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Economies of scale, efficiency and profitability of the convection industry in the city of Palembang

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ABSTRACT

The development of the industrial sector is greatly influenced by economies of scale, efficiency and profitability. The small convection industrial sector always follows changes in clothing models and creativity that consumers like. This research aims to find out the value of economies of scale and measure the level of efficiency and profitability in small convection industries in the city of Palembang. The type of data used is primary data related to small convection industries in Palembang City. The research method used is qualitative and quantitative with analysis of the scale of production results using the Cobb-Douglas production function, efficiency and profitability. The research results show that the variables of labor (X1), capital (X2) and digital technology (dummy) simultaneously and partially have a positive and significant effect on the amount of production (Y). The economic scale of the small convection industry in Palembang City is in a condition where the return to scale is decreasing. The efficiency value is above average at 52 percent and below average at 48 percent. Agencies or authorities at the Palembang City level, including related parties, are expected to be more active in socializing People's Business Credit so as to facilitate capital and marketing of small convection industries, because based on the results of in-depth interviews with respondents, overall they already have business capital, and the government is expected to be able to distribute it. assistance with production support equipment to business actors thereby providing encouragement to improve production performance.

1. Introduction

Economic growth is supported by all economic aspects, namely in the agricultural, livestock and fisheries, tourism, mining and processing industry sectors. One of the economic sectors that supports the economy of South Sumatra is the processing industry sector, below is the gross regional domestic product (GRDP) of the processing industry in South Sumatra. The average GRDP rate based on constant prices for the South Sumatra processing industry from 2010 to 2020 provides information that the South Sumatra processing industry is dominated by the food and beverage industry at an average of 8.92 percent, this indication is due to an increase in production and productivity in the agricultural sector of South Sumatra which comes from food crops and horticulture, livestock, plantations and fisheries (Bappenas, 2015). The manufacturing sector has a major role in supporting economic growth, which expands business opportunities and expands employment opportunities.

Based on the average GRDP rate at constant prices for the South Sumatra processing industry from 2010 to 2020, there are five processing industry sectors, one of which is the textile and apparel industry with a percentage of 6.18 percent (Hunga & Restiani, 2010). In the 2020 classification of the

processing industry, the textile and apparel industry sector is in second place in the micro-small industry with 26.77 percent of the total, in contrast to the medium-large industry, only 2.81 percent of the total (BPS, 2022), this is due to the textile and South Sumatra apparel is in the process of development, where many business actors start from small sizes, such as woven ikat, songket, cloth blongsong, jumputan and others (Handayani, 2016). The large number of textile and apparel industry business actors in the micro-small industry category is due to the assistance of machines to produce yarn, natural dyes and others by the South Sumatra Industry and Trade Service (Disperindag) (Gumiwang, 2015).

Table 1. Number of Small Micro Industry Companies (IMK) in the Province of South Sumatra Province in 2016-2020

Regency	Number of IMK Companies				
	2016	2017	2018	2019	2020
Ogan Komering Ilir	7768	8308	12764	6046	8544
Banyuasin	6147	6028	6233	3946	3989
Ogan Komering Ulu Timur	8683	9929	8369	10277	10120
Ogan Ilir	14799	9441	10434	20421	18238
Palembang	12445	13911	15609	8881	10463

Source: (BPS South Sumatra, 2020)

Table 1 and Table 2 shows that the number of micro-small industrial companies in Ogan Ilir Regency is more than Palembang City, but the number of Palembang City workforce absorption is superior, this indicates that Palembang City has quite good potential for employment in micro-small industries. The large number of workers absorbed in this sector is the apparel industry due to increased growth in the production of the apparel industry. Fambeu (2024) argued that no direct relationship between concentration and exports but whether economies of scale (through size), technological constraint (ICT), and foreign participation (FDI) can influence this relationship. The results show that through the adoption of ICT, the internal rivalry effect is operational. In low industrial concentration (in more competitive market), the most digital firms improve their international market share.

