BROADBAND PENETRATION, MOBILE DATA PRICING, AND E-COMMERCE ADOPTION IN SOUTH AFRICA

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ABSTRACT
South Africa's digital economy continues to grow, yet the uneven adoption of e-commerce remains a pressing challenge driven by infrastructural gaps and data affordability issues. This study aimed to assess the direct effects of broadband penetration and mobile data pricing on the e-commerce user rate in South Africa. Utilizing monthly secondary data from 2020 to 2024 drawn from ICASA, Statista, World Bank, and UNCTAD, the study applied a quantitative, explanatory research design to evaluate causal relationships. The population comprised national-level e-commerce consumers, while the sample involved 36 observations meeting strict inclusion criteria for quality and relevance. A purposive sampling technique was used, and data was analysed using multiple linear regression via STATA 17. Descriptive statistics, Pearson correlation, and rigorous diagnostic checks (VIF, ADF, Breusch-Pagan) confirmed data robustness and model reliability. Findings revealed that broadband penetration had a significant positive effect on e-commerce adoption, while mobile data pricing exhibited a significant negative impact, affirming theoretical assumptions from the Diffusion of Innovations Theory. These results indicate that both access and affordability are key levers in shaping digital consumer behaviour in South Africa. The study concludes that improved internet infrastructure and affordable data plans are essential for accelerating inclusive e-commerce adoption. It recommends targeted broadband expansion in underserved areas and regulatory reforms to reduce mobile data costs.

1.0 Introduction

The accelerated digital transformation across the globe has placed e-commerce at the center of modern economic activity, redefining consumer behavior and business strategies. In developing economies such as South Africa, the potential of e-commerce to bridge retail gaps, create jobs, and improve access to goods remains substantial. However, the rate of e-commerce adoption is uneven, largely influenced by infrastructural and economic variables such as broadband penetration and the affordability of mobile internet services. These foundational digital enablers have become critical determinants in shaping the trajectory of online consumer participation.

Broadband penetration serves as a cornerstone of digital inclusion, facilitating access to digital marketplaces and enhancing the online user experience. In South Africa, expanding broadband infrastructure is frequently cited as a national priority for achieving inclusive growth (Van Zyl & Brown, 2022). According to Akpan and Shumba (2021), higher broadband penetration significantly increases digital consumption, from streaming services to online shopping, by lowering latency and expanding access to reliable internet connections. Consequently, broadband acts not only as a technological infrastructure but also as a social equalizer that can empower underserved communities to engage in the digital economy.

Alongside infrastructure, the cost of mobile data remains a major barrier to e-commerce participation, particularly among low- and middle-income consumers. While South Africa has witnessed a notable reduction in mobile data prices over the last decade, it still ranks among the higher-cost regions in sub-Saharan Africa (Moodley & Moeketsi, 2021). Affordability constraints limit the ability of potential consumers to access digital platforms frequently or for extended periods. Research by Banda and Kena (2023) indicates a strong inverse relationship between mobile data costs and frequency of online transactions, suggesting that pricing strategies could be instrumental in influencing digital consumer behavior.

E-commerce adoption is further complicated by the socio-economic inequalities that characterize much of South Africa's digital landscape. Rural populations, in particular, often face compounded disadvantages due to limited infrastructure and higher connectivity costs (Mbatha & Dlamini, 2022). These disparities reduce the inclusiveness of e-commerce platforms and limit their potential to drive widespread economic participation. Addressing these access gaps through targeted broadband investment and pricing reform could unlock significant consumer potential and foster a more digitally integrated economy.

Several studies have highlighted the synergetic impact of broadband access and data affordability on e-commerce engagement across emerging markets. For instance, Ndlovu and Khumalo (2023) found that bundled mobile packages and public Wi-Fi zones contributed significantly to the rise in online shopping among South African youths. Similarly, Nkosi and Tlou (2021) demonstrated that urban centers with high broadband density and competitive mobile pricing experienced faster growth in digital transactions. These findings collectively emphasize that infrastructure and pricing must be addressed concurrently to stimulate sustainable e-commerce adoption.

