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Original Article

Factors Affecting Labor Productivity in the Coconut Oil Industry in Kekeran Hamlet, Batu Layar Village, West Lombok Regency

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This article contributes to:

Abstract. This study investigates the factors influencing labor productivity in the coconut oil industry in Kekeran Hamlet, Batu Layar Village, West Lombok Regency. Utilizing a quantitative approach, the research focuses on four independent variables—wages, age, work experience, and gender—while labor productivity serves as the dependent variable. Data were collected through surveys, interviews, and documentation involving 52 randomly selected respondents from a population of 108 workers. The analysis employed Confirmatory Factor Analysis (CFA) and Principal Component Analysis (PCA) to assess the significance and contribution of each factor. The results show that wages are the most dominant factor affecting productivity, followed by gender differences. The study highlights the importance of adequate compensation and gender-sensitive approaches to enhance productivity in local resource-based industries. Recommendations for future research include the use of Common Factor Analysis for deeper exploration and comparison.

Keywords: Wages, Age, Gender, Experience, Productivity.

1. Introduction

Development is a process of targeted change aimed at improving the social and economic conditions of a community in a sustainable manner [1]. One of the primary goals of economic development is to improve public welfare and reduce poverty. In this development process, the industrial sector plays a crucial role because it can significantly contribute to increasing national income, expanding job opportunities, and reducing unemployment [2]. The success of development in the industrial sector is inseparable from the existence and contribution of various production factors, including labor, raw materials, and capital. Among the three, labor is the most crucial factor because it is directly involved in the production process and plays a role in determining the level of productivity. Labor plays a role in increasing the efficiency, effectiveness, and competitiveness of industry [3]. According to Law Number 13 of 2003 concerning Manpower, labor is every person who is able to perform work to produce goods and/or services, either to meet their own needs or those of the community. García-Gómez et al. [4] added that the workforce includes the entire working-age population (15–64 years) who are ready and able to work, whether they are already working, looking for work, or are currently studying or taking care of a household.

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In West Lombok Regency, the majority of the population works in the service, agricultural, and manufacturing sectors. Based on data from the Statistics Indonesia (BPS) of West Lombok Regency (2024), the distribution of the working population by primary occupation shows that the service sector dominates with a percentage of 54.77%, followed by the agricultural sector (23.23%), and the manufacturing sector (22.00%). This relatively small manufacturing sector holds significant potential for further development to support local economic development, particularly through strengthening local natural resource-based industries. One of the growing manufacturing sectors in West Lombok Regency is the coconut oil industry, particularly in Kekeran Hamlet, Batu Layar Village. Based on initial observations, there are 16 Micro, Small, and Medium Enterprises (MSMEs) operating in this industry, employing a total of 108 people. This industry utilizes local resources, including coconuts, which are abundantly available and have been processed for generations by the local community. Coconut oil production is considered to have high economic value and is an alternative livelihood that can improve community welfare. Furthermore, this industry also creates job opportunities and encourages inclusive regional economic growth.

Labor productivity is a key indicator in assessing the performance of the coconut oil industry in the region. Productivity is defined as the ability of workers to produce goods or services within a specific time period, which can be measured by comparing output to inputs, such as working hours and wages. Van praag and Versloot [5] emphasizes that high wages tend to be directly proportional to labor productivity, as they can motivate workers to work more optimally and efficiently. In addition to wages, other factors such as age, work experience, and gender also influence labor productivity. Those of productive age (15–64 years) have better physical abilities and adaptability to work demands and technology use than those of non-productive age [6]. Dewa et al. [7] added that with increasing age, individuals' physical abilities tend to decline, which impacts productivity. On the other hand, adequate work experience can improve workers' skills and efficiency in carrying out their duties, although length of service is not the sole indicator of experience [8].

Gender is also a variable that can influence productivity. Bhattacharya et al. [9] stated that men generally have higher productivity levels due to physical factors and social responsibilities. However, in work contexts that require precision and patience, women can demonstrate superior productivity. Based on this background, this study aims to further examine the factors influencing labor productivity in the coconut oil industry in Kekeran Hamlet, Batu Layar Village, West Lombok Regency. This research is crucial for gaining a comprehensive understanding of the determinants of labor productivity in the local industrial sector, which in turn can serve as a basis for formulating policies to increase productivity and empower the community's economy.

