avoid threats in the environment (Barney, 1991). This allows the company to implement strategies that increase their efficiency and effectiveness (Capron & Hulland, 1999). Resource-based view theory is useful for analyzing the internal resources of an organization and emphasizing those resources, and also for formulating strategies in order to reach sustainable competitive advantage (Madhani, 2010).

Resource-based view theory states that a valuable resource will enable the company to reduce costs while setting the price for a product or service at the same time (Joyce & Winch, 2004). Dutta et al. (2003) argued that to maintain the existing competitive advantage, the company must choose an appropriate pricing strategy to set prices and increase economic potential. The company's capability to set the right price is an important means of adjusting value and a significant determinant of the company's ability to generate value.

#### *Activity-based View Theory*

Activity-based view theory, proposed by Porter (1998), complements resource-based view theory and states that competitive strategy is manifested in a company's activities as it competes to reach its competitive advantage. Through those company activities, company resources will generate value for customers (Porter, 1998; Ray et al., 2004). Porter (1998) adds that utilization of activity drivers such as capacity, location, and scale can push the company to create value for customers through lower costs, producing efficient, qualified, innovative, and effective outcomes of company activities. With an activity-based view, the company will gain an advantageous position by configuring its separate industry-specific activities using cost drivers (Hill & Jones, 2012; Peteraf & Barney, 2003) so as to identify value-added activities and non-value-added activities (Wegmann & Nozile, 2009). This analysis uses an ABC system and can help companies to achieve overall efficiency by reducing or eliminating their non-value-added activities.

With an activity-based view, the cost driver used in an ABC system will reduce activity costs by lowering input costs or reducing the number of inputs needed to produce the same output (Hill & Jones, 2012; Peteraf & Barney, 2003). In addition, the activity-based view can help the company increase production efficiency and thus reduce costs and boost profitability (Demsetz, 1973; Foss, 1997).

#### *Definition of Activity-based Costing System*

An ABC system is a cost-planning system that tracks costs to calculate a product price based on the activities that consume resources (Chongruksut & Brooks, 2005). Chongruksut & Brooks mentioned that there are seven important factors in the implementation of ABC systems. They are top management support, competition, performance evaluation and compensation, training, non-accounting ownership, resources, consensus and clarity of objectives. The main purpose of an ABC system is to provide detailed information that describes the range of costs and consumption involved in activities done throughout the organization as well as to provide accurate information to managers to improve their decisions, including decisions on competitive pricing (Holmen, 1995).

ABC systems emphasize that most costs can be traced by assigning costs to the activities required to produce outputs, so that the calculation of a product's main cost by applying ABC will be more accurate than costs calculated using traditional systems (Sumarsid, 2011). In addition, the application of ABC can help employees to analyze costs and identify activities that improve value (value-added) and activities that do not improve value (non-value-added) (Wegmann & Nozile, 2009). This analysis can help companies to achieve overall efficiency by reducing or eliminating non-value-added activities.

### *Definition of Pricing Strategy*

Pricing strategy is one of the most important management decisions because it affects a company's profitability and returns along with its competitiveness (Monroe, 2003). In order to be able to compete in the market, a company must well regulate its pricing strategy so as not to lose control of the market, nor lower its profitability or cost-effectiveness (T. Nagle & Hogan, 2007). Nagle and Hogan also argued that the appropriate pricing strategy will affect customer consumption levels because the price the customer is willing to pay depends on the price set by the main competitor. Therefore, inappropriate pricing strategy allows customers to increase their bargaining power, forcing a price reduction or discount.

Pricing strategy can be classified into three types: cost-based pricing, customer value-based pricing, and competitor-based Pricing. Cost-based pricing is a pricing method based on the total costs incurred to produce a product sold and adding a certain percentage as profit. Customer value-based pricing is a method of pricing products based on the value of the product to the customer rather than on production costs. Competitor-based pricing focuses on the prices of similar products released by similar industries (T.T. Nagle & Holden, 2003).

