

FACTORS INFLUENCING THE TOTAL SALES OF FRUITS AND VEGETABLES ON DIGITAL PLATFORMS

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Abstract: The development of digital technology and a pandemic have increased online transactions on digital platforms. The most widely used digital platforms for online transactions in Indonesia are Shopee, Tokopedia, and Bukalapak. Digital platforms will become essential actors in the agribusiness system in the future. Fresh agricultural products marketed on digital platforms are included in the fruit and vegetable category. This research aims to analyze the factors that influence the total sales of fruits and vegetables on the digital platforms. The method used in this research is panel data regression. The results show that the effect is positive and negative based on types of products. The number of reviews through digital platforms influences significantly on total fruit and vegetable sales. However, the price does not influence significantly on total sales. Meanwhile, other factors include rating, store type, and promotion provide results of varying significance by commodity. Because review is the most important factor that affect total sales in digital platforms, seller needs to focus on how to control reviews in each digital platform. The understanding can help the seller to increase their total sales.

Keywords: digital farmer, e-commerce, marketing, marketplace, robust least squares

Abstrak: Perkembangan teknologi digital dan adanya pandemi telah meningkatkan transaksi daring yang dilakukan di platform digital. Platform digital yang paling banyak digunakan untuk transaksi daring di Indonesia adalah Shopee, Tokopedia, dan Bukalapak. Platform digital akan menjadi penting pada sistem agribisnis masa depan. Produk pertanian segar pada platform digital terdapat pada kategori buah dan sayur. Tujuan dari penelitian ini adalah untuk menganalisis faktor-faktor yang mempengaruhi total penjualan buah dan sayuran pada platform digital tersebut. Metode yang digunakan dalam penelitian ini adalah regresi data panel. Hasil analisis menunjukkan pengaruh positif dan negatif berdasarkan jenis produk. Faktor yang berpengaruh signifikan terhadap total penjualan buah dan sayur melalui platform digital adalah jumlah ulasan, sementara faktor yang tidak berpengaruh signifikan adalah harga. Faktor lainnya seperti peringkat, jenis toko, dan promosi memberikan hasil yang berbeda-beda menurut komoditas. Oleh karena ulasan merupakan faktor yang paling penting yang mempengaruhi total penjualan pada platform digital, penjual harus fokus untuk memahami bagaimana mengendalikan ulasan pada masing-masing platform. Pemahaman tersebut dapat membantu penjual untuk meningkatkan total penjualan.

Kata kunci: : e-commerce marketplace, pemasaran, petani digital, robust least squares

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INTRODUCTION

The development of information and communication technology in the agricultural sector and agricultural extension is not yet optimal but is perceived in various ways. The ways include the use of social networks and online media to market agricultural products, the cybernetic expansion, and the use of social networks for the transfer of appropriate technology. A digital communication network allows farmers and ranchers to maintain networks, innovation, and virtual markets, as well as to increase human capital (Ar-Rozi et al. 2020). Digital platforms are shaping new markets and forms of interaction for their users globally, expanding the potential customer base, and improving how they connect (Dmitrieva, 2020).

The most widely used digital platforms for e-commerce transactions in Indonesia are Shopee, Tokopedia, and Bukalapak based on the number of visitors. Shopee, Tokopedia, Bukalapak, Lazada, and Blibli have a total visitor count of more than 100 million visitors. It proves that almost half of the population in Indonesia has started to own and move on activities in the online transactions. The platform user also supports the five e-commerce sites that dominate almost half of Indonesia's population regarding online shopping and selling (Putri and Zakaria, 2020).

Internet access is the key to selling fruit and vegetables through digital platforms. The ability of farmers to access the internet can support farmers in getting the information they need (Suprehatin, 2019). Selling fruits and vegetables through digital platforms can maximize farmer profits because the transaction does not involve collecting traders (Hamdani et al. 2021). Digital platforms will become essential actors in the agribusiness system in the future. In digital platforms with the advancement of the internet, the aggregator is in the middle between upstream, cultivation, downstream, and supporting institutions subsystems (Meliala et al. 2020). The use of digital platforms allows farmers and retailers to receive higher prices to increase farmers' income (Jahroh and Meliala, 2021). Sales made on digital platforms challenge farmers and direct-to-consumer sellers to maintain product quality until it reaches consumers (Tirdasari et al. 2021).

