

The Effect of Supply Chain Management and Machine Maintenance on Production Performance at CV Pabrik Tahu Sumedang

Ananda Lutfi Berlyawan^{1*}, Djoko Hananto²

^{1,2}Management Study Program, Faculty of Economics and Business, Universitas Muhammadiyah Jakarta, Indonesia

Email: ¹⁾ berlyawanlutfi@gmail.com, ²⁾ joko.hananto@umj.ac.id

Received : 05 January - 2025

Accepted : 09 February - 2025

Published online : 12 February - 2025

Abstract

This study aims to analyze the impact of Supply Chain Management (SCM) and machine maintenance on production performance at CV Pabrik Tahu Sumedang. In the food industry, production efficiency is a crucial factor in maintaining business sustainability and company competitiveness. SCM plays an essential role in ensuring the availability of raw materials, smooth distribution, and coordination among parties within the supply chain, thereby optimizing the production process. On the other hand, proper machine maintenance is necessary to maintain operational stability, reduce the risk of equipment failure, and enhance production effectiveness. This research utilizes a quantitative approach by conducting a survey and distributing questionnaires to 54 employees at CV Pabrik Tahu Sumedang. To ensure the reliability of the data, the analysis technique employed is multiple linear regression, starting with validity, reliability, and classical assumption tests. The implications of this study suggest that the company must continuously optimize supply chain management to minimize production constraints, such as delays in raw material supply and distribution inefficiencies. Additionally, the company should implement a more structured machine maintenance strategy, including preventive and corrective maintenance, to ensure machines operate in optimal conditions. By improving SCM and machine maintenance aspects, the company can enhance overall production performance, maintain competitiveness, and meet the growing market demand.

Keywords: Supply Chain Management, Machine Maintenance, Production Performance, Operational Efficiency.

1. Introduction

Food is a basic human need that is inseparable from life. The food consumption pattern of each individual varies greatly and is influenced by various factors, including income level. The global food industry continues to innovate to meet consumers' increasing demands for nutritious, delicious, safe and quality food products. In Indonesia, soybeans are one of the strategic food commodities that are rich in vegetable protein and fiber. The potential for using soybeans as a source of food is vast, considering the wide range of products that can be made from them through processing, ranging from tofu and tempeh to modern processed products such as soy milk and tofu nuggets. However, fluctuations in soybean production in the country are a challenge, so sustainable efforts are needed to increase productivity and diversify processed soybean products.

Processed soy products such as tofu have become an integral part of Indonesian cuisine. The high demand for affordable vegetable protein makes tofu a popular choice for the community. In addition to tofu, other processed soy products such as silken tofu, crispy tofu, and tofu nuggets are increasingly in demand, especially by the younger generation who are looking for healthy and delicious food alternatives. The market potential for processed soy



products in Indonesia, especially in big cities like Jakarta, is very promising. In addition, traditional processed soy products such as Sumedang tofu (also known as *Tahu Sumedang*) are also gaining popularity for their convenience and deliciousness. Market research shows that the demand for innovative and highly nutritious processed soy products continues to increase, thus this is a golden chance for the soybean processing industry in Indonesia to grow and expand.

Based on the production data of CV Pabrik Tahu Sumedang knows per pcs where 1 pcs is produced in 1 board every month in every year and it can be seen that the production process at CV Pabrik Tahu Sumedang decreased by 2.37% in 2022 from $26,556 - 25,926 = 934 / 26,556 = 0.0237 * 100 = 2.37\%$, and decreased in 2023 by 2.18% from $25,926 - 25,360 = 566 / 25,926 = 0.0218 * 100 = 2.18\%$, various factors impact the fluctuation of production percentages, such as the Covid-19 transition period when the government implemented community activity restrictions. Additionally, other factors contributing to decreased production include insufficient raw material inventory within the company.

In addition, challenges in supply chain management and the implementation of machine maintenance are key to production performance to ensure sustainability and operational efficiency in meeting changing market needs. In this context, the food industry focuses not only on production, but also on aspects of sustainability and social responsibility to maintain public health, which is one of the assessments in company performance.

Performance itself refers to the results or performance achieved by individuals or groups of people in accordance with the responsibilities and authority given by the company according to the company (Yuliana & Mahrizal, 2023). According to Roosdiana (2021) production performance refers to how well a company can generate profits based on its sales, assets, and share capital. Investors are more likely to put their money into companies that are making good profits, hoping to see returns on their investments.

The idea of performance pertains to the measure of success attained by a business or corporation in meeting job expectations (Iswandi & Rahmadani, 2022). It determines business performance measures including growth, profit and is measured by asking respondents to indicate the rate of change in revenue performance, sales profit performance in three years.