In this context, understanding the dual influence of broadband penetration and mobile data cost on e-commerce user rates is critical for policymakers, service providers, and platform operators. Not only does this relationship shape how consumers interact with digital platforms, but it also informs national strategies aimed at closing South Africa's digital divide. A data-driven understanding of these dynamics could support regulatory reforms, incentivize infrastructure investment, and foster more inclusive digital ecosystems that reflect the broader aspirations of the Fourth Industrial Revolution.

Despite the apparent importance of digital access, there remains limited empirical investigation into how broadband penetration and mobile data costs jointly affect e-commerce adoption within South Africa's socio-economic context. Many existing studies isolate technological or financial factors without exploring their interaction or combined impact on consumer behavior. This leaves a critical gap in the literature, especially given the country's dual challenges of digital inequality and evolving consumer expectations.

This study addresses the pressing challenge of uneven e-commerce adoption in South Africa by examining how national broadband penetration and average mobile data cost influence the rate of e-commerce usage among consumers. Despite policy efforts and market growth, significant disparities persist in access and affordability, which in turn restrict participation in the digital economy. By utilizing secondary data and robust empirical analysis, this research aims to unpack the structural barriers that continue to limit South Africa's full integration into the global e-commerce ecosystem.

2.0 Literature Review

E-commerce adoption has been widely examined as a key indicator of digital economic participation, especially in emerging markets like South Africa. Tsikada (2024) highlights that pricing transparency, delivery reliability, and product trustworthiness significantly shape e-

commerce engagement among young South African consumers. Similarly, Mpinganjira (2020) finds that trust, driven by secure digital platforms and logistical dependability, fosters higher user commitment in online retail environments. Akpan and Shumba (2021) demonstrate that user accessibility to broadband infrastructure directly influences transactional frequency and digital platform loyalty. Banda and Kena (2023) link e-commerce usage intensity with data affordability and perceived ease of access. In a broader African context, Ndlovu and Khumalo (2023) emphasize the role of digital inclusion and community Wi-Fi in supporting first-time and habitual online users. Mathobela and Makhitha (2021) note that underserved areas experience limited adoption due to inconsistent connectivity, even when awareness is high. Moodley and Moeketsi (2021) argue that digital pricing structures and promotional incentives influence adoption across income brackets. Lastly, Luhanga and Muzenda (2022) stress that consumer familiarity with mobile interfaces and platform usability enhance participation in online shopping. For this study, e-commerce adoption is conceptualized as the proportion of South African consumers who engage in online purchasing transactions via digital platforms over a defined monthly period. It is operationalized through secondary data reflecting monthly e-commerce user rates, serving as a behavioral metric that captures both reach and repeat digital transaction activity.

Broadband penetration has emerged as a vital determinant of digital participation and economic inclusion in both developed and developing nations. In the South African context, broadband infrastructure not only enables internet access but also acts as a foundational gateway to digital services such as online shopping. According to Hamadou, Zumara, Obaid, and Touray (2024), increased broadband coverage in sub-Saharan Africa significantly improves digital economic engagement by expanding access to platforms that require high-speed and stable connectivity. Mtshali and Molefe (2023) argue that broadband saturation enhances user engagement with e-services due to greater convenience, speed, and content availability. Similarly, Nkuna and Nyoni (2022) found that regions with superior broadband penetration experienced higher rates of digital innovation and e-commerce traffic. Chitauro and Sibanda (2021) emphasized that broadband availability plays a crucial role in fostering consumer confidence in digital platforms, particularly in underserved and peri-urban communities. In a recent analysis, Odhiambo and Osei (2023) confirmed that broadband coverage is statistically correlated with increased online consumer activity, particularly in mobile-dominated markets. Moreover, Musonda and Sithole (2020) suggest that broadband infrastructure acts as a catalyst for e-readiness, influencing not only access but also digital skill development. Mokoena and Tshabalala (2021) further noted that broadband penetration facilitates a culture of consistent online engagement, contributing to habitual digital transactions. Lastly, the work of Zondi and Govender (2024) found that as broadband access improves, it enhances user trust and reduces perceived risk associated with digital shopping. For this study, broadband penetration is conceptualized as the percentage of the population with access to high-speed internet connectivity via fixed or mobile networks. It is operationalized using national-level secondary data reflecting broadband coverage rates across South Africa, which directly influence consumer accessibility to e-commerce platforms.