Table 2. Number of Micro-Small Industry Workers (MSI) in the Province South Sumatra

Regency	Number of MSI Workers				
	2016	2017	2018	2019	2020
Ogan Komering Ilir	16798	18531	26654	13935	18863
Banyuasin	16713	17562	14498	8603	7495
Ogan Komering Ulu Timur	23425	20922	18897	22645	20381
Ogan Ilir	25019	15213	24486	27110	26843
Palembang	33056	33412	45465	17353	23557

Source: (BPS South Sumatra, 2020)

One type of company that manufactures and manages apparel is convection, South Sumatra Province has quite good development of the convection industry, based on data from the Central Bureau of Statistics for South Sumatra Province, the number of companies and small convection industry workers in South Sumatra, is dominated by Palembang City with a total 39 companies and a workforce of 363 workers. The city of Palembang has become the center of the small convection industry in South Sumatra due to a cooperation program with the Palembang cooperative and UKM services as well as the Palembang City industry office. Palembang City is the center of education with many schools and universities, and is an area with a dense population that encourages the growth of small convection industries in Palembang City (Mavilinda et al., 2021). Zou (2024) stated that industrial upgrading is promoted through four intermediate variables: cost saving, value chain upgrading, economies of scale, economies of scope and modularization, and technology diffusion.

The development of the output obtained by each industry is directly related to the input used in the production process so that the role of capital or investment, labor and technology is utilized properly

so that it has an impact on maximum profits (Suripto, 2011). Research conducted by Sidiq & Paradita (2017) explains that the return to scale value of the lurik weaving business is experiencing increasing returns to scale. In contrast to research conducted by Niatika & Arka (2019) which revealed that the wooden sculpture craft industry in Ubud District, Gianyar Regency is in a Constant Return to Scale condition and the nature of its production is capital intensive. Wilanda & Rustariyuni (2019) revealed that the economic scale condition is simultaneously in the Increasing Retrun to Scale condition but partially in the Decreasing Retrun to Scale condition and the use of production factors in this industry is not yet efficient. Meanwhile, according to Alawiyah et al (2019) there is a good efficiency value so that the efficiency of the gedogan weaving industry business in Pringgasela Village has a good opportunity to be developed. Therefore, based on the statement above, it makes researchers interested in seeing how the condition of the production scale, efficiency and profitability of small convection industries in South Sumatra (Wibowo, 2012).

2. Method

This research was conducted within the scope of small convection industries, the selection of small industries by the authors because they control 59.4 percent of the total number of business units in South Sumatra. The convection industry was chosen because it is a leading sector and has fashion value so it is widely used by the public, the data obtained will be tested for validity and reliability. The data source taken to support this research is based on primary data with a total sample taken of 60 people and is a business engaged in the convection sector. This study uses data collection based on simple random sampling technique and uses closed interviews and observation. The author uses self-observation which is part of data collection, by analyzing the performance of the object under study and the interviews used are data collection techniques by asking directly to small industry players. This study used an analytical approach or technique, namely a quantitative descriptive analysis technique. Quantitative descriptive analysis technique is an analysis that uses mathematical, statistical, and econometric approaches, especially those that show the relationship between variables. This study uses the Cobb-Douglas approach because one approach can explain the relationship between labor and capital on output using multiple regression analysis (Giang & Huong, 2023). For multiple regression analysis based on Gujarati (2004) the equation as follows:

$$LnY = \alpha_0 + \beta_1 LnX1 + \beta_2 LnX2 + \beta_3 D + \mu \quad (1)$$

Where Y is the value of number of production; $X1$ is the labor; $X2$ is the capital; D is the dummy variable for digital technology with the value shows not yet using digital technology and value 1 means already using digital technology; α_0 is the constanta; β_1 - β_3 is the coefficient of independent variables; μ is the disturbance error and notation Ln that all variables used in this study transform to logarithm. The relationship between production inputs with production results or output that is labor is an important part in helping a business to create a lot of output, if a large number of workers are employed, the production value will increase (Arsha & Natha, 2013). Capital is the main part and is directly related to the production process, the higher the existing capital, the faster and faster business development (Marselina, 2016). Digital technology is a part that is used to speed up the production process, if the use of digital technology experiences a more modern update, it will increase the amount of production (Dewi & Marhaeni, 2016). Profitability analysis is calculated using Profit margin on sales (Gross Profit Margin) (Nikensari, 2018) and to determine the value of profitability used the following formula:

$$GPM = \frac{(NPB - HPP)}{NPB} \; x \; 100\% \quad (2)$$

Where NPB is the net sales value; HPP is the cost of goods sold and the formula for efficiency analysis based on Hasibuan (1993) that $Efficiency = \frac{Value\ added}{Middle\ Cost}$.

