

THE IMPACT OF E-COMMERCE ON GROSS REGIONAL DOMESTIC PRODUCT IN INDONESIA IN 2013-2024

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ABSTRACT

This comprehensive study seeks to analyze the significant impact of digital developments on Indonesia's Gross Regional Domestic Product (GRDP), focusing on two main factors: the value of e-commerce transactions and the number of internet users from 2013-2024. This study applies a quantitative approach through a multiple linear regression model with the Ordinary Least Squares (OLS) technique, carefully processing time series data to ensure robust analysis results. The study's results prove a positive correlation between the two digital variables and Indonesia's GRDP, where the increase in e-commerce transactions and the growth in internet users show a significant contribution to the expansion of Indonesia's GRDP. This correlation emphasizes the transformative role of digital adoption in driving economic growth in various sectors. Analysis revealed that the digital economy contributes to Indonesia's GRDP and shows consistent growth patterns, especially in urban areas with digital infrastructure and a high internet penetration rate. Both variables -the value of e-commerce transactions and the number of internet users- simultaneously contributed 65.21 percent to Indonesia's GRDP.

Introduction

Information and communication technology development has transformed Indonesia's economic landscape, mainly through the rapid growth of electronic commerce (e-commerce). Based on APJII (2024) data, the number of internet users in Indonesia in 2024 has reached 221.56 million out of a total population of 278.69 million, with a penetration rate of 79.5%. This substantial growth in internet penetration has created a solid foundation for developing the digital economy, especially the e-commerce sector, one of the main drivers of the national economy.

The phenomenon of e-commerce growth in Indonesia has shown an impressive trend over the last decade. A study conducted by Deloitte (2021) revealed that the contribution of e-commerce to the Indonesian economy continues to increase significantly, with consistent growth since 2013. The rapid acceleration of e-commerce growth is strongly supported by the dominance of millennial consumers and Generation Z, who are digital natives and tech-savvy (Kredivo Group, 2023). This digital transformation is changing people's consumption patterns and impacting the regional economic structure, as reflected in Gross Regional Domestic Product (GRDP). In the context of regional economic growth, Anggraeni et al.

(2024) research shows that the value of e-commerce transactions in Indonesia has reached a penetration level of 78% of total retail transactions, indicating the sector's great potential in encouraging regional economic growth. This development is in line with the efforts of the government to accelerate digital transformation and equitable economic development throughout Indonesia. Micro, Small, and Medium Enterprises (MSMEs), the backbone of the regional economy, have undergone a significant transformation through the adoption of e-commerce. MSMEs contribute 60.6% to the Gross Domestic Product (GDP) nationally and absorb 107.6 million workers in Indonesia (Ramli, 2020). Integrating MSMEs into the e-commerce ecosystem has opened up new opportunities to increase their contribution to the GRDP.

The dynamics of e-commerce growth in Indonesia are inseparable from the vital role of infrastructure and internet connectivity. The APJII survey shows that the internet penetration rate, which reached 79.5% at the beginning of 2024, has increased by 1.31% compared to 2023. This increase in internet accessibility catalyzes the growth of e-commerce transactions in various regions of Indonesia. Studies on the impact of e-commerce on GRDP are becoming increasingly relevant, considering the contribution of this sector is projected to reach 24.1% of the total retail market in the coming year (Statista, 2022). This consistent growth reflects structural transformations in the economy of regions where digital economic activities are increasingly integrated with traditional sectors.

Based on this background, this study aims to analyze the impact of e-commerce on GRDP in Indonesia during 2013-2024 by using two main variables, namely the value of e-commerce transactions and the number of internet users. This analysis is crucial considering that Indonesia has become the e-commerce market leader in the ASEAN region, contributing 52% of the total regional e-commerce revenue. An in-depth understanding of the relationship between e-commerce and GRDP will provide an empirical foundation for more targeted and effective digital economy policymaking. Through a comprehensive approach to analyzing historical data from 2013-2024, this study is expected to reveal significant patterns and trends in the relationship between e-commerce growth and GRDP. The results of this research will contribute to the development of academic literature on the digital economy and can be a valuable reference for stakeholders in formulating policies for the sustainable development of the digital economy at the regional level.

