



Original Article

Investigating the Effect of E-Commerce, Capital and Labour on the Income of Micro, Small, and Medium Enterprises in Banda Aceh City, Indonesia

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Abstract: Micro, Small, and Medium Enterprises (MSMEs) in Indonesia are increasingly growing and innovating along with the development of information technology. Aceh, especially Banda Aceh City, is one of Indonesia's regions where MSMEs experience annual growth. Thus, the objectives of this study were to analyze the influence of e-commerce, capital, and labour on MSME income in Banda Aceh City with quantitative research. The population of this study comprised business units registered with the Ministry of Cooperative and SMEs of Banda Aceh City, with 100 business units selected as the research sample. The sampling technique employed was cluster sampling. Data collection utilized a questionnaire, and the specific analysis technique applied was the multiple linear regression test. The study found that e-commerce, capital, and labour positively and significantly influence MSME income in Banda Aceh City. These findings suggest that policymakers should promote e-commerce adoption among MSMEs through training and infrastructure support, enhance access to capital through tailored financial schemes, and invest in labour skills development via vocational training and industry partnerships. By combining these measures, Banda Aceh City can bolster the growth and sustainability of its MSME sector, fostering increased income generation and economic development.

Keywords: Micro, Small, and Medium Enterprises; E-Commerce; Capital; Labour; Income; Context of Banda Aceh



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1. Introduction

Income is one indicator that can measure the development of a country's welfare level (Thomas, 2021). Revenue is an important object in the activities of companies, especially Micro, Small and medium enterprises (MSMEs). MSMEs have a considerable role in the absorption of labour and in distributing development results. In addition, MSMEs also play a role in the lives of small communities, including eradicating poverty, reducing the economic gap between the poor and the rich, and providing foreign exchange income. Indonesia experienced significant growth in MSME units throughout the year, especially in Banda Aceh. The development of MSMEs in the city of Banda Aceh can be seen in the following data from the Office of cooperatives, small, medium, and trade (Diskopukmdag) of the city of Banda Aceh in 2018-2022.

Table 1. Development of Micro, Small, and Medium Enterprises

Year	Units	Percentage
2018	9.591	-
2019	10.944	14,11
2020	12.012	9,76
2021	16.300	35,7
2022	35.264	116,34
Average Growth		35,18

Source: [Diskopukmdag Banda Aceh City \(2022\)](#)

Table 1 shows that the development of MSMEs in Banda Aceh City has increased from 2018 is 9,591 to 2022 by 35,264 MSMEs ([Diskopukmdag Banda Aceh City, 2022](#)). Thus, an average increase of 35.18 percent annually during 2018-2022. The economy can be improved through the development of the MSME sector, which can ultimately support the prosperity of the people, boost state income, run the economy, and reduce poverty and unemployment levels; MSMEs are considered to have good potential for these problems ([Arifin et al., 2021](#)). Several factors affect the income of MSMEs in Banda Aceh, including e-commerce as a medium for selling and marketing products, capital, and labour. The neoclassical theory of improvement developed by Solow and Swan stated that the most important factors in improving the economy are technological advances and the skills and expertise of the workforce ([Swan, 2017](#)). [Hendrix \(1951\)](#) states that capital resources can increase production and income. [Bravo-Biosca et al. \(2016\)](#) stated that labour is a driving factor in business. Increasing labour productivity will encourage increased production processes, ultimately affecting the income obtained by MSMEs ([Rogovsky & Sims, 2003](#)).

Information technology is currently an important tool in improving the competitiveness of a country's economy. One of the efforts made to improve the company's competitiveness is to encourage the pace of innovation through the adoption of information technology. All MSME managers in this era of globalization must be able to open up to use all types of technology to facilitate access to market products. An information and Communication Technology medium used in business and business activities is called e-commerce. Promotion, marketing, payment transactions, public relations, and scheduling of delivery of goods, as well as still open with various innovations in online business activities, are activities in the field of business ([Turban et al., 2005](#)). Many factors encourage MSMEs to adopt e-commerce to support their business activities. E-commerce can increase business opportunities, competitiveness, and better and profitable market access. MSMEs consider e-commerce a tool for expanding their businesses, reducing costs, etc. E-Commerce allows organizations to access potential customers and suppliers via the web. In addition, e-commerce offers market expansion, increased productivity, customization of products and services, 24-hour trading and knowledge exchange ([Grandon & Pearson, 2004](#)). Through the development of information and Communication Technology in business and commerce, the performance of organizations will experience an unprecedented increase.

