
Effect of Operational Risk on Third-party Payment Processing among Retailers in Nairobi County, Kenya

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Abstract

The study addresses the effect of operational risk on third-party payment processing among retailers in Nairobi County, Kenya. Methodically, the study was guided by the positivism research philosophy and applied a descriptive cross-sectional research design targeting 226 retailers under the registered payment service providers regulated by the Central Bank of Kenya. The sample size of 144 heads of finance and compliance, and risk managers/heads of payments was drawn using a stratified sampling technique. Primary data was collected through a self-administered questionnaire, which was designed based on the research objectives. Secondary data regarding firm size (total assets) was gathered from the financial statements. Both descriptive and inferential analyses were employed for analysis. The descriptive statistics revealed that errors had the highest average mean of 4.07, followed by internal control systems with an average mean of 3.98, while the stability of payment systems had an average mean of 3.86. Regression analysis results showed that operational risk sub-constructs (stability of payment systems, errors and internal control systems) influence third-party payment systems as supported by the F-statistic, $F(3,117) = 11.405, p = .000 < .05$, thus rejecting the null hypothesis. The study concludes that operational risk influences third-party processing among retailers in Nairobi County, Kenya. The study therefore recommends that management of the retailers in Nairobi County should invest in training to facilitate their capacity to improve their internal controls and personal skills, which may lead to a decrease in operational risk and performance failure, thus increasing their third-party payment processing.

Keywords: Operational risks, Third-party Payment Processing, Retailers, Stability of Payment Systems, Internal Control Systems, Errors

Introduction

Technology has been and keeps transforming societies through creation of new opportunities for different organizations as they serve their clients in the digital era. The dynamics in this space has brought about innovations that are embraced by the society (Saisimulinya & Khaoyamuyobo, 2022). Financial and technological firms are coming up with new digital ways of making payments. One of the developing areas is in the provision of payment services that endeavors to

offer seamless experiences in the retail sector, convenience to clients and customers as well as offering fast means of receiving cash by businesses (Munyao, 2020). These technological developments come with risks that need to be considered and managed to benefit both the payment service providers and the retailers. Some of the risks include charge backs, fraud, data breaches, unreliable infrastructure, breakdowns and unprecedented delays and lack of legal and institutional frameworks in governments on e-payments as well as integration issues (Saisimulinya & Khaoyamuyobo, 2022).

Risk refers to the probability of an adverse event occurring and is inherent in all types of businesses because of the high level of uncertainties in their internal and external environment (Tasmin & Muazu, 2019). According to BCBS (2017), operational risks result from failed procedures, systems, or policies such as employee errors, systems failures, fraud, or other criminal activity and any event that disrupts business processes. This definition includes legal risk but excludes strategic and reputational risk. Operational risk was essential for this study as it tackles the "human factor" and infrastructure weaknesses (such as employee error, fraudulent activities, or IT outages) that cause roughly 60% of major corporate losses. Mrindiko et al., (2020) posited that ineffective operational risk management is the primary cause of many financial institutions' failures and can lead to large financial losses and even bankruptcy. Besides, the credit quality is considered a proxy of the operational performance and financial health of financial institutions. Bocker and Kluppelberg (2019) suggest that the only feasible way to manage operational risk successfully is by identifying and minimizing it, which requires the development of adequate quantification techniques. According to Kuritzkes (2022) assessment of the operational risk is very crucial, for achieving the objectives, as objective establishment provide basis for determining how operational risk should be managed.

Zhao and Sun (2022) posited that third-party online payment has become the new form of online payment. In its early development, online payment was more reflected in the involvement of the traders and the bank. Since the existence of banks to provide online payment services for individual with high cost, imperfect social credit system, distrust, high risk of direct payments, the interests of both parties could not be effectively guaranteed, which virtually limited the development of online payment (Li, 2020). In order to solve these problems of online payment, the third-party online payment form came forward. The third-party online payment platform plays the role as an intermediary to reduce the cost of banking services and eliminate the distrust of trading parties (Wang, 2019).

