

**FACTORS INFLUENCING LABOR DEMAND IN SMALL AND MICRO  
CONVECTION MANUFACTURING INDUSTRY IN TEMBOK BANJARAN  
VILLAGE, ADIWERNA DISTRICT, TEGAL REGENCY**

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**ABSTRACT**

The textile product industry or the convection industry in Adiwerna District is one of the small and micro industries that employs a significant number of workers. The convection industry is concentrated in the villages of Tembok Banjaran, Tembok Kidul, Tembok Lor, and Tembok Luwung. There are more small convection businesses in Tembok Banjaran compared to Tembok Kidul. However, the number of workers employed by the small convection industry in Tembok Kidul is higher than in Tembok Banjaran. The research aims to analyze the influence of wages, output value, and technology on the demand for labor in the small and micro convection industry in Tembok Banjaran, Adiwerna District, Tegal Regency. The data used in this research are primary data, and the data analysis technique used is multiple linear regression analysis. The results show that wages do not have a significant influence on labor demand, while output value has a significant positive influence on labor demand. There is no significant difference in the average labor demand between industries with complete machine technology and industries with incomplete machine technology. The implication of this research is the need for efforts to develop small and micro industries into medium or large industries. Increasing the scale of the industry will lead to increased output and increased labor demand.

**Keywords:** Labor Demand, Small and Micro Convection Industry, Wages, Output Value, Technology.

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**1. Introduction**

The processing industry is an economic activity aimed at transforming raw materials into finished or semi-finished goods, and/or goods with low value into goods with higher value (Central Statistics Agency, 2022). The processing industry in Tegal Regency is capable of creating a significant number of business opportunities and absorbing a large workforce. The number of businesses in Tegal Regency is 24,347, with a total workforce of 80,371. The number of businesses and workforce is closely tied to the role of Small and Micro Industries. The number of Small and Micro Industries businesses and workforce in Tegal Regency is larger than the number of Medium and Large Industries. According to Table 1 data, the number of Small and Micro Industries in Tegal Regency is 24,214 businesses with a workforce of 56,783, while Medium and Large Industries only has 133 businesses with a workforce of 23,588. This means that the economic growth and employment in Tegal Regency largely depend on Small and Micro Industries.

Table 1. Number of Businesses/Companies and Workforce in the Processing Industry by Business Scale, according to Regencies in Central Java, 2020.

Regency	Small and Micro Industries	Workforce in Small and Micro Industries	Medium and Large Industries	Workforce in Medium and Large Industries
Cilacap	45.748	90.020	32	8.975
Purbalingga	51.254	96.493	96	9.918
<b>Banyumas</b>	<b>73.715</b>	<b>116.330</b>	<b>155</b>	<b>44.674</b>
Banjarnegara	30.011	39.785	26	5.646
Kebumen	52.497	102.149	183	9.685
Purworejo	19.701	32.231	21	5.797
Wonosobo	25.408	61.595	101	7.826
Magelang	37.505	70.882	102	16.304
Boyolali	33.062	138.969	127	71.669
Klaten	35.753	50.497	155	28.376
Sukoharjo	22.417	43.315	230	68.577
Wonogiri	45.245	101.377	28	12.735
Karanganyar	11.538	21.618	191	66.568
Sragen	21.105	37.708	90	24.340
Grobogan	9.610	23.230	34	17.729
Blora	9.872	22.209	30	3.222
Rembang	13.347	34.276	66	6.191
Pati	12.415	27.582	229	24.337
Kudus	19.042	34.159	230	138.308
Jepara	49.657	94.812	376	80.054
Demak	16.271	37.981	120	37.829
Semarang	28.987	47.106	172	106.100
Temanggung	33.440	120.655	54	19.508
Kendal	15.244	41.405	86	25.187
Batang	27.689	36.824	86	16.687
Pekalongan	45.467	89.825	212	22.936
Pemalang	51.334	90.553	63	10.659
<b>Tegal</b>	<b>24.214</b>	<b>56.783</b>	<b>133</b>	<b>23.588</b>
Brebes	14.969	27.621	84	26.720
<b>JAWA TENGAH</b>	<b>912.421</b>	<b>1.874.926</b>	<b>4.372</b>	<b>1.133.790</b>