3. Results and Discussion

This study used a small industrial convection company in Palembang City, South Sumatra. Based on the sample criteria used. Construct reliability tests aimed to examine the quality of the survey in which the results are expected to reflect stability in determining the measures and procedures used in the study (Pramuja et al., 2021). Table 3 shows The significant value of this variable is less than 0.05

and the Cronbach's Alpha value is 0.841 greater than 0.6 (Karnoto, 2024), meaning that the variable is reliable.

Table 3. Result of Reliability Test

Correlation Probability	Sig.	Reliability Statistics	
		Cronbach's Alpha	N of Items
Number of Working Hours	0.001		
Capital	0	0.841	3
Digital Technology	0		

Source: data procesed

The regression model is declared passed if the residuals obtained from the regression model are normally distributed, after testing, the calculation results are obtained on Table 4 and the Jarque-Bera probability value is 0.2542 > α = 0.05, so it can be said that the regression model has normally distributed residuals. Testing at the multicollinearity stage aims to determine whether or not there is a correlation between the independent variables. A good regression model is the absence of multicollinearity. After testing each independent variable, the calculation results are obtained. Table 4 shows that each VIF value of the labor variable is 1.153 <10, the capital variable is 2.784 <10 and the digital technology variable is 2.562 <10. The centered VIF value of the three independent variables <10 indicates the above model is free from multicollinearity. The heteroscedasticity test aims to test whether the residual variance has similarities or not from one observation to another. Heteroscedasticity testing is carried out and the calculation results show that the probability value on Obs*Rsquared is 0.8769 > α = 0.05, so it can be concluded that there are no symptoms heteroscedasticity.

Table 4. Result of Multiple Regression

Variable	Coefficient	Centered VIF
C	3.698	NA
	(3.849)***	
LnX1	0.198	1.154
	(2.353)**	
LnX2	0.791	2.784
	(14.334)***	
D	0.059	2.563
	(2.778)***	
Diagnostic Tools		
R-squared	0.894	
F-statistics	156.818***	
Classical Assumption		
Normality Test	0.254	
Heteroskedasticity Test	0.8769	

Source: data procesed

The calculation that has been obtained from the multiple linear regression equation with the Cobb-Douglas approach is as follows:

$$LnY = 3.698 + 0.198LnX1 + 0.791LnX2 + 0.059D$$

The calculation of the F test was carried out to determine the effect of labor (X1), capital (X2) and digital technology (Dummy) on the production of small convection industries with a significant level of 5 percent and degrees of freedom (k-1);(nk) which in this case was obtained F table = F 0.05 (4-1);(60-4) = 3.242. The results of the F test show that the calculated F value is (156.818) greater than the F table (3.242), so it can be concluded that labor, capital and digital technology have a simultaneous significant effect on the small convection industry production in Palembang City. The results of this study are in accordance with the results of research conducted by Niatika & Arka (2019) and Wibowo (2012) which stated that labor, capital and digital technology had a positive and significant effect on the total production of small convection industries in Palembang City. This is also supported by the coefficient of determination (R2) of 0.894, which means that the production of small convection industries in Palembang City is 89.4 percent influenced by labor, capital and digital technology and the remaining 10.6 percent is influenced by other variables not included in the model.