It is known from the sales data of CV Pabrik Tahu Sumedang above had experienced a decrease in sales of 2.37% in 2022 from $982,572,000 - 959,262,000 = 23,310,000 / 982,572,000 = 0.0237 * 100 = 2.37\%$, then decreased again by 2.18% in 2023 from $959,262,000 - 938,320,000 = 20,942,000 / 959,262,000 = 0.0218 * 100 = 2.18\%$, therefore researchers want to know how much the company's performance results decreased from 2021 to 2023 from the supply chain management and machine maintenance factors applied. According to Anindita and Noegroho (2019) in their research stated that there exists a strong correlation between the state of liquidity and the financial success of a company.

Implementing Supply Chain management can enhance the competitiveness and overall performance of manufacturing companies (Alabdullah & Kanaan-Jebna, 2023). Profits and operational efficiency can be boosted through the effective implementation and proper management of supply chain practices (Alam & Tui, 2022). In supply chain management, suppliers, manufacturing, storage, and distribution are all interconnected with the goal of reducing expenses and delivering quality services to customers. The main objective in any supply chain is to optimize the overall value created (Alam & Tui, 2022).

Supply chain management involves various methods to simplify the coordination of suppliers, production facilities, storage areas, and distribution centers in order to efficiently produce and deliver goods at the optimal time and place to reduce expenses and ensure

customer satisfaction. Rohaeni & Sutawijaya (2020) states that the supply chain consists of: 1) A sequence of different physical locations and geographic areas, such as suppliers, manufacturers, distributors, retailers, and customers, where goods are stored or undergo changes in form or value; and 2) An integrated series of tasks associated with sourcing raw materials, manufacturing intermediate and final goods, and delivering those goods to clients both within and outside the network.

Based on Sutia et al. (2020), supply chain management has an influence on competitive advantage with indicators of supply chain management, by establishing strong partnerships with suppliers, nurturing customer relationships, and sharing information, companies can enhance their competitive edge through various factors such as pricing, quality, innovation, reliability, and speed to market. Effective implementation of supply chain management can boost a company's competitive advantage.

A supply chain management (SCM) system refers to the software utilized by businesses to organize and oversee the movement of their goods, starting from raw material production to final product delivery. These systems are responsible for handling procurement, tracking orders, ensuring quality control, fulfilling orders, managing distribution, and other related tasks (Awaliya et al., 2023). Usually, when SCM systems are put in place, they include tools for collaboration that can be used by a wide variety of individuals and departments within the operational process, spanning from manufacturing to product delivery. This group may consist of suppliers, producers, logistics coordinators, distributors, sellers, and additional parties. Contemporary SCM platforms incorporate innovative technologies like ERP in order to enhance the functioning of the company (Awaliya et al., 2023). According to research by Wulandari et al. (2016), this study has a positive influence from supply chain management on company performance.

Maintenance involves keeping factory equipment and facilities in good condition by making necessary repairs or replacements to ensure smooth production operations as planned, enabling the facilities to be utilized for the production process before the scheduled period (Assauri, 2008). Machine maintenance is an activity carried out to maintain and care for factory equipment or facilities such as machinery and take the necessary corrective and adjustment actions to ensure satisfactory production operations as planned according to Irsyad et al. (2024). Referring to Irsyad et al. (2024), machine maintenance is an action that aims to maintain and maintain the optimal condition of the machine or work equipment, so that it can be utilized for production purposes in accordance with the plan that has been prepared.

In simple terms, machine maintenance is a step needed to maintain and restore the best condition of the machine or work equipment, so that it is able to operate optimally in the production process. According to Sofyan Assauri (2004) that maintenance is a function in a factory company that is as important as other functions such as production. This is because if we have equipment or facilities, then usually we always try to keep using the equipment and facilities. In the research of Irsyad et al. (2024), the findings of this research indicate that proper maintenance of machinery greatly enhances the efficiency of the production process, while maintaining control over raw material inventory also plays a pivotal role in improving production performance.

