The Influence of Trust and Risk in Behavioural Intention to Adopt Mobile Financial Services among the Poor

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Abstract: *Risk and trust are very critical in dealing with the poor. Avoiding as well as managing risk is a precondition for them to move out of poverty. This paper studies the relationship between trust and risk in mobile money technology adoption by the poor. Mobile money, sometimes called mobile financial services is one of the categories of Information Technologies that promises to substantially transform the lives of the poor through financial inclusion. The study used quantitative data from three mobile money services in Kenya, M-PESA, Airtel Money and Orange Money, to provide empirical evidence. Quantitative data was collected through a questionnaire using a five point likert scale from 283 respondents from seven poor divisions in Nairobi. We used Structural Equation Modelling (SEM) using AMOS 16 to validate the research model. SEM uses Confirmatory Factor Analysis (CFA) to align the tested measures to the specific constructs by measuring the extent to which each construct contributes to the overall model. CFA also tests the separation between constructs by evaluating the fit in the overall model. The study established that trust and risk were significant determinants of adoption of mobile money transfer in Kenya. It also established that risk moderates trust in mobile money adoption among this population. We recommend that mobile money providers invest in building trust among the users keeping in mind that demonstrating reduced risk will enhance the positive effect of trust on the intention to adopt mobile money. The paper makes a contribution to the understanding of factors to be studied particularly in the evaluation of e-commerce and e-business.*

Key Words: *Adoption, Behavioural Intention, Mobile Money, Poor.*

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1. Introduction

There has been incredible uptake of mobile money products in a number of developing countries since 2005. Mobile operators and financial institutions view the mobile phone as an additional channel if not a transformative one for financial services. Regardless of the advancements, there remain many technical and non-technical obstacles that must be addressed in order to enhance adoption. For example, insufficient security features or lack of Trust would lead to discomfort among the users of electronic systems.

Use of mobile phones to access financial services has been given many terminologies. Mobile Financial Services, Mobile Money, Mobile Transactions, Mobile Payments, Mobile Banking or E-wallets are some of the common terminologies, which are sometimes used interchangeably. For purposes of this paper we adopt mobile money, as used by the association of mobile operators using GSM technologies (GSMA).

The setting of this study was in Kenya, an economically developing country considered very successful in mobile money. Kenya has four mobile network operators (MNOs) all of which have launched mobile money products. Safaricom, the leading MNO, controlling a close to 70 percent market share of mobile phone subscribers operates M-Pesa ('M' for mobile and 'Pesa' for money); Airtel Kenya operates Airtel Money; Telkom Orange operates Orange Money while Yu Essair operates Yu Cash. All the mobile operators started off with domestic money transfer and have continued to add services like airtime purchase, bill payment, bank account link among others. As of June 2012, there were over 17 million mobile money subscribers. M-Pesa had a little over 14 million of them.

The World Bank estimated that 1.29 billion people lived in absolute poverty in 2008, below $1.25 a day, a figure that represents 22 percent of the developing world population [46]. This poor people are characterised by low literacy levels, limited economic opportunities, lack of assets, poor education and capabilities as well as disadvantages entrenched in social and political inequalities [19].

Some on the poor have been motivated by wanting to figure out how to make the poor save more and borrow less, as a way of helping them get out of poverty. Low income earners face a lot of challenges while trying to accumulate wealth [39]. There is substantial evidence that the poor want to save, but find it hard to. In his studies, Rutherford found that the poor lack appropriate instruments for managing their finances [5].

The poor are generally vulnerable to shocks and are thus sensitive about their financial resources. Access to formal financial services has remained very low in many developing countries. Risk and Trust are very critical in dealing with the poor. Avoiding as well as managing Risk is a precondition for them to move out of poverty [19].

We aim to demonstrate how critical Trust between the individual and mobile money provider is critical for adoption of such services. We also go a step further and empirically demonstrate the relationship between Trust and Risk in the context of mobile money adoption. Using M-PESA, Airtel Money and Orange Money as examples we focus on the institutional Trust between the consumer and the operators Safaricom, Airtel and Orange. We use quantitative data to provide empirical evidence that institutional Trust needs to be factored in when deploying and evaluating adoption of mobile money, particularly among the poor.

2. Review of Relevant Literature

2.1. Trust

A concept of Trust has been defined and studied in many disciplines: economics perspective [15], social science [37], technological [26, 10], human-computer interaction [34] or even managerial [5]. It is a complex, multi-dimensional, context-dependent construct [11], resulting to multiple definitions that are based on particular research contexts.