### *Definition of Competitive Advantage*

Competitive advantage is defined as a company's ability to maintain their position over competitors (Li et al., 2006). Competitive advantage is the advantage obtained over competitors by providing consumers with higher value, either by offering lower prices or giving greater benefits and services at a higher price (Kurt Christensen, 2010). Research conducted by Li et al. (2006) stated that price/cost, quality, delivery dependability, product innovation, and time to market are some important factors of competitive advantage.

Companies with competitive advantage have the opportunity to create greater, or at least more efficient, economic value than their competitors (Peteraf & Barney, 2003). Saloner et al. (2011) argued that companies with competitive advantage can produce multiple services or products with higher customer value than those produced by competitors or they may produce a service or product at a lower cost than their competitors. Companies are considered to have competitive advantage when they have achieved more advantages than their market competitors have, or when they can surpass competitors in other significant activities (Huff et al., 2009).

### *Effect of Activity-based Costing Systems on Pricing Strategy*

ABC systems have become an effective tool for management because the information they provide can be used in many managerial decisions, including pricing (Vasilić, 2017). An ABC system allows the construction of initial unit cost and price simulations of the sales object that support the implementation of competitive pricing strategy (Stevenson et al., 1993). Brierley et al. (2001) analyzed many product pricing practices and their effects on pricing in European manufacturing sectors. Their research shows that one of the most important considerations for European companies in setting good product prices is their ABC system information. Cardinaels et al. (2004) also provided experimental evidence of the advantages of developing a pricing system using ABC systems in 120 health care organizations. It was found that ABC systems provided more accurate cost information so that the decision makers had a better understanding of proper pricing strategy.

In addition, Bromwich & Hong (1999), in their study focusing on an analysis of ABC system success, found that it helps businesses to accurately measure production costs before deciding on the right price. Bromwich and Hong found that cost estimation methods that do not use ABC systems might provide the wrong data for management to make decisions, especially in pricing strategy.

Failing to meet ABC system requirements can distort production costs and thus weaken a company's competitive position. With an ABC system, companies can have a better understanding of the basis of costs, thus enabling them to formulate more precise pricing strategy (Dickeson, 2001).

*H1: Activity-based costing systems affect pricing strategy.*

*Effect of Pricing Strategy on Competitive Advantage*  
Hinterhuber & Liozu (2014) pointed out that pricing is fundamental to improving financial performance and can influence competitive advantage. To achieve competitive advantage, companies must regulate their pricing strategy well in order to manage market control, profitability, and cost effectiveness. This is because a choice of affordable goods with the same or even better quality will highly attract customers (Bregman, 1995; T. Nagle & Hogan, 2007).

Choosing the wrong pricing strategy for a product will lessen market demand for the product. Therefore, setting the price to a lower rate may help companies to maintain their existence; in addition, when a product's price is higher than it should be, companies may lose customers (Deshpande, 2018). Thus, an appropriate pricing strategy is a strong factor in attracting attention and increasing sales. It is also a big influence on customer loyalty, which also determines companies' competitive advantage (Avlonitis & Indounas, 2006).

*H2: Pricing strategy affects competitive advantage.*

*Effect of Activity-based Costing Systems on Competitive Advantage*

ABC systems have been suggested as an appropriate tool to guide and direct companies' improvement processes because ABC systems can reduce product costs and lower product prices. The implementation of an ABC system will classify the company's activities into value-added ones and non-value-added ones. This will help companies to eliminate non-value-added activities with the collected ABC system information (Gunasekaran & Sarhadi, 1998) and lead to the establishment of competitive advantage.

With ABC systems, companies can create products with a competitive advantage because the production costs can be reduced, leading to lower selling prices compared to competitors (Sheehan & Foss, 2009).

In addition, companies adopting ABC systems can obtain a better competitive advantage than their competitors because ABC systems provide accurate cost information (Kaličanin & Knežević, 2013). Moreover, by gaining a better understanding of the costs through ABC system implementation, management can take better decisions in terms of competitive advantage. That is, they can create better quality products at competitive prices (Bogdănoiu, 2009). Therefore, ABC systems are a powerful tool whose implementation can enhance companies' competency in managing competitive advantage.