Table 1. Research Gap

Researcher Name and Year	Research Title	Variables used	Research Results
(Irmawati, 2007)	The Effect of Supply Chain Management on Performance at PTPN VIII Gunung Mas Bogor	Company Performance, Supply Chain Management	The impact of Supply Chain Management on the performance of companies suggests that strategies for managing suppliers have a beneficial influence on company performance.
(Suharto, 2013)	Analysis of the Effect of Supply Chain Management on Competitive Advantage and Company Performance	Supply Chain Management, Company Performance	The connection between supply chain management and competitive advantage, supply chain management and company performance, and competitive advantage and company performance is crucial.
(Wulandari et al., 2016)	The Effect of Supply Chain Management on Company Performance through Competitive Advantage	Supply Chain Management, Company Performance	Company performance is enhanced by effective supply chain management.
(Rahadi, 2012)	Effect of Supply Chain Management on the Company's Operational Performance	Supply Chain Management, Company Operational Performance	Supply chain management contributes positively to the operational efficiency of the company.
(Iqbal, 2017)	The Effect of Machine Maintenance on Production Process Performance	Machine Maintenance, Production Process Performance	Regular machine maintenance is important for the efficiency of the production process. Neglecting this maintenance can lead to machine failure, causing disruptions in the production process.
(Irsyad et al., 2024)	The Effect of Machine Maintenance and Raw Material Inventory Control on Production Process Performance in Wood Processing Small Industries	Machine Maintenance, Raw Material Inventory Control, And Production Process Performance	Machine maintenance greatly improves the efficiency of production processes, while effective management of raw material inventory also has a significant impact on production performance.

Source: Data processed by the author

The goal of this research is to investigate how Supply Chain Management and Machine Maintenance impact the production performance of CV Pabrik Tahu Sumedang, considering the explanation provided earlier and the current situation.

2. Literature Review

2.1. Production Performance

Performance refers to how well tasks are carried out in an organization to achieve its goals, objectives, mission, and vision according to Sutia et al. (2020) it determines business performance measures including growth, profit and is measured by asking respondents to indicate the rate of change in revenue performance, sales profit performance in three years. According to Alam & Tui (2022) the success of a company reflects its overall condition during

a specific timeframe, showcasing the outcomes and accomplishments influenced by the company's utilization of resources in operational activities. Production performance describes the overall condition of the company both in terms of operations and finance. The higher the company's success rate in achieving its goals, then good operational processing, and stable financial conditions can illustrate that the company's performance level is good.

2.2. Supply Chain Management (SCM)

Managing the supply chain includes overseeing various activities, such as obtaining materials and services, converting them into final or intermediate goods, and distributing them to clients (Anon, 2021). Based on Anon (2021), the coordination of all processes within an organization or company to prepare and deliver products or services to consumers is known as supply chain management. This system, originally known as logistics management, has evolved over time.

2.3. Machine Maintenance

Referring to Assauri (2008) cited in Anggraini & Maulana (2016), maintenance involves maintaining and repairing factory facilities or equipment as necessary to ensure that production operations are running smoothly and as planned. According to the opinion of Agus (2015), the function of maintenance is to be able to extend the economic life of existing production machinery and equipment and strive for the production machinery and equipment to always be in an optimal and ready-to-use state for the implementation of the production process.

2.4. Research Framework

In research of Wulandari et al. (2016), there is a positive influence on supply chain management on production performance, there is a positive influence on machine maintenance on the smooth production process, and lay out on the smooth production process, and in research Irsyad et al. (2024), effective maintenance of machinery greatly influences the efficiency of the production process, while proper management of raw material inventory significantly boosts the overall performance of production. Based on the research presented, the authors draw a framework as follows:

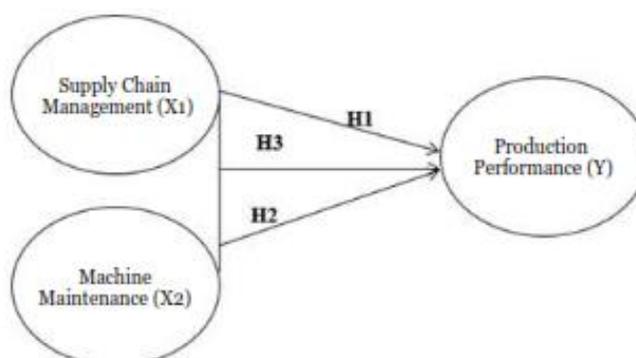


Figure 1. Research Framework

Description:

- X₁ = Independent Variable 1 (Supply Chain Management)
- X₂ = Independent Variable 2 (Machine Maintenance)
- Y = Dependent Variable (Production Performance)

Based on the research results presented, the research hypothesis is formulated as follows:

H1: Supply chain management has a positive effect on company performance.

H2: Machine maintenance has a positive effect on company performance.

H3: Supply chain management and machine maintenance together have a positive effect on company performance.

3. Methods

3.1. Research Design

This research method uses quantitative methods. Quantitative research method according to Sugiyono (2015) is the research methodology influenced by positivism philosophy involves analyzing samples and research populations. Sampling techniques are typically random or based on randomness, and data collection is done using research instruments. Quantitative analysis is utilized to measure and test previously set hypotheses.

3.2. Operational Variables

There are two research variables, namely the dependent variable and the independent variable. The independent variables in this study are X1 supply chain management and X2 machine maintenance. The dependent variable in this study is Y production performance.

