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Assessing the Impact of e-Levy on Perceived Value and Customer Satisfaction of Mobile Money Innovation in Ghana

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ABSTRACT

The study examines the effect of e-levy on the perceived value and customer satisfaction of mobile money innovation in Ghana. The study employed a quantitative approach using a sample of 500 mobile money users across the Greater Accra metropolis. The study utilized structural equation modeling (SEM) to conduct explorative factor analysis (EFA), confirmatory factor analysis (CFA) and hypotheses testing to generate the results of the study. The study found a significant positive relationship between perceived value and customer satisfaction. However, e-levy negatively moderates the relationship between perceived value and customer satisfaction. The study is the first of its kind to investigate the role of e-levy on user perceived value and customer satisfaction from a marketing perspective within a specific industry context. The study offers managers of mobile money service providers a helpful guidance for developing and implementing policies that increase customer satisfaction and business sustenance.

KEYWORDS

Mobile money; e-levy; perceived value; customer satisfaction

Introduction

The imposition of e-levy on digital transactions is fast becoming a common phenomenon among developing countries facing economic difficulties and seeking to augment their domestic revenue following the post Covid-19 global economic downturn (Kumalasari et al. 2022). Current research indicates that implementing electronic transaction taxes adversely affects user perceived value of digital financial services, implying a possible discontinuation of service usage as these additional fees tend to diminish customer value perceptions resulting in overall negative disposition toward the service (Ayo et al. 2016; Dzandu, Hanu, and Amegbe 2022; Pobee, Jibril, and Owusu-Oware 2023; Rahi, Abd Ghani, and Alnaser 2017).

Ghana's implementation of e-levy has witnessed some dramatic scenes in government policy implementation in recent history due to massive opposition that accompanied its introduction. Ghana made headlines in 2022 when it passed the e-levy act, which imposed a 1.5% tax on specific digital payments and was subsequently

reduced to 1%, subject to a minimum exemption of GHS100. In a study by Amoah et al. (2023) on user willingness to pay the tax, 46% of respondents indicated their unwillingness to pay (Amoah et al. 2023) which implies a possible massive cessation or reduction of mobile money usage due to e-levy. Interestingly, policymakers have touted e-levy as a progressive approach to expanding the tax net to increase tax revenue to salvage Ghana from its ailing economy following the ravages of the Covid-19 pandemic. They contend that it aligns with the changing socio-economic behaviors and consumption patterns (Koomson, Koomson, and Abdul-Mumuni 2023). Nevertheless, opponents argue that e-levy directly reduces the perceived value and cost-effectiveness of digital financial services, thus undermining efforts at financial inclusion for the unbanked population, as well government's own policy initiative of digitization. Furthermore, these levies negatively impact customer/user satisfaction and trust, thereby impeding fintech innovation aimed at promoting financial access and participation (Koomson, Koomson, and Abdul-Mumuni 2023).

The ongoing debate highlights important yet unresolved questions surrounding the imposition of e-levy in developing economies thus accentuating the need for further research to unravel new insights to help resolve the issue. According to Cabral and Marques (2023), the cardinal goal of innovation is to improve customer service. Other studies have equally reaffirmed the crucial importance of service innovation in enhancing customer satisfaction (Lemy, Goh, and Ferry 2019; Yeh, Chen, and Chen 2019).

This study has serious ramifications at both industry-specific level involving service providers as well as a possible indirect effect on financial inclusion and digitization. Countries like Kenya, Ghana, and Uganda have reported mobile money penetration rates of 87%, 82%, and 60% respectively as of 2021 (Montejo et al. 2022). Mobile money is considered a transformative fintech innovation in developing countries, as it overcomes historical barriers such as infrastructure limitations, lack of identification, and high costs that have prevented low-income individuals and households in rural areas from accessing formal financial services (Suri and Jack 2016). However, the introduction of e-levy poses a direct threat to its core value proposition of affordability and convenience typically associated with mobile money innovation. This negatively impacts the adoption and utilization of mobile money services and introduces uncertainties that might erode the potential gains of mobile money such as consumer trust and satisfaction (Rehman et al. 2022). Thus, the implementation of e-levy not only amplifies risks but also undermines financial inclusion in a counterproductive way.