2. Method

This study uses a quantitative approach with the aim of measuring and analyzing the influence of factors such as wages, age, work experience, and gender on labor productivity in the coconut oil industry in Kekeran Hamlet, Batu Layar Village, West Lombok Regency. The research location was chosen purposively because the area has active coconut oil industry activities with a workforce of 108 people. The research was conducted after the proposal seminar was approved. The population in this study was all coconut oil industry workers in the area. Due to time and resource limitations, the researcher used a probability sampling technique with a simple random sampling method. The number of samples was determined using the Slovin formula with an error

rate (α) of 10%, resulting in a sample of 52 respondents. The data collection technique was carried out through a survey using a questionnaire as the main instrument, accompanied by interviews, literature studies, and documentation to support data completeness [10].

The type of data used is quantitative data sourced from primary data (responders' questionnaires) and secondary data (agency data such as the NTB Provincial Statistics Agency). The independent variables in this study include wages (X1), age (X2), work experience (X3), and gender (X4), while the dependent variable is labor productivity (Y). The operational definition of productivity is expressed as the ratio between the number of production (bottles) and working hours, while wages are measured in rupiah per month, age and work experience in years, and gender using a dummy variable (1 = male, 0 = female). The data were analyzed using multivariate statistical techniques, specifically factor analysis with the Confirmatory Factor Analysis (CFA) approach, to test the suitability of the indicators to the variable constructs. The analysis feasibility test was carried out using the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity. A KMO value > 0.5 indicates that the data is suitable for analysis. Indicators with communalities values above 0.5 and significant factor loadings will be retained in the model. Total variance explained exceeding 60% indicates that the construct can adequately explain data variability [11].

3. Results and Discussion

3.1 Respondent Characteristics

This study involved 52 coconut oil industry workers in Kekeran Hamlet, Batu Layar Village. These respondents had diverse characteristics, one of which can be identified by the amount of wages they received. Based on the research results, data on the distribution of wages among respondents is presented in Table 1, which illustrates the range of daily and monthly earnings received by workers in the industry.

Table 1. Number and Percentage of Respondents Based on Wages

level	productivity	Wage level				Total	
		Low		High			
		Count	Column %	Count	Column %	Count	Column %
	low	24	850.7%	11	450.8%	35	670.3%
	medium	4	140.3%	12	50.0%	16	300.8%
	high			1	40.2%	1	10.9%
Total		28	100.0%	24	100.0%	52	100.0%

Based on the table above, the lowest wage level is Rp. 900,000-Rp. 1,000,000, the middle wage level is Rp. 1,050,000-Rp. 10,200,000, and the highest wage level is Rp. 10,350,000-Rp. 10,500,000. Furthermore, the results of the research conducted obtained data on the age of respondents which can be seen in Table 2.

Table 2. Number and Percentage of Respondents by Age

Level	Productivity	Age level				Total	
		Young		Mature			
		Count	Column %	Count	Column %	Count	Column %
	low	15	930.8%	20	550.6%	35	670.3%
	medium	1	60.3%	15	410.7%	16	300.8%
	high			1	20.8%	1	10.9%
Total		16	100.0%	36	100.0%	52	100.0%

Based on Table 2, the respondents were categorized as young people aged 20-40 years and adults aged 41-60 years. The results of the research obtained data on respondents' work experience can be seen in Table 3.

Table 3. Number and Percentage of Respondents Based on Work Experience

Productivity	Level of work experience						Total	
	Low		Medium		High		Count	Column %
	Count	Column %	Count	Column %	Count	Column %		
low	31	72.1	4	57.1			35	670.3
medium	12	270.9	3	420.9	1	50.0	16	300.8
high					1	50.0	1	10.9
Total	43	100.0	7	100.0	2	100.0	52	100.0

Based on Table 4, the lowest category of little work experience is 1-5 years, the moderate work experience category is 6-10 years, and the highest category of little work experience is >10 years. Based on the results of the research conducted, data obtained regarding the gender of the respondents can be seen in Table 4.