Method

This quantitative descriptive research examines the complex relationship between e-commerce transactions and the number of internet users as an independent variable and its effect on the Gross Regional Domestic Product (GRDP) in Indonesia as a dependent variable. This approach was chosen because it can provide a systematic overview of the relationship between the development of e-commerce and regional economic growth through numerical data and statistical analysis. This study uses secondary data in a time series, analyzing a decade of economic and technological transformation from 2013 to 2024. The selection of this period considers the significant growth phase of e-commerce in Indonesia, where, according to Globe Newswire (2024), the value of e-commerce transactions is projected to reach USD 44.7 billion by 2024, with an annual growth rate of 10.65%. This research aims to uncover the individual and combined impacts of the development of e-commerce and the expansion of internet users in Indonesia on the trajectory of regional economic growth in Indonesia. Data collection is carried out through documentation studies by accessing the

official portal of the relevant institution, namely the Central Bureau of Statistics (BPS) for Indonesia's GRDP data, Indonesian Internet Service Providers Association (APJII) for internet user statistics, as well as the Ministry of Trade of the Republic of Indonesia, Statista, and Lokadata for e-commerce transaction data. The collected data will then go through a processing stage that includes tabulation and standardization of units, as well as adjustment of periods to ensure consistency of analysis.

Internet user statistics serve as an independent variable that is important in this research, and they serve as the primary indicator of the potential of the digital economy. Users represent the fundamental driving force behind the growth of e-commerce, which actively participates in the digital market and drives demand within the online ecosystem. Their role is more than just consumption, as they contribute to the broader digital transformation of the Indonesian economy and the subsequent growth pattern. Economic growth, measured through long-term GRDP expansion, is a dependent variable in the framework of this study. This deliberate measurement does not include the effects of population growth and structural economic changes to focus on economic development.

This study employs the primary analysis technique of the multiple linear regression of Ordinary Least Squares (OLS). This method was selected due to its established reliability in estimating the regression function outside the sample and its capacity to minimize the deviation between the calculated results and the actual observations. The OLS approach provides a more straightforward and accessible methodology than alternative linear regression modeling techniques while upholding statistical rigor and precision in analysis. To ensure the highest level of accuracy and eliminate the potential for human error in statistical calculations, the study utilized the Eviews statistical software. This computer program processes complex statistical operations with a configured confidence level of 95% ($\alpha = 0.05$), thus providing robust statistical validation for research findings. This methodological approach allows for a comprehensive analysis of how digital transformation affects Indonesia's economic landscape, mainly through e-commerce and internet adoption. This research methodology has been carefully designed to capture the nuanced relationship between digital adoption and economic growth while maintaining the validity and reliability of statistics. Through this approach, this research aims to contribute meaningful insights to understanding how technological advancements and digital trade affect economic development in the Indonesian context. The following is the equation of the OLS model used in the test in this research:

$$PDRB_t = \beta_0 + \beta_1 NTE_t + \beta_2 PI_t + \varepsilon_t$$

where:

$PDRB_t$ = Gross Regional Domestic Product

$\beta_0; \beta_1; \beta_2$ = constant

NTE_t = Economic Transaction Value

PI_t = Internet User

ε_t = error term

t = sector time

Results and Discussion

A. Classical Assumption Test

1. Normality Test

The data normality test is used to determine and measure whether the data obtained has a normal distribution and whether it comes from a population with a normal distribution (Gunawan, 2020). Data is stated to be generally distributed if Jarque Bera > chi-squares and/or the probability (p-value) is > $\alpha = 5\%$.