Several studies have established the relationship between operational risk and third-party payment platforms. Yao and Li (2022), in a study on operational risk assessment of third-party payment platforms, a case study of China, that intended to assess the operational risk on third-party payment platforms through database construction and risk modelling revealed that legal risk and external fraud risk are the two main causes of operational risk. These risks arise from penalty losses for violating laws and regulations and user's compensation losses, speculative behavior, website vulnerabilities and hacker attacks. Virender (2021) researched on risks in e-banking and their management in Meerut, India and found that internet banking has some inherent operational risks to its nature. Cheng et al. (2020) confirmed that credit risk, operational risk and liquidity risks influence the profitability of e-payments in South African commercial banks. Mbogo (2020) indicates that unlike cash, mobile payments mitigate the operational risk of cash theft as it offers

a more secure platform for transaction. On the contrary, Gadzo et al., (2019) showed that operational risk influences the third-party payment systems performance of the universal banks in Ghana negatively. Overall, the literature presents mixed and often contradictory findings, indicating that the relationship between operational risk and third-party payment processing remains contested and context-dependent.

Third-party payment is widely used. However, due to the incomplete laws and policies of our country and the failure to establish a national credit system, the security of third-party payment cannot be well guaranteed and faces many challenges. There are still many deficiencies, mainly as follows: not suitable for buyer-to-buyer (B2B); buyers and sellers often appear in the transaction disputes, the financial departments may find it challenging to obtain evidence; payment platform is flawed, there will inevitably be man-made situations. Moreover, delayed settlements by PSPs causes cash flow challenges to merchants, and many times they pay more in transaction fees leading to increase in their expenses and at times suffer exchange losses (Ndwiga, 2021). In 2019, Safaricom was sued for the alleged breach of data privacy of an estimated 11.5 million subscribers; critics pointed to the absence of data protection laws in Kenya as an enabling factor of the scandal (Bandura & Ramanujam, 2021). In addition, there are some third-party payment platform security vulnerabilities that need to be improved. Therefore, this study focused on retailers to establish the effect of operational risks on third-party payment processing.

The Problem

According to Tahseen (2024), the crucial function that retailers play might be impacted by external and internal threats, including inept management, risks, economic issues and legal regulations. The possibility of a business partner delaying or completely failing to fulfil their contractual agreement by the due date might seriously undermine the financial institution's ability to operate normally. However, the retailers and financial institutions with high risk also run a significant risk of bankruptcy, which also puts depositors at risk (Balungi, 2023). The majority of financial authorities and regulators are quite concerned about the different risks financial institutions face, and their effect on third-party payment processing (Aldaye, 2022).

The risks inherent in third-party payment processing cannot be overlooked, a report by the Central Bank of Kenya (CBK) indicates that banking and mobile money services risks eroding customer confidence, though a disruptive innovation, it came with risks that raise consumer protection issues as well as financial stability risks thus increasing risk exposures (Daniel et al., 2022). The sector's financial sustainability and long-term viability are threatened by liquidity, credit risk, operational risk, interest rate, market risk, and exchange rate risks despite the development in the sector (Bank Supervision Annual Report, 2023). Numerous merchants using PSPs experience system failures forcing them to sort out client deposits manually, which consumes much time and ends up inconveniencing their clients. The PSPs do not settle the collected monies within the stipulated time and this leads to cash-flow issues in the merchant organizations (Kumari & Chatteraj, 2021). Rotich (2022) revealed that the banking sector stability report of 2022 found that customers who have lost money through cybercrime accounted for 25.9 percent for mobile money users. Kenya Power ended prepaid token purchase from third-party vendors from September 1, 2022, citing cost cutting measures, since processing by third parties who earned

commissions meant that the electricity tokens cost was higher, compared to direct processing through Kenya Power (Ambani, 2022).

Nasr et al. (2020) found that e-payments made it easier for people to survive and helped them save a lot of money and time while Atoyebi (2024) revealed that digital banking can lead to increased risks such as cybersecurity risks whereby digital hackers can compromise customers' personal information including account details, leading to identity theft and financial fraud. Kanyaru and Kyalo (2022) concluded that the challenges are related to the financial and operational risks that affect online merchants. From a managerial perspective, Daniel et al. (2022) concluded that several retailers have undergone managerial challenges such as poor management, funds embezzlement, lack of accountability, trust, ethics, lack of skilled labour and the role of CBK as a regulator. Even with the availability of resources, most of the retailers fail due to numerous risks resulting from lack of risk management techniques and proper managerial training and initiative.