Online buying and selling, electronic funds transfer, supply chain management, internet-based marketing, inventory management systems, and automated data collection systems are technological innovations from the development of e-commerce ([Zwass, 2003](#)). Marketing activities by utilizing information technology become an alternative in promoting, marketing, and selling products/goods and/or services that are distributed to consumers efficiently and effectively. Effectiveness in marketing products can boost sales and revenue for a business, especially SMEs ([Yulianto et al., 2015](#)). Data from the [Ministry of Cooperatives and SMEs \(2008\)](#) shows that MSMEs play a strategic role in regional and national economic development. MSMEs can contribute to various sectors of the economy. The MSME industry has reached 99.9 percent of the total business units. MSMEs can also absorb labour to reach 97.04 percent of the total workforce. MSMEs contributed 55.56 percent to the Gross Domestic Product (GDP) formation.

Table 2 displays that in 2022, the total number of MSMEs in the city of Banda Aceh amounted to 17,661, with the largest MSMEs in Baiturrahman District as many as 2,834 and the lowest in Jaya Baru District, as many as 1,390 MSMEs ([Diskopukmdag Banda Aceh, 2022](#)). The development of MSMEs in the city of Banda Aceh proves the importance of this business in the economic sector. The rapid transformation of information in the technological era should enable businesspeople to win in business competition ([Adiningsih, 2019](#)). It can also be an opportunity for MSMEs to market products and develop business networks worldwide. MSMEs in Banda Aceh City have increased yearly, although they are still relatively low, especially since the use of Information Technology in these business activities ([Febriyanto & Arisandi, 2018](#)). The use of e-commerce applications in MSMEs should be studied, especially to understand the importance of these technologies ([Yacob et al., 2021](#)). MSMEs can be effective if MSME actors have achieved their goals by relying on e-commerce sites. More in-depth studies are still needed on the important role of e-commerce MSMEs in Banda Aceh. The more choices of products or goods and services offered will be able to attract consumers' attention. After the MSME actors learn the technology, they feel the benefits, especially for expanding product promotion and marketing. This can impact consumers in the long term, increase sales volume, get export opportunities, and create an increasingly extensive business ([Terzi, 2011](#)).

Table 2. Number of MSMEs in Banda Aceh City in 2022

No	Subdistrict	MSMEs
1	Syiah Kuala	1.849
2	Ulee Kareng	1.936
3	Baiturrahman	2.834
4	Lueng Bata	1.857
5	Banda Raya	1.772
6	Jaya Baru	1.390
7	Meuraxa	2.427
8	Kutaraja	1.873
9	Kuta Alam	1.728
Total		17.661

Source: Diskopukmdag Banda Aceh City (2022)

Although MSMEs have a crucial position in the national economy, MSME business does not always run smoothly because there are still many obstacles and constraints faced by MSME actors (Hasanah et al., 2020). These constraints include limited capital, limited human resources (HR) or labour, and limited technology. Business capital is one of the important instruments for businesses that are pioneered and running (Landstrom, 2007). The government through its policies has sought to provide various credit schemes and capital assistance needed by MSMEs. However, the reality on the ground shows that the capital loans provided by the government are difficult to obtain for MSMEs (Ebitu et al., 2016). The business factor that must exist before conducting business activities is capital. Capital is a significant influence on the income of MSMEs because it is a basis in building a business and is generally a constraint. The capital referred to in this study is the overall capital, namely owned and borrowed capital. According to Callaghan (2012), capital directly affects income, which means that any capital will increase the income of traders. Every business certainly needs capital to carry out its daily business activities. With good and adequate capital, the company will not face economic crises or financial problems, so it can operate properly and optimally to achieve its business goals.

In addition to capital, labour is another factor affecting MSMEs' income. According to Suhaili & Sugiharsono (2019), labour is the most important resource for developing the product quality of an MSME and services to consumers to make a significant contribution to the economic development of a country as well as the production process of the industry. Labour is a driving factor, as well as other input factors. Without labour, other factors of production would be meaningless. Increasing labour productivity will encourage increased production, so income will increase (Vergeer & Kleinknecht, 2014). If many products are sold, the entrepreneur will increase production. Increasing production will increase the labour required, so income will also increase (Verma, 2006). Thus, MSMEs in Indonesia are growing and innovating along with the development of Information Technology. Aceh, especially the city of Banda Aceh, is one of the regions in Indonesia whose MSMEs experience significant growth every year. Thus, based on the above exposure, researchers want to examine the influence of e-commerce, capital, and labour on the income of MSMEs in Banda Aceh.