Tabel 2. Operational Variables

No.	Variable	Dimension	Indicator	Scale
1.	Production Performance (Y)	Quality	Employee perception of the quality of work produced where the work process is close to perfection.	Likert 1-5
		Quantity	Expected target amount exceeds the set target	
		Timeliness	The rate at which activities are completed at the earliest possible time while maximizing the time available for other activities	
		Effectivity	Increasing the efficiency of resource utilization can lead to maximizing the utilization of organizational resources such as manpower, funding, and technology.	
		Efficiency	Measuring the degree of conformity of output generation using the lowest possible cost	
2.	Supply Chain Management (X ₁)	Information Sharing	Getting information, maintaining information, conveying information	Likert 1-5
		Long-term Relationship	Trust each other, committed, dependence on production activities	
		Cooperation	More than one party, have a common goal, mutually beneficial	
		Integration Process	Improving relationships, decision making, operating the flow source	
	Machine Maintenance (X ₂)	Maintenance Strategy	Replacement, short-scale checking, maintenance schedule, design modification, correction maintenance	Likert 1-5
		The main purpose of maintenance	Extend tool life, ensure equipment availability, ensure safety of machine users	

3.3. Data Sources

For the primary data, the researchers carried out a field survey in this research by utilizing a questionnaire survey technique. Secondary data, including books, literature, and related readings, was used to complement the primary data required for the study. The primary data source for collecting data in this research project is essential.

3.4. Population and Sample

All 54 employees of CV Pabrik Tahu Sumedang were included in the study population. The saturated sampling technique, a form of Non-Probability Sampling, was utilized by the authors to select the sample for the study. Based on the explanation of the sample technique provided, it was decided that the sample would consist of all employees at CV Pabrik Tahu Sumedang, totaling 54 individuals.

3.5. Data Collection Methods

In this study the authors used a data collection method with a questionnaire where a set of lists of questions were submitted to respondents to answer them. The questions in the questionnaire are closed, meaning that the answers chosen by the respondent are not given the opportunity to provide answers outside the answers given.

According to Sugiyono (2017) the Likert scale is employed to assess the viewpoints, beliefs, and understandings of an individual or a collective regarding societal occurrences. Utilizing the Likert scale in this research, participants had to select a response option, with each answer being assigned a specific score based on the measurement standards for variables X and Y, as outlined below:

Table 3. Likert Scale

No.	Detail	Score
1.	Strongly Disagree (SD)	1
2.	Disagree (D)	2
3.	Neutral (N)	3
4.	Agree (A)	4
5.	Strongly Agree (SA)	5

3.6. Data Analysis Method

The data analysis technique in this study used the help of the Statistical Package for Social Science (SPSS) for Windows Release 22.0 computer program. The method used is associative hypothesis testing, namely knowing the relationship between two or more variables. Where variable X (independent variable) is Supply Chain Management (X_1) and Machine Maintenance (X_2), while variable Y (dependent variable) is Production Performance. The data analysis method is as follows:

3.6.1. Data Instrument Test

The assessment of the data instrument consists of verifying its validity and reliability to ensure the accuracy and consistency of the tools employed in this research, serving as a method to evaluate the quality of the data. A valid instrument is an instrument used for accurate data measurement.

1) Validity Test

In determining whether or not a correlation coefficient is appropriate:

- a. The significance level of 0.05 (5%) or at a significance of 0.01 (1%) means that an internal is considered valid if it correlates significantly with the total score.

b. Or if making a direct assessment of the correlation coefficient, a minimum correlation limit of 0.30 can be used. Any item that achieves a minimum correlation coefficient of 0.30 is considered satisfactory. It can even be lowered to 0.25 but a total of up to 0.20 is not recommended.

2) Reliability Test

Reliable means trustworthy as well as reliable. So that even several times repeated the results will remain the same (consistent). Reliability testing can be done externally (stabililit / test retest, equivalent or a combination of both) and internally (consistent analysis of the items on the instrument). A value that can be said to be reliability if:

- a. By using a real level of 5%, it means that the value of the instrument can be said to be reliability if the alpha value is greater than the critical r value in product moment.
- b. Or we can use the 0.6 limit. Reliability of less than 0.6 is not good, while 0.7 is acceptable or above 0.8 is good.

3.6.2. Classical Assumption Test

1) Normality Test

The purpose of conducting a normality test is to ascertain whether the residual or confounding variables in the regression model follow a normal distribution. The t and F tests rely on the assumption of normality in the residual values. If this assumption is not met, the statistical test is not reliable when working with a small sample size. There are two methods for determining if the residuals follow a normal distribution: examining graphs and conducting statistical tests. The Kolmogorov-Smirnov test is utilized to assess the normality of the data. The criteria for testing data normality include:

- a. If the significance value > 0.05 , it can be concluded that the residual distribution of this research data is normal.
- b. If the significance value < 0.05 , it can be concluded that the residual distribution of the research data is not normal.