Source : Central Java Provincial Statistics Agency, 2020a, 2020b

Based on Table 1, the number of Small and Micro Industries in Tegal Regency is ranked seventeenth with a total of 24,214 businesses. This number is significantly lower compared to Banyumas Regency, which has the highest number of businesses in Central Java with 73,870. However, the average workforce absorption per business in the Small and Micro Industries in Tegal Regency is much higher, at 2,35 employees per business, while the average workforce absorption per business in Banyumas Regency is 1,58 employees. These figures are obtained by calculating the averages from Table 1.

Table 2. Recapitulation of Data on the Number of Small and Micro Industries in Tegal Regency based on Districts, 2022.

Districts	Small and Micro Industries
Margasari	57
Bumijawa	56
Bojong	15
Balapulang	36
Pagerbarang	35
Lebaksiu	29
Jatinegara	115
Kedungbanteng	13
Pangkah	55
Slawi	142
Dukuhwaru	72
<b>Adiwerna</b>	<b>2.051</b>
Dukuhturi	523
Talang	1.743
Tarub	24
Kramat	59
Suradadi	75
Warureja	16
<b>Total</b>	<b>5.116</b>

Source : Azizah, 2022

Adiwerna District is one of the districts with the highest number of Small and Micro Industries in Tegal Regency. According to Table 2, the number of Small and Micro Industries businesses in Adiwerna District reaches 2,051. The small and micro industries in Adiwerna District include 778 units of metal machinery and electronics industries, 2,434 units of textile product industries, and 1,944 units of food industries (Central Agency of Statistics of Tegal Regency, 2016). The textile product industry, or convection industry, is one of the small and micro industries that significantly absorb the workforce in Adiwerna District, employing around 8,837 individuals, primarily concentrated in Tembok Banjaran, Tembok Kidul, Tembok Lor, and Tembok Luwung villages (Central Agency of Statistics of Tegal Regency, 2016).

Table 3. Number of Convection Industry and Workforce according to Villages in Adiwerna District, 2020

Village	Large		Medium		Small	
	Number of Businesses	Workforce	Number of Businesses	Workforce	Number of Businesses	Workforce
Pagiyanten	-	-	-	-	7	70
Harjosari Lor	-	-	-	-	4	44
Harjosari Kidul	-	-	1	22	5	30
Tembok Lor	-	-	-	-	741	2.964
<b>Tembok Kidul</b>	-	-	10	282	<b>801</b>	<b>4.001</b>
<b>Tembok Banjaran</b>	-	-	9	212	<b>832</b>	<b>3.328</b>
Tembok Luwung	-	-	1	32	121	402
Adiwerna	-	-	-	-	1	12

Village	Large		Medium		Small	
	Number of Businesses	Workforce	Number of Businesses	Workforce	Number of Businesses	Workforce
Kalimati	-	-	-	-	5	45
Lemahduwur	-	-	-	-	10	70
Pesarean	-	-	-	-	1	10
Ujungrusi	-	-	-	-	26	104
Pagedangan	-	-	-	-	1	8
Sum 2020	-	-	21	548	2.555	11.088

Source : Central Agency of Statistics of Tegal Regency, 2020

Specifically, Table 3 shows that the medium-sized convection industry businesses in Adiwerna District are dominant located in Tembok Kidul Village, while the small-sized convection industry businesses in Adiwerna District are dominant located in Tembok Banjaran Village. In Table 3, for the small-sized convection industry in Adiwerna District, we can observe the comparison of the workforce according to the number of convection industry businesses in Tembok Banjaran Village and Tembok Kidul Village. The research problem in this study is that the number of small-sized convection industry businesses in Tembok Banjaran Village is higher than in Tembok Kidul Village, but the average workforce absorption per business in Tembok Banjaran Village is four workers, which is less than the average workforce absorption per business in Tembok Kidul Village, which is five workers. Apart from this issue, there are inconsistent findings in previous studies regarding the impact of wage variables on labor demand. Tangarife's research (2013) states that wages have a positive effect on labor demand. However, research conducted by Ariska (2018), Cahyadi (2018), Darmawan & Triyowati (2016), Habib & Sadek (2020), Maryam (2015), and Rostiana & Sagara (2018) indicates that wages have a negative effect on labor demand. Additionally, Rumerung's research (2015) states that wages do not have a significant effect on labor demand. Therefore, further research is needed with the title Factors Influencing Labor Demand in Small and Micro Convection Manufacturing Industry in Tembok Banjaran Village, Adiwerna District, Tegal Regency."