For purposes of this study and paper, we consider a definition that is relational, an argument developed by two researchers who investigated Trust in M-Pesa in Kenya [27]. Their argument emerged as a property of relations between two or more social actors who have expectations about each other's future behaviour. In their study, the researchers found that M-Pesa customers did not Trust the agents as much as they did the institution, in this case Safaricom. In addition, there was evidence that customers trusted the institutional leaders, a critical component for a mobile money user Trust of an institution providing the service.

Trust plays a critical role in social interactions where uncertainties and dependencies exist and tends to influence people's lives a great deal. Building Trust takes time and is a gradual process [42].

Using electronic means to transfer money has a characteristic of uncertainty and therefore requires an element of Trust. In 1996, Quelch and Klein indicated that Trust is a critical factor in order to motivate buying through the Internet and concluded that lack of Trust is a barrier to internet commerce [33]. According to Disabatino many Dot.com companies failed mainly because the sellers were unable to create a strong relationship of Trust with their customers [7]. A high level of Trust encourages customers to conduct online purchases, while lack of it prevents online shopping [17].

The providers as well as the technology for mobile money should be trusted by users to enhance adoption and uptake. Lack of consumer perceived Trust in such systems is one of the main barriers to mobile commerce transactions in a mobile environment [40]. Uncertainty about security raises concerns about the safety of money.

It can be concluded that establishing Trust is critical in enabling people, particularly the poor to adopt electronic transactions.

2.2. Risk

There have been attempts to define perceived Risk in the context of technology adoption, particularly for internet based transactions like e-commerce and e-banking. One definition is "the consumer's perceptions of the uncertainty and the possible undesirable consequences of buying a product or service" [24]. Another definition states that perceived Risk is a customer's subjective assessment of the consequence of making a purchasing mistake [28].

Just like Trust, research has shown that perceived Risk influences adoption of technology. One study suggests that perception of Risk may generate anxiety that influences the consumer decision-making process [44]. The desire to minimize Risk has been found to strongly determine behaviour by superseding the willingness to maximize utility [1]. Similarly, reducing uncertainty has been found to positively influence consumers' intention to adopt electronic transactional systems [6].

Risks are mitigated by enforcing security and controls. If users believe that there is substantial security in a system, their perceived Risk is reduced. Perception of Risk depends on an individual. It's a personal characteristic, influenced by many aspects.

2.3. Trust Relates to Risk

The concept of Trust is intimately linked to Risk and expectations. Trust is used as a substitute for Risk, but it also creates a Risk for the Truster [3].

Trust is essential in situations where Risk, uncertainty and interdependence exist and the online environment encapsulates these factors. Existing studies have produced mixed results on the role of perceived Risk in transacting online and Trust of the online service provider. One such study could not establish if Risk determines Trust, or is actually Trust or is an outcome of Trust [25].

In the context of information systems research and more particularly in e-commerce the two constructs, Trust and Risk, have been found to act independently on behaviour, or have a mediating relationship or have a moderating relationship [13].

Some studies have purely investigated Trust in general and its effect on behavioural intention [11, 41] while others have explored various dimensions of Trust and

their effect on behavioural intention [27]. Other studies have attempted to explore Risk as a determinant of Trust, and vice versa - a mediating effect [22, 20, 43, 32 and 30] while others have analysed both Trust and Risk as independent determinants of behavioural intention [21]. Yet another category of studies have purely investigated Risk as a determinant of intention to use technology [36] while others have attempted to investigate the moderating effect of Risk on Trust - and vice versa [14]. One particular study established that Trust and Risk can alternate in determining the intention to participate in an online transaction. In the study, the researchers established that for scenarios where Risk is low, Trust and not perceived Risk determines the intention and as the Risk increases, Trust takes a secondary role and the perceived Risk plays a greater role in determining intention [12].

It is therefore without a doubt that Trust and Risk are linked factors since actions cannot be taken with complete certainty [47]. Essentially, the higher the Trust one has in a partner, the less perceived Risk in dealing with that partner. The second type of Risk is associated with the nature of transaction (Büttner, et al., 2008) and has a different association with Trust. The more Risky a type of transaction is perceived to be, the more Trust is required in order to engage in an interaction with that partner [25].

From a practical point of view, it might seem obvious that increasing Trust and reducing Risk will result in increased adoption of a technology. One study shows that to increase Trust, there needs to be a reduction of the perceived Risk by customer [25], and that leads to a positive customer perception in acceptance of electronic banking. However the complexity of the relationship does not make it automatic, depending on the context and timing [13]. One study shows that perceived Risk tends to be the overriding factor at the initial stages of a relationship. But when the parties have multiple transactions over time and the relationship becomes a long-term one, Perceived Trust dominates in determining the intentions [10].