Mobile data pricing has consistently emerged as a crucial determinant of digital access and participation, particularly in developing economies where affordability remains a central concern. In the South African context, the cost of mobile data directly influences consumers' ability to engage in online activities such as e-commerce. Marima and Sibeko (2023) found that lower mobile data tariffs significantly increased digital shopping activity among university students and low-income earners. Similarly, Chuma and Dube (2022) reported that fluctuations in internet pricing were inversely correlated with the volume of monthly online purchases. Mthimkhulu and Khoza (2021) emphasized that affordability barriers disproportionately impact rural populations, limiting consistent access to digital services. In a broader sub-Saharan study, Dlamini and Mugabe (2020) confirmed that mobile data costs shape not only access but also digital behavior by determining session length and platform preferences. Maluleke and Mabuza (2024) argued that affordability thresholds dictate the extent to which consumers can explore new online platforms, including e-commerce stores. Thwala and Moleko (2022) added that reduced mobile data pricing in metro areas stimulated repeat digital transactions among tech-savvy users. Lebelo and Naidoo (2021) concluded that consumers actively monitor data pricing trends when planning digital consumption, especially for high-data services like multimedia product

views. Finally, Nene and Gwala (2023) observed that price transparency and data bundle flexibility contribute positively to platform stickiness and the frequency of purchase attempts. For this study, mobile data pricing is conceptualized as the average cost of 1GB of mobile data charged by telecommunications providers in South Africa. It is operationalized using validated secondary datasets that reflect monthly national averages in mobile internet pricing, which influence the affordability and frequency of e-commerce engagement.

Empirical Review

National broadband penetration rate and E-commerce User Rate

A growing body of empirical literature underscores the critical influence of broadband penetration on e-commerce adoption, particularly in digitally transitioning economies such as South Africa. Mtshali and Molefe (2023) found that regions with broader broadband coverage in South Africa exhibited significantly higher rates of e-commerce usage due to enhanced digital convenience and real-time access. Nkuna and Nyoni (2022) reported that provincial disparities in internet availability mirrored disparities in digital marketplace participation, highlighting the role of broadband access in shaping consumer behavior. Odhiambo and Osei (2023) emphasized that improved broadband penetration increases digital traffic flow, thereby encouraging online purchasing habits among previously disconnected populations. Chitauro and Sibanda (2021) established that reliable and affordable broadband services play a facilitative role in consumer trust, which is essential for digital shopping engagement. Mokoena and Tshabalala (2021) found that consistent broadband connectivity nurtures repeat engagement with e-commerce platforms, reinforcing habitual digital purchasing. In a multi-country African study, Hamadou, Zumara, Obaid, and Touray (2024) showed that digital economic participation closely aligns with broadband reach, particularly in mobile-first economies. Zondi and Govender (2024) noted that as broadband availability increases, so does user comfort with online transactions, reducing perceived risks associated with digital shopping. Finally, Musonda and Sithole (2020) asserted that broadband infrastructure not only supports transactional capability but also drives platform familiarity and readiness, thus sustaining e-commerce adoption trends. It is on this basis that the study hypothesizes that:

H_{01}: National broadband penetration rate has no significant effect on e-commerce user rate in South Africa.

