

# Uncertain Supply Chain Management

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## The role of supply chain management in entrepreneurial activities and product innovation on SMEs performance

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### ABSTRACT

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The purpose of this research is to provide practical and theoretical insights about how small and medium enterprises (SMEs) adapt and further develop entrepreneurial activities, product innovation and SME business performance. This study used a quantitative method using a questionnaire for data collection. The research data developed by distributed online questionnaires by social media. The number of samples used was 230 respondents using a purposive sampling technique. Partial Least Square (PLS) is used for data processing by SmartPLS 4.0. Based on the results of data analysis it is concluded that entrepreneurial competence has a significant effect on business performance and entrepreneurial competence has a significant effect on product innovation. Product innovation has also a significant effect on the performance of SME businesses.

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### 1. Introduction

The supply chain is a network of several independent companies or groups that work together to create and distribute a product to end users. Regarding the process, supply chain management deals with the flow of goods, information and money (Adnani et al., 2023). In addition, supply chain management also relates to the planning, production, inventory, transportation and retail design processes of a product and service, including waste management. In the current era, supply chains enter a system based on information technology to increase creativity (value creation), effectiveness, information sharing and collaboration between actors involved, both companies, entrepreneurs, and so on. On the other hand, a supply chain management system or supply chain (demand) is also required not only to discuss economic aspects, but also needs to pay attention to environmental and social aspects to achieve the goals of a company (Bayraktar et al., 2009).

According to the technical aspect, the supply chain or supply chain involves cross-scientific fields into one system. This scientific field covers the upstream-downstream production system, starting from the preparation of raw materials, then supplying these raw materials to the industrial sector, then the raw materials are processed at manufacturing companies, which then produce a product that is ready to be distributed to retailers until it reaches consumers. This fact shows that the supply chain is a complex system, to manage it, we need devices that can manage complexity effectively and efficiently (Al-Omouh et al., 2023).

The application of Supply Chain Management (SCM) is carried out by various manufacturing companies to create their competitiveness in producing products/goods in the market. The supply chain is the supply chain of goods, where the goods flow from upstream to downstream as a chain following several actors or a number of parties. According to Qiao and Zhao (2023), the flow of goods is the physical flow from upstream to downstream. There are 3 supply chains, namely the flow of goods, information and money. Of the three that are very important in a company is the flow of information. The characteristics of a company that has good supply chain management, according to the Supply Chain Council, has a methodology called

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SCOR, which stands for Supply Chain Operation Reference. There are different aspects for a company's supply chain management to run well, such as reliability and responsiveness (Adnani et al., 2023). Wijaya et al. (2023) found that 60% of the valid innovations in the manufacturing sector are SMEs, but many of them are not successful due to a lack of professionalism in inability to collaborate with traffic agencies. Adnani et al. (2023) revealed that there is a positive relationship in significant internal variable competence (strategic, relational, conceptual, personal, opportunity, learning, ethical, and failure) with innovation. Innovative changes are driven by entrepreneurial competence demonstrating quality in terms of entrepreneurial competence and innovation in business performance.

Given the reliability of this tradition, innovation is accepted as necessary and is a vital resource for the sustainability and growth of the company (Cahyono et al., 2023). Innovation is a strategic all-rounder for business in dealing with a dynamic environment. SMEs carry out innovation to be involved in producing new ideas which are very necessary in producing new products. A recent study conducted by Yang and Wang (2023) found that product innovation in process innovation has a positive effect in determining business success in SMEs. Innovation has a positive relationship with business success, and it is proposed to focus more on innovation to increase customer satisfaction (Al-Omouh et al., 2023). Competition is the core of success, when the company is unable to adapt, change and build a culture of innovation. The concept of innovation from an organizational perspective takes all the ability to create something new and also leads to repetition, change, in behavior by using good skills. Organizational ability is needed to innovate and to provide solutions to meet customer's needs to improve performance (Cerchione et al., 2018). Innovation is received as needed and is a vital source of data for the sustainability and growth of the company in order to ensure the success of SMEs (Chen & Su, 2023).