## 2. Literature Review

### 2.1 Labor Demand

The demand for labor refers to the quantity of labor needed by a company at a specific wage level. If a business has a high demand for output value, it will also have a high demand for capital and labor, resulting in higher costs for both capital and labor. In terms of labor utilization, companies strive to optimize the optimal number of workers to maximize profits (Sukarniati, 2019).

The factors influencing labor demand include changes in the wage rate. As the wage (W) increases, the quantity of labor demanded (L) decreases. This is due to the production effect (output value effect) and the substitution effect (Yogi et al., 2020). The shift in the labor demand curve is also caused by changes in the price of output value and productivity. If the price of output value rises, the labor demand curve will shift to the right, and vice versa (Yogi et al., 2020). In addition to wages, output value prices, and productivity, another factor that influences labor demand is technological progress. Technological advancements can either reduce or increase the demand for factors of production, particularly labor. If technological progress improves productivity, the demand for labor will increase. However, if technological progress is substitutionary in nature, it will reduce the demand for labor (Syaiful et al., 2022).

## 2.2 Wages

Wages represent the cost incurred by business owners to pay for labor in the form of money received as compensation for producing goods or services (Utami, 2021). Economists tend to examine the income received by workers in terms of real average wages, which indicate the purchasing power for the time they sacrifice, or in other words, wages divided by the cost of living. Ghofur (2020) explains the wage theory, also known as the marginal productivity theory, which focuses on the utilization of labor input and price formation. In addition to the marginal productivity theory, there is also the efficiency-wage theory in economics, which states that higher wages can affect worker productivity. In other words, worker productivity increases when wages increase (Ghofur, 2020). With higher wages, workers pay more attention to their health by meeting their nutritional needs, resulting in higher productivity for workers with better health.

## 2.3 Production Output Value

The value of output is obtained by multiplying the quantity of production output by its price (Daengs, 2020). Production output refers to all the goods or services produced by a company that generate added value, either in terms of sales value or revenue (Poniman & Hadiyat, 2015). The production function is a mathematical equation that represents the relationship between production factors (inputs) and the level of production (output) generated (Sujarwo, 2019). In other words, it is a mathematical equation that describes the maximum amount of output produced from a given set of inputs using a specific technology (Sutanto, 2015). According to Sujarwo (2019), the production function is formulated as follows:

$$y = f(x) \tag{1}$$

where  $y$  represents output and  $x$  represents production input, both of which are positive numbers. The function  $f(x)$  shows the relationship between inputs and output, and it is positive and continuous. The basic assumption about the nature of the production function based on economic theory is that all producers adhere to the law of diminishing returns, which states that increasing one type of production input will initially increase the production output and subsequently raise the value of the company's output. However, if inputs are continuously increased, the production output and its value will decrease (Hartono, 2016).

## 2.4 Technology

Technology refers to tools or machines used to assist or facilitate human daily tasks (Bagaskoro, 2019). In the business context, technology is closely related to manufacturing-based industries, which can be categorized as capital-intensive or labor-intensive industries. In capital-intensive industries, the investment value is significantly high, and advanced technology is commonly utilized. Moreover, the workforce in these industries often possesses high levels of competence. On the other hand, labor-intensive manufacturing industries have lower investment values compared to capital-intensive industries. The technology used in these industries is relatively low or moderate, and the workforce consists of a large number of individuals with varying levels of competence (Bachrun, 2019).