*H3: Activity-based costing systems affect competitive advantage*

## Research Methodology

### *Sample*

This research uses a quantitative case study approach with primary data. The data and information in this study were collected using questionnaires in a survey that was developed from previous studies to test the hypotheses presented. In this case, respondents filled out an assessment with a five-point Likert scale, where 1 point means "strongly disagree," and 5 points mean "strongly agree" with the statement given. The questionnaire was distributed in September 2020 and ended two months later in November 2020.

This research used a non-probability sampling technique. Non-probability is a sampling technique that does not provide chances for every element or member of the population to be selected as part of the sample. Sample selection was done using a purposive sampling method wherein the samples are not randomly selected, and information is obtained based on certain criteria.

In this research, the samples selected were those that met the following criteria: (a) manufacturing company is located in Indonesia and is still operating, (b) has an active email address, (c) implements an ABC system in its operations. Based on these criteria, there were 69 samples that met the requirements.

### *Measures*

There are three research variables, namely ABC system as the independent variable, pricing strategy as intervening variable, and competitive advantage as dependent variable. Table A1 in the appendix shows the definition of the variables in this study. The list of questions for each item in this study is structured in Table A2-A4 in the appendix. The instrument used in this study was a Likert scale of 1 to 5. On the scale, 1 indicates "strongly disagree," 2 indicates "fairly disagree," 3 indicates "disagree," 4 indicates "agree" and 5 indicates "strongly agree."

To measure a company's ABC system, this research adopted seven important factors in the implementation of ABC systems identified by Chongruksut & Brooks (2005). These consisted of top management support, competition, performance evaluation and compensation, training, non-accounting ownership, resources, consensus and clarity of objectives. Next, to measure pricing strategy, this research used three types of pricing strategy identified by T.T. Nagle & Holden (2003), namely cost-based pricing, customer value-based pricing, and competitor-based pricing.

To measure competitive advantage, this research employed five important factors of competitive advantage which were adopted based on a research study by Li et al. (2006). These consist of price/cost, quality, delivery dependability, product innovation, and time to market.

### *Data Analysis*

The data was analyzed using the Partial Least Square (PLS) method with WarpPLS software to test its validity, reliability, and the hypotheses.

WarpPLS was chosen because it could process smaller samples (J.F. Hair et al., 2011). With PLS, the influence among variables in this research can be predicted. PLS has two models, which are the inner model and the outer model. The inner model can be used to test the relationship between variables, while the outer model is used to test the validity and reliability of the study.

## **Results and Discussion**

For this study, 200 questionnaires were distributed and 92 questionnaires were returned. However, those who met the criteria, namely those who apply the ABC System to their company, were only 69 of the respondents (75%) and those who do not meet the criteria (those who do not apply the ABC system) as many as 23 respondents (25%). The input data required by PLS is a minimum of 30 data or questionnaires for the sample to be declared eligible. In this case, the sample to be tested and processed was 69 respondents. Most of the respondents who met the criteria—a total of 43 (62%)—were large companies with more than 1000 employees, while 26 respondents (37%) were companies with fewer than 1000 employees. This shows that most of the companies that implement activity-based costing are large companies, according to the sample gathered.

The model suitability test in Table 1 reveals that this model is acceptable because it conforms to the minimum limit. In addition, we calculated the model suitability of the measurement and the quality index value, and it was found that it fits well (J. Hair et al., 2014). This research also adopted Kock's (2015) suggestion on the use of nonlinear bivariate causality direction ratio (NLBCDR) to test for causality. The result confirms that NLBCDR value is 0.833, which is greater than the required limit of 0.7.