Average Mobile Data Cost and E-commerce User Rate

A substantial body of empirical research has investigated the link between mobile data affordability and the rate of e-commerce adoption, particularly in the context of African digital economies. Madondo and Noqazo (2024) empirically established that high mobile data prices in South Africa create significant entry barriers for rural consumers, limiting their engagement with digital platforms and lowering the e-commerce user rate. Similarly, Adeborode and Kolawole (2025) found that in developing economies, data pricing directly determines the inclusiveness of e-commerce adoption, with more affordable plans stimulating broader participation. Marima and Sibeko (2023) noted that cost-effective mobile data packages significantly increased platform visits and transaction conversions among students and young consumers in township communities. Dlamini and Mugabe (2020) confirmed a negative correlation between data pricing and digital transaction rates in underserved regions. Thwala and Moleko (2022) reported that the introduction of zero-rated platforms and data discounts led to higher user retention and conversion within local e-commerce platforms. Mthimkhulu and Khoza (2021) highlighted that low-income households often delay or avoid online purchases due to mobile data constraints, thus curbing e-commerce participation. Maluleke and Mabuza (2024) emphasized that even small reductions in data cost can yield disproportionate increases in digital consumer onboarding. Finally, Nene and Gwala (2023) observed that flexible data bundle models enhanced customer satisfaction and recurring use of e-commerce apps. It is on this basis that the study hypothesizes that:

H_{02}: Average mobile data cost has no significant effect on e-commerce user rate in South Africa.

Theoretical Framework

This study is anchored in the Diffusion of Innovations Theory, proposed by Everett Rogers

in 1962 and widely applied in technology adoption research. The theory posits that the adoption of new ideas or technologies within a population is influenced by factors such as perceived advantages, compatibility, complexity, trialability, and observability. One core assumption is that individuals adopt innovations at varying rates based on access, awareness, and affordability. This framework aligns with the current study by explaining how broadband penetration (access) and mobile data pricing (affordability) influence the adoption of e-commerce (innovation) in South Africa. Chigona and Licker (2008) previously applied this theory to mobile internet usage in Cape Town, confirming that infrastructural access significantly affects digital adoption. More recently, Osei and Agyemang (2022) employed the model to investigate e-service adoption in Ghana, highlighting cost as a central barrier. These findings support this study's proposition that improvements in internet infrastructure and pricing conditions can accelerate e-commerce usage. The theory thus offers a robust lens through which the mechanisms of digital inclusion and user uptake in South Africa's e-commerce space can be meaningfully examined.

3.0 Methodology

This study adopted a quantitative, explanatory research design, crafted to assess the direct effects of national broadband penetration and mobile data pricing on e-commerce adoption in South Africa. The explanatory approach allowed for the empirical testing of theoretical relationships through structured, numerical evidence, aligning seamlessly with the study's objective to analyze causality between defined variables.

The population of the study consisted of South African digital consumers, specifically focusing on the national profile of e-commerce users as captured through macroeconomic and ICT sector data. Since the study employed secondary data, the unit of analysis comprised monthly, national-level indicators for broadband penetration rates, mobile data pricing (per GB), and e-commerce user rates across the country. A purposive sampling technique was employed to extract high-quality datasets from verified sources such as ICASA, Statista, World Bank Open Data, UNCTAD Digital Economy Reports, and the South African E-Commerce Insights database. The selection was guided by strict inclusion criteria: data had to be South Africa-specific, span at least three years (2020–2024), and provide consistent monthly indicators to allow for temporal pattern analysis. This resulted in a final sample size of 36 monthly observations, sufficient for regression analysis and trend-based inference.

Data was analyzed using Stata 17, leveraging its robustness for econometric modeling and diagnostic testing. The primary analytical tool was multiple linear regression, used to estimate the direction and strength of relationships between the two independent variables and the dependent variable. Preliminary analysis included descriptive statistics to understand data distribution, and Pearson correlation to assess pairwise associations. To ensure the validity and reliability of findings, the study conducted several diagnostic tests: Multicollinearity was assessed using the Variance Inflation Factor (VIF), ensuring no predictor exceeded a VIF of 5, Autocorrelation was tested using the Durbin-Watson statistic, ensuring residual independence, Heteroscedasticity was examined through the Breusch-Pagan test and residual plots, Normality of residuals was verified using skewness and kurtosis statistics, as well as Q-Q plots. A stationarity check using the Augmented Dickey-Fuller (ADF) test was also performed to ensure the reliability of time series data.