### 2.5 Small and Micro Industries

Micro-industry refers to small industries whose production processes are located near or even within the home. According to Purwanto (2021), the characteristics of micro-industries include employing one to four workers, limited capital, family-based labor, and the business owner being the head of the family. Examples of micro-industries include the convection industry, tofu and tempeh industry, batik industry, pottery or ceramic industry, as well as various small snack food industries (Purwanto, 2021).

Small industry, on the other hand, refers to industries with a larger scale compared to micro-industries. According to Purwanto (2021), the characteristics of small industries include employing five to nineteen workers, requiring relatively small capital, and sourcing labor from the local community or relatives.

### 3. Research Methodology

This study employs a quantitative approach. The labor demand of the convection industry, which is the research object, is located in Tembok Banjaran Village, Adiwerna District, Tegal Regency. The determination of the sample size in this study uses Taro Yamane's formula with the following formula (Sugiyono, 2018):

$$n = \frac{N}{1+N(e)^2} \quad (2)$$

Where:

n = sample size

N = population size

e = level of significance (5% or 10%) (Imran, 2017)

The population data of small convection industries in Tembok Banjaran Village can be seen in Table 1.8, with a total population of 832. Therefore, the sample size can be determined as follows:

$$n = \frac{N}{1+N(e)^2} = \frac{832}{1+832(0,1)^2} = \frac{832}{9,32} = 89,27 \text{ atau } 89 \text{ responden} \quad (3)$$

In this study, the data sources are primary data and secondary data. The research is conducted by directly communicating with the respondents through interviews or distributing questionnaires. Secondary data refers to data obtained or collected to support or complement the primary data. The data analysis technique used in this study is multiple linear regression. Multiple linear regression is a regression model that involves more than one independent variable. The purpose of multiple linear regression analysis is to test the influence of more than one independent variable on the dependent variable (Gani & Amalia, 2018). This research aims to determine the influence of wages (X1), output value (X2), and technology (X3) on labor demand (Y).

## 4. Results

### 4.1 Classic Assumption Tests

The results of the classic assumption tests (Table 4) indicate that the regression equation in this study is free from classic assumption issues. The regression equation in this study is free from problems of normality, multicollinearity, heteroscedasticity, and autocorrelation.

Table 4. Classical Assumption Results

Classical Assumption Test	Result			Description
1. Detection Normality a. Jarque-Bera b. Probability	0,114883 0,944177			Free of normality problems
2. Detection Multicollinearity a. VIF	Wages (X1)	Output Value (X2)	Technology (X3)	Free of multicollinearity problems
	1,471049	1,252718	1,660544	
3. Detection of Heteroscedasticity (Autogressive Conditional Heteroscedasticity) a. Prob. Chi-Square	0,2460			Free of heteroscedasticity problems
4. Detection of Autocorrelation a. Durbin Watson	1,756674			Free of autocorrelation problems

Source: Processed primary data, 2023

The method used for testing normality is the Jarque-Bera test. If the probability value is  $> 0.05$  (sig.), then the residuals are normally distributed. If the probability value is  $< 0.05$  (sig.), it indicates that the residuals are not normally distributed. From Table 4, the probability value of the model is 0.944177. Since the probability value is  $> 0.05$  (sig.), it indicates that the residuals are normally distributed.

Detection of multicollinearity is a problem that indicates a linear relationship among independent variables. Multicollinearity can be identified by examining the VIF (Variance Inflation Factor) values. The VIF values should be around 1 and not exceed 10. Based on Table 4, it can be concluded that all variables do not exhibit multicollinearity symptoms as the VIF values are not greater than 10. The conclusion in this study is that the regression model does not have multicollinearity issues.

Detection of heteroscedasticity is tested using the Autoregressive Conditional Heteroscedasticity (ARCH) test. The decision criterion for the ARCH test is that if the Probability C-Square value is greater than 5% or 0.05, there is no heteroscedasticity. Conversely, if the Probability C-Square value is less than 5% or 0.05, it indicates heteroscedasticity. Based on Table 4, the probability C-Square value is larger than 0.05, specifically 0.2460, indicating that the regression model does not exhibit heteroscedasticity.