In the industrial world, especially in manufacturing, competition is getting tougher, causing the advantages of optimizing and integrating the company's supply chain to become the main focus of pushing a company to excel in competition. Organizations need to use strategic and entrepreneurial perspectives to survive in an age of highly competitive business environments (Chen & Su, 2023). The perspective of strategy or the integration of strategy and entrepreneurship is called strategic entrepreneurship which has a role as a search for opportunities and profits. Modern business competition has an impact on changing the focus of competition between companies independently towards business competition such as supply chains. According to Yang and Wang (2023), this condition exists in an era of competition between business networks, where the role of the company manufacturing has changed from supplying domestic companies to international markets through local companies. Companies need to develop mutual trust and relationships in social capital with business partners, given the higher level of communication of their business operations. The role of social capital and entrepreneurial strategy in the supply chain context is very important to test, it has the goal of achieving competitive advantage at the supply chain level (Cerchione et al., 2018).

From all these studies, there is a relationship between supply chain management practices with competitive advantage and organizational performance, where increasing this competitive advantage can be a positive thing to improve organizational performance. Several SMEs in developing their operational performance have implemented supply chain management practices, such as involving suppliers as partners in the process of supplying raw materials, maintaining good relations with consumers to provide service satisfaction to consumers, as well as managing information related to product development for both suppliers and consumers and competitive strategies to meet operational quality standards by providing guaranteed product quality according to the market.

There have been many previous studies that examined the effect of supply chain management practices on competitive advantage. There are also many previous studies regarding the effect of supply chain management practices on organizational performance. There are also many previous studies that examine the influence of competitive advantage and organizational performance, and vice versa. This indicates that there is a relationship between supply chain management practices with competitive advantage and organizational performance, where this increase in competitiveness can be one of the positive things to improve organizational performance, which can also be applied by SMEs in facing economic upheaval.

Many previous studies have examined the strategies of organizations or companies to continue to develop and to improve their competitiveness to be more competitive in global market competition. A competitive advantage is the ability to provide the necessary basis for an organization to differentiate itself from its competitors. Olofsson et al. (2008) suggest that competitive advantage can be seen from how products can have competitive prices, provide many and varied product offers, and have good bonds with customers. Meanwhile, Marinagi et al. (2014) suggest that to increase competitive advantage, companies must support both their internal functions and their exchange of information with supply chain partners in an effective way. The results of research by Handoko et al. (2015) show that SCM practices have a positive impact on competitive advantage. Not only that, research by Jones (1998) also supports that many organizations realize that SCM is the key for building a sustainable competitive advantage for their products and/or services in an increasingly crowded and fiercely competitive market. Several studies have shown that there is a relationship between supply chain management practices and the competitive advantage of an organization or company.

## **2. Literature Review and Hypothesis Development**

According to Chen and Su (2023), innovation is a broader concept that addresses the application of new ideas, products or processes. Innovation is the result of creative ideas owned by the company. So, the company is expected to form new thoughts

in dealing with competitors and customers with a variety of existing requests. Effective product innovation/new product development strategies often determine the success and survival of a company. New product development requires effort, time, and ability including the high risk and cost of failure. However, if the product innovation carried out produces positive results and can penetrate market share, then this is a big advantage for the company. Time to market is the extent to which an organization can introduce/launch new products faster than other competitors and it is an important dimension of competitive advantage (Holweg et al., 2005). When a company can launch its new product faster than competitors, this allows the organization to be able to seize market share first and even be able to lead the market and will generate higher profits. Several studies regarding the relationship between quality practices and innovation performance (Saini et al., 2023). Lenny et al. (2007) and Saini et al. (2023) propose some common ground between innovation and Supply Chain Management. Some researchers often argue whether innovations help or hinder the implementation of innovations. It is also important to determine whether the implementation of SCM positively influences the company's innovation performance. For example, in the implementation of SCM, companies share customer requests with suppliers. The information fosters product innovation among supply chain partners. The implementation of information technology in SCM is potentially capable of offering new ways of providing services to customers. Dewi et al. (2023), Kadiane et al. (2023) and Kumar et al. (2015) found that collaboration through information sharing has a positive influence on supply chain innovation. Therefore, this study seeks to test empirically whether the implementation of supply chain management can improve a company's innovation performance. The proposed hypothesis is as follows:

**H<sub>1</sub>:** *Supply Chain Management has a positive and significant influence on Product Innovation.*

According to Adnani et al. (2023), the competitive advantage of supply chain management is how it is able to manage the flow of goods or products in a supply chain, or in other words, how the network of production and distribution activities of a company can work together to meet consumer demands. The main objectives of SCM are timely delivery or delivery of products to satisfy consumers, reduce costs, increase all results from the entire supply chain, reduce time to concentrate planning and distribution activities. Previous studies have shown a relationship between SCM and organizational performance. Cahyono et al. (2023) found that the implementation of SCM can lead to increased competitive advantage and improve organizational performance. Al-Omouh et al. (2023) examined small medium-sized companies and also found that the implementation of SCM has a direct and significant influence that causes high and low company performance. Research shows an explicit relationship between the implementation of SCM and organizational performance. Therefore, the researcher proposes the following hypothesis:

**H<sub>2</sub>:** *Supply Chain Management has a positive and significant effect on SMEs Performance.*

Suppliers play an important role in the company's activities. Supplier integration is a form of cooperation or partnership between a company and its suppliers whose activities are making plans, developing inter-organizational strategies, developing integrated processes to share information and experience in running organizations. Wijaya et al. (2023) and Yang and Wang (2023) stated that company capability is the company's ability to integrate, configure, acquire, and utilize existing resources, and respond to market changes. Companies that have developed a high level of supplier integration typically demonstrate significant strategic alignment between themselves and their materials and service providers. Collaborative strategies can contribute to increasing the effectiveness and efficiency of innovation strategies by facilitating access to complementary assets and knowledge, as well as by reducing the risks associated with R&D-intensive projects. This means that both parties share the same vision of the total value creation process and each is willing to share responsibility to meet customer requirements. Previous studies have shown a relationship between SCM and organizational performance. Wang et al. (2023) and Wijaya et al. (2023) found that the implementation of SCM can lead to increased competitive advantage and improve organizational performance. Wang et al. (2023) researched SMEs and found that the implementation of SCM had a direct and significant influence that caused high and low company performance. Research shows an explicit relationship between the implementation of SCM and organizational performance. Therefore, the researcher proposes the following hypothesis:

**H<sub>3</sub>:** *Product Innovation has a positive and significant effect on SMEs Performance.*

## 2. Method

This research is a type of correlational research by using a qualitative approach in the empirical research category. The population in this research is all SMEs and used a sample of 230 respondents with the aim of selling in order informality in the data obtained to be more accurate. Sample taking uses purposive sampling, variable measurement of entrepreneurial competence, product innovation and performance uses a Likert scale of 5 points (1 = mutually disagree - 5 = mutually agree). Data collection with a questionnaire given to the respondents. The data that has been collected is tabulated and further processed using the Partial Least Square (PLS) software.

The measurement of the variable instrument for entrepreneurial competence (X1) uses as many as 10 indicators from Wijaya et al. (2023), Yang and Wang (2023) including (1) Ability to control risk, (2) Calculating and analyzing informality, (3) Dynamic, (4) Building social networks, (5) Initiative, (6) Innovation, (7) Ability to complete materials, (8) leadership, (9),

(10) Communication. The product innovation variable (Y1) uses 4 indicators of the measurement instrument from Yang and Wang (2023): (1) Advantages of new products, (2) Recognizable products, (3) Products accepted by consumers, (4) Return of new products. Furthermore, the measurement of the usual performance variable (Y2) uses 4 indicators from Yang and Wang (2023) which includes: (1) partial growth, (2) sales growth, (3) traffic growth, (4) asset growth. Fig. 1 shows the structure of the proposed study.