The COVID-19 pandemic has changed consumer shopping behavior from face-to-face to online shopping. Online shopping allows for a "shifting

shopping habit" that demands a change in the strategy of many business actors, from farmers as product providers, traders in online stalls, payment agents, packaging, and delivery of goods. This change occurs because online shops can serve the buying and selling process anywhere, anytime, and by anyone. This model change is also a transformation of the marketing model, the communication model from face-to-face to indirect communication, and the delivery model (Gunawan et al. 2020). The primary purpose of using e-commerce by business actors is to increase profits. With the existence of e-commerce, business actors can utilize other another objective to reach broader market share. Business actors can not only make e-commerce a selling portal but also build relationships and new market concepts, use a more effective marketing system, and make e-commerce a learning medium. Business actors can also observe sales made by competitors and adopt them (Hardilawati, 2020).

Fresh agricultural products marketed on digital platforms are included in the fruit and vegetable category. The use of digital platforms as a marketing channel for fruit and vegetables can expand the market and increase sales turnover (Zebua and Sunaryanto, 2021). Therefore, this study analyzes the factors influencing the total sales of products in the fruit and vegetable category with the highest sales in Bukalapak, Shopee, and Tokopedia.

METHODS

The data used is secondary data from the digital platform. Data collection was carried out three times. The first time on September 9, 2021, is a discount time for Shopee users called "Shopee 9.9 ". The second on September 19, 2021, is without discounts for Tokopedia, Shopee, and Bukalapak users. The third time was the particular discount time for Tokopedia users on September 29, 2021. The method used is panel data regression analysis with the help of E-Views software version 12 Student Version.

The data for each factor analyzed in this research were available in the product information displayed on the digital platform. Each factor has been standardized to uniform the measurement (Table 1).

The factors measured are the total product sold (Y), price (X_1), review (X_2), rating (X_3), store type (X_4), and promotion (X_5). Total product sold is the dependent

factor. The independent factors consist of price, review, rating, store type, and promotion. The hypothesis is:

1. The influence of price on the total sold product
H0: Price is not influencing the total sold product significantly
H1: Price is influencing the total sold product significantly
2. The influence of review on the total sold product
H0: Review is not influencing the total sold product significantly
H1: Review is influencing the total sold product significantly
3. The influence of rating on the total sold product
H0: Rating is not influencing the total sold product significantly
H1: Rating is influencing the total sold product significantly
4. The influence of store type on the total sold product
H0: Store type is not influencing the total sold product significantly
H1: Store type is influencing the total sold product significantly
5. The influence of promotion on the total sold product
H0: Promotion is not influencing the total sold product significantly
H1: Promotion is influencing the total sold product significantly

The hypothesis formulated below:

$$Y = \beta_0 + X_1\beta_1 + X_2\beta_2 + X_3\beta_3 + X_4\beta_4 + X_5\beta_5 + \epsilon$$

Where, β_0 (intersep); $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ (slope); ϵ (error)

The digital platform – Bukalapak, Shopee, and Tokopedia – have different ways to classify the seller's store type. This research codes the store type to standardize the data. The store type coding is based on determining store criteria from the Tokopedia, Shopee, and Bukalapak. Shopee and Tokopedia have four types of stores, while Bukalapak has more (Table 2).

The data available on the seller's account has a different appearance on each platform. In Tokopedia and Shopee, this data is available directly on the product information page. In Bukalapak, the required data is located on the product information page and store information. An overview of the display of product information on Tokopedia is presented in Figure 1.

Marketplaces compete by doing different promos and advertisements to get sympathy and interest from buyers (Witro et al. 2021). Discounted prices positively and significantly affect consumers' purchase intentions in the flash sale program at Shopee (Prasetyo et al. 2019). Free delivery promotions encourage consumers to buy products whose quality cannot be easily judged by previous consumers by providing a risk premium and increasing consumer influence (Shehu et al. 2020).