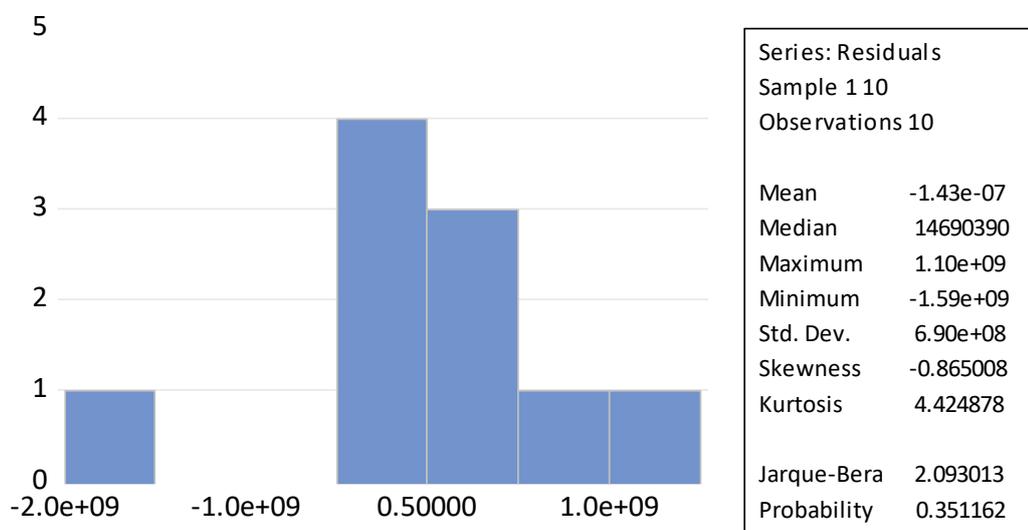


Figure 1. Normality Test Results

The result of the probability test for normality of 0.351162 is greater than $\alpha = 5\%$ (0.05). Therefore, it can be concluded that the data is distributed normally.

2. Multicollinearity Test

The multicollinearity test aims to determine whether a regression model exhibits a correlation between independent variables or among independent variables (Ghozali, 2016). The VIF (Variance Inflation Factors) method can be used for the multicollinearity test. If the VIF value is more significant than 10.0, it is indicated that multicollinearity is present; conversely, if the VIF value is less than 10.0, the regression model may be considered to have passed the multicollinearity test (Ghozali, 2016).

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	1.59E+18	26.05275	NA
NTE	8.38E-12	10.40746	5.028666
PI	120.4313	53.65294	5.028666

Figure 2. Multicollinearity Test Results

Based on the study's results, there was no multiple linear relationship in all variables free, including the VIF values of e-commerce transaction records and internet users, respectively, which were 5.028666 and 5.028666, where the value did not exceed 10.0. Therefore, it can be concluded that this regression model has passed the multicollinearity test, as stated in the test results.

3. Heteroscedasticity Test

Heteroscedasticity tests are performed on regression models to assess whether there is a variance inequality of the residual in another observation (Juliandi et al., 2014). One of the methods that can be employed to detect the presence or absence of symptoms of heteroscedasticity is the White test. If the *Prob. Obs*R-squared* < 0.05, it is concluded that the data exhibits symptoms of heteroscedasticity or that the assumption of the heteroscedasticity test is not met. Conversely, if the value of *Prob. Obs*R-squared* > 0.05, then the data does not exhibit symptoms of heteroscedasticity, or the assumption of the heteroscedasticity test has been satisfied.

Heteroskedasticity Test: White			
Null hypothesis: Homoskedasticity			
F-statistic	39.66249	Prob. F(5,4)	0.0017
Obs*R-squared	9.802286	Prob. Chi-Square(5)	0.0810
Scaled explained SS	8.225049	Prob. Chi-Square(5)	0.1443

Figure 3. Heteroscedasticity Test Results

The heteroscedasticity test table shows that the *Probability Obs*R-squared* value is 0.0810. This indicates that the value of 0.0810 is greater than the value of $\alpha = 0.05$. Therefore, it can be concluded that the data do not exhibit symptoms of heteroscedasticity or that the heteroscedasticity assumptions have been fulfilled (passed the heteroscedasticity test).

4. Autocorrelation Test

Autocorrelation tests can detect the presence or absence of relationships between residuals in regression models using the Durbin-Watson (DW) method. This method was developed by assuming that the perturbation variable relates only to the perturbation variable of the previous period (first lag), which is known as the first-order autoregressive model (autoregressive = AR1), and the independent variable does not contain the independent variable that is the lag of the dependent variable (Widarjono, 2023). According to Widarjono (2023), the criteria for determining the presence or absence of autocorrelation are as follows.

- a. If $0 < d < d_L$, then there is a positive autocorrelation.
- b. If $d_L < d < d_U$, then it is suspected that there is a positive autocorrelation (hesitation).
- c. If $d_U < d < 4 - d_U$, then there is no autocorrelation.
- d. If $4 - d_U < d < 4 - d_L$, then it is suspected that there is a negative autocorrelation (hesitation).
- e. If $4 - d_L < d < 4$, then there is a negative autocorrelation.