With this background, we were convinced that it is important to investigate the dynamics of these relationships in the context of poor mobile money users who have interacted with a specific product by a mobile operator. We desired to investigate which construct influences behavioural intention and which one moderates the relationship.

3. Methodology

3.1. Research Process

This paper was extracted from a larger study whose aim was to develop a model for mobile money adoption among the poor. The methodology had two phases of data collection. First, a qualitative exploratory data collection and literature review were done to establish the core constructs, variables and moderators and second, a quantitative data collection from sampled areas in the city of Nairobi in Kenya was done. One of the outputs of the qualitative study was the book "Money, Real Quick: Kenya's Disruptive Mobile Money Innovation" [31].

The Kenya National Bureau of Statistics (KNBS) classifies the population into 5 levels based on social and economic well being. Level 4 and 5 are considered as poor (KNBS, 2011).

The researchers identified 52 enumeration areas (EAs) which are considered poor from the eight administrative divisions in Nairobi. From this sampling frame, seven EAs were sampled. These areas were Huruma, Riruta Satelite, Kayole, Dandora Phase 2, High-ridge, Highrise and Outer Ring**.**

Structural Equation Modelling (SEM) which was used to guide the study requires at least 200 respondents to test a model. The researchers aimed at collecting data from 300 respondents, which would be at least 50% above the required number. From the responses collected, a total of 283 instruments were valid and were used for the analysis.

The demographic profile of the respondents is outlined in Table 1. Majority of the respondents were M-Pesa users (80%), there were a little respondents (53%) were between 18 and 30 years.

Table 1. Demographic Characteristics.

Variable		Frequency	%
Gender	Male	162	57
	Female	121	43
MM Service	MPESA	226	80
	AIRTEL	37	13
	ORANGE	20	7
Age	18 – 25	85	30
	26 – 30	65	23
	31 – 35	58	20
	36 – 40	26	9
	41 – 45	24	8
	46 – 50	9	3
	51 – 55	12	4
	Above 56	4	1

4. Research Model and Hypothesis for this paper

"Error! Not a valid bookmark self-reference" depicts the research model for this study.

The following are the hypothesis tested in this research paper.

- H1: Trust has a positive effect on the Behavioural intention.
- H2: Risk moderates Trust in mobile money adoption.
- H3: Risk has a positive effect on Behavioural intention toward.
- H4: Trust moderates Risk in mobile money adoption.

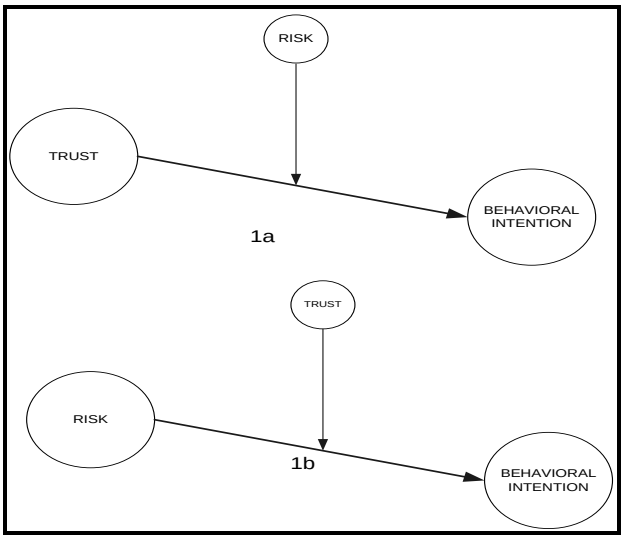

Figure 1. Modelling Trust and Risk.

4.1. Research Instrument Development

The study used questionnaire, a common tool used in Behavioural science research as the main research instrument. The construct used in the questionnaire were adapted from previous research and reflected the research model used in the study. A pre-test was conducted to validate the instrument, feedback obtained and changes made as deemed necessary. Table 2 shows the result of the validated questionnaire.

Cronbach's alpha is a measure of internal consistency/reliability showing how closely related a set of items are as a group. A reliability coefficient above 0.700 is considered a relatively high internal consistency or adequate convergence [16]. Three variables were used to obtain data about Trust and Risk while behavioural intention had two. It is recommended that corrected item-total correlations should range between .30 and .70 for a good scale [9]. Values above 0.7 indicate that the individual variables could be measuring the whole construct and there may be elements of redundancy.