2) Multicollinearity Test

According to Ghozali (2017) tolerance assesses the fluctuation of specific independent variables not accounted for by other variables. Hence, a low tolerance indicates a high VIF value, showing that each independent variable is influenced by the others. Basically, when conducting regression analysis, each factor being studied is treated as the outcome and compared to the other factors being analyzed. Therefore, a low tolerance level is equivalent to a high VIF value, since VIF is calculated as the reciprocal of tolerance. Typically, a tolerance value of 10 or below is considered indicative of multicollinearity. It is up to each individual researcher to decide how much collinearity they are willing to accept.

3) Heteroscedasticity Test

According to Ghozali (2017), heteroscedasticity refers to the presence of varying differences in the regression model. Conversely, homoscedasticity occurs when the variables in the regression model have consistent values. To identify issues related to heteroscedasticity, one can utilize the technique of graph analysis. This visual method involves examining the plot graph displaying the predicted values of the dependent variable (ZPRED) against the residuals (SRESID). The identification of heteroscedasticity can be determined by observing specific patterns in the scatterplot graph that displays the relationship between SRESID and ZPRED. The X and Y axes represent predicted values, while the Y axis displays the studentized residuals (Y prediction - actual). This helps in detecting whether heteroscedasticity is present or not.

The analysis relies on identifying a consistent pattern among data points, such as a wavy or widening and narrowing pattern, to detect Heteroscedasticity. In the absence of a

discernible pattern and with data points scattered equally above and below the Y axis, Heteroscedasticity is not present.

3.6.3. Multiple Linear Regression Analysis

In this study, multiple linear analysis is applied as the analytical tool to examine the formulated hypotheses. The focus is on utilizing techniques of multiple linear regression analysis to understand the linear relationship between the independent and dependent variables (Sugiyono, 2010). The multiple linear regression model can be expressed with the following formula:

$$Y = \alpha + b_1X_1 + b_2X_2 + e_i$$

Description:

- Y = Dependent variable (Production Performance)
- X₁ = Independent variable 1 (Supply Chain Management)
- X₂ = Independent variable 2 (Machine Maintenance)
- α = Constant
- b₁ = Regression coefficient of independent variable (Supply Chain Management)
- b₂ = Regression coefficient of independent variable 2 (Machine Maintenance)
- e_i = Exponential component

3.6.4. Coefficient of Determination Analysis (R²)

The coefficient of determination, which ranges from zero to one, shows how much independent variables can explain variations in the dependent variable. A low R value suggests that independent variables have a limited ability to clarify changes in the dependent variable. Conversely, a value near one indicates that the independent variables contain most of the essential information needed to predict changes in the dependent variable. The R Square number calculated using the SPSS software can be found in the summary table under the R Square column. Calculated using the following equation:

$$KD = r^2 \times 100\%$$

3.7. Hypothesis Testing

3.7.1. Partial Test (t test)

The decision-making basis used in the t test is as follows:

- 1) If the p-value is greater than 0.05, the hypothesis is considered invalid. This suggests that the independent variable does not have a notable impact on the dependent variable.
- 2) If the significance value is less than 0.05, the hypothesis will be deemed valid. This indicates that the independent variable has a noticeable impact on the dependent variable, leading to the hypothesis not being dismissed.

3.7.2. Simultaneous Test (F test)

The F test is employed to ascertain if the combined independent variables have a substantial impact on the dependent variable. The decision-making process depends on the following criteria:

- 1) If the F-statistic is smaller than the F-table statistic, then the null hypothesis is rejected in favor of the alternative hypothesis. Conversely, if the F-statistic is greater than the F-table statistic, then the null hypothesis is accepted over the alternative hypothesis.

- 2) If the significance level is greater than 5%, then the null hypothesis (H_0) is accepted, indicating that there is no concurrent effect of the independent variable on the dependent variable. Conversely, if the significance level is less than 5%, then the null hypothesis (H_0) is rejected, suggesting that there is a concurrent effect of the independent variables on the variable.

4. Results and Discussion

4.1. Research Results

4.1.1. Respondent Characteristics

This research project gathered first-hand information by distributing surveys to analyze the demographic details of the participants, such as gender, age, educational background, and years of professional experience. A significant portion of the participants were males, making up 72% (39 individuals), while the female respondents accounted for 28% (15 individuals), bringing the total number of participants to 54. Respondents were categorized into four age groups: 15% were under 25 years old, 30% were between 26-30 years old, 44% were between 30-45 years old, and 11% were over 46 years old.