Table 1. Factors measurement

Factor	Measurement
Total sold product	The amount of product sold
Price	Indonesia Rupiah
Review	The amount of review
Rating	The product rating (0-5)
Store type	Store coding (1-4)
Promotion	The number of promotion forms from the store for the product (Discount, cashback, free delivery)

Table 2. Coding of store type

Code	Store Criteria from Digital Platform		
	Bukalapak	Shopee	Tokopedia
1	User, pedagang, pedagang besar	Seller	Regular merchant
2	Calon juragan, juragan, good seller	Star seller	Power merchant
3	Recommended seller, trusted seller, top seller	Star+	Power merchant pro
4	Bukamall	Shopee mall	Official store

RESULTS

Analysis of Factors Influencing the Total Sales in Bukalapak

The analysis begins with determining the best analysis model. Three models were used to analyse the factors that influence the sales. The best model is determined through the Chow, Hausman, and Lagrange-Multiplier (LM) tests (Table 3).

The Chow test cannot be performed because an error appears near singular matrix data that cannot be processed using the Fix Effect Model (FEM) analysis model. The Hausman test shows a probability value of 0.0000, meaning that the better model is FEM. The Lagrange-Multiplier test was carried out with a probability result of 0.000, so the recommended model

is Random Effect Model (REM). The Common Effect Model (CEM) model gives an R-squared of 0.9833, and the REM model gives 0.9919. Therefore, the REM is selected. Data analysis is carried out after testing the classical assumptions of the research data. The results are presented in Table 4.

The test results show that a value of less than 0.9 on all independent factors, so the data used does not contain multicollinearity. The test results show a probability of 0.0000, which is less than 0.05, so the data used is declared not to pass the heteroscedasticity test. Therefore, data analysis was carried out using the Robust Least Squares (RLS) method which immune to deviations from the classical assumption test. There are three RLS types: M-estimation, S-estimation, and MM-estimation (Table 5).

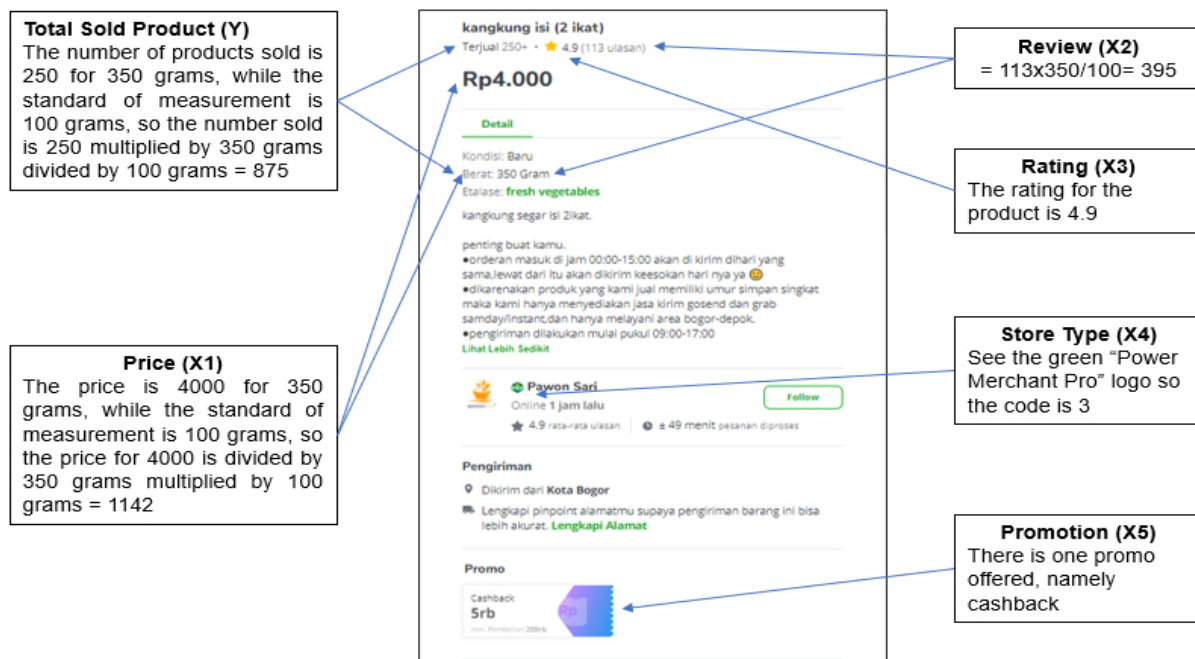


Figure 1. Example display of product information on Tokopedia

Table 3. Determination of the best model for total sales in Bukalapak

Test	Probability	Chosen model
Chow	Near singular matrix	CEM
Hausman	0.0000	FEM
LM	0.0000	REM