Table 4. Number and Percentage of Respondents Based on Gender

Productivity	Gender				Total	
	Female		Male		Count	Column %
	Count	Column %	Count	Column %		
low	20	100.0%	15	460.9%	35	670.3%
medium			16	50.0%	16	300.8%
high			1	3.1%	1	10.9%
Total	20	100.0%	32	100.0%	52	100.0%

Based on the table above, productivity levels by gender are as follows: 20 women had the lowest productivity level, 15 men had the lowest productivity level, 16 men had the average productivity level, and 1 man had the highest productivity level.

3.2 Factor Analysis Results

In this study, the dependent variable is work productivity (Y), while the independent variables consist of wages (X1), age (X2), work experience (X3), and gender (X4). To determine the feasibility of the data in factor analysis, the Kaiser-Meyer-Olkin (KMO) Test and Bartlett's Test were used. The KMO test is used to measure sample adequacy to ensure whether factor analysis can be applied appropriately. A KMO value exceeding 0.5 indicates that the data has adequate sample adequacy and is suitable for further analysis using factor analysis. Conversely, if the KMO value is less than 0.5, the data is considered ineligible because the correlation between the variables is not strong enough to form valid factors. The results of the KMO and Bartlett's Tests in this study are shown in Table 5.

Table 5. KMO and Barlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.762
Bartlett's Test of Sphericity	Approx. Chi-Square	980,997
	df	10
	Sig.	0.000

Based on Table 5, it is known that the Kaiser Meyer Oikin measure of sampling adequacy (KMO MSA) value is 0.762 > 0.05, so it can be concluded that the variables are correlated and can be processed further.

3.3 Test Measure of Sampling Adequacy

The results of the anti-image matrices test can be seen in Table 6.

Table 6. Anti-Image Matrices

		Y	X1	X2	X3	Gender
Anti-image Covariance	Y	0.322	-0.173	-0.131	-0.063	-0.206
	X1	-0.173	0.483	-0.059	-0.041	-0.070
	X2	-0.131	-0.059	0.663	-0.216	.132
	X3	-0.063	-0.041	-0.216	0.675	-0.055
	X4	-0.206	-0.070	.132	-0.055	0.490
Anti-image Correlation	Y	0.718[a]	-0.438	-0.284	-0.135	-0.518

	Y	X1	X2	X3	Gender
X1	-0.438	0.832[a]	-0.105	-0.072	-0.143
X2	-0.284	-0.105	0.717[a]	-0.324	0.231
X3	-0.135	-0.072	-0.324	0.847[a]	-0.096
X4	-0.518	-0.143	0.231	-0.096	0.729[a]

Based on the output in Table 6, the MSA value of each indicator is more than 0.5. So it meets the criteria of the MSA and can be analyzed further without eliminating the indicators used. The MSA value in the anti image matrix table, contained in the anti image correlation shows wage (X1) is 00.718, age (X2) is 00.832, work experience is (X3) 00.717, and gender (X4) is 00.729.

3.4 Communalities

The method used to form the factors is principal components analysis (PCA). The number of variables to be extracted is shown in Table 7.

Tabel 7. Communalities

Items	Raw		Rescaled	
	Initial	Extraction	Initial	Extraction
Y	3850.386	3780.525	1.000	0.982
X1	2E+010	2E+010	1.000	1.000
X2	1020.351	340.316	1.000	0.335
X3	60,583	10,827	1,000	0.278
X4	0.241	0.109	1.000	0.453

Table 7 shows how much a variable can explain a factor. The first factor variable (X1) has a communalities value of 1.000, which means that this factor is able to explain 100% of the formed factors. The second factor (X2) has a communalities value of 0.335, which means that this factor is able to explain 33% of the formed factors. The third factor (X3) has a communalities value of 0.278, which means that this factor is able to explain 27% of the formed factors. The fourth factor (X4) has a communalities value of 0.453, which means that this factor is able to explain 45% of the formed factors. Therefore, the greater the communalities value, the stronger the relationship with the factors that will be formed.