From a policy perspective, the Central Bank has helped to regulate the PSPs in Kenya. However, majority of the PSPs have operated for a good number of years without regulation by the CBK, and some are still in operation without proper regulations, this caused and continues to cause anxiety to the merchants because in case of closure, the merchants do not have any fall back (Daniel et al., 2022). This lack of specific research on legal and regulatory constraints on third-party payment processing counteracts genuine efforts in designing programs to best facilitate their growth and risk management of the sector. Therefore, the researcher's aim in this study was to fill the gaps by establishing the effect of operational risk on third-party payment processing among retailers in Nairobi County.

The general objective of this study was to determine the effect of operational risk on third-party payment processing among retailers in Nairobi County, Kenya.

Literature Review

Theoretical Review

This study was anchored on Enterprise Risk Management (ERM) Theory. According to Nocco and Stulz (2016), Enterprise Risk Management (ERM) is a theory that advocates for the measurement and management of notable risk facing a given entity than the management of each risk independently. Its main aim is to combine the risk management silos in an organization into one holistic and comprehensive framework. ERM helps to address and manage all types of risks, including financial and non-financial risks, facing an organization. This collective approach of combining and consolidating various types of risks minimizes the effects of individual risks compared to overall risks, which results in increased profitability and productivity through cost savings (Alviniussen & Jankensgard, 2019). Lai (2018) contends that a financial institution should determine and evaluate its risks in all its entire subsidiaries, branches, and entities in its area of jurisdiction. In line with the examination in progress, institutions within financial sector assess the interactions between financial risks alongside other risks that they are susceptible to as a result of their nature of operations. These risks span from operating, security and financial risks which include operational, interest rate, reputational, credit and legal risks as they influence the liquidity level of a financial institution. This theory therefore informs the independent variable (operational

risk) and its influence on third-party payment processing for among retailers in Nairobi County. This means that the among retailers have to constantly evaluate and manage operational risks their businesses are exposed to so as to maintain a sound liquidity position that favours their third-party payment processing.

Empirical Review

Mrindoko, Macha and Gwahula (2020) posited that operational risk includes legal risk arising from events such as internal and external fraud, employment practices and workplace safety, products and business practices, damage to physical assets, business disruptions, system failures, and process management (Altaf et al., 2021). Operational risk is inherent in all financial institutions products, activities, processes and systems (Zainuddin et al., 2023). Laksana, Shaferi and Naznii (2023) found that most people in the Banyumas region did not agree that Internet banking had high operational risks while Mishchenko et al. (2022) operational risk is rampant in electronic and mobile money. Kamau (2019) revealed that operational risk was very critical and it was 44percent out of the other risks that occurred in commercial banks, and this is due to the high increase in the use of automated technology, lack of qualified staffs and lack of management supports in the organizations, and also the internal and external frauds.

Methodology

The study was guided by the positivism research philosophy guides this study as it allowed the researcher to observe the social reality objectively. Moreover, positivism allows for a casual explanation and predicts the relationship between variables using empirical methods. The study applied a descriptive cross-sectional research design because it was the most suitable as it reveals accurate information that allows inferences through hypothesis testing. The study targeted 226 retailers under the registered payment service providers regulated by the Central Bank of Kenya. Yamane's (1967) formula was used to draw the sample size of 144 heads of finance and compliance and risk managers/heads of payments who were selected using stratified sampling technique. The choice of sample frame was ideal because they represent the interests of the sector of choice in Kenya on the subject of interest in the study (Creswell, 2014).

Table 1

Sample Size Distribution

PSPs	Population (N)	Sample Size n)	Verified Return Rate
IPay	45	29	24
Craft Silicon Limited	14	10	9
Direct Pay Limited (DPO)	8	5	4
Pesawise Services Limited	10	6	5
Kenswitch Limited	9	6	3
Pesalink	39	24	20
PesaPal Ltd	40	25	22
Cellulant Kenya Ltd	8	5	4

Webtribe Ltd – Jambo Pay	42	27	24
Sasa Pay	11	7	6
Total	226	144	121

Primary data was collected through a self-administered questionnaire which was designed based on the research objectives. Secondary data regarding firm size (total assets) was gathered from the financial statements. Since 10% of the sample size is recommended by Mugenda and Mugenda (2009), the study selected 14 (10% of 144) respondents to participate in the pilot study. Cronbach alpha, which is a measure of internal consistency, was used to test the internal reliability of the measurement instrument. The pilot study results revealed an overall Cronbach's value of 0.875 which is excellent for the study. To enhance the content validity, expert opinion from professionals in this field, researcher's thesis supervisors was sought. Their comments were incorporated to improve the instrument. The face validity was enhanced by the instruments review. In the case of construct validity, a five-point Likert scale was used as well as Principal Component Analysis (PCA). The pilot study results revealed that the variables had a factor loading of >0.4, thus valid.