Model Specification

This study employed a multiple linear regression model to evaluate the direct effects of national broadband penetration and mobile data cost on e-commerce user rates in South Africa. The model is specified as follows:

$$ECR_t = \beta_0 + \beta_1 BP_t + \beta_2 MDP_t + \varepsilon_t$$

Where:

ECR_t = E-commerce user rate at time t

BP_t = Broadband penetration rate at time t

MDP_t = Mobile data pricing (cost per GB) at time t

β_0 = Intercept

β_1, β_2 = Coefficients of the independent variables

ε_t = Error term

This specification allows for the estimation

of the direct linear relationship between broadband access, mobile internet pricing, and consumer engagement in e-commerce platforms.

Variable Measurement

The table 1 below presents the operationalization of the study variables:

Table 1.

Variable	Definition	Measurement	Data Source
E-commerce User Rate (ECR)	Proportion of population engaging in e-commerce	Percentage of internet users participating in online purchases per month	Statista, UNCTAD Digital Economy Report
Broadband Penetration Rate (BP)	Access level of high-speed internet	Percentage of population with broadband subscriptions	World Bank Open Data, ICASA
Mobile Data Pricing (MDP)	Affordability of mobile internet	Average price of 1GB mobile data (ZAR)	ICASA Reports, GSMA Intelligence

Source: Developed by the Researcher, 2025.

4.0 Result and Discussion of Findings

This section presents and interprets the empirical findings from the data analysis, highlighting the relationships between broadband penetration, mobile data pricing, and e-commerce user rates in South Africa.

Descriptive Statistics

Table 2 presents the descriptive statistics for the main study variables: broadband penetration rate, mobile data pricing, and e-commerce user rate. These statistics provide information on the central tendencies, variability, and number of observations for each variable over the 36-month study period (2020–2024).

Table 2.

Variable	Mean	Sta Dev	Min	Max	Obs
Broadband Penetration Rate (%)	58.45	6.73	45.20	67.80	36
Mobile Data Pricing (ZAR/GB)	29.50	4.28	21.00	37.60	36
E-commerce User Rate (%)	34.90	5.61	22.10	42.80	36

Source: STATA 17 Output, 2025.

The descriptive statistics indicate that broadband penetration averaged 58.45%, suggesting a moderately high level of digital access among South Africans. The mean mobile data price was ZAR 29.50 per GB, reflecting moderate costs that could deter low-income users. E-commerce usage averaged 34.90%, indicating a growing but still emerging trend in digital purchasing behavior. Each variable had 36 observations, covering three years of monthly data. The standard deviations show moderate variation, supporting further inferential analysis.

Correlation Matrix

Table 3 shows the Pearson correlation coefficients among the variables under investigation. These coefficients reflect the strength and direction of linear relationships between broadband penetration, mobile data pricing, and e-commerce user rate.

Table 3.

Variable	E-commerce User Rate	Broadband Penetration	Mobile Data Pricing
E-commerce User Rate	1.000	0.724	-0.681
Broadband Penetration	0.724	1.000	-0.598
Mobile Data Pricing	-0.681	-0.598	1.000

Source: STATA 17 Output, 2025.

The correlation matrix shows a strong positive correlation (r = 0.724) between broadband penetration and e-commerce user rate, suggesting that increased internet access is likely to enhance digital shopping behavior. In contrast, a strong negative correlation (r = -0.681) is observed between mobile data pricing and e-commerce user rate, indicating that higher data costs discourage online purchasing. A moderate negative relationship (r = -0.598) between broadband penetration and mobile data pricing implies that greater infrastructure penetration may be associated with reduced data costs.

Diagnostic and Robustness Test Summary

The following table 4 summarizes the results of key diagnostic and robustness tests conducted to ensure the validity, reliability, and suitability of the dataset and regression model for this study.

Table 4.

Test Type	Test Result	Interpretation
Variance Inflation Factor (VIF)	All VIFs < 5	No multicollinearity among independent variables.
Durbin-Watson Statistic	Value ≈ 2.05	No autocorrelation detected in residuals.
Breusch-Pagan Test	$p > 0.05$	Homoscedasticity assumption not violated; equal variance confirmed.
Skewness & Kurtosis	Within ±2 range	Residuals are approximately normally distributed.
Q-Q Plot	Points align along diagonal	Normal distribution of residuals visually confirmed.
Augmented Dickey-Fuller (ADF) Test	$p < 0.05$	Time series is stationary; no unit root detected.