Dependent Variable: PDRB
 Method: Least Squares
 Date: 12/20/24 Time: 11:38
 Sample: 1 10
 Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.44E+09	1.26E+09	5.102717	0.0014
NTE	-6.46E-07	2.90E-06	-0.222994	0.8299
PI	23.42173	10.97412	2.134270	0.0702

R-squared	0.729436	Mean dependent var	9.99E+09
Adjusted R-squared	0.652132	S.D. dependent var	1.33E+09
S.E. of regression	7.82E+08	Akaike info criterion	44.03600
Sum squared resid	4.28E+18	Schwarz criterion	44.12678
Log likelihood	-217.1800	Hannan-Quinn criter.	43.93642
F-statistic	9.435941	Durbin-Watson stat	1.941809
Prob(F-statistic)	0.010303		

Figure 4. Regression Analysis Results

n\k	1	2	3	4	5	6	7	8	9	10										
6	0.610	1.400																		
7	0.700	1.356	0.467	1.896																
8	0.763	1.332	0.559	1.777	0.367	2.287														
9	0.824	1.320	0.629	1.699	0.455	2.128	0.296	2.588												
10	0.879	1.320	0.697	1.641	0.525	2.016	0.376	2.414	0.243	2.822										
11	0.927	1.324	0.758	1.604	0.595	1.928	0.444	2.283	0.315	2.645	0.203	3.004								
12	0.971	1.331	0.812	1.579	0.658	1.864	0.512	2.177	0.380	2.506	0.268	2.832	0.171	3.149						
13	1.010	1.340	0.861	1.562	0.715	1.816	0.574	2.094	0.444	2.390	0.328	2.692	0.230	2.985	0.147	3.266				
14	1.045	1.350	0.905	1.551	0.767	1.779	0.632	2.030	0.505	2.296	0.389	2.572	0.286	2.848	0.200	3.111	0.127	3.360		
15	1.077	1.361	0.946	1.543	0.814	1.750	0.685	1.977	0.562	2.220	0.447	2.471	0.343	2.727	0.251	2.979	0.175	3.216	0.111	3.438
16	1.106	1.371	0.982	1.539	0.857	1.728	0.734	1.935	0.615	2.157	0.502	2.388	0.398	2.624	0.304	2.860	0.222	3.090	0.155	3.304
17	1.133	1.381	1.015	1.536	0.897	1.710	0.779	1.900	0.664	2.104	0.554	2.318	0.451	2.537	0.356	2.757	0.272	2.975	0.198	3.184
18	1.158	1.391	1.046	1.535	0.933	1.696	0.820	1.872	0.710	2.060	0.603	2.258	0.502	2.461	0.407	2.668	0.321	2.873	0.244	3.073
19	1.180	1.401	1.074	1.536	0.967	1.685	0.859	1.848	0.752	2.023	0.649	2.206	0.549	2.396	0.456	2.589	0.369	2.783	0.290	2.974
20	1.201	1.411	1.100	1.537	0.998	1.676	0.894	1.828	0.792	1.991	0.691	2.162	0.595	2.339	0.502	2.521	0.416	2.704	0.336	2.885
21	1.221	1.420	1.125	1.538	1.026	1.669	0.927	1.812	0.829	1.964	0.731	2.124	0.637	2.290	0.546	2.461	0.461	2.633	0.380	2.806
22	1.239	1.429	1.147	1.541	1.053	1.664	0.958	1.797	0.863	1.940	0.769	2.090	0.677	2.246	0.588	2.407	0.504	2.571	0.424	2.735
23	1.257	1.437	1.168	1.543	1.078	1.660	0.986	1.785	0.895	1.920	0.804	2.061	0.715	2.208	0.628	2.360	0.545	2.514	0.465	2.670
24	1.273	1.446	1.188	1.546	1.101	1.656	1.013	1.775	0.925	1.902	0.837	2.035	0.750	2.174	0.666	2.318	0.584	2.464	0.506	2.613
25	1.288	1.454	1.206	1.550	1.123	1.654	1.038	1.767	0.953	1.886	0.868	2.013	0.784	2.144	0.702	2.280	0.621	2.419	0.544	2.560
26	1.302	1.461	1.224	1.553	1.143	1.652	1.062	1.759	0.979	1.873	0.897	1.992	0.816	2.117	0.735	2.246	0.657	2.379	0.581	2.513
27	1.316	1.469	1.240	1.556	1.162	1.651	1.084	1.753	1.004	1.861	0.925	1.974	0.845	2.093	0.767	2.216	0.691	2.342	0.616	2.470
28	1.328	1.476	1.255	1.560	1.181	1.650	1.104	1.747	1.028	1.850	0.951	1.959	0.874	2.071	0.798	2.188	0.723	2.309	0.649	2.431
29	1.341	1.483	1.270	1.563	1.198	1.650	1.124	1.743	1.050	1.841	0.975	1.944	0.900	2.052	0.826	2.164	0.753	2.278	0.681	2.396
30	1.352	1.489	1.284	1.567	1.214	1.650	1.143	1.739	1.071	1.833	0.998	1.931	0.926	2.034	0.854	2.141	0.782	2.251	0.712	2.363