The study employed descriptive statistics such as frequency distribution, percentages, mean and standard deviation to understand the data. Inferential statistics namely correlation analysis and regression analysis were used.

The study model used was as follows:

$$y = Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 (X_1 * M) + \beta_5 (X_2 * M) + \beta_6 (X_3 * M) + \beta_7 M + \varepsilon$$

Where:

Y = Dependent variable (Third-party payment processing); β_0 = Constant term;

$\beta_1, \dots, \beta_7$ = Beta coefficients, X_1 = Stability of payment systems, X_2 = Errors

X_3 = Internal control systems, M = Moderator (Firm size), ε = Error term (standard error)

A significance level of $p \leq .05$ was used by the study to depict a significant association between the independent and dependent variables. Diagnostic tests were conducted for normality, linearity, multicollinearity and homoscedasticity. The data was presented in figures and tables.

Results

Correlation Analysis

The findings in Table 2 reveal that operational risk was positively correlated to third-party payment processing $r = (121) = .436$ $p = 000 < .01$. This positive coefficient suggests that when operational risk increases, third-party payment processing of retailers in Nairobi County, Kenya tends to increase, meaning that better management of operational risk is significantly associated with improved third-party payment processing, and effective operational risk controls contribute to more stable and efficient payment processing systems.

Table 2:

Correlation Analysis for Operational Risk on Third-Party Payment Processing

Proxy	Coefficient (r)	P-value
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Operational Risk	.436	.000
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** . Correlation is significant at the 0.01 level (2-tailed).

Hypothesis Testing

Regression analysis was utilized to determine the effect of operational risk on third-party processing among retailers in Nairobi County, Kenya. The hypothesis of this study was:

H0₁: There is no significant relationship between operational risk and third-party payment processing among retailers in Nairobi County, Kenya.

Model 1: The findings in Table 3 indicate that there is a linear relationship between operational risk sub-variables (errors, internal control systems and stability of payment systems) and third-party processing among retailers in Nairobi County, Kenya ($r=.476$). Additionally, the study findings indicate that the r-squared was .226 indicating that 20.6% of the changes in third-party processing among retailers in Nairobi County, Kenya was due to operational risk sub-variables (errors, internal control systems and stability of payment systems).

Model 2: The table reveals the degree to which operational risk influence third-party with the inclusion of firm size as a moderating variable was statistically significant, ($r=.426$, $r^2 = .227$). The research results also suggested that 22.7% of third-party payment processing can be attributed to operational risk sub-variables (errors, internal control systems and stability of payment systems) with the inclusion of firm size as the moderating variable, while the remaining 77.3% can be attributed to other factors not included in the study and the error term. The change in r-squared was significant, indicating a significant improvement in the unmoderated model when the moderating variable was included (r squared change = 0.089, $p < 0.05$).

Table 3

Regression Model Summary for Operational Risk and Third-Party Payment Processing

Std. ErrorChange Statistics									
Model	R	Adjusted R Square	Rof Estimate	theR Change	SquareF Change	df1	df2	Sig. Change	F
1	.476 ^a	.226	.206	5.94176	.226	11.405	3	117	.000
2	.476 ^b	.227	.200	5.96504	.001	.089	1	116	.766

a. Predictors: (Constant), errors, Internal control systems, Stability of payment systems

b. Predictors: (Constant), errors, Internal control systems, Stability of payment systems, firm size

Model 1: The study results in Table 4 reveal that the relationship between operational risk sub-variables (errors, internal control systems and stability of payment systems) and third-party processing was significant, $F(3,117) = 11.405$, $p=.000<.05$. Therefore, the overall model was found to be a good predictor in linking operational risk sub-variables (errors, internal control systems and stability of systems) and third-party payment processing among retailers in Nairobi County, Kenya.