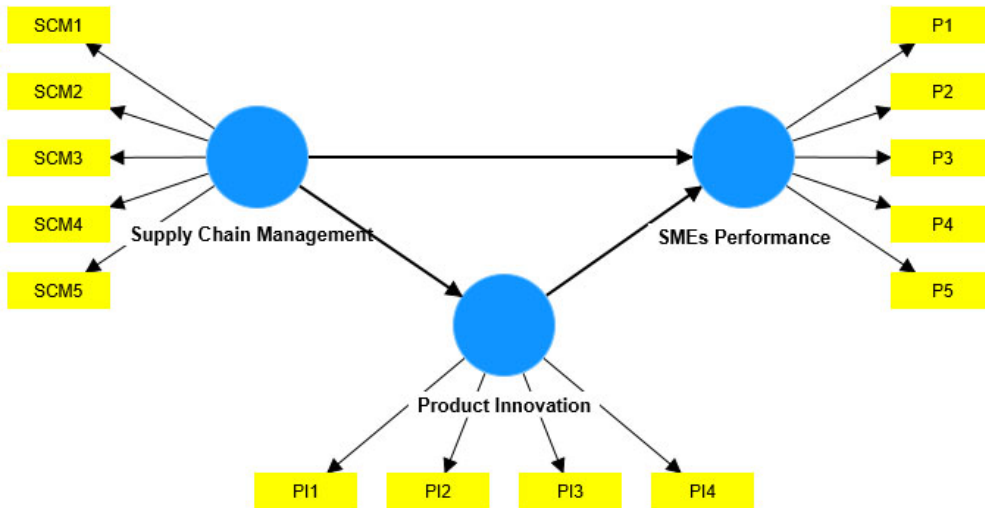


Fig. 1. Research Model

### 3. Result and Discussion

#### 3.1 Measurement Model (Outer Model)

We use statistical tests to examine the reliability of the results. An indicator is declared valid if it has a loading factor value > 0.7 in the value of Average Valuation Extracted (AVE) > 0.5. Testing reliability using Cronbach alpha > 0.7 and composite reliability (CR) > 0.7.

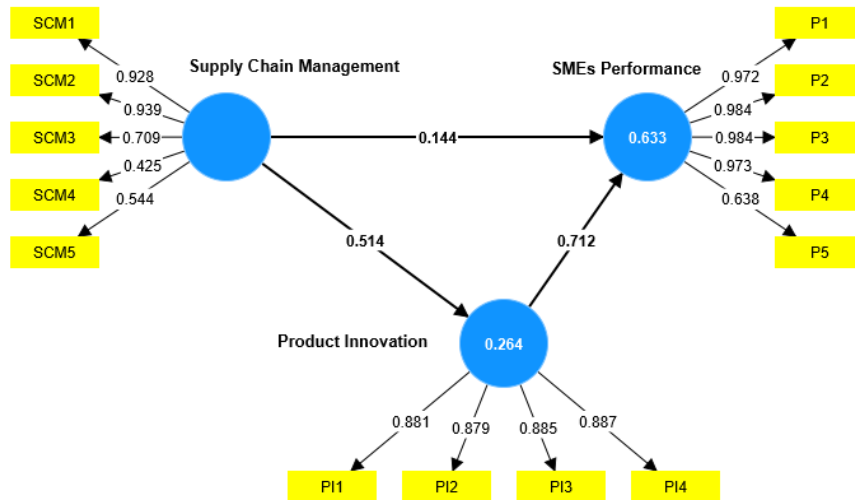


Fig. 2. Validity Testing

Based on the results of PLS, we have found that all indicators are within the range of suitable values, which confirm the overall examination. Table 1 shows the results.