Figure 5. Durbin-Watson Table with $\alpha = 0.05$

The regression analysis results table (figure 4) shows that $n = 10$, k (independent variable) = 2, and Durbin-Watson statistical results = 1.941809. Based on the Durbin-Watson table with $\alpha = 0.05$ (figure 5), the following results are obtained:

- d_L value = 0.697
- $4-d_L$ value = 3.303
- d_U value = 1.641
- $4-d_U$ value = 2.359
- Value d (Durbin Watson) = 1.941.

Thus, the Durbin-Watson autocorrelation test results indicate that $d_U < d < 4-d_U = 1.641 < 1.941 < 2.359$. This suggests that the data does not have autocorrelation or that the regression model has passed the autocorrelation test.

B. Statistical Hypothesis Testing

1. T-test (Partially)

The t-test was conducted to detect the partial impact of independent variables on the dependent variable at a significant level $\alpha = 5$ percent of *Ceteris paribus*. The test criteria t-statistic (Ghozali, 2016) is that if the significant value of the t-test is > 0.05 , there is no impact between independent and dependent variables. Meanwhile, if the significance of the t-test is < 0.05 , it means that there is an impact between independent and dependent variables.

Based on the regression analysis results (figure 4), several t-test (hypothesis test) results analyses, including the following, can be concluded.

- a. The value of e-commerce transactions has a t-statistic value of -0.222994 and a Prob value (Significance) of 0.8299 (> 0.05). Thus, the value of e-commerce transactions has a non-significant effect on regional economic growth.
- b. The number of internet users has a t-statistic value of 2.134270 and a Prob value (Significance) of 0.0702 (> 0.05). Thus, the number of internet users has an insignificant effect on regional economic growth.

The results of the t-test that show the absence of significant impact can be explained through interrelated fundamental factors. First, traditional sectors and manufacturing industries still dominate Indonesia's economic structure. GRDP, as an indicator of regional economic growth, is more impacted by conventional sectors such as agriculture, mining, and the processing industry. Despite the increase in internet users and the value of e-commerce transactions, its contribution to GRDP is still relatively small compared to these sectors. Second, there is a significant digital divide between regions in Indonesia. Uneven internet infrastructure causes the penetration of digital technology and e-commerce to be concentrated in certain regions, especially in Java and big cities. This results in the economic impact of digital activities not being reflected evenly in the calculation of the national GRDP. Third, the characteristics of e-commerce transactions in Indonesia have some statistical limitations. Many e-commerce transactions occur in the informal economy or are not well recorded, so they are not included in the calculation of GRDP. In addition, most e-commerce transactions represent a shift from conventional transactions to digital platforms rather than creating new economic value. Fourth, there is a lag effect or time lag between the increase in internet usage and e-commerce transactions and their impact on GRDP. Digital transformation takes time to produce a multiplier effect in the economy, including increased productivity and efficiency that can contribute to GRDP. Fifth, the methodology of measuring GDRP conventionally may not fully accommodate the added value generated by the digital economy. Digital economic activities have unique characteristics that differ from traditional economic activities, such as network effects and intangible value, which are difficult to measure using the existing GRDP calculation method.

The insignificance in the t-test does not mean that internet users and e-commerce transactions have absolutely no role in the economy. On the contrary, it shows that the relationship between these variables is complex and requires a more comprehensive analytical approach. In conclusion, several structural, methodological, and temporal factors

explain the insignificance of the relationship between the number of internet users and the value of e-commerce transactions on Indonesia's GRDP in the T-test. Understanding these factors is important for the development of more effective digital economy policies in the future.