To determine whether there is autocorrelation in the residuals or not, this assumption can be examined through the Durbin-Watson test. The Durbin-Watson statistic for the model is 1.756674. This value falls within the range of 1.7254 (Du) – 2.2433226 (4-Du), indicating the absence of autocorrelation in the regression model.

### 4.2 Multiple Linear Regression Analysis

The results of multiple linear regression analysis using the natural logarithm transformation on variables Y, X1, and X2 are as follows:



$$\text{LnY} = -8.987372 + 0.207687 \text{ LnX1} + 0.507116 \text{ LnX2} - 0.028032\text{X3} \quad (4)$$

In this equation, LnY represents the natural logarithm of the dependent variable (Y), LnX1 represents the natural logarithm of the first independent variable (X1), LnX2 represents the natural logarithm of the second independent variable (X2), and X3 represents the third independent variable without transformation. The regression coefficients provided indicate the relationship between the independent variables and the dependent variable. Positive coefficients (0.207687 and 0.507116) indicate a positive relationship between the independent variables and the dependent variable, while a negative coefficient (-0.028032) indicates a negative relationship between the independent variables and the dependent variable.

#### 4.3 Coefficient of Determination ( $R^2$ )

The coefficient of determination ( $R^2$ ) is used to measure how well the model explains the variation in the dependent variable using the independent variables. The coefficient of determination ranges between zero (0) and one (1). Based on the results of the coefficient of determination in the small and micro-sized convection industry, the Adjusted ( $R^2$ ) value of 0.698777 indicates that the variables of wages, output value, and technology collectively explain 69.8777 percent of the variation in the labor demand variable.

#### 4.4 Hypothesis Testing

Hypothesis testing is performed using the F-test and t-test. The F-test is used to determine whether all the intended independent variables in the model have a significant combined effect on the dependent variable. The F-test involves comparing the probability value of the F-statistic with the alpha level (5% = 0.05), where the probability value from the F-statistic should be smaller than 5%. Based on the calculations, the computed F-statistic is 69.04753, and the probability (F-statistic) is 0.000000. With an alpha level of 5% and a confidence level of 95%, the null hypothesis ( $H_0$ ) is rejected, and the alternative hypothesis ( $H_1$ ) is accepted. This means that the variables of wages, output value, and technology collectively have a significant influence on labor demand.

Table 5. Result of F-test

Tested Variable	Value
F-statistic	69,04753
Prob (F-statistic)	0,000000

Source: Processed primary data, 2023

Table 6 Result of t-Statistic Test

Variable	t-statistic	t table	Sign.	Explanation
Wage (X1)	0,974849	1,66298	0,3324	Not significant
Output Value (X2)	12,39093	1,66298	0,0000	Significant
Technology (X3)	-0,188419	1,66298	0,8510	Not significant

Source: Processed primary data, 2023

To determine whether the independent variables have a partial effect on the dependent variable, this study uses the t-test. The t-test involves comparing the calculated t-value with the critical



t-value from the t-table. If the calculated t-value is greater than the critical t-value, then the independent variable has a significant effect on the dependent variable. Based on Table 6, the critical t-value is 1.66298 with an alpha level of 5% or 0.05. Therefore, the following conclusions can be drawn:

#### 4.4.1 Wage variable (X1):

The calculated t-statistic for the wage variable is smaller than the critical t-value,  $0.974849 < 1.66298$ . Therefore,  $H_0$  is accepted and  $H_1$  is rejected, indicating that there is no significant partial effect between the wage variable and the labor demand variable.

#### 4.4.2 Output value variable (X2):

The calculated t-statistic for the output value variable is larger than the critical t-value,  $12.39093 > 1.66298$ . Thus,  $H_0$  is rejected and  $H_1$  is accepted, indicating that there is a significant partial effect between the output value variable and the labor demand variable.

#### 4.4.3 Technology variable (X3):

The calculated t-statistic for the technology variable is smaller than the critical t-value,  $-0.188419 < 1.66298$ . Therefore,  $H_0$  is accepted and  $H_1$  is rejected, indicating that there is no significant partial effect between the technology variable and the labor demand variable.