Despite the ongoing debate surrounding the e-levy policy, there is limited empirical evidence available to evaluate its real-time impact on the marketing performance outcomes of mobile money service providers. A study conducted in Kenya by Bachas et al. (2022) found that the implementation of excise duty tax on mobile money transactions led to 11% decrease in demand among low-income users. This decrease in demand, which was observed among users who were already price-sensitive, incidentally hindered the achievement of financial inclusion goals. Our study provides a modest contribution to the

research conversation by focusing on the perceptual impact of mobile money users. Our main focus is in line with the evolving policy debates surrounding the development of digital taxation systems in developing countries. These systems aim to balance revenue objectives with the goal of promoting inclusive digitization as well as the possible negative spinoff on the service providers' business performance. As highlighted by Mhlanga and Mpofu (2023), digital tax policies in emerging markets face tradeoffs between generating revenue and creating an environment that supports connectivity, technological advancement, and inclusive participation. Hence, there is the need for cautious optimism, if any, in the implementation of new taxes on mobile money platforms and other digital services that play a crucial role in achieving socio-economic development goals.

There is no denying the fact that mobile money innovation has had a significant positive impact on the promotion of financial inclusion in the financial services landscape in Ghana. The principal advantages underpinning mobile money utilization derive from its immediacy and ubiquity (Zhou 2013). Its introduction has come forth as a significant landmark and has brought ease, convenience and access to monetary transmission and facilitated business transactions across all sectors of the economy (Dupas et al. 2018; Riley 2018). Its perceived value reached a crescendo during the covid-19 era and has since remained a dominant mainstay in the financial services ecosystem even in the post-covid era.

It is therefore essential to examine the repercussions of e-levy on mobile money user/customer perceived value and satisfaction in order to determine its implications at both industry and societal levels to inform policy decisions of the service providers. User perceptions regarding Ghana's e-levy policy remain largely unexplored, though initial evidence suggests adverse effects on mobile money utilization and financial inclusion (Amoah et al. 2023; Anyidoho et al. 2022). This underscores the urgent need for research to inform policy and practice. Incidentally, studies on the effects of e-levy and mobile money services, have tended to focus on the political and economic ramifications at the macro-economic level rather than a focus on customer-specific

requirements at the industry-level requiring strategic policy interventions from business perspective by the service providers which are at the core of a customer-centric marketing thinking (Asongu 2023). The closest study that investigated user perceptions of the tax in Ghana was on willingness to pay (Amoah et al. 2023). Consequently, very little is known about the impact of e-levy on customer perceived value and the resultant customer satisfaction. This study aims to bridge this gap by providing a nuanced understanding of the interplay between these factors within the context of Ghana's mobile money landscape while also providing empirical evidence to help settle the ongoing debate on digital services taxation since much of the debate lacks empirical substance.

The results of the study are intended to provide valuable insights for policy makers of mobile money service providers to shape their policy decisions to cope with the exigencies of the tax. The insights will also benefit telecommunication regulators and policy makers as they consider future calibrations of their policies. The rest of the paper is organized as follows: study context, literature review and hypotheses, methodology, results, discussion, theoretical implications, practical implications and implications for future studies.

Study context

One of the major developments in Ghana's telecommunications and financial services landscape is the introduction of mobile money innovation which has attracted the interest of scholars and practitioners across the globe (Mabkhot, Salleh, and Shaari 2016; Twum et al. 2022). However, a number of countries in the developing world, especially, in rural areas have limited access to formal financial institutions as a result of inadequate infrastructure and funds. About 2.2 billion people globally lack access to formal banking (Mpofu 2022). Interestingly, the advent of mobile money services is gradually becoming the means of saving and disbursement within the informal sector of the developing world and the unbanked especially in rural Ghana.

According to Yu and Ibtasam (2018), the rapid growth of mobile money service subscription and utilization in Ghana is said to have added to the growing infiltration and use of mobile phones.

Similarly, the drastic increase in the patronage of mobile money is attributable to contemporary advancements in information technology (Jakhiya, Mittal, and Purohit 2020). Since its inception in 2009, mobile money has witnessed a meteoric rise from a subscriber base of less than 5m in 2013 to 38.4m in 2020 (Bank of Ghana 2017). Technology has enabled service integration among commercial banks and telecommunication companies. Today, mobile money users are able to manage their banking services such as withdrawals, deposits and check balances through mobile money services on their mobile phones conveniently without physically going to the bank. In Ghana for instance, the rate of mobile money service transactions has over the years seen substantial growth. For example, between 2012 and 2016, the sector experienced a growth of 73.4% (Bank of Ghana 2017). A similar trend has been reported in other countries in the sub-region such as Uganda, Kenya, South Africa and Nigeria (Bank of Ghana 2017).