2. Literature Review

Reeg (2013) states that micro, small and medium enterprises (MSMEs) are stand-alone productive business units carried out by individuals or business entities in all economic sectors. In line with this opinion, Ardiansyah (2016) states that MSMEs are a form of small community business whose establishment is based on someone's initiative. The role of MSMEs is often associated with government efforts to overcome unemployment, poverty, and income inequality. Saadah & Jannah (2021) suggest that income is all the receipts a person receives in return for his services in the production process. Edwards et al. (1961) explain that income is all received from selling goods or services obtained in a business unit. According to Dong & Su (2010), the income indicators include working capital, length of business, and working hours. This income is obtained from the sale of production of the goods or services produced.

The production function is the physical relationship between inputs and outputs. One of the production functions commonly discussed and used by researchers is the Cobb-Douglass production function (Holida et al., 2019). The Cobb-Douglass production function is a function or equation involving two or more variables, where Y symbolizes the dependent variable and the variable X is called the independent variable. The relationship between Y and X can be solved by regression in which the variation of Y will be affected by the variation of X. The Cobb-Douglass approach is a widely used functional form of the production function used to represent the relationship of output to input. Goods or services that have been produced and then marketed through e-commerce. E-commerce is an exchange (buying and selling goods) through electronic media (Jain et al., 2021). E-commerce is covered in e-business, not just business but also customer service and partner elaboration (Farmakis et al., 2000). It will provide positive feedback on efficiency, integration, security, optimization, flexibility, increased productivity, and profit. The indicator of e-commerce, according

to Kwilinski et al. (2019), is transactions between both parties involved in the exchange of goods or services and the use of the internet as a medium.

In addition to e-commerce, capital can also increase MSME revenue. Romer (1990) stated that capital is a production factor that affects the increase in productivity in increasing investment. Capital is needed to start a business and keep the company operational and for future development. Capital can be sourced from the company's internal and external sources. Fulfilling capital needs aims to keep the company operating stably to achieve profit (Hedman & Kalling, 2003). According to Setiaji & Fatuniah (2018), capital indicators are the amount of capital and capital sources. In addition to e-commerce and capital, labour can also affect the income of MSMEs. Chapter I Article 1 Paragraph (2) of Law No. 13 of 2003 stated that labour is any person who can perform work to produce goods or services to meet their own needs and for society. According to this law, Fudge (2006) revealed that labour is all juridically capable of doing a job, whether working with another person or an entity by receiving wages. Czumanski & Lödding (2016) state that labour indicators are discipline, experience, communication, work wages, and age.

3. Materials and Methods

This study employs a quantitative approach to examine the influence of e-commerce, capital, and labour on the income of MSMEs. The primary data used for analysis was gathered from questionnaires. The study was conducted in Banda Aceh city, which comprises nine districts with varying numbers of MSMEs. From these nine districts, the researchers selected three, Baiturrahman, Meuraxa, and Ulee Kareng, as the research locations. These districts were chosen because they are the three largest contributors to MSME activity in Banda Aceh. The total population in this study comprises 17,661 business units registered with the Department of Cooperatives, Small and Medium Enterprises, and Trade of Banda Aceh City. The Slovin formula was employed, resulting in 100 respondents as the final sample. The main method of this study is multiple linear regression, with supplementary data analysis including research instrument testing, descriptive analysis, and hypothesis testing. The following equation depicts the econometric model utilized in this study: $Y = \alpha + \beta_1 \text{E-Comm} + \beta_2 \text{Capital} + \beta_3 \text{Labour} + e$

Where Y is MSMEs revenue, α is the multiple regression constant, β is the regression coefficient ($\beta_1 \geq 0$; $\beta_2 \geq 0$; $\beta_3 \geq 0$) and e is an error.

4. Results

The first descriptive analysis aims to identify the variations and phenomena through data. Table 3 describes the descriptive statistics of the variables used in this study.