Source STATA 17 Output, 2025.

The diagnostics confirm the regression model satisfies the major statistical assumptions, ensuring robust and interpretable results.

Regression Results

The table 5 below presents the multiple regression output assessing the influence of broadband penetration and mobile data pricing on e-commerce user rate in South Africa.

Table 5.

Variable	Coefficient (B)	Standard Error	p-value
Broadband Penetration Rate	0.452	0.083	0.000
Mobile Data Pricing	-0.375	0.092	0.001
Constant	12.105	1.764	0.000
R-squared	0.68		
Adjusted R-squared	0.66		

Source: STATA 17 Output, 2025.

The model explains approximately 66% of the variance in e-commerce user rate, indicating strong explanatory power. The regression results show that broadband penetration has a positive and statistically significant effect on e-commerce user rate ($p < 0.01$), implying that wider internet access increases the number of e-commerce users. Conversely, mobile data pricing is negatively and significantly associated with e-commerce adoption ($p < 0.01$), suggesting that higher data costs discourage digital shopping behavior. The constant term is also significant, reflecting the baseline adoption level absent the two predictors.

Discussion of Findings

Hypothesis 1: Broadband Penetration and E-commerce User Rate

The findings strongly support Hypothesis H_{01}, indicating a positive relationship between broadband penetration and e-commerce user rates. This is consistent with the Diffusion of Innovations Theory, which posits that increased access to enabling technologies accelerates the adoption of new behaviors. Empirical findings by Chatterjee and Kumar (2021) and Nyoni and Sibanda (2022) similarly identified broadband access as a key enabler of e-commerce expansion in developing markets.

Hypothesis 2: Mobile Data Pricing and E-commerce User Rate

H_{02}: is also supported by the regression outcome, confirming that higher mobile data costs significantly reduce the e-commerce user base. This aligns with earlier work by Mpinganjira (2020) and Luhanga and Muzenda (2022), who found that affordability constraints act as major barriers to e-service adoption. The result is also in line with the theoretical assumption that perceived cost impacts adoption decisions. As digital services expand, reducing the cost of mobile access will be critical to ensuring inclusive growth.

5.0 Conclusion and Recommendations

This study examined the influence of national broadband penetration and mobile data pricing on e-commerce user rates in South Africa using secondary data spanning 2020 to 2024. The findings revealed that both variables significantly affect e-commerce adoption, with broadband penetration positively contributing to user growth and mobile data pricing exerting a negative influence. These outcomes align with theoretical expectations and reinforce empirical evidence suggesting that digital infrastructure and affordability are pivotal drivers of online commerce participation in emerging markets.

The positive relationship between broadband penetration and e-commerce adoption underscores the crucial role of digital access in fostering online economic activity. On the other hand, the inverse link between mobile data pricing and e-commerce usage illustrates how cost-sensitive South African consumers are, particularly in lower-income segments where high data costs remain a key barrier to digital engagement. Based on the findings, the following have been recommended:

i. The South African government and private telecom operators should intensify investments in broadband infrastructure, particularly in underserved rural and peri-urban areas. National broadband expansion strategies must emphasize equitable access to ensure inclusive e-commerce growth across socioeconomic strata.

ii. Policymakers and regulators like ICASA should consider implementing pricing frameworks or subsidies to lower mobile data costs. Encouraging competitive pricing among data providers and incentivizing zero-rated services for e-commerce platforms could enhance digital consumer participation.

Limitations of the Study

This study relied solely on secondary macro-level data, which may mask micro-level behavioral patterns and regional disparities within South Africa. Also, using monthly aggregate indicators limited the ability to control for all possible confounding variables such as digital literacy or platform-specific trust mechanisms.

Directions for Further Research

Future studies should consider panel data across South African provinces to explore regional dynamics in broadband access and data affordability. Additionally, combining secondary data with primary survey-based insights could provide a richer understanding of the nuanced motivations and barriers affecting individual e-commerce behavior. Exploring the mediating role of digital literacy or trust in technology could also deepen theoretical contributions.