Model 2: The p-value of model 2 was used to determine whether firm size had a moderating effect on the relationship between operational risk sub-variables (errors, internal control systems

and stability of payment systems) and third-party payment processing. The table reveals that with the inclusion of firm size as a moderating variable, the model was still significant as supported by the F-statistic, $F(4, 116) = 8.509, p = .000 < .05$. The outcomes show that the regression model performs well in interpreting the data. Based on the findings, the null hypothesis was rejected

Table 4

ANOVA Results for Operational Risk and Third-Party Payment Processing

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1207.943	3	402.648	11.405	.000 ^b
	Residual	4130.631	117	35.305		
	Total	5338.574	120			
2	Regression	1211.097	4	302.774	8.509	.000 ^c
	Residual	4127.477	116	35.582		
	Total	5338.574	120			

a. Dependent Variable: Third-Party Payment Processing

b. Predictors: (Constant), Errors, Internal control systems, Stability of payment systems

c. Predictors: (Constant), Errors, Internal control systems, Stability of payment systems, firm size

Model 1: The results of the regression coefficients for operational risk sub-variables (errors, internal control systems and stability of payment systems) presented in Table 5 found that errors ($\beta = .518, t = 2.715, p < .05$) positively and statistically influences third-party payment processing. However, internal control systems ($\beta = -.074, t = -.501, p > .05$) and stability of systems ($\beta = .250, t = 1.304, p > .05$) and insignificantly influences third-party payment processing.

Model 2: The results of the moderated model demonstrate that firm size had a statistically significant effect on the relationship between errors and third-party payment processing among retailers in Nairobi County, Kenya ($\beta = .528, t = 2.715, p < .05$). The study results also showed that firm size has an insignificantly moderating influence on the relationship between stability of systems ($\beta = .244, t = 1.260, p > .05$) and internal control systems ($\beta = -.080, t = -.478, p > .05$) and third-party payment processing among retailers in Nairobi County, Kenya. moreover, the multicollinearity results ranged between 1.046 and 3.328, implying that there was no multicollinearity between operational risk and third-party payment processing.

Table 5

Regression Coefficient Results for Operational Risk and Third-Party Payment Processing

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.	Collinearity Statistics	
		B	Std. Error	Beta	t		Tolerance	VIF
1	(Constant)	76.340	4.932		15.480	.000		
	Stability of payment systems	.250	.191	.167	1.304	.195	.403	2.479

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	Internal control systems	-.074	.110	-.083	-.675	.501	.435	2.298
	Errors	.518	.191	.396	2.715	.008	.310	3.224
	Firm Size	-.815	.000	-.025	-.298	.766	.956	1.046
2	(Constant)	76.426	4.959		15.411	.000		
	Stability of payment systems*Firm Size	of.244	.193	.163	1.260	.210	.399	2.507
	Internal control systems*Firm Size	-.080	.112	-.089	-.712	.478	.424	2.360
	Errors*Firm Size	.528	.194	.404	2.715	.008	.301	3.328

a. Dependent Variable: Third-Party Payment Processing

The findings of the study derive a linear regression model for between operational risk and third-party payment processing as follows:

$$y = Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 (X_1 * M) + \beta_5 (X_2 * M) + \beta_6 (X_3 * M) + \beta_7 M + \varepsilon$$

$$y = Y = 76.340 + .250X_1 + -.074X_2 + .518X_3 + .244(X_1 * M) - .080(X_2 * M) + .528(X_3 * M) - .815M$$

Where:

Y = Dependent variable (Third-party payment processing);

β_0 = Constant term;

$\beta_1, \dots, \beta_7$ = Beta coefficients

X_1 = Stability of payment systems

X_2 = Errors

X_3 = Internal control systems

M = Moderator (Firm size)

ε = Error term (standard error)