The tests of reliability (Cronbach's alpha coefficient and the item correlations) confirmed that the instrument used for the final survey was reliable.

5. Analysis and Results

Structural Equation Modelling (SEM) using AMOS 16 was used to validate the research model. SEM uses Confirmatory Factor Analysis (CFA) to align the tested measures to the specific constructs by measuring the extent to which each construct contribute to the overall model. CFA also tests the separation between constructs by evaluating the fit in the overall model. These properties make SEM a powerful tool in testing structural models.

Table 2. Reliability analysis of the constructs.

Construct	Cronbach Alpha coefficient	Reliability Level	Variable	Inter-Item Correlation range for the three variables	Item-Total Correlation range for the three variables
PT	0.797	Acceptable	PT1	0.514-0.650	0.577-0.863
			PT2		
			PT3		
PR	0.732	Acceptable	PR1	0.398-0.622	0.455-0.617
			PR2		
			PR3		
BI	0.918	Excellent	BI1	0.848	0.848
			BI2		

PT = Perceived Trust
PR = Perceived Risk
BI = Behavioural Intention

5.1. Data Validity and Reliability

Validity analysis is used to determine how consistently the selected variables measure some construct. It's the goodness of the data that was collected. Convergent validity, (sometimes called correlational or criterion analysis) assesses the degree to which measure of the same construct are correlated. It indicates that items that are indicators of a specific construct should converge or share a high proportion of variance in common. Data has to be tested for validity before proceeding to test the model [16]. We tested for both convergent and discriminant validity (see Table 3 & Table 4).

Table 3. Data Convergent Reliability.

Indicator variable	Standardized loading	SMC Estimate	Significant?
PT1	0.82	0.6724	Yes
PT2	0.81	0.6561	Yes
PT3	0.86	0.7396	Yes
PR1	0.80	0.6400	Yes
PR2	0.87	0.7569	Yes
PR3	0.82	0.6724	Yes
BI1	0.95	0.9025	Yes
BI2	0.89	0.7921	Yes

Table 4. Comparing AVE and SIC.

Construct	AVE	SIC
PT	0.65	0.435, 0.300
PR	0.67	0.267, 0.316
BI	0.85	0.594, 0.634

Squared Multiple Correlations (SMC) for the observed variables is a good measure for construct validity [2]. SMC measures the correlation between a measurement/indicator variable and the construct it measures. To obtain the SMC for an observed variable, we used Analysis for Moment Structure (AMOS) which computes the indicator's standardised loading

needed to compute the SMC as the square of the indicator loading. A good SMC measure should be over 0.50 [18]. All the SMCs for the observed variables of the constructs were more than 0.50. Using the rule of thumb that standardized loadings estimates should be 0.5 or higher [29], we were convinced that convergent validity was met.

Discriminant validity measures the extent to which a construct is truly distinct from other constructs (i.e., unidimensional). This is a measure of how each of the constructs in the model is different. When the construct inter-correlation is greater than 0.80 or 0.90, it suggests that there is lack of discriminant validity [18]. If discriminant validity test fails, then it implies that some of the conclusions made later concerning the relationships between constructs could be incorrect. Strength of relationships could be overestimated or underestimated [8].

We compared the average variance extracted (AVE) for one of two constructs with the square of the correlation between the two constructs. The test was to establish if the squared correlation would be less than either of the construct's AVE's. This would mean that the latent variables have higher internal variance than the variance shared between them [16]. In other words, the latent construct should explain more of the variance in its item measures. The rule of thumb is that the constructs' AVE values should be greater than the corresponding squared inter-construct correlation estimates (SIC). The test for discriminant validity passed as per Table 4.

5.2. Structural Model and Hypothesis Testing

Model fit indices are used to tell the model overall fit characteristics. The common fit measures used to estimate a measurement model fit include, the normed chi-square, a ratio of chi-square to the degrees of freedom (X^2/df). A small chi-square value relative to its degree of freedom is indicative of good fit. Ratios in the order of 3 to 1 or less are considered good for fitness [22], the normed fit index (NFI) is a ratio of the difference in the chi-square value of the estimated model and a null model divided by the chi-square value for the null model. A value should be between 0 and 1. The closer it is to 1, the better the fit [45]. The comparative fit index (CFI) is an improved version of NFI. It is normed, to ensure values range between 0 and 1. A value above 0.90 is considered a good fit [22], the root mean square error of approximation (RMSEA) is a very commonly used means of measuring fitness. It factors in sample size and model complexity in its computation. A low value indicates better fit. A value of 0.05 or 0.08 has been considered a good cut-off. Recent research argues against this cutting off and instead proposes a confidence level be included for even lower RMSEA values. Therefore, values of 0.03 to 0.08 with a confidence of 95% are considered acceptable [38][4]. Table **5** and Table 6 shows the estimates for both the constructs. The fit indices indicate good fit hence no modification on the model was required.