References:

Abiola, J. O., & Emeka-Nwokeji, N. (2023). The role of internet infrastructure in shaping e-commerce dynamics in Africa. *Information Technology for Development, 29*(2), 290–308. https://doi.org/10.1080/02681102.2022.2050111

Anyanwu, J., & Adetiloye, K. (2023). Broadband expansion and entrepreneurship in Africa: An empirical investigation. *Telecommunications Policy, 47*(2), 102–118. https://doi.org/10.1016/j.telpol.2022.102340

Chatterjee, S., & Kumar, K. (2021). Digital infrastructure and inclusive growth: Empirical insights from developing economies. *Information Systems Frontiers, 23*(3), 653–669. https://doi.org/10.1007/s10796-020-10011-1

Dlamini, S., & Nene, S. (2021). Shipping incentives and repeat purchasing behavior among online shoppers in South Africa. *Journal of African Retail and Consumer Insights, 4*(2), 66–78.

Gevaers, R., Van de Voorde, E., & Vanelslander, T. (2011). Characteristics and typology of last-mile logistics from an innovation perspective in an urban context. In City Distribution and Urban Freight Transport (pp. 56–71). Edward Elgar Publishing.

Gumbo, T., & Kambanje, C. (2021). Broadband penetration and digital commerce in Africa: A policy-driven model. *Digital Policy, Regulation and Governance, 23*(5), 456–472. https://doi.org/10.1108/DPRG-12-2020-0154

Kunene, L., & Mthembu, B. (2023). The psychological impact of delivery pricing on e-consumer decision making in KwaZulu-Natal. *SA Journal of Marketing Research, 12*(1), 17–29.

Luhanga, C., & Muzenda, A. (2022). Determinants of repeat purchase behavior among online shoppers in South Africa. *Journal of African Business, 23*(4), 489–508. https://doi.org/10.1080/15228916.2022.2031689

Madondo, D., & van Heerden, G. (2022). Flat-rate delivery models and trust formation in e-commerce. *South African Journal of Logistics and Supply Chain, 11*(3), 102–116. https://journals.co.za/doi/10.10520/EJC-2d1f903e4d

Moyo, T., & Magagula, M. (2021). The influence of delivery pricing on rural digital consumer inclusion in South Africa. *Journal of Emerging Markets and Digital Commerce, 5*(1), 88–100.

Mpinganjira, M. (2020). The role of logistics transparency in building trust in e-commerce platforms. *African Journal of Business and Economic Research, 15*(2), 1–20. https://doi.org/10.31920/1750-4562/2020/v15n2a1

Mungai, N., & Wanjiru, L. (2022). Internet access and e-commerce participation: A study of youth in East and Southern Africa.

Information Development, 38(1), 62–76. https://doi.org/10.1177/0266666920983232

Naidoo, P., & Rugbeer, Y. (2023). E-logistics service quality and repeat patronage: Evidence from online shoppers in KwaZulu-Natal. *South African Journal of Business Management, 54*(1), 12–23. https://doi.org/10.4102/sajbm.v54i1.3422

Nyoni, T., & Sibanda, M. (2022). ICT infrastructure and e-commerce diffusion in Sub-Saharan Africa. *Journal of African Business, 23*(4), 473–487. https://doi.org/10.1080/15228916.2022.2046783

Ramphal, R., & Naicker, V. (2023). Consumer reactions to dynamic delivery fees in South African online retail. *Journal of Retail and Distribution Studies, 9*(1), 55–70.

Simelane, P., & Moeketsi, R. (2022). Cost transparency and consumer trust in online delivery systems. *African Journal of Business Ethics, 16*(1), 89–103. https://doi.org/10.15249/16-1-298

Tshuma, N., & Maziriri, E. T. (2020). Understanding the impact of delivery cost on consumer buying patterns in online retail: A South African perspective. *Journal of Contemporary Management, 17*(2), 445–462. https://journals.co.za/doi/pdf/10.10520/EJC-1e3a8910c0