Table 1.  
*Model Fit And Quality Indices*

|                                                                                  |
|----------------------------------------------------------------------------------|
| Average path coefficient (APC)=0.541, P<0.001                                    |
| Average R-squared (ARS)=0.478, P<0.001                                           |
| Average adjusted R-squared (AARS)=0.466, P<0.001                                 |
| Average block VIF (AVIF)=1.445, acceptable if <= 5, ideally <= 3.3               |
| Average full collinearity VIF (AFVIF)=1.859, acceptable if <= 5, ideally <= 3.3  |
| Tenenhaus GoF (GoF)=0.495, small >= 0.1, medium >= 0.25, large >= 0.36           |
| Sympson's paradox ratio (SPR)=1.000, acceptable if >= 0.7, ideally = 1           |
| R-squared contribution ratio (RSCR)=1.000, acceptable if >= 0.9, ideally = 1     |
| Statistical suppression ratio (SSR)=1.000, acceptable if >= 0.7                  |
| Nonlinear bivariate causality direction ratio (NLBCDR)=0.833, acceptable if >= 0 |

Table 2 presents the respondents' scores in research variables. The mean value is found to be greater than 3.40, indicating that the respondents' response to the ABC, PS, and CA variables is quite high. In addition, the standard deviation value of each variable is in the range of 0.533–1.033, which is considered high. This means that the respondents answered questions with a high degree of diversity.

Based on Table 2, it can also be concluded that each indicator in the measured construct has a higher loading value than the loading value on other constructs. Therefore, it can be concluded that the constructs have sufficient discriminant validity.

Table 2.  
*Indicators' Loading, Cross Loading Value, Mean And Standard Deviation*

|       | ABC     | PS     | CA     | SE    | p-value | Mean | SD    |
|-------|---------|--------|--------|-------|---------|------|-------|
| ABC1  | (0.532) | -0.231 | 0.201  | 0.101 | <0.001  | 4.58 | 0.579 |
| ABC2  | (0.523) | -0.237 | 0.017  | 0.101 | <0.001  | 4.54 | 0.698 |
| ABC3  | (0.696) | -0.373 | 0.174  | 0.095 | <0.001  | 4.49 | 0.699 |
| ABC4  | (0.589) | -0.201 | 0.305  | 0.099 | <0.001  | 4.61 | 0.699 |
| ABC5  | (0.630) | -0.384 | 0.292  | 0.097 | <0.001  | 4.52 | 0.699 |
| ABC6  | (0.672) | -0.077 | 0.036  | 0.096 | <0.001  | 4.61 | 0.599 |
| ABC7  | (0.634) | 0.317  | 0.002  | 0.097 | <0.001  | 4.26 | 0.980 |
| ABC8  | (0.624) | 0.184  | 0.037  | 0.098 | <0.001  | 4.14 | 1.033 |
| ABC9  | (0.719) | 0.079  | -0.096 | 0.095 | <0.001  | 4.28 | 0.838 |
| ABC10 | (0.763) | 0.075  | -0.130 | 0.093 | <0.001  | 4.29 | 0.859 |
| ABC11 | (0.715) | -0.040 | -0.306 | 0.095 | <0.001  | 4.33 | 0.869 |
| ABC12 | (0.757) | 0.127  | -0.288 | 0.093 | <0.001  | 4.39 | 0.771 |
| ABC13 | (0.776) | 0.245  | -0.155 | 0.093 | <0.001  | 4.29 | 0.750 |
| ABC14 | (0.698) | 0.330  | 0.108  | 0.095 | <0.001  | 4.46 | 0.698 |

Table 2. (Continued)  
*Indicators' Loading, Cross Loading Value, Mean And Standard Deviation*