The emergence of electronic transactions and mobile money services has revolutionized payments and financial services, especially in developing countries (Donovan 2012). Mobile money services allow users to store, send, and receive money using their mobile phones without requiring a bank account. By facilitating financial inclusion, these services have significantly impacted economic development and consumer empowerment in an unprecedented way (Suri and Jack 2016). However, governments are grappling with issues like taxation of these digital financial transactions, especially in developing economies seeking to widen the tax net to increase revenue. For instance, Ghana introduced an electronic levy (e-levy) in 2022 that charges 1.5% on certain digital payments and transactions (Quartey and Nyarko 2022). This sparked intense debate regarding its potential impact on the successful mobile money ecosystem that has driven financial inclusion.

Literature review and hypotheses

Theoretical underpinning of the study

The research is grounded in the Customer Value Theory (Woodruff 1997), which emerges as a

potent theoretical framework, offering profound insights into the interplay between perceived value, customer satisfaction, as well as, the potential ramifications of the recently introduced e-Levy in Ghana. Propounded by Woodruff (1997), the Customer Value Theory posits that customers' perceptions of value are inextricably linked to their consumption experiences in terms of desired outcomes, purposes, or objectives. This framework posits that customers perceived value is a tradeoff between the benefits they receive and the sacrifices they incur in acquiring and utilizing a product (Woodruff 1997; Lam et al. 2004). Concurrently, the perceived sacrifices associated with mobile money services involve the tangible and intangible costs incurred by customers, including monetary expenditures, time investments, and cognitive efforts required to navigate and utilize these platforms (Woodruff 1997; Lam et al. 2004). The introduction of the e-Levy has the potential to disrupt this delicate balance between perceived benefits and sacrifices. If e-Levy is perceived as eroding the cost-effectiveness or convenience of mobile money services, it could diminish the perceived benefits, thereby negatively affecting the overall value proposition (Karunaratna and Kumara 2022). Further, if the implementation of the e-levy introduces additional complexities or cognitive burdens for customers, it could amplify the perceived sacrifices, potentially aggravating dissatisfaction and undermining the sustained adoption and usage of these innovative financial platforms (Thong et al. 2011). It is crucial to acknowledge that perceived value and customer satisfaction are mutually enhancing such that customers who perceive greater value from a product or service tend to experience higher levels of satisfaction (Lam et al. 2004; Ravald and Grönroos 1996). Conversely, if the perceived value diminishes, it could potentially erode customer satisfaction, thereby posing challenges to the continued growth and adoption of mobile money services in Ghana. By leveraging the Customer Value Theory as a guiding framework, researchers can gain invaluable insights into the intricate interplay between the e-Levy, perceived benefits, perceived sacrifices, perceived value, and customer satisfaction within the context of mobile money innovation in Ghana. This theoretical underpinning facilitates a nuanced

understanding of the factors influencing user perceptions and behaviors, ultimately informing strategies to optimize the value proposition and foster sustained customer engagement with mobile money innovation.

Perceived value

Perceived value is fast gaining credence as an important marketing construct in contemporary business management literature (Brimah et al. 2023; Hsiao 2022; Karjaluoto et al. 2019; Lin, Wang, and Huang 2020; Rahi, Abd Ghani, and Alnaser 2017; Ryu, Lee, and Gon Kim 2012). Previous studies have confirmed that the concept of perceived value provides a solid theoretical foundation for explaining consumer behavior in the context of e-services (Karjaluoto et al. 2019; Li and Mao 2015). Scholars have linked positive perceived value to customer satisfaction (Ghazali et al. 2019; Pan et al. 2021). Perceived value refers to the consumer's overall appraisal of the usefulness of a product or service based on their perceptions of what is received (benefits) and what is given up (costs) to acquire and use it (Zeithaml 1988). In the context of mobile money, perceived value encompasses dimensions like convenience, transaction safety, financial cost, functional value (meeting transaction needs), social value (enhancement of social self-concept) and emotional value (feelings associated with using the service) (Karjaluoto et al. 2019). Previous research has highlighted convenience, usefulness, compatibility, transaction safety and affordable pricing as key drivers that motivate online shopping behaviors (Ghazali et al. 2019). In the mobile money domain, perceived value encompasses dimensions such as convenience, transaction safety, financial cost, functional value, social value, and emotional value (Karjaluoto et al. 2019). Within mobile money contexts, perceived value encompasses dimensions such as convenience, transaction safety, and customer support (Alhallaq et al. 2019). In tandem with the Technology Acceptance Model (TAM) posits that an individual's inclination to embrace technology rests on two pillars: perceived ease of use and perceived usefulness (Davis et al. 1989) which are critical elements shaping value perceptions. These factors, interwoven, exert a profound influence on user

acceptance, attitude, and continuous utilization of technological services (Venkatesh and Davis 2000).