Regarding educational background, the majority (82% or 44 respondents) had a high school/vocational high school education, followed by 13% (7 respondents) with a D3 diploma, and 5% (3 respondents) with a bachelor's degree. No respondents reported having a higher level of education. In terms of work experience, the largest group (52% or 28 respondents) had been working for 11-15 years. This was followed by 32% (17 respondents) with 6-10 years of experience, 9% (5 respondents) with less than 5 years of experience, and 7% (4 respondents) with more than 16 years of experience.

4.1.2. Research Instrument Test Results

1) Validity Test

The Validity Test is used to determine the feasibility of a list of questions on defining a variable in a survey model, and can be declared valid if the significant value is below 0.05. The test criteria are if $r\text{-statistic} > r\text{-table}$ then the question instrument is significantly correlated to the total score or declared valid. The amount of data (n)=54 obtained the result $df = 54 - 2 = 52$, then obtained an $r\text{-table}$ of 0.2681. The analysis results show the value of r statistic with r table of 0.2681, so the results obtained are all valid Production Performance questions because all items $r\text{-statistic}$ greater than $r\text{-table}$. The value of r statistic with r table is 0.2681, so the result obtained is that all Supply Chain Management statements are valid because all items $r\text{-statistic}$ greater than $r\text{-table}$. The calculated r value with r table is 0.2681, so the result obtained is that all Machine Maintenance statements are valid because all r items statistic greater than $r\text{-table}$.

2) Reliability Test

This research considers an instrument to be trustworthy if its Cronbach Alpha value is 0.600 or higher. If an instrument's Cronbach Alpha value falls below this threshold, it is deemed untrustworthy. The testing process involves evaluating 5 instruments for Production Performance, 12 instruments for Supply Chain Management, and 8 instruments for Machine Maintenance that have been deemed legitimate. The analysis findings indicate that both the independent and dependent variables are considered dependable, as they exhibit a Cronbach Alpha value exceeding 0.600. This suggests that the results are deemed satisfactory with a reasonably high value.

4.1.3. Classical Assumption Test Results

1) Multicollinearity Test

Table 4. Multicollinearity Test Result

Model	Coefficients ^a					Collinearity Statistics	
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF
	B	Std. Error	Beta				
1 (Constant)	3,152	1,691		1,864	0,068		
Supply Chain Management	0,241	0,055	0,604	4,397	0,000	0,305	3,274
Machine Maintenance	0,181	0,093	0,268	1,948	0,057	0,305	3,274

a. Dependent Variable: Production Performance

Source: SPSS V.20 data processing results

According to the data presented in table 4, the VIF (Variance Inflation Factor) value is 3.274 which is less than 10, and the tolerance value is 0.305 which is greater than 0.10 for all variables analyzed in the research. This demonstrates that there is no strong linear correlation among the independent variables. Consequently, the regression model utilized in this study did not detect any multicollinearity issues and satisfied the criteria for a reliable regression model.

2) Normality Test

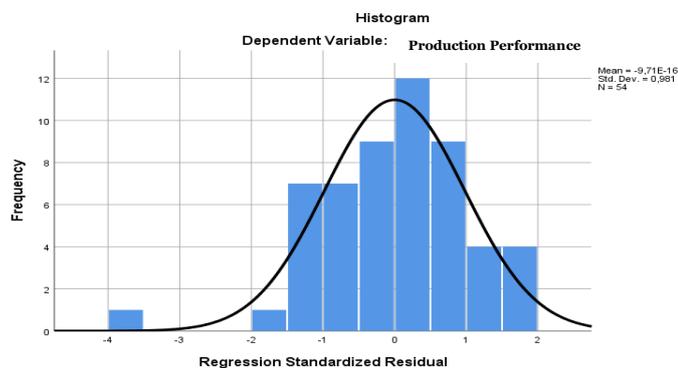


Figure 2. Histogram Graphic

Source: SPSS V.20 data processing results

Based on Figure 2 above, it shows that the curve line is normal, this is shown because the histogram image is not left-skewed, this regression model can be said to be suitable for use, so it can be concluded, the data in this study is normally distributed.

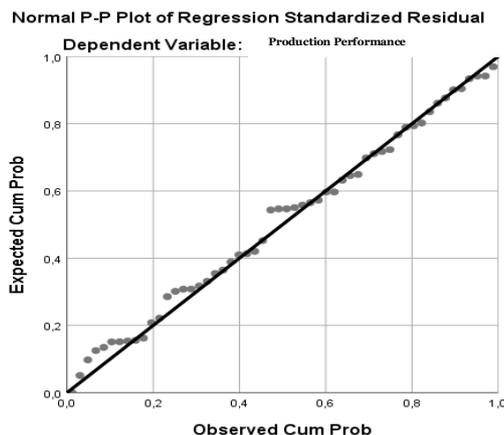


Figure 3. Normality Results
Source: SPSS V.20 data processing results

According to the information displayed in Figure 3, the data points on the P-P Plot are distributed evenly along the diagonal line, indicating that the data in this research follows a normal distribution.