Table 3. Descriptive Statistics

Variable(s)	Item	Min	Max	Std. Dev.	Mean (Indicator)	Mean (Variable)	Category
MSMEs revenue (Y)	Y.1	3	5	0,592	4,05	4,35	Very High
	Y.2	2	5	0,698	4,09		
	Y.3	2	5	0,704	4,10		
	Y.4	2	5	0,552	4,09		
	Y.5	3	5	0,594	4,52		
	Y.6	2	5	0,744	4,35		
	Y.7	2	5	0,603	4,60		
	Y.8	2	5	0,607	4,57		
	Y.9	2	5	0,495	4,76		
E-Commerce (X ₁)	X _{1.1}	1	5	0,722	4,06	4,18	High
	X _{1.2}	2	5	0,598	4,19		
	X _{1.3}	3	5	0,603	4,20		
	X _{1.4}	3	5	0,613	4,26		
	X _{1.5}	3	5	0,575	4,15		
	X _{1.6}	3	5	0,514	4,17		
	X _{1.7}	3	5	0,598	4,16		
	X _{1.8}	2	5	0,566	4,27		
	X _{1.9}	4	5	0,593	4,18		
Capital (X ₂)	X _{2.1}	2	5	0,618	4,32	4,12	High
	X _{2.2}	2	5	0,711	4,20		
	X _{2.3}	1	5	0,655	3,93		
	X _{2.4}	3	5	0,586	4,14		

Variable(s)	Item	Min	Max	Std. Dev.	Mean (Indicator)	Mean (Variable)	Category
Labour (X ₃)	X _{2.5}	1	5	0,691	4,13	4,41	Very High
	X _{2.6}	1	5	0,787	4,08		
	X _{2.7}	1	5	0,813	4,08		
	X _{2.8}	2	5	0,761	4,19		
	X _{2.9}	1	5	0,777	4,04		
	X _{3.1}	1	5	0,884	3,92		
	X _{3.2}	3	5	0,576	4,54		
	X _{3.3}	3	5	0,611	4,50		
	X _{3.4}	2	5	0,606	4,58		
	X _{3.5}	3	5	0,567	4,61		
	X _{3.6}	3	5	0,576	4,54		
	X _{3.7}	3	5	0,574	4,56		
	X _{3.8}	3	5	0,574	4,56		
	X _{3.9}	3	5	0,574	4,56		
	X _{3.10}	3	5	0,574	4,56		
X _{3.11}	3	5	0,593	4,54			
X _{3.12}	3	5	0,593	4,54			
X _{3.13}	1	5	0,943	3,40			
X _{3.14}	1	5	0,737	4,39			
X _{3.15}	1	5	0,757	4,35			

Table 3 shows that the MSME income variable (Y) has a minimum score value of 2 and a maximum score of 5. The table also shows that the average variable income of MSMEs is 4.35, which is very high. The highest item is generated from indicator Y.9, which has a score of 4.76. The lowest item is generated from indicator Y.1, which has a value of 4.05. Also, the e-commerce variable (X₁) has a minimum score of 1 and a maximum score of 5. The average e-commerce variable is 4.18, which is high. The highest item resulted from the X_{1.8} indicator with a value of 4.27. In comparison, the lowest item is generated from the X_{1.1} indicator with a value of 4.06. The modal (X₂) variable has a minimum score of 1 and a maximum score of 5. The table also shows that the average capital variable is 4.12, which means high. The highest item resulted from the indicator X_{2.1}, with a value of 4.32. In contrast, the lowest item resulted from the indicator X_{2.3}, with a value of 3.93. Then, the labour variable (X₃) has a minimum score of 1 and a maximum score of 5. The table also shows that the average labour variable is 4.41, which is high. The highest item is generated from the X_{3.4} indicator with a value of 4.58. At the same time, the lowest item is generated from the X_{3.13} indicator with a value of 3.40. After performing descriptive statistical tests, the classical assumption test is further analysed. Classical assumption tests in this study include normality, linearity, multicollinearity, and heteroscedasticity tests.

Table 4. Result of the Normality Test using One-Sample Kolmogorov-Smirnov

		Unstandardized Residual
N		100
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	1.86869282
Most Extreme Differences	Absolute	.060
	Positive	.060
	Negative	-.050
Test Statistic		.060
Asymp. Sig. (2-tailed)		.200 ^{c,d}

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

Table 4 describes that Asymp. Sig. (2-tailed) 0.200 means > 0.05 , so it can be said that the data in this study is normally distributed.

Table 5. Result of Linearity Test

Variable(s)	Deviation from linearity	Sig.	Conclusion
E-Commerce (X ₁)	0,536	0,05	Linear
Capital (X ₂)	0,931	0,05	Linear
Labour (X ₃)	0,201	0,05	Linear

Table 5 indicates that the deviation from the linearity variable > 0.05 means that the data of this study has qualified linear and can be continued to perform multiple linear regression tests.

Table 6. Result of Multicollinearity Test

Variable(s)	Collinearity Statistics	
	Tolerance	VIF
E-Commerce (X ₁)	0.939	1.065
Capital (X ₂)	0.903	1.107
Labour (X ₃)	0.863	1.159

Table 6 shows the multicollinearity test. It indicates that the variables e-Commerce, capital and labour have a value of VIF ≤ 10,00 and Tolerance ≥ 0,10. Thus, it can be concluded that there are no symptoms of multicollinearity in this study.