Discussion

The study sought to determine the effect of operational risk on third-party payment processing among retailers in Nairobi County, Kenya. In this study, the variable of operational risk was studied using the subconstructs of stability of payment systems, internal control systems and errors. The results of the regression analysis revealed that operational risk and third-party payment processing among retailers in Nairobi County, Kenya were positively and significantly correlated at $p < .05$. These results were validated by Lyambiko (2021) and Ali et al. (2022) further observed that performance was affected by risks in operation in Tanzanian and Pakistan commercial banks respectively. Onsongo (2020) revealed that operational risk had a positive insignificant effect on performance of NSE listed firms in Kenya while Bekele (2019), Epetimehim and Obafemi (2021)

and Ng'aari (2020) found that operational risk has significant positive effect on bank performance. Hakimi and Boukaira (2020) also found a positive and significant effect of operational risk on performance of Tunisian banks. Ali and Oudat (2020) reported no relationship between operational risk and bank performance. However, the findings contradict a study done by Koros (2023) that established that operational risk negatively affects the financial sustainability of private universities in Kenya. A study by Altaf et al. (2021) observed that increase in operational risk resulted in huge losses incurred by banks while Yousef et al. (2023) showed that operational risk negatively affects banks financial performance in the MENA region.

Operational risk is a core pillar of Enterprise Risk Management (ERM) theory because it directly affects business continuity, regulatory compliance, and organizational resilience. The study findings reveal that operational risk is central to the ERM theory since the ERM theory stresses embedding operational risk awareness into the organizational culture. Additionally, modern ERM systems use GRC (Governance, Risk, Compliance) platforms to turn operational risk data into real-time intelligence.

This finding highlights the critical importance of addressing stability of payment systems, internal control systems and errors to ensure the long-term third-party payment processing of these firms and maintain stakeholder trust. Operational risks could instigate policy initiatives aimed at strengthening operational resilience within the retailers by developing comprehensive guidelines and frameworks to ensure the establishment and maintenance of robust operational processes and systems. The recognition of its influence may lead to increased regulatory scrutiny, imposing a greater compliance burden on banks. While the intention behind such scrutiny is to strengthen operational frameworks, the resulting challenges in terms of resource allocation and adaptation to new regulatory requirements could pose difficulties for retailers. Striking a balance between ensuring compliance and avoiding excessive burdens is crucial to fostering a regulatory environment that promotes operational resilience without unduly hampering the operational efficiency of the retailers.

Conclusions

Following the study findings and discussion, operational risk has a positive and significant effect on third-party payment processing among retailers in Nairobi County, Kenya. This study concludes that improvement in operational risk would have beneficial effects on third-party payment processing among retailers in Nairobi County, Kenya. The study finds that addressing stability of payment systems, internal control systems and errors to ensure the long-term third-party payment processing of these firms and maintain stakeholder trust.

Recommendations and Areas for Further Research

The study finds the relationship between operational risk and third-party payment processing among retailers in Nairobi County, Kenya to be significant. Therefore, there is a need for retailers to look at other operational risks such as service disruptions, outsourcing failures, and internal fraud, in addition to stability of systems, internal control systems and fraud. The study also suggests that an internal control system needs to be reviewed occasionally to ensure future operational risks and previously unsolved risks are minimized. The study also recommends the managers of the retailers in Nairobi County to invest in employee and management training as this

would facilitate their capacity to improve their internal controls, corporate governance and personal skills which may lead to a reduction in fraud cases and performance failures and this would ultimately increase their third-party payment processing.

The study was limited in scope to retailers in different sectors. Consequently, the study recommends an extension of the study to specific retailers, such as financial services only, manufacturing sector or agricultural sector to better understand the effect of risks and enhance validity. Moreover, this study used a questionnaire survey and the only data gathering method. Future research should consider applying mixed methods research where a questionnaire is complemented by other qualitative data gathering methods such as key informant interviews and focus group discussions. Such qualitative data gathering insights would provide more in-depth information and explanations regarding the effect of risks on third-party payment processing. The study makes an important contribution to understanding payment system adoption in emerging markets. The findings across all four risk categories are particularly noteworthy. The findings suggest that retailers may be viewing these risks as manageable challenges rather than barriers to adoption. This counterintuitive finding adds significant value to third-party payment processing literature. Future researchers can explore how emerging technologies such as artificial intelligence (AI) can be leveraged to mitigate risks in organizations.

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We the authors declare that each author contributed significantly to the conception, research, writing and preparation of the final work.

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Declaration of Competing Interests

The authors declare no conflict of interest.

Ethical Approval and Research License

Ethical approval for this study was obtained from United States International University-Africa Research Ethics Committee and NACOSTI (License No: NACOSTI/P/24/41411).

Licensing Statement

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