|      | ABC    | PS      | CA      | SE    | p-value | Mean | SD    |
|------|--------|---------|---------|-------|---------|------|-------|
| PS1  | -0.213 | (0.611) | 0.209   | 0.098 | <0.001  | 4.14 | 0.625 |
| PS2  | -0.253 | (0.733) | -0.012  | 0.094 | <0.001  | 4.14 | 0.772 |
| PS3  | -0.467 | (0.580) | 0.298   | 0.099 | <0.001  | 4.22 | 0.661 |
| PS4  | -0.163 | (0.679) | 0.178   | 0.096 | <0.001  | 4.12 | 0.777 |
| PS5  | 0.213  | (0.841) | -0.146  | 0.091 | <0.001  | 4.41 | 0.773 |
| PS6  | 0.659  | (0.786) | -0.370  | 0.093 | <0.001  | 4.33 | 0.852 |
| CA1  | 0.130  | -0.165  | (0.781) | 0.093 | <0.001  | 4.67 | 0.560 |
| CA2  | 0.138  | -0.189  | (0.820) | 0.092 | <0.001  | 4.61 | 0.647 |
| CA3  | -0.018 | -0.090  | (0.864) | 0.090 | <0.001  | 4.67 | 0.560 |
| CA4  | -0.032 | 0.025   | (0.875) | 0.090 | <0.001  | 4.68 | 0.556 |
| CA5  | -0.614 | 0.311   | (0.559) | 0.100 | <0.001  | 4.49 | 0.779 |
| CA6  | 0.152  | -0.143  | (0.867) | 0.090 | <0.001  | 4.68 | 0.528 |
| CA7  | -0.316 | 0.436   | (0.554) | 0.100 | <0.001  | 4.65 | 0.590 |
| CA8  | 0.051  | 0.031   | (0.731) | 0.094 | <0.001  | 4.55 | 0.697 |
| CA9  | 0.118  | 0.257   | (0.655) | 0.097 | <0.001  | 4.32 | 1.007 |
| CA10 | 0.117  | -0.167  | (0.853) | 0.091 | <0.001  | 4.49 | 0.720 |

Table 3 shows the value of the measurement model in relation to the correlation between constructs. The result indicates that the square root AVE value or the diagonal value is greater than 0.50. This value describes the validity or convergent construct which explains more than half of the variance indicators. In addition, each composite reliability value and Cronbach's alpha value reaches the acceptable range of 0.7. Thus, this research model is proven to be reliable.

Table 4 shows the effect sizes for the path coefficients. All values in the table below are greater than 0.02, which means that they have sufficient effect to be declared relevant from a practical point of view. Figure 1 describes the SEM model applied in this research. The beta coefficient ( $\beta$ ) shows the strength of the relationship between the latent variables associated with the arrows. The results are highly significant with  $p < 0.001$ .

Table 5 explains the direct effect as well as the indirect effect of the variables. Based on the research results, the R2 value obtained is 0.42, meaning that 42 percent of variation of the PS variable can be described by the ABC variable with the ABC variable path coefficient of 0.65. The direct effect of CA is described by ABC and PS of 0.54 with ABC and PS variable path coefficients of 0.76 and 0.21, respectively. Afterwards, R2 is used to calculate Goodness of Fit (GoF) as follows:  $Q^2 = 1 - ((1 - 0.42) \times (1 - 0.54)) = 73\%$ . The indirect influence score from ABC in CA with the mediating variable PS 0.42 means that PS is able to mediate the relationship between ABC and CA. The total ABC score can positively influence CA directly and indirectly.

Table 3.  
*Correlation Among Latent Variables With Sqrts. Of Aves, Composite Reliability And Cronbach's Alpha*

|     | ABC     | PS      | CA      | Composite<br>reliability | Cronbach's<br>alpha |
|-----|---------|---------|---------|--------------------------|---------------------|
| ABC | (0.671) | 0.609   | 0.571   | 0.919                    | 0.904               |
| PS  | 0.609   | (0.711) | 0.209   | 0.858                    | 0.800               |
| CA  | 0.571   | 0.209   | (0.765) | 0.932                    | 0.917               |

Table 4.  
*Effect Size For Path Coefficients*

|     | ABC   | PS    | CA |
|-----|-------|-------|----|
| ABC | -     | -     | -  |
| PS  | 0.420 | -     | -  |
| CA  | 0.491 | 0.045 | -  |

Table 5.  
*Inner Model Result*

|          | Direct effect | Indirect effect                  | Total effect     |
|----------|---------------|----------------------------------|------------------|
| ABC → PS | 0.65 (p <.01) | -                                | 0.648 (p <0.001) |
| PS → CA  | 0.21 (p 0.03) | -                                | 0.213 (p 0.030)  |
| ABC → CA | 0.76 (p <.01) | ABC → PS → CA<br>0.138 (p 0.046) | 0.901 (p <0.001) |