Table 4. Classical assumption test of total sales in Bukalapak

Test	Result	Meaning
Multikolinearity	$-0.0000 < x < 0,9$	Passed test
Heteroskedastisity	0.0000	Not passed test

Data analysis used the RLS M-estimation method (Table 6). The adjusted R-squared shows that price, number of reviews, ratings, store type, and number of promotions influence total sales by 77%. Price has a positive, not significant effect on total sales, in line with Lestari and Hanum (2019) that the price does not influence consumer buying interest in total sales in Bukalapak because the most influencing factors are trust in the quality and consistent scales.

The number of reviews positively and significantly affects to the total sales. When searching on a digital platform, the information displayed is limited to the number of reviews given by buyers. When opening the product information page, only five reviews are shown with the highest rating, so that reviews with bad ratings remain unknown if potential buyers did not open the review menu and read all the reviews.

The rating has a positive but insignificant effect on total sales in Bukalapak. The research shows that the ranking is in the range of 4.8-5 for products that have been sold. There is no difference in buyer satisfaction for all sellers analyzed, so the ratings do not significantly influence the total sales.

The store type has a positive and significant effect on total sales in Bukalapak. Store type indicates the status of the store owned by the seller. The status of this store is displayed on the product information. Therefore, buyers can find out the store's status directly when searching in Bukalapak.

The number of promotions has a positive and insignificant effect on total sales in Bukalapak. The result confirms that buyers do not prioritize the costs incurred in purchasing in Bukalapak as a factor influencing purchasing decisions. Thus, the number of promotions does not significantly affect total sales.

Table 5. Selection of RLS type for total sales in Bukalapak

Type	R-Squares
M-estimation	0.787710
S-estimation	Error
MM-estimation	Error

Table 6. The results of the test of the effect on the total sales in Bukalapak

Factors	Coefficient	Z-Statistics	Probability
Price	1.14	0.51	0.61
Review	2.46	317.08	0.00
Rating	0.17	1.19	0.23
Store type	2.32	6.51	0.00
Promotion	0.18	-0.40	0.69
Robust Statistics			
R-squared		0.79	
Adjusted R-squared		0.77	
Deviance		911.34	
Scale		2.92	
Prob		0.00	

Analysis of Factors Influencing the Total Sales in Shopee

The analysis begins by determining the best analysis model. Chow, Hausman, and LM tests were used to determine the best model. The test results are presented in the Table 7. The results of the Chow test give a probability value of 0.0000, indicating that the probability is less than 0.05 significance. The Chow test results choose the FEM analysis model compared to the CEM. Hausman test results give a probability value of 0.0000, indicating that the probability is less than 0.05 significance. The result means that the Hausman test results choose the FEM model compared to REM. The Chow and Hausman tests are sufficient to determine the best model used in data analysis, namely the FEM model. The LM test was performed to compare between CEM and REM. The results of the LM test chose the REM model. The model used in the study remains the FEM model based on the Chow and Hausman tests. Data analysis is carried out after testing the classical assumptions of research data that consists of normality, multicollinearity, and heteroscedasticity tests (Table 8).

The results of the classical assumption test showed that the data did not pass the normality test, which caused the FEM analysis model cannot be used to analyze the data. Therefore, data analysis was carried out using the RLS method which immune to deviations from the classical assumption test. There are three RLS types: M-estimation, S-estimation, and MM-estimation (Table 9).

The RLS type is used by selecting the most significant R-squares result. The most considerable value of R-squares is the S-estimation. Therefore, data analysis was carried out using the RLS S-estimation method (Table 10).