**Table 1**  
Measurement Model

| Construct/indicator     | $\alpha$ | CR    | AVE   |
|-------------------------|----------|-------|-------|
| Supply Chain Management | 0.904    | 0.926 | 0.678 |
| Product Innovation      | 0.890    | 0.916 | 0.644 |
| SMEs Performance        | 0.906    | 0.925 | 0.640 |

### 3.2 Structural Model (Inner Model)

Sholihin and Ratmono (2013) suggested testing the inner model by looking at the value of the coefficient of determination ( $R^2$ ). The  $R^2$  value is grouped into three groups, namely  $> 0.75$  (substantial),  $0.50 - 0.75$  (moderate) and  $0.25 - 0.50$  (weak). Based on the results, it is known that the value of the coefficient of determination ( $R^2$ ) on product innovation is influenced by SCM of 0.264 or 26.4% and 73.6 % of the product innovation variable is affected by other factors outside the research model. This means that the SCM of SMEs is not qualified enough to encourage product innovation. Furthermore, the performance variable is usually affected by product innovation and SCM has a value of 0.633 or 63.3% and 36.7 % of the product innovation variable is affected by other factors outside the research model.

#### Heretroit – Monotrait Ratio (HTMT)

The best recent measurement criterion is to look at the Heretroit-Monotrait Ratio (HTMT) value. If the HTMT value is  $< 0.90$  then a construct has good discriminant validity.

**Table 2**  
Heretroit – Monotrait Ratio (HTMT)

| Variables               | Heretroit – Monotrait Ratio (HTMT) |                    |                  |
|-------------------------|------------------------------------|--------------------|------------------|
|                         | Supply Chain Management            | Product Innovation | SMEs Performance |
| Supply Chain Management |                                    |                    |                  |
| Product Innovation      | 0.462                              |                    |                  |
| SMEs Performance        | 0.321                              | 0.312              |                  |

The conclusion of the Heteroit-Monotrait Ratio (HTMT) test is as follows

1. Supply Chain Management on Product Innovation has a Heteroit-Monotrait Ratio value of 0.462  $< 0.90$  meaning that the discriminant validity is good, or really different from other constructs (unique constructs).
2. Supply Chain Management on SMEs performance has a Heteroit-Monotrait Ratio (HTMT) value of 0.321  $< 0.90$ , meaning that discriminant validity is good, or completely different from other constructs (unique constructs).
3. Product innovation on SMEs performance has a Heteroit-Monotrait (HTMT) value of 0.321  $< 0.9$  meaning that the discriminant validity is good, or really different from other constructs (unique constructs).

### 3.3 F-Square

The F-square measurement is a measure used to assess the relative impact of an influencing variable (exogenous) on an affected variable (endogenous). The F-square criteria according to are as follows: (1) If the value of F-square = 0.02 means the small effect of exogenous variables on endogenous; (2) If the F-square value = 0.15 means that the effect is being/moderate from the exogenous variable to the endogenous one; and (3) If the F-square value = 0.35, it means that the effect is large from the exogenous variables on the endogenous ones.

**Table 4**  
F-Square

| Variables               | F-Square                |                    |                  |
|-------------------------|-------------------------|--------------------|------------------|
|                         | Supply Chain Management | Product Innovation | SMEs Performance |
| Supply Chain Management |                         | 0.561              |                  |
| Product Innovation      |                         |                    |                  |
| SMEs Performance        | 0.096                   | 0.021              |                  |

The conclusion from the F-Square results from the table above is as follows:

- a) Product Innovation and SMEs Performance f-square=0.021 means the small effect of exogenous variables on endogenous ones.
- b) Product Innovation and Supply Chain Management f-square=0.561 means that the effect is large from the endogenous exogenous variables.
- c) Supply Chain Management and SMEs Performance F-square=0.096 means the small effect of exogenous variables on endogenous.

### 3.4 Q-square

The Q-square value is also used to determine the goodness of the model, where the higher the Q-Square value indicates that the structural model is getting fit with the data. The Q-square test in this study can be seen in the following table:

**Table 5**  
Q-square Test Results

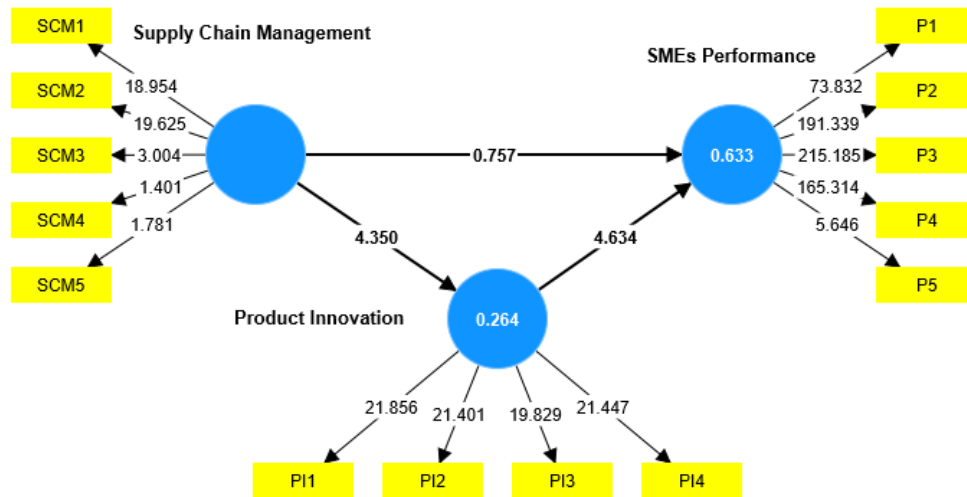
| Variable                | SSO     | SSE     | Q <sup>2</sup> (=1-SSE/SSO) |
|-------------------------|---------|---------|-----------------------------|
| Supply Chain Management | 600,000 | 600,000 |                             |
| Product Innovation      | 600,000 | 383,710 | 0.370                       |
| SMEs Performance        | 600,000 | 383,651 | 0.420                       |

Based on the table above, it is known that the sum of the Q-Square values for the two endogenous variables is 0.79. These results mean that the magnitude of the diversity of data described by this research model is 79.%. While the remaining percentage of 21% is explained by other factors that are outside the model of this study. Thus, this research model is declared to meet the requirements of goodness (model fit).

### 3.5 Goodness of Fit (GoF)

GoF is a measure of the accuracy of the model as a whole, because it is considered a single measurement of the measurement of the outer model and the inner model. The measurement value based on Goodness of Fit has a range of values from 0 to 1. The GoF value is getting closer to 0 indicating the model is getting less good, conversely the further away from 0 and the closer to 1, the better the model. The criteria for the strength and weakness of the model are based on GoF measurements, namely 0.36 (GoF large); 0.25 (GoF medium), and 0.10 (GoF small). To find out the GoF value in PLSSEM it was done manually and the resulting GoF value = 0.318 Small GoF value = 0.1, medium GoF = 0.25, and large GoF = 0.38. From testing R2, Q2 and GoF, it can be seen that the model formed is robust. So that hypothesis testing can be conducted.

## 4. Hypothesis Testing



**Fig. 3.** Hypothesis testing

Testing the research hypothesis can be done by looking at the t statistic in the p-value with a significance of 0.05.

**Table 2**  
Structural Estimates Result

| Variable                                     | p-value | Result   |
|--|---------|----------|
| Supply Chain Management → Product Innovation | 0.000   | Accepted |
| Supply Chain Management → SMEs Performance   | 0.000   | Accepted |
| Product Innovation → SMEs Performance        | 0.000   | Accepted |

Based on the results of PLS processing in Table 2, it is known that the original sample values of p-value of 0.000 < 0.05, which means that SCM has a significant impact on SMEs performance, so it can be concluded that H<sub>1</sub> accepted. This means better SCM possessed by SMEs leads to better SMEs performance. The results of the research are in accordance with the RBV

theory demonstrated by Lenny et al. (2007) and Lestari et al. (2020) in that a business is supposed to be able to achieve mutual advantages. The findings of this research confirm Dewi et al. (2023), which proves that product innovation is an important hallmark for SMEs to improve normal performance. The findings of this research are also consistent with the results of the research Kadiane et al. (2023).