The success of pricing strategy in building competitive advantage is very much determined by the implementation of an ABC system. This is because the applied pricing strategy may help companies to increase their competitiveness by reducing production costs and enabling them to adjust prices according to their customer preference. If a company does not implement an ABC system, the pricing strategy chosen by the company has less potential to help the company achieve competitive advantage. If the company applies an ABC system, the pricing strategy chosen by the company will impact competitive

advantage through top management support, competition, performance evaluation and compensation, training, non-accounting ownership, resources, consensus and clarity of objectives.

This research proves that the manufacturing-sector companies that implement ABC systems can reach competitive advantage more effectively through their pricing strategies. This is proven by the high average response score (Table 2). The highest average pricing strategy obtained is PS5 points, which indicates that cost-based pricing is the approach most used by respondents when companies apply ABC systems.

This result is supported by Hinterhuber (2008) in his study which states that the main source for setting prices is the data resulting from cost accounting using cost-based pricing. Cost-based pricing is considered quite simple because its calculation can be obtained by adding up direct costs and overhead costs (Calabrese & De Francesco, 2014).

Competitive advantage allows an organization to differentiate itself from its competitors, and competitive advantage itself is the result of critical management decisions (Tracey et al., 1999). The results of this research found that the highest average points in the competitive advantage section are CA4 and CA6. This means that the manufacturing companies offer the highest quality products and reliable product delivery.

This research also proved that an ABC system has a positive effect on pricing strategy in tracing costs to calculate product prices (Hypothesis 1). This is in line with previous studies (Bhimani & Pigott, 1992; Innes & Mitchell, 1995; Krumwiede & Roth, 1997; Turney, 1996) that found similar results. Another result found is that pricing strategy has a positive effect on competitive-advantage building (Hypothesis 2). These results confirm several previous studies (Bregman, 1995; Dutta et al., 2003; T. Nagle & Hogan, 2007; Tuncel et al., 2005; Agbaeze et al., 2020; BAČÍK et al., 2014; Jun & Lee, 2020; Nair, 2019). The findings of this research also prove that ABC systems have a positive effect on competitive advantage because they enable production of competitive products (Hypothesis 3). This finding supports previous research (Bogdănoiu, 2009; Gunasekaran & Sarhadi, 1998; Kaličanin & Knežević, 2013) that found the same results, stating that ABC systems were used in managing competitive advantage.