The value of Adjusted R-squared is 0.67. The result shows that the factors of price, number of reviews, ratings, type of shop, and number of promotions together influence total sales in Shopee by 67% by considering the number of data samples and the number of factors used. The analysis results show that the price has a positive and insignificant effect on total sales in Shopee. Changes in total sales in Shopee prices have a more negligible effect on the quantity demanded.

Table 7. Determination of the best model for total sales in Shopee

Test	Probability	Chosen model
Chow	0.0000	FEM
Hausman	0.0000	FEM
LM	0.0000	REM

Table 8. Classical assumption test of total sales in Shopee

Test	Result	Meaning
Multikolinearity	-0.0000<x<0.9	Passed test
Heteroskedastisity	0.0000	Not passed test

Table 9. Selection of RLS types for total sales in Shopee

Type	R-Squares
M-estimation	0.632334
S-estimation	0.692204
MM-estimation	0.618296

Tabel 10. The results of the test of the effect on total sales in Shopee

Factors	Coefficient	Z-Statistics	Probability
Price	1.57	0.35	0.72
Review	3.62	29030.95	0.00
Rating	-0.21	-18.22	0.00
Store type	-0.03	-1.16	0.24
Promotion	0.06	2.15	0.03
Robust Statistics			
R-squared		0.69	
Adjusted R-squared		0.67	
Deviance		0.65	
Scale		0.80	
Prob		0.00	

The number of reviews positively and significantly affects total total sales in Shopee. The number of reviews shows the number of buyers who have an attachment to products, whether it is an attachment to writing positive or negative reviews. When opening product search page on a digital platform, the information displayed is limited to the number of reviews given by buyers. When opening the product information page, only one to five reviews are displayed with the highest rating, namely a rating of five. Hence, reviews with bad ratings can only be known if potential buyers open the review menu and read all the reviews. The research shows that the ratings are in the range of 4.8-5, so all reviews are a form of buyers' positive attachment to the purchased product.

The rating has a negative and significant effect on total sales in Shopee. The rating shows the level of buyer satisfaction with the purchased product. The results showed that products with a rating of 4.8 and 4.9 had more total sales than the majority of total sales in Shopee products with a rating of 5, which could be due to the development of rating falsification by sellers so that buyers had more confidence in products with a rating of 5.

The store type has a negative and insignificant effect on total sales in Shopee. Official stores with official labels do not have products that sell well, while sellers are one level below, namely "Star+" at Shopee, "recommended seller," "trusted seller," and "top seller" in Bukalapak, they have more total sales. Fruit and vegetable are a product purchased without regard to the brand or legality of the seller, so the store type has a negative and insignificant effect on total sales in Shopee.

The number of promotions positively and significantly affects total sales. Sellers who give many promotions to their buyers have products sold than sellers who do not give promotions. Therefore, the number of promotions positively and significantly affects total sales.

Analysis of Factors Influencing the Total Sales in Tokopedia

The analysis begins with determining the best analysis model. Three models can analyze the factors that influence the total sales in Tokopedia through the digital market. The three models are CEM, FEM, and REM. Chow, Hausman, and LM tests were used to determine the best model (Table 11).

The model used in the study is the FEM model based on the Chow and Hausman tests. Data analysis can be done after testing the classic al assumptions of research data (Table 12).

The test was less than 0.9 on all independent factors, so the data used were declared to have passed the multicollinearity test. The test shows a probability of 0.4607 more than 0.05. Hence, the data used is declared to have passed the heteroscedasticity test. As a result, data analysis was carried out using the FEM method (Table 13).

The adjusted R-squared for total sales in Tokopedia is 0.97. The price, number of reviews, ratings, type of store, and number of promotions influence total sales in Tokopedia by 97%. The analysis results show that the price has no effect and is not significant to total sales in Tokopedia. Total sales in Tokopedia are more influenced by other factors, namely the number of reviews, ratings, type of store, and the number of promotions.

The number of reviews has a negative and significant effect on total sales in Tokopedia. The analysis results show that comparing the number of reviews with total sales will decrease along with the increase in total sales in Tokopedia. The number of reviews shows the number of buyers who have an attachment to products, whether it is an attachment to writing positive or negative reviews.