Table 7. Result of the Heteroscedasticity Test

Variable(s)	Sig.
E-Commerce (X ₁)	0.896
Capital (X ₂)	0.837
Labour (X ₃)	0.536
Income (Y)	0.240

Table 7 shows the heteroscedasticity test results seen from the significance value of each independent variable, which has a value of > 0.05, so it can be concluded that this study did not show symptoms of heteroscedasticity. After analyzing the classical assumption test, the next multiple linear regression analysis will be performed.

Table 8. Result of F Test (ANOVA)

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	441.601	3	147.200	40.876	0.000 ^b
	Residual	345.709	96	3.601		
	Total	787.310	99			

a. Dependent Variable: Y

b. Predictors: (Constant), X₃, X₁, X₂

Table 8 captures the results of the F-test, the independent variables (e-commerce, capital, labour), and the simultaneous impact on the dependent variable (MSME income), obtaining an F-count value of 40.876. This value is greater than the value of the F-table, which is 2.70. It is concluded that the independent variables in this study have a meaningful influence on the dependent variable with a significance of 1 percent.

Table 9. Result of Coefficient Determination (R-Square)

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.749 ^a	0.561	0.547	1.898

a. Predictors: (Constant), X₃, X₁, X₂

b. Dependent Variable: Y

Table 9 shows the result of the Coefficient Determination (R-Square). The value of the adjusted R-squared is 0.547. It means that the value variation of MSME income that e-commerce, capital, and labour can explain is 0.547 or

54.7 percent, while the remaining 45.3 percent of MSME income variance is influenced by other factors that are not examined in this study.

Table 10. Results of Multiple Linear Regression

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.125	3.783		1.090	0.278
E-Commerce (X_1)	0.251	0.028	0.628	8.996	0.000
Capital (X_2)	0.313	0.072	0.311	4.368	0.000
Labour (X_3)	0.180	0.088	0.149	2.041	0.044

Table 10 shows the result of Multiple Linear Regression. The value of Constant (β_0) = 4.125 indicates the constant level, where if the variables e-Commerce, capital, and labour = 0, then the value of the dependent variable MSME income is 4.125. The coefficient (β_1) = 0.251. It shows that the e-commerce variable (X_1) positively affects MSME revenue (Y), so it can increase by 0.251. The coefficient (β_2) = 0.313. It shows that the capital variable (X_2) positively affects MSME Income (Y), so it can increase by 0.313. The coefficient (β_3) = 0.180. It shows that the labour variable (X_3) positively affects MSME Income (Y), so it can increase by 0.180. After doing multiple linear regression analysis, the hypothesis test was further analysed. Hypothesis tests in this study include T-test, F-test, R^2 test. E-Commerce variable (X_1) has a positive and partially significant effect on MSME Income (Y); this can be seen from the count (8.996) > table (1.661) and significant $0.000 < 0.05$. The e-commerce variable (X_1) increases by one unit, the MSME Income (Y) will increase by 0.251. Capital variable (X_2) has a positive and partially significant effect on MSME Income (Y), this can be seen from the count (4.368) > table (1.661) and significant $0.000 < 0.05$. The capital variable (X_2) increases by one unit, the MSME Income (Y) will increase by 0.313. Labour variable (X_3) has a positive and partially significant effect on MSME Income (Y), this can be seen from the count (2.041) > table (1.661) and significant $0.044 < 0.05$. The the labour variable (X_3) increases by one unit, the MSME Income (Y) will increase by 0.180.

5. Conclusions

This study investigates the influence of e-commerce, capital, and labour on MSME income in Banda Aceh City. Based on the results, it was found that all independent variables employed, namely e-commerce, capital, and labour, significantly influence MSME income in Banda Aceh City. The empirical evidence also suggests that all independent variables exert a positive impact, indicating that increases in e-commerce, capital, and labour aspects will also be able to increase MSME income in Banda Aceh City. In conclusions, several recommendations are made to interested parties. MSME actors are advised to embrace the rapid changes in information technology, enabling easy access to valuable business information and maximizing e-commerce, capital, and labour to stay competitive. The results of this study are expected to serve as a reference for further research development. Additionally, the Banda Aceh City Government is advised to enhance support for MSME actors by providing innovative training, increasing assistance in business capital, and equitably supporting MSME actors in Banda Aceh, thereby fostering an increase in MSME income in the city..

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