Table 5. Fit Indices for Trust Impact on Behavioural Intention.

Fit Indices	Recommended Value	Measurement Model
$X^2/d.f.$	≤ 3.00	1.7648
NFI	≥0.90	0.9869
CFI	≥0.90	0.9942
RMSEA	≤0.06	0.0521

Table 6. Fit Indices for Risk Impact on Behavioural Intention.

Fit Indices	Recommended Value	Measurement Model
$X^2/d.f.$	≤ 3.00	1.5510
NFI	≥0.90	0.9853
CFI	≥0.90	0.9946
RMSEA	≤0.06	0.0442

AMOS generates multiple outputs for testing hypotheses on the research model, assessed the model fitness and investigated whether the relationships are consistent with theoretical expectations. For purposes of comparing the relative effect of Trust and Risk on BI, we display the standardized regression weights.

The relation between Trust and Behavioral Intention had three observable items on construct Trust and two items on construct Behavioral Intention. The regression weights on Trust variables are PT_1 = 0.66, PT_2 = 0.73 and PT_3 =0.61 which collectively accounted for 99% on Trust. The two items measuring Behavioral Intention had structural weights BI_1=.40 and BI_2=.66 which collectively accounted for 97% on this construct. The structural weight between Trust and Behavioral Intention is .83 (Figure 1).

Similarly, the relation between Risk and Behavioral Intention had three observable items on construct Trust with the following structural weights PR_1=.17, PR_2=.83 and PR_3=.76 and collectively accounted for 98% on Trust Construct. The two items measuring Behavioral Intention had structural weights BI_1=.54 and BI_2=.69 which collectively accounted for 86% on this construct. The structural weight between Trust and Behavioral Intention is .96 (Figure 2).

The regression weight of Risk to Behavioral intention is higher than the weight of Trust to BI.
The structural findings are in agreement with our hypothesis H1 and H3. Both Trust and Risk positively impacts mobile money adoption, however Risk has a higher influence on adoption of mobile money services than Trust.

5.3 Moderating Effect

The moderating effect of risk and trust was investigated through multi-group analysis and measurement invariance. Hierarchical clustering in SPSS was conducted to identify relatively homogeneous groups of cases for each of the moderators before proceeding to multi-group analysis. The SPSS cluster analysis revealed two groups on the risk variable divided into cluster groups of 46 and 237

while the Trust variable revealed two groups of 74 and 209.

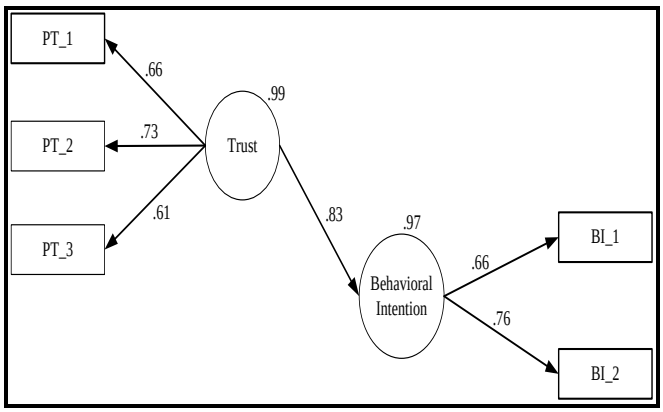

Figure2. Influence of Trust on Behavioural Intention.

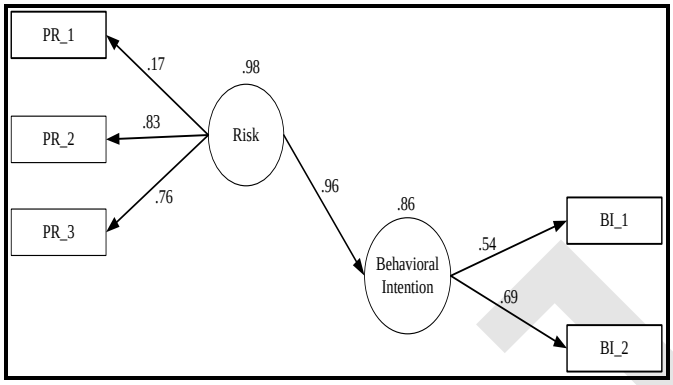

Figure 3. Influence of Risk on Behavioural Intention.