## 5. Discussion

### *5.1 The influence of wages on the labor demand of small and micro convection industries in Tembok Banjaran Village*

Based on the research findings, wages do not have a significant influence on the labor demand of small and micro convection industries in Tembok Banjaran Village. This is consistent with the research conducted by Rumerung (2015), where the results showed that wage levels do not affect the labor demand in small craft industries in the Maluku Province. In the small craft industries in Maluku Province, it is challenging to increase wages because any wage increase would require funds, while the produced goods may not be immediately sold. As a result, business owners do not have additional capital to increase wage levels. Similarly, in the small and micro convection industries in Tembok Banjaran Village, wages do not have an impact on labor demand. This is because additional wages require funds, while the produced goods are not directly sold by the business owners. The selling system for convection products involves the business owners handing over the produced goods to third parties for sale or marketing. Therefore, the income from the production output is not directly received by the business owners. Additionally, the wages received by workers in each business vary depending on the type of work and the production capacity that each worker can achieve. This wage system is called the piece-rate system, where wages are determined based on the volume of work or production capacity and the time taken to complete it.

### *5.2 The influence of output value on the labor demand of small and micro convection industries in Tembok Banjaran Village*

Based on the research findings, the coefficient of the output value variable is 0.507116, which means that a one percent increase in output value will lead to a 0.507116 increase in labor demand. The coefficient of this variable has a positive direction with a significance value of  $0.0000 < 0.05$ , indicating that the output value variable has a positive and significant impact

on labor demand in small and micro convection industries in Tembok Banjaran Village. This is consistent with the research conducted by Ningrum (2022), where the results showed that the output value has a positive and significant effect on labor demand. Increasing the output value will enhance the capacity of small and micro convection businesses to increase the number of workers. As the production capacity increases and the output value obtained by the business grows, the need for labor also increases, without neglecting the need for other factors of production such as technology and workforce quality. In this study, the output value refers to the income or revenue obtained by a convection business in Tembok Banjaran Village within a one-week period, measured in Indonesian Rupiah. Similar to the research conducted by Ningrum (2022), increasing the output value of small and micro convection industries in Tembok Banjaran Village will enhance the business's ability to increase the number of workers.

### *5.3 The influence of technology on the labor demand of small and micro convection industries in Tembok Banjaran Village*

Based on the research findings, technology does not have a significant influence on the labor demand of small and micro convection industries in Tembok Banjaran Village. This means that there is no difference in labor demand between businesses using complete machine technology and those using incomplete machine technology. This is consistent with the research conducted by Cahyadi (2018), where the results showed that technology has a negative and insignificant impact on labor absorption in the ready-made convection industry in Denpasar City. This is because as technology becomes more advanced, the need for labor increases.

In this study, technology is measured based on the completeness of the machines used by convection businesses in Tembok Banjaran Village. The completeness of machines refers to the use of production tools other than sewing machines. The research results indicate that technology does not have an impact on labor demand because even if a convection business does not have complete machinery, there are other convection business owners who can perform the required tasks.

## **6. Conclusion**

Based on the data analysis and research conducted, the research findings indicate that wages do not have a significant effect on the demand for labor in small and micro convection industries in Tembok Banjaran Village. However, the value of output has a significant effect on the demand for labor in these industries. Technology, on the other hand, does not have a significant effect on the demand for labor in small and micro convection industries in Tembok Banjaran Village. The implication of this research is the need for efforts to develop small and household industries into larger industries, such as medium or large industries. Increasing the scale of the industry will lead to higher output, thus increasing the demand for labor. According to the research findings, a positive and significant relationship exists between the value of output and the demand for labor. If industries can absorb more labor, it can help reduce unemployment rates. The development of small and micro industries into medium and large industries requires the involvement of the government in setting policies and providing support to small and household industries. In this regard, the Tegal Regency Government needs to make various efforts to develop small and household industries, including providing training, assistance in promotion, financial support, production facilities, internships, benchmarking activities, and more.

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