Customer satisfaction

Customer satisfaction represents a customer's evaluative judgment of consumer overall experience with an offering over time (Johnson, Anderson, and Fornell 1995). It encompasses both cognitive elements, such as performance assessments on salient attributes, and affective elements, including emotional reactions (Prastawa et al. 2019). In the realm of mobile payment systems, satisfaction is determined by dimensions such as convenience, compatibility, perceived risk, and system quality (Mouakket 2020). Customer satisfaction describes the degree to which the product or service meets or surpasses the customer's expectations (Oliver 2010). Key drivers of satisfaction with mobile money include factors related to system quality, information quality, service quality and perceived value (Alhallaq et al. 2019). The relationship between perceived value and customer satisfaction is explained through Expectancy Disconfirmation Theory (Oliver 1977), which posits that consumers determine satisfaction by comparing their pre-purchase expectations of performance with their subjective perception of the product or service's actual performance. When actual performance exceeds expectations (positive disconfirmation), satisfaction increases. The reverse effect occurs when expectations exceed performance (negative disconfirmation). Thus, Expectancy Disconfirmation Theory suggests that higher levels of perceived value lead to increased customer satisfaction. "Satisfaction helps customers to develop a positive attitude and a strong affinity to their service providers" (Anabila 2021, p.160). Scholars have linked positive perceived value to customer satisfaction (Ghazali et al. 2019; Pan et al. 2021). On the basis of the above literature, the following hypothesis has been drawn.

H1: Perceived value has a positive effect on customer satisfaction with mobile money services.

Moderation effect of e-levy

Electronic levy or e-levy refers to a tax imposed by governments on electronic financial transactions

and payments, especially mobile money transfers (Anam, 2019; Quartey and Nyarko 2022). For instance, Ghana introduced a 1.5% e-levy in 2022, raising concerns about its potential impact on financial inclusion efforts through mobile money (Quartey and Nyarko 2022). As an additional cost to users, e-levy may negatively moderate perceived value and satisfaction with mobile money if the tax burden is deemed high. While no specific study has examined the direct impact of e-levy, analogous research on service taxes and charges provides relevant insights. Baishya and Samalia (2020) conducted a comparative study showing that reducing taxes and fees positively influenced mobile wallet adoption intentions by enhancing perceived value around cost. Lin, Wang, and Huang (2020) found transaction charges to negatively moderate the impact of perceived usefulness and ease of use on usage intentions of mobile payment apps. Xu et al. (2015) established that transaction fees negatively moderate perceived value and satisfaction evaluations of payment system users across contexts. According to Katusiime (2021), a tax imposition on mobile money services has been observed to detrimentally influence the adoption and usage rates within Uganda's mobile money ecosystem. This tax was later reduced to 1% due to the massive opposite by the citizenry.

While no study has yet examined e-levy impact on consumer value perceptions and consumer satisfaction, analogous research on service taxes and charges provides relevant insights. Baishya and Samalia (2020) comparative study confirmed that reducing taxes and fees positively influenced mobile wallet adoption intentions by enhancing perceived value around cost. Lin, Wang, and Huang (2020) found transaction charges to negatively moderate the impact of perceived usefulness and perceived ease of use on usage intentions of mobile payment apps. Xu et al. (2015) established that transaction fees negatively moderate perceived value and satisfaction evaluations of payment system users across contexts. Collectively, these studies lend credence to the negative moderating effect of transaction taxes and charges like e-levy on perceived value-satisfaction linkages. The moderating effect of e-levies is explained through the Customer satisfaction theory (Woodruff 1997), which examines how characteristics of an economic exchange impact participation decisions and value creation.

By increasing the financial costs associated with digital transactions, e-levy tends to diminish the net value derived by users of mobile money services.

By incorporating these elements, the conceptual framework provides a comprehensive lens through which to analyze the intricate relationships between the E-Levy, perceived value, and customer satisfaction within the mobile money innovation landscape in Ghana. Consequently, e-levy is expected to attenuate the positive relationship between perceived value and customer satisfaction, hence, the following hypothesis has been proposed.

H2: E-levy negatively moderates the positive relationship between perceived value and customer satisfaction.

Conceptual framework

The conceptual framework for this research is illustrated in Figure 1. It depicts the interrelationships between the E-Levy, perceived value, and customer satisfaction within the context of mobile money innovation in Ghana.

The framework postulates that the e-Levy, as an external factor, may influence the perceived value of mobile money services, which involves dimensions such as perceived benefits, perceived sacrifices, and perceived quality (Zeithaml 1988). Additionally, the e-Levy may directly impact customer satisfaction with mobile money services. Perceived value, in turn, is hypothesized to mediate the relationship between the e-Levy and customer satisfaction, as customers' perceptions of the value derived from mobile money services are likely to shape their overall satisfaction levels.