Multiple group covariance analysis using Structural Equation Modelling analysis was performed based on the cluster groups after obtaining satisfactory fit indices for each group. The estimates and the critical ratios output's significance is used to test if the moderator has an affect across the groups beings tested. If the ratios are insignificant, it is concluded the variable has moderating effect, however further analysis on other measurements such as structural weights and measurement weights need to be carried out.

The estimates and critical ratios output for the moderators are indicated in Table 7 and Table 8. The path estimate for the Risk moderator is insignificant for group 1 while for the Trust moderator the path is significant for all the cluster groups. The results indicate the Risk variable is operating differently across the two groups while the Trust moderator is invariant across the groups. We proceed with further structural weights measurement invariance analysis to ascertain whether these conclusions are true.

Table 7. Estimates and Critical ratios for Risk moderator.

Paths	Risk group 1		Risk group 2		Notes
	Estimate	C.R	Estimate	C.R	
Trust - BI	0.6087	0.2051 n/s	0.6877	9.5665***	Not significant for group 1

Table 8. Estimates and Critical ratios for Trust moderator.

Paths	Trust group 1		Risk group 2		Notes
	Estimate	C.R	Estimate	C.R	
Trust - BI	0.6333	4.5621***	0.8124	2.346***	Significant for both groups

*** p<.001

5.4 Trust Moderator

Table 9 indicates the structural analysis output for the Trust moderator. Using the p value, we test whether the structural weights between the two groups is equal. The results indicates the structural weights between the two Risk groups are invariant (equal) as indicated by the insignificant p value (>0.05). This indicates that the moderator is operating the same across the two groups. The change in CFI is analysed in order to support this conclusion.

The change in CFI is more than .01 in measurement weights while for the structural weights, the change is less than .01 (see Table 10), which is indicative of invariance as concluded earlier**.** Based on this analysis, we conclude that trust has no moderating effect.

Table 9. Structural Weights Model for Trust Moderator.

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho-1-2
Structural weights	1	-6.8684	1.0000	-.0183	-.0193	-.0275	-.0290

Table 10. AMOS output text. (Model fit): Baseline Compression – Trust moderator.

Model	**NFI Delta1**	**RFI rho1**	**IFI Delta2**	**TLI rho2**	**CFI**	**Change in CFI**
Unconstrained	.7896	.7896	.8341	.8341	.8341	
Measurement weights	.7896	.7896	.8341	.8341	.8341	0.0222
Structural weights	.8080	.8171	.8559	.8631	.8563	-0.0307
Structural intercepts	.7762	.7966	.8246	.8414	.8256	-0.2754
Structural means	.5128	.5764	.5463	.6088	.5502	-0.1167
Structural covariances	.3997	.4998	.4270	.5279	.4335	-0.4335
Saturated model	1.0000		1.000		1.000	
Independence model	.0000	.0000	.0000	.0000	.0000	

Table 11. Structural Weights Model for Risk Moderator.

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho-2
Structural weights	6	-2.4365	1.0000	-.0125	-.0133	-1213	-.1352

Table 12. AMOS output text. (Model fit): Baseline Compression – Risk moderator.

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI	Change in CFI
Unconstrained	5	-2.6209	1.0000	-.0135	-.0143	
Measurement weights	6	-2.4365	1.0000	-.0125	-.0133	0.0051
Structural weights	7	-1.5004	1.0000	-.0077	-.0082	0.6554
Structural intercepts	8	118.7807	.0000	.6106	.6472	1.1558
Structural means	9	330.8834	.0000	1.7011	1.8030	0.0054
Structural covariances	10	331.8669	.0000	1.7061	1.8084	0.1657
Saturated model	15	362.2892	.0000	1.8625	1.9741	
Independence model	5	-2.6209	1.0000	-.0135	-.0143	

5.5. Risk Moderator

The moderating effect of Risk is analysed in the same manner as the Trust moderator. The structural weights between the two cluster groups are invariant (equal) as indicated by the insignificant p value (>0.05) as shown in Table 11.

Further analysis on the change in CFI indicated the change is less than .01 in measurement weights while for the structural weights, the change is more than .01 (see Table 2) indicating variance. The Risk moderator is variant in the structural weights hence we conclude Risk has a moderating effect.