2. F test

The statistical F test determines the collective impact of all independent variables on dependent variables. The testing criterion is that if the significant value of F is less than 0.05, it can be concluded that independent variables simultaneously affect dependent variables or vice versa (Ghozali, 2016). Based on the results of the regression analysis (figure 4), it is known that the F-statistic value is 9.435941 with a Prob value (F-statistic) of 0.010303 (<0.05); thus, it can be concluded that the value of e-commerce transactions and the number of internet users has a significant simultaneous effect on regional economic growth.

3. Determination Coefficient Test (R2)

The determination coefficient (R2) test aims to measure the model's ability to explain the impact of independent variables on dependent variables (Kuncoro, 2019). If the value of Adjusted R Square (R2) is close to 1, then the independent variable can explain the variation of the dependent variable well. Based on the regression analysis results (figure 4), it is known that the Adjusted R Square value is 0.652132, so it can be concluded that the contribution of e-commerce transactions and the number of internet users to regional economic growth simultaneously is 65.21%. Meanwhile, the remaining 34.79% is impacted by other variables outside this study.

Conclusion

This study aims to analyze the impact of digital technology developments on the Indonesian economy in the 2013-2024 period by focusing on two independent variables, namely the value of electronic commerce transactions (e-commerce) and the number of internet users. Based on the data analysis that has been carried out, the research results show that the increase in e-commerce activity has a positive correlation, which is significant to Indonesia's economic growth. However, the insignificance in the t-test does not imply that internet users and e-commerce transactions have no role in the economy at all. On the contrary, this indicates that the relationship between these variables is complex and requires a more comprehensive analytical approach.

This positive correlation indicates a fundamental transformation in transaction patterns in the economy of the Indonesian people from a conventional system to a digital-based system. Furthermore, this study proves that the growth in internet users contributes significantly to the increase in Gross Regional Domestic Product (GRDP) in Indonesia. There is a clear causal relationship between the number of internet users and the strengthening of national economic fundamentals. The results of statistical analysis show that these two variables – the value of electronic trade transactions and the number of internet users – simultaneously contribute 65.21% to Indonesia's economic growth. Meanwhile, 34.79% of the variation in economic growth is explained by the variables beyond the scope of this study. The data confirms the significance of digital transformation in contemporary Indonesian economic development.

References

- Anggraeni, Lidya, Syamsurijal Tan, Junaidi, & Erni Achmad. (2024). E-Commerce's Impact on Economic Growth. *Nomico Journal*, 1(6). <https://doi.org/10.62872/jagdc251>
- Asosiasi Penyelenggara Jasa Internet Indonesia (APJII). (2013). *Penggunaan Internet Sektor Bisnis 2013*.
- Asosiasi Penyelenggara Jasa Internet Indonesia (APJII). (2014). *Profil Pengguna Internet Indonesia 2014*.
- Asosiasi Penyelenggara Jasa Internet Indonesia (APJII). (2016). *Penetrasi dan Perilaku Pengguna Internet Indonesia Survey 2016*.
- Asosiasi Penyelenggara Jasa Internet Indonesia (APJII). (2017). *Laporan Penetrasi dan Perilaku Pengguna Internet Indonesia Survey 2017*.
- Asosiasi Penyelenggara Jasa Internet Indonesia (APJII). (2018). *Laporan Survei Penetrasi & Profil Perilaku Pengguna Internet Indonesia 2018*.
- Asosiasi Penyelenggara Jasa Internet Indonesia (APJII). (2020). *Laporan Survei Internet AP JIL 2019-2020 (Q2)*.
- Asosiasi Penyelenggara Jasa Internet Indonesia (APJII). (2022). *Profil Internet Indonesia 2022*.
- Asosiasi Penyelenggara Jasa Internet Indonesia (APJII). (2023). *Press Conference Survei Penetrasi Internet Indonesia 2023 Tahap 1*.
- Asosiasi Penyelenggara Jasa Internet Indonesia (APJII). (2024). *Survei Penetrasi Internet Indonesia 2024*.
- Badan Pusat Statistik. (2018). *Produk Domestik Regional Bruto Provinsi-Provinsi di Indonesia Menurut Pengeluaran 2013-2017*. Badan Pusat Statistik.
- Badan Pusat Statistik. (2020). *Produk Domestik Regional Bruto Provinsi-Provinsi di Indonesia Menurut Pengeluaran 2015-2019*. Badan Pusat Statistik.
- Badan Pusat Statistik. (2021). *Produk Domestik Regional Bruto Provinsi-Provinsi di Indonesia Menurut Pengeluaran 2016-2020*. Badan Pusat Statistik.
- Badan Pusat Statistik. (2022). *Produk Domestik Regional Bruto Provinsi-Provinsi di Indonesia Menurut Pengeluaran 2017-2021*. Badan Pusat Statistik.
- Badan Pusat Statistik. (2023). *Produk Domestik Regional Bruto Provinsi-Provinsi di Indonesia Menurut Pengeluaran 2018-2022*. Badan Pusat Statistik.
- Badan Pusat Statistik. (2024). *Produk Domestik Regional Bruto Provinsi-Provinsi di Indonesia Menurut Pengeluaran 2019-2023*, Vol. 10. Badan Pusat Statistik.
- Deloitte Indonesia Perspective. (2021). *Realising the Potential of Indonesia's Digital Economy*. 2nd edition.
- Ghozali, I. (2016). *Aplikasi Analisis Multivariete Dengan Program IBM SPSS 23*. 8th edition. Badan Penerbit Universitas Diponegoro: Semarang.
- Globe Newswire. (2024). Indonesia Ecommerce Market Databook 2024, Featuring Bukalapak, JD.id, Lazada, Shopee, Tokopedia, GoFood, GrabFood, Kulina, Wahyoo, Agoda, Bobobox, PegiPegi, Tiket and Traveloka. <https://www.globenewswire.com/news-release/2024/06/12/2897607/0/en/Indonesia-Ecommerce-Market-Databook-2024-Featuring->
-