Methodology

This study is a quantitative in nature, relying on primary data using a survey *via* a questionnaire. Convenience sampling, a non-probability sampling technique was employed in selecting a total of 500 respondents for the study. Hence, respondents were selected based purely on their availability and readiness to participate and not on any randomized (probabilistic) sampling approach. Data collection lasted nearly two months between 5th June, 2023 and 2th July 2023.

Completed questionnaires were coded and analyzed *via* Statistical Product and Services Solution (SPSS version 23). Items for perceived value were adapted from Rahi, Abd Ghani, and Alnaser (2017) and Hsiao (2022), items for customer satisfaction were adapted from Anabila (2021) while those of e-levy were gleaned from the general literature. To ensure validity and consistency, various tests including: “normality test, the Cronbach’s alpha test of reliability, Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett’s test of sphericity” were conducted. The study employed an exploratory factor analysis in deriving components under the research objectives considering that, the variables were measured using a scale. In developing the components, the study adopted the principal component analysis as the extraction method to generate factor scale measure or components for the variables in question. A correlation matrix was derived among the statements under each variable after which a principal component analysis was employed in gathering the component. Looking out for correlation among the statements is very relevant because it is desirable for the statements in scales to be moderately correlated before they can be suitable for

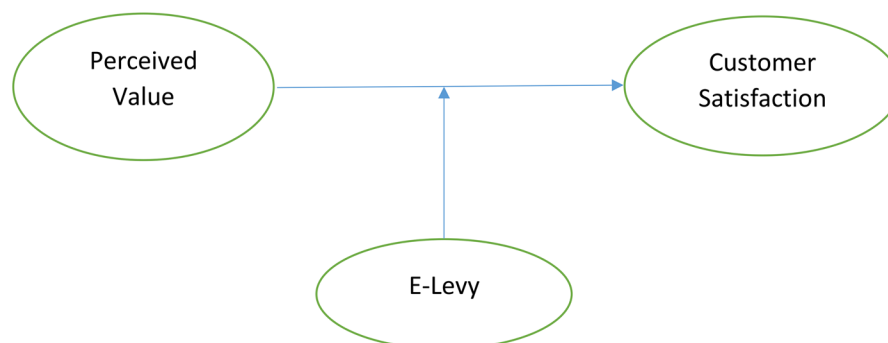


Figure 1. Conceptual model.

component generation as noted by Jaadi (2019). Hence, this was done for all the items under the factor scales that were measured and subsequently reinforced by the Cronbach's alpha test of reliability. The data analysis procedures employed in this study include confirmatory factor analysis and structural equation modeling using IBM AMOS version 23.0 (Byrne 2013) and Hayes Process Macro (Hayes 2017). SEM was also adopted to examine the relationship among the constructs that were extracted from the exploratory factor analyses.

Results

The background information solicited from the participants in the study includes telephone network, gender, age group, and education. The

majority of the respondents were MTN MoMo users (69%), followed by Vodafone (17%), and Airtel/Tigo (14%). 75% of respondents were below 40 years whereas the rest (25%) were 40 years and above. Majority (53%) of the respondents were female and the rest were males (47%). Majority of the respondents had Diplomas or lower (52%) whereas the rest had First Degrees or higher (48%).

Exploratory factor analysis

Exploratory factor analysis applied to all the questionnaire items produced three main factors including perceived value, customer satisfaction, and e-levy implementation. The three constructs had about 92% of the total variance explained. The KMO value was 0.892 thus indicating that the sample size used is very adequate for factor analysis. See Table 1 for details.

Table 1. Principal component analysis.

Item	Factors		
	1	2	3
CON2	0.811		
CON4	0.785		
CON1	0.775		
CON3	0.752		
PV2		0.825	
PV4		0.814	
PV3		0.783	
EL1			0.927
EL2			0.903
EL4			0.719
Eigenvalue	3.242	3.18	2.871
% of Variance	32.417	31.802	28.713
Cum. % of variance	32.417	64.218	92.931

KMO = 0.892; Barlett's Test Chi-square = 8929.58 df = 45, p=0.000; Total variance explained = 92%.