Based on this analysis, hypothesis H2 is supported and H4 rejected in this study. We conclude that Risk moderates Trust in mobile money adoption**.**

6. Conclusion

Since the introduction of mobile money by Safaricom in 2007, other telecom network providers have been subsequently introduced more innovative products but they have been poorly adopted. Beyond Kenya, many mobile money products have been launched but not much success has been reported. Though many studies have been done analysing the driving forces behind adoption, most of them have focused on the supplier side.

This study sought to model Trust and Risk in the adoption of mobile money transfers among the poor in Kenya. It aimed at investigating the relationship between Risk and Trust in adoption of mobile money.

Trust and Risk were found to be significant determinants of Behavioural Intention to use mobile money transfer in Kenya. The findings support the traditional view on the effect of Risk and Trust on usage of financial services. Furthermore, the need for consumers to have confidence in a mobile money service before adoption was significantly confirmed. It was also established that Risk moderates Trust in mobile money adoption among this population.

Mobile money providers have to invest in building Trust among the user keeping in mind that demonstrating reduced risk will enhance the positive effect of Trust on the intention to adopt mobile money.

References

[1] Bauer, H., Barnes, s., Reichardt, T. & Neumann, M., 2005. Driving Consumer Acceptance of Mobile Marketing: A Theoretical Framework and Empirical Study. *Journal of Electronic Commerce & Research,* 6(3).

[2] Bollen, K. A., 1989. *Structural Equation Modelling with latent variables.*

[3] Bouckaert, G. & Van de Walle, S., 2001. *Government Performance and Trust in Government. Paper for the Permanent Study Group of Productivity and Quality in the Public Sector*. s.l., EGPA Annual Conference, Vaasa, Finland, 5–8 September.

[4] Browne, M. W. & Cudeck, R., 1993. *Alternative ways of assessing model fit.*. Newbury Park: SAGE Publications.

[5] Cavoukian, A. & Hamilton, T., 2002. *The Privacy Payoff. HowSuccessful Business Build Consumer Trust.*:McGraw-HillRyerson Trade.

[6] Chen, H., 2008. *Individual Mobile Communications Services and Tariffs.* Daqing, Heilongjiang, China.

[7] Disabatino, J., 2000. U.S., Latin America Blending e-Commerce. *Computerworld*, Volume 29.

[8] Farrell, A. M., 2009. *Insufficient discriminant validity: A comment on Bove, Pervan, Beatty, and Shiu (2009).*

[9] Ferketich, S., 1991. *Focus on psychometrics: Aspects of item analysis.*. s.l.:Research in Nursing & Health, 14, 165–168..

[10] Fukuyama, F., 1995. *Trust: The Social Virtues and the Creation of Prosperity*. Harmondsworth: Penguin Books.

[11] Gefen, D., 2000. E-commerce: The role of familiarity and trust. *Omega: The international journal of management science*, 28(5), pp. 725-737.

[12] Gefen, D., 2002a. Customer loyalty in e-commerce.. *Journal of the Association of Information Systems,* Volume 3, pp. 27-52.

[13] Gefen, D., Rao, V. S. & Tractinsky, N., 2003. *The conceptualisation of trust, risk and their relationship in electronic commerce: The need for clarifications.* s.l., Proceedings of the Thirty-sixth Hawaii International Conference on System Sciences..

[14] Grazioli, S. & Wang, A., 2001. Looking without seeing: Understanding unsophisticated consumers' success and failure to detect internet deception. *ICIS.*

[15] Guerra, G. A., Zizzo, D. J., Dutton, W. H. & Peltu, M., 2003. *Economics of Trust in the Information Economy: Issues of Identity, Privacy and Security,* Oxford: Oxford Internet Institute. Technical report, Research Report No. 1.

[16] Hair, J., Black, W., Babin, B. & Anderson, R., 2010. *Multivariate Data Analysis.* Upper Saddle River, NJ: Prentice Hall.

[17] Hoffman, D. L., Novak, T. P. & Peralta, M. A., 1999. Building consumer trust online.. *Communications of the ACM,* Volume 4, pp. 80-85.

[18] Holmes-Smith, Cunningham, E. & Coote, L., 2006. *Structural Equation Modelling:From the fundamentals to advanced topics.* s.l.:School Research, Evaluation and Measurement Services, Education& Statistics Consultancy, Statsline..

[19] IFAD, 2011. *Rural Poverty report 2011.* [Online] Available at: www.ifad.org/rpr2011/report/e/overview.pdf [Accessed July 2012].

[20] Jarvenpaa, S. L., Knoll, K. & Leidner, D. E., 1998. Is Anybody Out There? Antecedents of Trust in Global Virtual Teams. *Journal of Management Information Sytems,* Vol. 14(4), pp. 29-64.