[Bukalapak-JD-id-Lazada-Shopee-Tokopedia-GoFood-GrabFood-Kulina-Wahyoo-Agoda-Bobobox-PegiPegi-Tiket-and-Traveloka.html](#)

- Gunawan, C. (2020). *Mahir Menguasai SPSS: Panduan Praktis Mengolah Data Penelitian New Edition Buku Untuk Orang Yang (Merasa) Tidak Bisa dan Tidak Suka Statistika*. Deepublish: Sleman.
- International Trade Administration. (2024). *Indonesia – Country Commercial Guide: eCommerce*. <https://www.trade.gov/country-commercial-guides/indonesia-ecommerce>
- Juliandi, A., Irfan, & Saprihal Manurung. (2014). *Metodologi Penelitian Bisnis: Konsep dan Aplikasi*. UMSU Press: Medan.
- Kementerian Perdagangan. (2023). *Raih Potensi Ekonomi Digital, Kemendag Dorong Peningkatan Digitalisasi UMKM*. <https://www.kemendag.go.id/berita/siaran-pers/raih-potensi-ekonomi-digital-kemendag-dorong-peningkatan-digitalisasi-umkm-malang>
- Kredivo Group. (2023). *Laporan Perilaku Konsumen e-Commerce Indonesia 2023: Pemulihan Ekonomi dan Tren Belanja Pasca Pandemi*. <https://kredivocorp.com/wp-content/uploads/2023/06/2023-Indonesia-e-Commerce-Behavior-Report.pdf>
- Kuncoro, M. (2019). *Metode Riset untuk Bisnis dan Ekonomi*. 3rd edition. Erlangga: Jakarta.
- Lokadata. (2021). *Transaksi E-commerce, 2017-2021**. <https://lokadata.beritagar.id/chart/preview/transaksi-e-commerce-2017-2021-1617945737>
- Maulana, Elang Mulya & Hendra Kusuma. (2024). Analysis of the Influence of Technology, Information, and Communication Developments on Economic Growth in Java Island 2018-2022. *Jurnal Ilmu Ekonomi*, 8(4), 378-385.
- Ramli, K. (2020). 'Indonesia on the Move: Improving Connectivity to Support E-commerce', in Chen, L. and F. Kimura (eds.), *E-commerce Connectivity in ASEAN*. Jakarta, Indonesia: Economic Research Institute for ASEAN and East Asia, pp.31-50.
- Statista. (2022). *E-commerce as a share of total retail market in Indonesia from 2018 to 2019, with forecasts for 2020 to 2022*. <https://www.statista.com/statistics/1250931/indonesia-e-commerce-contribution-to-overall-retail-market/>
- Statista. (2024). *E-commerce in Indonesia*. <https://www.statista.com/topics/5742/e-commerce-in-indonesia/>
- Widarjono, A. (2023). *Ekonometrika*. 3rd edition. Universitas Terbuka: Tangerang Selatan.