3) Heteroscedasticity Test

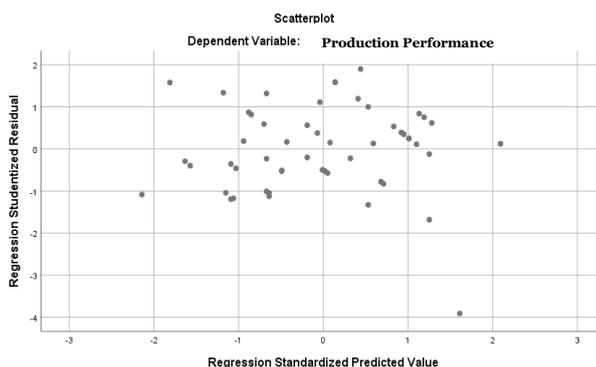


Figure 4. Heteroscedasticity Test Result
Source: SPSS V.20 data processing results

According to the analysis of heteroscedasticity shown in Figure 4 through scatterplot, it is evident from the discernible pattern and the distribution of points both above and below zero on the Y axis that heteroscedasticity is not present in the regression model.

4) Multiple Linear Regression Analysis

Table 5. Multiple Linear Regression Test Results

Model	Coefficients ^a					Collinearity Statistics	
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF
	B	Std. Error	Beta				
1 (Constant)	3,152	1,691		1,864	0,068		
Supply Chain Management	0,241	0,055	0,604	4,397	0,000	0,305	3,274
Machine Maintenance	0,181	0,093	0,268	1,948	0,057	0,305	3,274

Source: SPSS V.20 data processing results

According to the data in table 5, the multiple linear regression equation can be organized in the following manner:

$$Y = 3,152 + 0,241 X_1 + 0,181 X_2$$

- a. The constant value (α) = 3,152 means that if Supply Chain Management and Machine Maintenance are 0 or constant (fixed), then the value of Production Performance is 3,152.
- b. The coefficient value (β_1) of Supply Chain Management is 0.241, meaning that if the Supply Chain Management variable increases by 1%, assuming the machine maintenance variable remains, the performance will increase by 0.241 with a positive direction. Therefore, if Supply Chain Management increases, then Production Performance will also increase.
- c. The coefficient value (β_2) of Machine Maintenance is 0.181, meaning that if the Machine Maintenance variable increases by 1% assuming the Supply Chain Management variable remains, the performance will increase by 0.181 and has a positive direction. Therefore, if Machine Maintenance increases, then Production Performance will also increase.

5) Coefficient of Determination Analysis

Table 6. Test Results of the Coefficient of Determination Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,840 ^a	,706	,694	1,32020

a. Predictors: (Constant), Machine Maintenance, Supply Chain Management

b. Dependent Variable: Production Performance

Source: SPSS V.20 data processing results

According to the findings in table 6, it is evident that the coefficient of determination (R^2) is 0.706, indicating that Supply Chain Management and Machine Maintenance contribute 70.6% to Production Performance. The remaining 29.4% is influenced by unexamined variables like Standard Operating Procedures, Layout, and other related factors.

4.1.4. Hypothesis Testing Results

1) T-test (Partial Test)

Table 7. T-test Result Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	3,152	1,691		1,864	,068
Supply Chain Management	,241	,055	,604	4,397	,000
Machine Maintenance	,181	,093	,268	1,948	,057

a. Dependent Variable: Production Performance

Source: SPSS V.20 data processing results

Calculation of t table $df = n - k - 1 = 54 - 2 - 1 = 51$, t-table value = 1.675

From the data above, we can explain that:

a. Effect of Supply Chain Management on Production Performance

According to the t-test findings, the t-value of 4.397 is greater than the t-table value of 1.675. Furthermore, with a significant value of 0.000 being less than 0.05, it can be concluded that the null hypothesis is rejected in favor of the alternative hypothesis. This indicates that Supply Chain Management plays a significant role in influencing Production Performance.

b. Effect of Machine Maintenance on Production Performance

According to the t-test findings, the t-statistic value is 1.948 which is greater than the t-table value of 1.675. Additionally, the significance value (sig value) is 0.057, higher than the threshold of 0.05, indicating that the null hypothesis (Ho) is affirmed while the alternative hypothesis (Ha) is dismissed. Hence, it can be concluded that Machine Maintenance does not have a noteworthy impact on Production Performance.