[21] Kim, K. & Prabhakar, B., 2000. Initial trust, perceived risk, and the adoption of internet banking. *Proceedings of ICIS.*

[22] Kline, R. B., 1998. *Principles and practices of structural equation modeling.* New York: Guilford.

[23] Lee, K. S., Seok, H. & Lee, S. Y., 2007. Factors Influencing the Adoption Behavior of Mobile Banking: A South Korean perspective.

[24] Littler, D. & Melanthiou, D., 2006. Consumer perceptions of risk and uncertainty and the implications for behavior towards innovative retail services: the case of internet banking. *Journal of Retailing and Consumer Services,* Volume 13, pp. 431-443.

[25] Mayer, R. C., Davis, J. H. & Schoorman, D. F., 1995. An integrative model of organizational trust. *The Academy of Management Review,* Volume 3, p. 709–734.

[26] Misztal, B. A., 1996. Trust in Modern Societies. *The Polity Press,* Volume Cambridge.

[27] Morawczynski, O. & Miscione, G., 2008. Exploring trust in mobile banking transactions: the case of M-Pesa in Kenya.

[28] Murphy, P. E. & Enis, B. M., 1986. Classifying Products Strategically. *Journal of Marketing,* 50(3).

[29] Nunnall, J. C., 1978. *Psychometric theory 2nd ed..* New York

[30] Olson, J. S. & Olson, G. M., 2000. i2i Trust in E-commerce. *Communications of the ACM,* 43(12), pp. 41-44.

[31] Omwansa, T. K. & Sullivan, P. N., 2012. *Money, Real Quick: The story of M-Pesa.* s.l.:Guardian.

[32] Pavlou, P. A., 2001. *Integrating trust in electronic commerce with the technology acceptance model: Model development and validation.* s.l., Proceedings of the Seventh Americas Conference on Information Systems.

[33] Quelch, J. A. & Klein, L. R., 1996. The Internet and international marketing. *Sloan Management Review,* pp. 60-75.

[34] Riegelsberger, J., Sasse, M. A. & McCarthy, J. D., 2005. The Mechanics of Trust: A Framework for Research and Design. *International Journal of Human-Computer Studies,* 62(3), pp. 381-422.

[35] Rutherford, S., 1999. *The Poor and Their Money. An essay about financial services for poor people.*

[36] Safeena, R., Date, H. & Kammani, A., 2010. Internet Banking Adoption in an Emerging Economy: Indian Consumer's Perspective.

[37] Salovey, P. & Rothman, A., 2003. Social Psychology of Health. *Psychology press.*

[38] Schumacker, R. E. & Lomax, R. G., 2004. *A Beginner's Guide to Structural Equation Modeling. 2nd ed.* Mahwah, NJ: Lawrence Erlbaum Associates, Inc..

[39] Sherraden, M. S., McBride, A. M. & Beverly, S. G., 2010. *Striving to Save.*

[40] Siau, K., Sheng, H. & Davis, S., 2004. A qualitative investigation on consumer trust in mobile commerce. *International Journal of Electronic Business,* 2(3), pp. 283-300.

[41] Son, J. Y., Narasimhan, S. & Riggins, F. J., 1999. Factors affecting the extent of electronic cooperation between firms: Economic and sociological perspectives. *ICIS.*

[42] Stamoulis, D., 2010. An approach and model for assessing the business value of e-banking distribution channels: evaluation as communication. *International Journal Of Information Manageme,* Volume 22, pp. 247-261.

[43] Sztompka, P., 1999. *Trust: A Sociological Theory.* Cambridge, U.K.: Cambridge University Press.

[44] Taylor, J. W., 1974. The Role of Risk in Consumer Behavior. *Journal of Marketing,* 38(2), pp. 54-60.

[45] Ullman, J. B., 2001. *Structural equation modeling. In B. G. Tabachnick & L. S. Fidell (2001). Using Multivariate Statistics (4th ed; pp 653- 771).*. Needham Heights, MA: Allyn & Bacon.

[46] WorldBank, 2012. *World Bank Sees Progress Against Extreme Poverty, But Flags Vulnerabilities: Press Release.* [Online] Available at: http://www.worldbank.org/en/news/2012/02/29/world-bank-sees-progress-against-extreme-poverty-but-flags-vulnerabilities [Accessed 10 August 2012].

[47] Yousafzai, S. Y., Pallister, J. G. & Foxall, G. R., 2003. A proposed model of e-trust for electronic banking.. *Technovation,* 23(11), pp. 847-860.

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