Table 4 shows the calculation used to see the effect of labor on the production of the small convection industry in Palembang City used the t test with a significant level of 5 percent and degrees of freedom (nk) in this case it was obtained t table = t 0.05 (60-4) = 1.672. The results of the t test show that the calculated t value is (2.353) greater than t table (1.672). Comparison of the calculated t value with t table, it can be concluded that labor has a positive and significant effect on the production of small convection industries in Palembang City. The results of this study are in line with the results of research that has been conducted by Arsha & Natha (2013) states that labor has a positive and significant relationship to production. The effect of capital on the production of small convection industries in Palembang City used the t test with a significant level of 5 percent and degrees of freedom (nk) in this case it was obtained t table = t0.05 (60-4) = 1.672. The results of the t test show that the calculated t value is (14.334) greater than t table (1.672), so it can be concluded that the capital variable has a positive and significant effect on the production of small convection industries in Palembang City. The results of this study are in accordance with the research Jelliani et al (2020) which states that capital has a positive and significant relationship to the amount of production.

the effect of digital technology on the production of the small convection industry in Palembang City used the t test with a significant level of 5 percent and degrees of freedom (nk) in this case it was obtained t table = t0.05 (60-4) = 1.672. The results of the t test show a calculated t value of (2.778) greater than t table (1.672), so it can be concluded that digital technology has a positive and significant effect on the production of small convection industries in Palembang City. The results of this study are in accordance with research conducted by Niatika & Arka (2019) which states that digital technology has a positive effect on the amount of production. Based on the results of the multiple linear regression equation that has been carried out using the Cobb-Douglas model on the variables of labor, capital and digital technology for small convection industries using the Eviews program, it is known that the value of $\beta 1 + \beta 2 = 0.198 + 0.79 = 0.988$. This shows that the value of the economy of scale of the small convection industry in Palembang City is in a decreasing return to scale condition, meaning that the scale of the business has decreased, for this reason, the economic scale must be increased by using capital by adding cloth raw materials. yarn, and others without compromising the quality and the workforce must increase its productivity fiber by making good use of digital technology (Fambeu, 2024).

The results of the calculation of the efficiency ratio level with a comparison of added value and intermediate costs of 60 small convection industry business actors in Palembang City, it shows variations in efficiency values, based on the average efficiency value obtained of 0.70 there are 31 businesses that have efficiency values above the average average or 52 percent, while the number of businesses that have an efficiency value below the average is 29 businesses or 48 percent. This indicates that the small convection industry business actors in Palembang City as a whole have carried out production activities by being able to increase production quantity without having to add input, although there are still small convection industry business actors in Palembang City who have low efficiency values (Sleem et al., 2024). Profitability or profit through calculating profit margin on sales using Gross Profit Margin (GPM), shows how a company's ability to run production efficiently and generate proportional profits. The table below shows the profitability calculation results of the average profitability value of small convection industries in Palembang City of 29.33 percent, companies that have a profitability value above the average are 58.3 percent or 35 companies and the remaining 41.7 percent or 25 companies that have a profitability value below the average (Tascón et al., 2023). This explanation, it shows that overall small convection industry businesses in Palembang City have the ability to generate quite a good profit relative to sales, although there are still companies that have a low profitability value, this is due to the impact of the Covid 19 pandemic which has made small industry profits. convection has not increased too much and the production costs incurred and the cost of goods sold have not been proportional so that the profits are not too large.

4. Conclusion

One of the economic sectors that supports the economy of South Sumatra is the processing industry sector. In the 2020 classification of the processing industry, the textile and apparel industry sector is in second place in the micro-small industry with 26.77 percent of the total, in contrast to the medium-large industry, only 2.81 percent of the total. The development of the output obtained by each industry is directly related to the input used in the production process so that the role of capital or investment, labor and technology is utilized properly so that it has an impact on maximum profits. There are evidence that there is no direct relationship between concentration and exports but whether economies

of scale (through size), technological constraint (ICT), and foreign participation (FDI) can influence this relationship.

The level of efficiency in the small convection industry in Palembang City from 60 sample companies has an average efficiency ratio of 0.72, the efficiency value above the average is 52 percent and the remaining 48 percent is still below the average efficiency. The profitability value of small convection industries in Palembang City with an average profitability rate of 29.33 percent, based on the number of companies studied, the profitability value is above the average of 58.3 and the remaining 42.7 percent has below average profitability. The results of this study are expected to be innovation and creativity for small convection industry entrepreneurs in the city of Palembang and for the government to be a reference for running programs in fostering micro and small businesses in the city of Palembang.

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