3.5 Total Variance Explained

The degree of variation in a variable that can be explained by a number of factors in factor analysis is determined through the total variance explained value [12]. In this context, a variable can be said to be unable to be adequately explained by the factors formed if the total variance explained value is less than 60%. In other words, if the percentage of cumulative variance explained by all extracted factors is below this threshold, then the factors are considered unable to represent or significantly describe the diversity of data from the variables analyzed. The results of the calculation of total variance explained in this study are shown in Table 8.

Tabel 8. Total Variance Explained

Component		Initial Eigenvalues	
		Total	% of Variance
Raw	1	2E+010	100,000
	2	2050,738	80.53E-007
	3	750,215	3.12E-007
	4	40,451	10.85E-008
	5	.118	40.90E-010
Rescaled	1	2E+010	100,000
	2	2050,738	80.53E-007
	3	750,215	3.12E-007

Component	Initial Eigenvalues	
	Total	% of Variance
4	40,451	10.85E-008
5	0.118	40.90E-010

In Table 8, it can be seen that there are five components that can represent the variable. Factor 1 has an eigenvalue value of 2,000 and a percent of variance of 100,000%, meaning that factor 1 is able to explain 100,000% of all total factors that influence labor productivity. Factor 2 has an eigenvalue value of 2,050,738 and a percent of variance of 80,530%, meaning that factor 2 is able to explain 80,530% of all total factors that influence labor productivity. Factor 3 has an eigenvalue value of 750,215 and a percent of variance of 3,120%, meaning that factor 3 is able to explain 3,120% of all total factors that influence labor productivity. Factor 4 has an eigenvalue value of 40,451 and a percent of variance of 10,850%, meaning that factor 4 is able to explain 10,850% of all total factors that influence labor productivity. Factor 5 has an eigenvalue of 0.118 and a percent of variance of 40.900%, meaning that factor 5 is able to explain 40.900% of the total factors that influence labor productivity.

3.6 Factor Loading (Component Matrix)

The level of variation of a variable in factor analysis is determined based on the total variance explained value [13]. This value describes how much of the variance in the overall data can be explained by the formed factors. In general, a variable can be said to be inadequately explained by the factors if the total variance explained value is below 60%. In other words, if the percentage of cumulative variance explained by the extracted factors is less than 60%, it can be concluded that the factors are unable to significantly represent the diversity of data from the variables analyzed. The results of the calculation of total variance explained in this study are shown in Table 9.

Table 9. Component Matrix

Items	Raw Component		Rescaled Component	
	1	2	1	2
Y	130,851	130,663	0.706	0.696
X1	1553,100.7	-0.001	1.000	0.000
X2	30,998	40,281	0.395	0.423
X3	1,064	0.834	0.415	0.325
X3	0.270	0.190	0.551	0.388

This Component Matrix (Table 9) shows the correlation value or relationship between each variable and the factors that will be formed. Based on the table above, it is still difficult to determine the exact position of the variables because there is still a (-) sign, therefore the factor components must be rotated. Factor rotation will clarify the position of a variable by looking at the largest loading value without looking at (+) and (-).

Tabel 10. Rotated Component Matrix

Items	Raw Component		Rescaled Component	
	1	2	1	2
Y	170,996	70,394	0.917	0.377
X1	608,240,965	1429,040.7	0.392	0.920
X2	50,505	2,002	0.544	.198
X3	1,184	0.652	0.461	0.254
X4	0.281	.174	0.572	0.355

The results obtained (Table 10) show that the factor loading values or correlation values between a variable and several factors have been sufficiently differentiated and ready for interpretation. All variables have a high factor loading on one factor and have a

relatively small factor loading for the other factors. The largest factor loading value for Wages (X1) is with factor 2 with a correlation value of 0.908. The largest correlation value is for age (X2) with a correlation value of 50,505. The largest correlation value is for work experience (X3) with a correlation value of 1,184. The largest correlation value is for gender (X4) with a correlation value of 572.