Supply chain management has also an impact on product innovation as shown in Table 2 that p-value  $0.000 < 0.05$  so  $H_2$  is accepted. This means that higher SCM possessed by the SMEs with financial capital are increasingly returning to product innovations that are produced. The results of this study are consistent with the Seman et al. (2019), Thakkar et al. (2009) and Wang et al. (2023) that organizational abilities such as knowledge competence to acquire competitive advantage Knowledge competence has become an organizational strategic asset. Others examined the relationship between knowledge competence and innovation with large companies, in general, the literature provides evidence that the higher the competency knowledge, the greater the level of innovation. The results of this research are consistent with Kumar et al. (2015) and Lenny et al. (2007). Even though entrepreneurial competence has a significant positive effect regarding the performance of SMEs.

Product innovation has an impact on SMEs performance as shown in Table 2 with a p-value  $0.000 < 0.05$  so  $H_3$  is accepted. This means the higher product innovation possessed by the SMEs with financial capital are increasingly returning to product innovations that are produced. Many business organizations are motivated to assess their potential and determine crucial aspects of success to outperform the competition because of the emergence of a dynamic industrial environment in the current global period (Adnani et al., 2023). The aim of this initiative is to provide customers with the best products. In terms of manufacturing and operations management, the company provides a mix of products and services to its customers. The current production system that must be used by companies faces obstacles as well as opportunities in presenting products in a broad sense. To make and distribute these products according to the preferences of the intended consumers, producers must first determine preferences according to the tastes of the intended consumers.

Consumers naturally expect to receive superior products at reasonable prices. Every business strives to make the best use of its resources and talents to meet customer expectations to meet the needs of these consumers. SCM can be used to manage a company's operations to move materials, information, and funds. One of the expenditures in product marketing is logistics management, which includes product design, material procurement, manufacturing, inventory control, and goods storage. Event coordination occurs not only within the company but also for every extracurricular activity (Bayraktar et al., 2009). Idea places the focus on an integrated pattern that includes the movement of goods from suppliers, manufacturers, and retailers to consumers. From now on, there are no significant barriers between supplier and end-user activities, so that the information mechanism between the various elements takes place in a transparent manner. According to Qiao and Zhao (2023) and Wang et al. (2023) the main goal of SCM is to meet customer needs so that goods that meet certain requirements can be delivered to customers at the right time, at the right price, and with excellent quality. The distribution of supplies from suppliers, the flow of materials during manufacture, and the distribution of finished products to consumers are all targeted for cost reduction. In this situation, the notion of SCM can be used to achieve optimal distribution. The focus of supply chain management is on the coordinated movement of products from suppliers, manufacturers and retailers to final customers.

Through the idea of SCM, various interactions between suppliers and final consumers are treated uniquely. Others argue that SCM is the process for producing goods that are supplied to consumers and consists of a number of different entities, including raw material suppliers, production facilities, warehouses, transporters, retailers, and, ultimately, sales and focuses not only on internal issues, but also on relationships with outside partner companies. In general, applying supply chain management ideas to businesses will result in benefits such as consumer happiness, increased sales, reduced costs, increased asset utilization, increased profits, and growing businesses (Adnani et al.,2023). The most important rule to consider when coordinating supply chain operations is to provide better results for the system as a whole, not just for each link individually. This principle must be changed both strategically and tactically to be successfully applied. On the other hand, failure is usually characterized by management's inability to outline the actions to be taken to synchronize complex supply chain components.

## 5. Conclusion

Based on the results of the calculations that have been discussed previously, it can be concluded that even though SCM has a positive and significant influence on Product Innovation, SCM has a positive and significant effect on SMEs performance, product innovation has a positive and significant effect on SMEs Performance. This means better SCM possessed by SMEs influence increasing SMEs performance. The results of the research are in accordance with the RBV theory that was demonstrated in that a business is supposed to be able to achieve mutual advantages. The findings of this research proves that product innovation is an important hallmark for SMEs to improve normal performance. Knowledge competence has become an organizational strategic asset. The research provides evidence that the higher the competency knowledge, the greater the level of innovation of SMEs. SMEs need to use strategic and entrepreneurial perspectives to survive in an age of highly competitive business environment. The perspective of strategy or the integration of strategy and entrepreneurship is called strategic entrepreneurship which plays a critical role as a search for opportunities and profits modern business competition has an impact on changing the focus of competition between companies independently towards business competition such as SCM in SMEs.

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