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Confirmatory factor analysis (CFA)

The three constructs were subjected to Amos version 28 for the purposes of confirmatory factor analysis (CFA) (Byrne 2013). Model fit indices, reliability analysis, convergent validity, and discriminant validity of the constructs are all included in the CFA methods (Hu and Bentler 1999). The measurement model had acceptable fit indexes ($\chi^2= 113.1$, $df = 32$, $\chi^2/df = 3.53$, CFI = 0.93, RMSEA = 0.076, TLI = 0.903) (Hu and Bentler 1999) as shown in Table 2.

Table 2. Details of items measurement, validity and reliability assessment results.

	Construct	loading	t
	Perceived Value ($\alpha=0.959$, CR = 0.962, AVE = 0.894)		
PV2	Using mobile money innovation increases my productivity.	0.98	Fixed
PV4	I find mobile money innovation to be useful for my financial needs	0.99	95.442
PV3	Using mobile money innovation provides me convenience and comfort	0.85	34.803
	Customer Satisfaction ($\alpha=0.978$, CR = 0.979, AVE = 0.922)		
CS1	I am happy with the quality of service I receive	0.87	Fixed
CS3	I enjoy the use of mobile money transfer services	0.98	37.271
CS2	Service vendors are professional in dealing with customers	1.00	39.392
CS4	I rate my satisfaction with mobile money service as excellent	0.99	38.758
	E-levy ($\alpha=0.928$, CR = 0.937, AVE = 0.833)		
EL1	The introduction of e-levy has affected my usage rate of mobile money	0.95	Fixed
EL2	e-levy has no influence on my mobile money usage pattern	0.95	41.436
EL4	Overall, I am pleased with mobile money services despite e-levy	0.83	28.868
	Model Fit info	Indeces	Recommended Value
	χ^2	113.1	-
	df	32	-
	χ^2/df	3.534	<5
	RMSEA	0.076	<0.08
	SRMR	0.09	<0.08
	CFI	0.931	>0.90
	TLI	0.903	>0.90

RMSEA=Root Mean Square Error of Approximation, SRMR=Standardized Root Mean Residual, CFI=Comparative Fit Index, AGFI=Adjusted Goodness-of-fit Index, TLI=Tucker-Lewis index.

Table 3. Convergent and discriminant validity.

Constructs	Convergent Validity					Fornell-Larcker			HTMT		
	α	CR	AVE	MSV	MaxR(H)	1	2	3	1	2	3
1. Perceived Value	0.959	0.962	0.894	0.805	0.990	0.945					
2. Customer Satisfaction	0.978	0.979	0.922	0.805	0.994	0.897***	0.960		0.879		
3. E-levy	0.928	0.937	0.833	0.389	0.954	0.613***	0.624***	0.913	0.657	0.683	

Square root of AVEs in diagonal-bold.

Reliability, convergent validity and discriminant validity

The Cronbach's test for reliability also measures the internal consistency or reliability of the scale and is expressed on a scale from 0 to 1 (Hajjar 2018). Here, a value above 0.7 is usually desirable according to Sharma and Lijuan (2014). Each of the main variables shows results for the exploratory factor analysis with the factor loadings, Kaiser-Meyer-Olkin Test of adequacy (KMO) and Bartlett's Test of Sphericity (BTS). The KMO test measures the suitability of the data for factor analysis (Shrestha 2021). Similar to the Cronbach alpha, KMO is measured on a scale that runs from 0 to 1, and authors like Amirrudin, Nasution, and Supahar (2020) argue that, a value below 0.6 is not reliable.

Table 3 lists the psychometric characteristics of the six constructs. Cronbach's alpha values for each of the three constructs were higher than 0.70, indicating good reliability (Nunnally 1978). Additionally, the model's convergent validity is sufficiently met by the three constructs, which all exhibited composite reliabilities above 0.70 and average variance extracted estimates (AVE) higher than 0.50. (Byrne 2013; Fornell and Larcker 1981). Discriminant validity tests were conducted using Fornell-Larcker criterion and HTMT (Henseler, Ringle, and Sarstedt 2015). The results also presented in Table 3 showed no discriminant validity problems (Figure 2).

Normality for the constructs (latent variables)

The normality tests were carried out for the three constructs of the study using skewness and kurtosis as shown in Table 4 (Blanca et al. 2013). All the constructs were normally distributed since the skewness was within -2 and 2 , and kurtosis between -7 and $+7$.