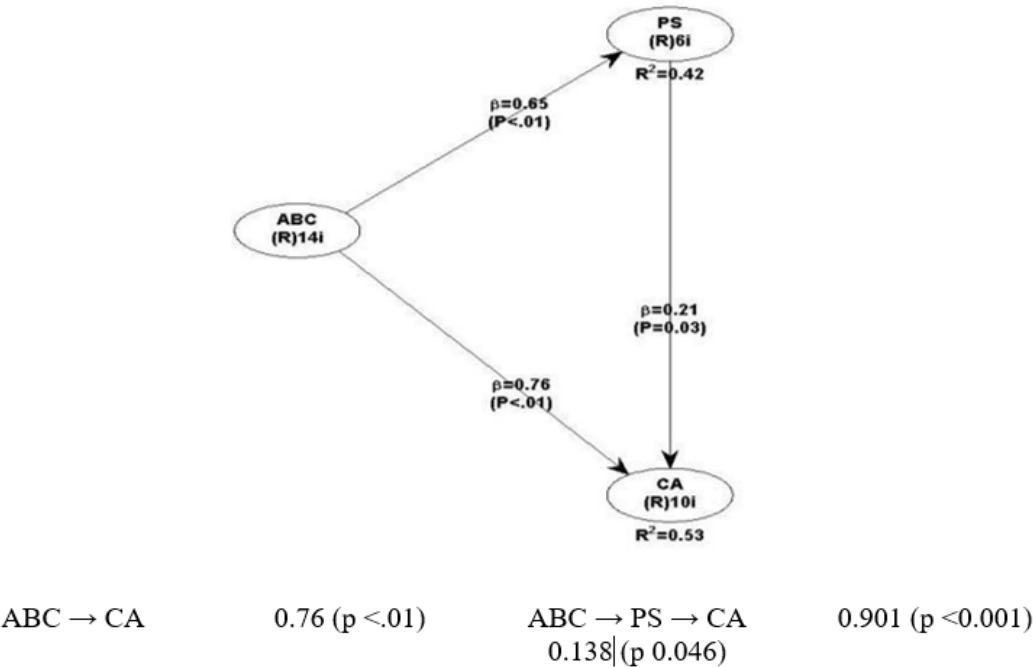


Figure 1.  
PLS-based structural equation model

In general, it can be concluded that all of the hypotheses presented in this research are acceptable because they have significant effects (Figure 1). Pricing strategy is able to mediate ABC-system influence on the achievement of companies' competitive advantage. In other words, pricing strategy can support and strengthen the influence of an ABC system on competitive advantage. Therefore, pricing strategy can affect competitive advantage directly or indirectly.

A resource-based view holds that a sustainable competitive advantage can be achieved if an organization has valuable, unique, rare resources which are difficult to imitate. This requires that a company explore its own internal competencies to identify those that would be considered best for obtaining competitive advantage (Arasa & Achuora, 2020). Activity-based costing will better inform decision makers to set optimal pricing strategy. This is in line with previous studies that examine the relationship between activity-based costing practice and pricing (Coskun & Yilmaz, 2013; Lu et al., 2017; Raucci et al., 2020).

Implementing activity-based costing involves significant investment. However, implementing activity-based costing can better inform decision makers by better explaining indirect costs, resulting in better cost-informed pricing. Agbaeze et al. (2020) conclude that cost-informed pricing practice has a significant positive impact on performance. Cost information can be used to implement a unique pricing strategy based on the organization's direction. Furthermore, different human capital of different organizations with similar directions could implement different pricing strategies.

Therefore, the result of this study which shows that pricing strategy mediates the relationship between activity-based costing and competitive advantage has important implications for management in organizations.

This unique internal competency of implementing activity-based costing and translating it to appropriate pricing strategy could be seen as a unique resource of the organization in achieving competitive advantage.

## Conclusion

Since the implementation of the ASEAN Economic Community (AEC), the competition among ASEAN manufacturing industries has become fiercer due to the entry of foreign manufacturing industries. Therefore, Indonesian manufacturing companies must improve their competitive advantage in order to maintain their position amid this fierce business competition. This research focuses on maintaining and improving companies' competitive advantage by implementing activity-based costing systems with pricing strategy as an intervening variable.

This study tried to fill the gap where there were very limited studies focused on the combined relationships of activity-based costing, pricing strategy, and competitive advantage. Most previous studies only examine the relationships among these three variables separately despite the fact that they are closely related. Furthermore, this study confirms that manufacturing companies in Indonesia that already implement activity-based costing could also consider pricing strategy to mediate the ABC influence on competitive advantage.

The results of this research also show that competitive advantage can be achieved through the use of appropriate resources such as top management support, competition, performance evaluation and compensation, training, non-accounting ownership, resources, consensus and clarity of objectives through ABC systems. With an ABC system, a company can identify several ways to trim its production costs rather than avoid total costs in the long run (Broad & Crowther, 2001).

ABC systems are a strategic management tool that can help companies to implement the appropriate pricing strategy. The pricing strategies that a company implements must be able to meet the needs of the company as a whole. Based on the research we conducted, we found a positive and significant relationship between companies' ABC systems, pricing strategy, and competitive advantage. Therefore, the three proposed hypotheses in this research can be accepted and companies are encouraged to apply ABC systems and choose the appropriate pricing strategy in order to achieve competitive advantage.