The rating has a positive and insignificant effect on total sales in Tokopedia. The rating shows buyer satisfaction with the products purchased. The research sample shows that the product ratings are in the range of 4.8-5 for products that have been sold. All buyers are satisfied with the products purchased, regardless of the store type. It also shows that there is no difference in buyer satisfaction for all sellers analyzed. Thus, the ratings do not significantly influence the total sales.

The store type has a positive and insignificant effect on total sales in Tokopedia. The assessment of store type is influenced by the ranking, while the ranking is insignificant to the total sales. Therefore, the type of store has no significant effect on total sales.

The number of promotions has a negative and insignificant effect on total sales in Tokopedia. The three types of promotions are related to the costs incurred by the buyer and the price factor, which is not significant to total sales in Tokopedia. Buyers do not prioritize the costs incurred in purchasing in Tokopedia as a factor influencing purchasing decisions. Therefore, the number of promotions does not significantly affect total sales.

Table 11. Determining the best model for Total sales in Tokopedia sales analysis

Test	Probability	Chosen model
Chow	0.0000	FEM
Hausman	0.0000	FEM
LM	0.1879	CEM

Table 12. Classical assumption test of total sales in Tokopedia

Test	Result	Meaning
Multikolinearity	-0.0000<x<0.9	Passed test
Heteroskedastisity	0.4607	Passed test

Tabel 13. The results of the test of the effect on total sales in Tokopedia

Factors	Coefficient	Z-Statistics	Probability
Price	-0.00	-0.32	0.75
Review	-17.43	-15.54	0.00
Rating	16.32	1.25	0.22
Store type	2.31	0.13	0.89
Promotion	-5.65	-0.34	0.73
Robust Statistics			
R-squared		0.98	
Adjusted R-squared		0.97	
Deviance		103.01	
Scale		2.07	
Prob		0.00	

Managerial Implications

Fruits and vegetables are essential food ingredients for health. These products are also inelastic. Price changes do not significantly influence total sales in line with Restuningtyaswidi and Simamora (2021) due to purchasing decisions are significantly influenced by product. Sellers can provide prices that match the quality of fruits and vegetables without worry about sellers' price competition will influence total sales. The number of reviews consistently shows a significant effect on total sales. Research supports this result by stating that customer reviews significantly influence customer trust, and customer trust significantly influences shopping decisions at Shopee (Hariyanto and Trisunarno, 2020) and Bukalapak (Mulyati and Gesitera, 2020). Customer reviews significantly influence purchasing decisions at Tokopedia (Arbaini et al. 2020). The buyer's knowledge of the product purchased will affect the reviews given (Rajeswari et al., 2020). The seller cannot control the number of reviews because the authority to write reviews rests with the consumer. Nevertheless, the seller can control their action when they sell the product with great customer handling to get better result of review. The rating shows that the level of customer satisfaction and product reputation has an enormous impact on buyer desires to purchase the products (Fikri et al. 2019). Product branding influences consumer responses to purchasing decisions (Khoa et al. 2020). The number of promotions factor consistently shows the varied effect on total sales. This occurs because fruits and vegetables are daily needs. Consumers will seek and buy the products despite no promotion.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Factors that have a significant effect on total sales at Bukalapak are reviews and store types, at Shopee are reviews, ratings, and promotions, and at Tokopedia are reviews. As a result, review is the most important factor that affect total sales in digital platforms. Hence, the seller needs to focus on each platform to achieve better result of review by way customer handling. The understanding can help the seller to increase their total sales.

Recommendations

This research can be developed into a strategy formulation for sellers to manage the reviews received. Fruit and vegetable sellers on digital platforms should focus on selling by prioritizing the number of reviews from customers because reviews are a significant factor in the three products analyzed. Sellers can communicate with buyers regarding purchased products to set the number of reviews. To control the reviews, its better for the seller to get proper training for customer handling. It will be great if the government can give proper training to the seller, collaborate, and facilitate the seller. In the long run, the government can encourage farmers to sell their product directly to the customer to reduce the marketing chain and margin.

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