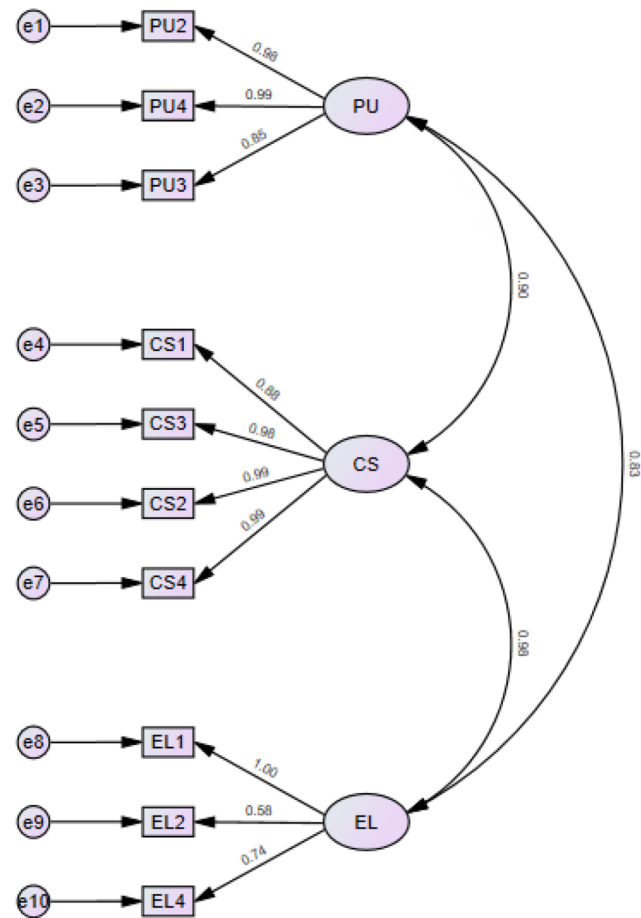


Figure 2. The CFA path diagram showing factor loadings and covariances.

Inter-construct correlations

The inter-construct correlation showed that all the variables had strong positive pairwise correlation coefficients as presented in Table 5 (Anderson and Gerbing 1988; Hair et al. 2016).

Hypotheses testing

The study's conceptual framework examines the effect of perceived value on customer satisfaction and e-levy moderating the relationship. The results using Hayes Process Macro Model 1 are presented in Table 6. There was a significant positive relationship between perceived value and customer

Table 4. Normality diagnostics.

Variables	Skewness		Kurtosis		Interpretation
	Statistic	Error	Statistic	Error	
1. Perceived Value	-2.151	0.109	5.588	0.22	Normal
2. Customer Satisfaction	-1.452	0.109	1.118	0.22	Normal
3. E-levy	0.615	0.109	-0.785	0.22	Normal

Table 5. Correlation matrix.

Constructs	1	2	3
1. Perceived Value	1.000		
2. Customer Satisfaction	0.878***	1.000	
3. E-levy	0.679***	0.706***	1.000

*** $p < 0.001$ (two-tail test).

satisfaction ($\beta = 0.18$, $t = 2.12$, $p < 0.05$). Therefore, hypothesis **H1** was supported. However, the results showed that e-levy negatively moderates the positive effect of perceived value on customer satisfaction, implying that e-levy reduces the positive effect of perceived value on customer satisfaction ($\beta = -0.54$, $t = -6.95$, $p < 0.001$). Therefore, hypothesis **H2** was also supported.

Discussion

The goal of this study was to establish the moderating effect of e-levy on perceived value and customer satisfaction of mobile money innovation in a developing country context. The results are intended to derive implications for policymakers of mobile money service providers seeking to mitigate the possible negative consequences of the e-levy on their consumer metrics and ultimately business performance. The study used SEM to determine the nature of underlying relationships in the proposed model. Specifically, it examines the relationships between perceived value and customer satisfaction, while also establishing the moderating effect of the e-levy on this baseline relationship. All the hypotheses were confirmed (H1-H3), thus lending credence to the basic assumptions underpinning the study. The positive association between perceived value and customer satisfaction (H1) underscores the crucial role of perceived value in enhancing customer satisfaction, while the negative moderation effect of the e-levy (H2) on perceived value and customer satisfaction portends a possible erosion of significant gains which could render the tax counter-productive to both the businesses providing the service and

society as a whole. This differential interplay between user approval of mobile money services and dissatisfaction with e-levies reveals key points of consideration for policy interventions. Managing this variation is critical to maintaining overall user satisfaction, reflecting the importance of user perceptions in influencing acceptance and satisfaction, as previous research has established (Brown and Venkatesh 2005; Ghazali et al. 2019; Pan et al. 2021).