The results of this study have important implications for management, especially in manufacturing companies. Management should realize that an ABC system is a unique resource of an organization which can help companies to implement the appropriate pricing strategy. The implementation of pricing strategy itself could also be seen as a unique internal competency which could help an organization to achieve competitive advantage. Therefore, management in ABC-implementing organizations can go further by linking the information from ABC practices to the pricing strategy of the organization. Thus, the organization will have a greater opportunity to achieve competitive advantage.

In this study, our sample is limited to Indonesian companies engaged in the manufacturing sector. There is potential for future research to examine the application of ABC systems in the manufacturing sector outside of Indonesia as well. Research in other sectors is also encouraged; for example, companies engaged in the service sector, both in Indonesia and in other countries, could be researched. Furthermore, the variables used in this research are dynamic variables. This means that respondents' perceptions will differ when they are applied in different places, at different times, and to different objects. 73 percent of GoF value implies that 27 percent of factors outside the variables used in this study can affect the result of the research findings, because competitive advantage can also be achieved using other strategies.

In addition, emphasizing the benefits of other ABC system implementations is another strategy for companies to achieve competitive advantage.

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Appendix

Table A1.  
Variable Definition

| Variable                             | Definition                                                                                                                                 |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Activity Based Costing System</i> | A cost planning method that tracks costs to calculate a product price based on the activities that consume resources.                      |
| <i>Pricing Strategy</i>              | One of the most important management decisions because it affects the companies' profitability and returns along with its competitiveness. |
| <i>Competitive Advantage</i>         | The companies' ability to maintain their position from the competitors.                                                                    |

Table A2.  
Items of Activity Based Costing

| Item number | Items                                                                                                                 |
|-------------|-----------------------------------------------------------------------------------------------------------------------|
| ABC1        | We have strong support from top management in terms of the ABC initiative                                             |
| ABC2        | Our leaders have a clear commitment to using ABC information as a basis for decision making                           |
| ABC3        | We improve the company's competitive position and profitability with ABC information                                  |
| ABC4        | We have a competitive strategy with regard to ABC                                                                     |
| ABC5        | We use ABC information for performance evaluation activities                                                          |
| ABC6        | We designed a compensation system in the company to motivate employees to implement ABC                               |
| ABC7        | We provide adequate training regarding ABC design and objectives                                                      |
| ABC8        | We provide training on ABC implementation                                                                             |
| ABC9        | All of our departments are committed to using ABC information in decision making                                      |
| ABC10       | We share accountants' ABC information with non-accountants                                                            |
| ABC11       | We have sufficient in-house resources to provide employees with opportunities to learn about ABC systems and benefits |
| ABC12       | Our leaders have provided sufficient resources, such as time and commitment to the ABC implementation effort          |
| ABC13       | We are implementing the ABC system effectively                                                                        |
| ABC14       | We use ABC to improve the accuracy of cost estimates for customized products                                          |

Table A3.  
Items of Pricing Strategy

| Item number | Items                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------------|
| PS1         | We offer competitive prices that trigger a reaction from competitors                                        |
| PS2         | We offer products at lower prices than competitors                                                          |
| PS3         | We believe our products offer customers an advantage                                                        |
| PS4         | We believe the value of the product felt by customers is in accordance with the benefits and costs incurred |
| PS5         | We calculate the selling price based on the total cost of the product                                       |
| PS6         | We determine the percentage of the profit margin in relation to the price of the product                    |

Table A4.  
Items of Competitive Advantage

| Item number | Items                                                                |
|-------------|----------------------------------------------------------------------|
| CA1         | We offer competitive prices                                          |
| CA2         | We able to offer prices that are lower or lower than our competitors |
| CA3         | We offer a very reliable product                                     |
| CA4         | We offer high quality products to customers                          |
| CA5         | We deliver customer orders on time                                   |
| CA6         | We provide reliable delivery                                         |
| CA7         | We provide products according to customer desires                    |
| CA8         | We modify our product offerings to meet customer needs               |
| CA9         | We have lower market time compared to the industry average           |
| CA10        | We develop products rapidly                                          |