2) F Test (Simultaneous Test)

Table 8. F-Test Result

ANOVA ^a						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	213,426	2	106,713	61,227	,000 ^b
	Residual	88,889	51	1,743		
	Total	302,315	53			

a. Dependent Variable: Production Performance

b. Predictors: (Constant), Machine Maintenance, Supply Chain Management

Source: SPSS V.20 data processing results

F-table calculation $df = n - k - 1 = 54 - 3 - 1 = 50$, F-table value = 3.18

Formula: $df (N1) = k - 1 = 3 - 1 = 2$

$Df (N2) = n - k = 54 - 3 = 51$

According to the results shown in table 8 of the F test, the value of 61.227 is greater than 3.18. Additionally, it is important to note that the significance value is less than 0.05, specifically $0.000 < 0.05$. The rejection of the null hypothesis leads to the acceptance of the alternative hypothesis. This indicates that Supply Chain Management and Machine Maintenance collectively contribute to a favorable and substantial impact on Production Performance at CV Pabrik Tahu Sumedang.

4.2. Discussion

4.2.1. Impact of Supply Chain Management (X₁) on Production Performance (Y)

The variable in Supply Chain Management plays a crucial role in influencing Production Performance at CV Pabrik Tahu Sumedang. This is evident from the comparison of t-statistic (4.397) to the t-table value (1.675). Furthermore, the significance value (0.000) is lower than the threshold (0.05), leading to the rejection of Ho and acceptance of Ha. This confirms that effective Supply Chain Management positively influences the company's production efficiency and overall performance.

4.2.2. Impact of Machine Maintenance (X_2) on Production Performance (Y)

At CV Pabrik Tahu Sumedang, the Machine Maintenance factor does not have a notable impact on Production Performance based on the comparison between the t-statistic and t-table values, which are 1.948 and 1.675 respectively. Furthermore, with the sig value being 0.057, which is greater than 0.05, the null hypothesis (H_0) is supported, while the alternative hypothesis (H_a) is dismissed. This suggests that while machine maintenance is essential for operational continuity, its direct influence on production performance is not statistically significant in this study.

4.2.3. Impact of Supply Chain Management (X_1) and Machine Maintenance (X_2) simultaneously on Production Performance (Y)

The collaboration of Supply Chain Management and Machine Maintenance has a strong and positive impact on Production Performance at CV Pabrik Tahu Sumedang. The results of the F test indicate a significant relationship, with a value of 61.227 which is greater than 3.14. Additionally, a significance level of 0.000, which is lower than 0.05, indicates that the null hypothesis is being discarded in favor of the alternative hypothesis. This finding highlights the importance of integrating both factors to enhance production efficiency and ensure sustainable operations within the company.

5. Conclusion

After considering the findings presented, it can be inferred that Supply Chain Management plays a crucial role in enhancing Production Performance at CV Pabrik Tahu Sumedang. This suggests that the company should place greater emphasis on Supply Chain Management to ensure a smooth and efficient production process. On the other hand, Machine Maintenance does not appear to have a positive or significant impact on Production Performance. However, the company still needs to consider this aspect to prevent disruptions in production activities. Additionally, this study demonstrates that both Supply Chain Management and Machine Maintenance have a positive and significant impact on Production Performance when considered together. Therefore, the company should continue to sustain and enhance the production process to achieve better results.

Based on these findings, there are both theoretical and practical implications. Theoretically, in Production Performance, it is essential to consider dimensions and indicators that play a crucial role in ensuring smooth and high-quality production. In Supply Chain Management, dimensions and indicators significantly influence production performance to create efficiency within the production system. Meanwhile, in Machine Maintenance, the company must establish and implement appropriate job roles to maintain product quality. Furthermore, the company should ensure the availability of necessary equipment and machinery in the production division and conduct regular maintenance, as this will impact the final product quality. Practically, the findings of this study can provide valuable insights for the company and employees of CV Pabrik Tahu Sumedang in assessing and evaluating Production Performance. By focusing on aspects of Supply Chain Management and Machine Maintenance, the company can enhance production efficiency and effectiveness.

After analyzing the findings and discussion, various suggestions can be taken into account. For CV Pabrik Tahu Sumedang, it is recommended to improve control and efficiency in Supply Chain Management to optimize production activities and achieve more effective outcomes. Additionally, regarding Machine Maintenance, the company should enhance and regularly schedule maintenance to minimize disruptions or damage that could affect worker

safety and production continuity. For future research, it is recommended to use diverse research methods and variables and conduct long-term observations. This will ensure more varied and reliable research findings while avoiding bias from continuously using the same methods. In addition, past research can act as a starting point for future studies, facilitating a steady and structured growth of knowledge.

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