3.7 Discussion

3.7.1 Measure Of Sampling Adequacy (MSA)

Based on the output from SPSS 13, a significance value of 0.762 was obtained, which is greater than 0.05. This indicates that the data has sufficient adequacy for factor analysis. Furthermore, to assess the feasibility of each variable in factor analysis, the Measure of Sampling Adequacy (MSA) was used. The calculation results show that all variables have MSA values above 0.5, which indicates that these variables are worthy of further analysis without the need for elimination. The MSA values based on the Anti-Image Correlation matrix are as follows: wages (X1) of 0.718, age (X2) of 0.832, work experience (X3) of 0.717, and gender (X4) of 0.729. These values have met the minimum threshold of feasibility required in factor analysis.

These findings align with research conducted by Teixeira et al. [14], which showed that demographic variables such as age, work experience, and gender had MSA values above 0.5 and were suitable for inclusion in factor analysis models for studies related to industrial labor productivity. Similarly, research by Thien and Hung [15] demonstrated that indicators such as wages and age were not only statistically significant but also consistently demonstrated adequate MSA values, supporting their use in further exploration of factors influencing performance. Therefore, these test results strengthen the validity of the research instrument and support the significant contribution of the indicators to forming latent factors related to work productivity [16].

3.7.2 Communalities

Based on the results of the communalities analysis, variable X1 has a value of 1.000. This indicates that all of the variance of the variable can be perfectly explained by the factors formed in the model, thus its contribution is very strong to the resulting factor structure. Meanwhile, variable X2 has a value of 0.335, which means that only 33.5% of its variance can be explained by the latent factors. Variable X3 has a communalities value of 0.278 (27.8%), and variable X4 of 0.453 (45.3%). Thus, only X1 has a very high contribution strength, while the other three variables show a relatively low level of variance representation in the model. In general, the communalities value reflects the extent to which a variable can be explained by the formed factors [17]. The higher the value, the stronger the relationship between the variable and the factors, and the more appropriate the variable is to be retained in the model. Conversely, a low value indicates that the variable is underrepresented by the factors, which can indicate weaknesses in the factor structure or a mismatch of the variable with the latent construct to be measured [18].

Compared with previous research, such as the study by Mirbagheri et al. [19], which conducted a factor analysis on variables influencing work productivity, it was found that variables with communalities values below 0.4 tended to be eliminated or revised to improve model robustness. In this context, variables X2 and X3, which have values below this threshold, require further consideration, whether to retain them based on theoretical considerations or replace them to strengthen the reliability of the results. However, these results can also be interpreted in terms of the relative contributions between the variables. Although X2 and X3 have low communalities, they may still have

strategic value in explaining certain aspects of work productivity not fully captured by the main factors, especially if there is theoretical evidence supporting their relevance.

3.7.3 Total Variance Explained

Based on the analysis results, five main components were obtained from the factor extraction process. The first component has an eigenvalue of 2,000 and explains 100,000% of the total variance. The second component has an eigenvalue of 2,050.738 and explains 80.530% of the variance. The third component explains 3.120% of the variance, the fourth 10.850%, and the fifth 40.900%. However, the percentage variance exceeding 100% indicates an anomaly in the output, possibly due to scaling errors or data normalization processes in the software. Therefore, this interpretation needs to be done carefully and it is recommended to re-examine the extraction method used [20].

4. Conclusion

Based on the discussion, it can be concluded that several factors influence labor productivity in the coconut oil industry in Kekeran Hamlet, Batu Layar Village, West Lombok Regency. The most dominant factor is wages, with an eigenvalue of 205.738 and a variation percentage of 8.530%. This indicates that the amount of wages received by workers plays a significant role in increasing work enthusiasm and productivity. In addition, gender also influences productivity, with an eigenvalue of 0.118 and a variation percentage of 4.900%. Differences in productivity between men and women are influenced by the physical condition, social roles, and responsibilities of each individual. This study used a factor analysis method with a Principal Component Analysis (PCA) approach to identify and group variables that influence productivity. For further research, it is recommended to consider using the Common Factor Analysis method to enable comparisons and obtain more in-depth results.

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6. Declaration

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