The study has established that consumer perception of value is not constant but moderated by other exogenic factors operating at the same time such as an intervening tax leading to reduction of disposition toward the service and customer satisfaction within the relevant firm or industry. Simultaneously, it recognizes the nuanced impact of the e-levy, introducing an additional 'cost' that tempers the positive impact of perceived value, in harmony with earlier works (Oliver 1980). Aligned with Transaction Cost Theory, the study unveils a scenario where users, confronted with higher transaction costs, may opt for alternatives (such as cash transactions) to minimize cost, thereby reducing the potential gains, such as the profit on mobile money services as well its proximate negative effect on digitalization and financial inclusion. This delicate balance between costs and benefits, critical to shaping value perceptions, influences purchase decisions and end-user satisfaction.

Contribution to knowledge

This investigation makes several significant contributions to the existing body of knowledge. First, it provides empirical evidence on the impact of taxation policies, specifically the e-levy on the perceived value and customer satisfaction of mobile money services. This is a relatively unexplored area in the literature. Second, the research contributes to the broader discourse on financial inclusion and the role of innovative technologies in facilitating access to financial services. By

Table 6. Moderation test.

Hypothesis	path	β	SE	t value	p value	LLCI (2.5%)	ULCI (97.5%)	Hypothesis results
H1	PV \rightarrow CS	0.18	0.08	2.125	0.034*	0.014	0.347	Supported
H2	PV*EL \rightarrow CS	-0.542	0.070	-6.927	0.000***	-0.695	-0.388	Supported

Note: PV (Perceived Value); CS (Customer Satisfaction); EL (E-Levy).

*** $p < 0.001$.

* $p < 0.05$ (two-tail test).

examining the potential implications of the e-levy, the study sheds light on the delicate balance between promoting financial inclusion and implementing taxation measures, ultimately informing strategies to ensure sustainable and equitable access to mobile money services. Furthermore, the findings of this study will inform policymakers, regulators, and mobile money service providers, enabling them to make data-driven decisions regarding taxation policies, pricing strategies, and service enhancements to maintain the competitiveness and sustainability of mobile money innovations. While previous studies have explored the adoption and diffusion of mobile money services (Aker and Mbiti 2010; Mondego and Gide 2022; Phan et al. 2020), the impact of taxation policies on perceived value and customer satisfaction remains somewhat unexplored in the literature. This research aims to bridge this gap by providing a nuanced understanding of the interplay between these factors within the context of Ghana's mobile money ecosystem.

Managerial implications

For money transfer service providers, the findings advocate for a delicate equilibrium: enhancing perceived value to bolster customer satisfaction while navigating the potential effects of policy changes. The imposition of taxes, fees, or regulations, like the e-levy, increase costs for customers, potentially eroding the positive impact of perceived value on satisfaction. The study draws attention to the strategic imperative for service providers to possibly take a second look of their pricing policies to cushion their customers against the full brunt of the tax. This could be accomplished by reducing their commission on mobile money transmission service to reduce the overall monetary burden for consuming the service in order to maintain their customers. Such a compromise will not only inure to favorable business prospects but also enhance business sustainability

as a socially responsible business practice. This is an indication of some necessary policy re-engineering to cushion their customers against the undesirable consequences of the tax to forestall the reduction of customer satisfaction with its attendant negative impact on profit. Since perceived value and customer satisfaction represent proxies that could predict user behavioral intentions to continue to patronize the service or otherwise, policymakers are alerted to the inadvertent negative consequences that e-levy has on key business metrics which could affect the bottom-line. In markets where alternatives are limited, additional costs could dampen the allure of digital financial services. Early engagement with private sector stakeholders is recommended, fostering a collaborative approach to understanding the potential effects and devise mitigation strategies. The subtle interplay between perceived value and satisfaction revealed in this study highlights the symbiotic relationship between business and developmental goals. In the final analysis, government, with its policy of promoting the private sector as the engine of growth should consider scrapping the tax at best, or in the least, consider reducing it to barest minimum of say, 0.5% to mitigate the undesirable consequences of the tax. By adhering to this prescription, government can facilitate enterprise/business development for overall national growth, since the tax undermines business prospects.

Implications for future research

This research provides avenues for future research, which invite scholars to explore the impact of the e-levy based on customer demographics and income levels. Comparative analyses between providers and studies that track the pre-and-post e-levy perspective could provide more significant evidence of causality. The focus on customer satisfaction as the dependent variable provides avenues for exploring other outcomes like behavioral intentions,

advocacy, churn, and actual usage patterns. Beyond the confines of a single developing nation, similar studies across countries at varying developmental stages may offer some insights into how the policy impacts are conditioned by contextual factors. As a whole, this study acts as a catalyst, paving the way for future research that aims to harmonize commercial, developmental, and policy objectives in the dynamic landscape of digital payments, especially within the relevant context of the study.

Disclosure statement

No potential conflict of interest was reported by the authors.

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