

# Effects of Financial Innovations on Profitability for Deposit Taking Microfinancing Institutions in Kenya

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**Abstract:** Recent studies have documented that innovations improve profitability of firms. This article documents that deposit taking micro financial institutions that have adopted financial innovations have increased their profitability. The study covered five years between 2009-2013. Both primary and secondary data were used in the study. Primary data was obtained through administration of drop and pick questionnaires to selected employees of the institutions. Secondary data was obtained from financial statements and management reports of these deposit taking microfinance institutions.

Data was analyzed using descriptive statistics, return on asset and multi-liner regression model to determine the effect of each financial innovation applied on profitability on the micro-financial institution. The results showed that most deposit taking microfinance institutions adopted these financial innovations in their current operations. There was strong positive relationship between individual innovations and profitability. In line with profitability ROA also showed improvement each year after the adoption of these financial innovations.

**Key words:** financial innovations; profitability; deposit taking micro financing institution

**JEL codes:** D

## 1. Introduction

The significance of financial innovation is widely recognized by many leading scholars, including Miller (1986) and Merton (1992) who both have highlighted the importance of new products and services in the financial arena. Frame and White (2004) extended financial innovation to include financial product, service, organizational form, new processes for a more developed and complete financial markets. Such innovation reduces costs, risks, or provides an improved service that meets particular needs of financial system participants.

The Kenyan financial sector has embraced a lot of reforms in the financial system. Irechukwu (2000) lists some financial services that have been revolutionized through the use of Information and Communication Technology (ICT) as including; account opening, customer account mandate, transaction processing and recording. ICT has provided self-service facilities (automated customer service machines) from where prospective customers can complete their account opening documents direct online. It assists customers to validate their account numbers and receive instruction on when and how to receive their cheque books, credit and debit cards. ICT products in use in the banking industry include: Automated Teller Machine (ATM), Smart Cards, Telephone Banking, Electronic

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Funds Transfer (EFT), Electronic Data Interchange (EDI), Electronic Home and Office Banking (EHOB).

Deposit-Taking microfinance institutions in Kenya have adopted these new financial innovations. These include Mobile banking, online banking, Real Time Gross Settlement (RTGS), ATM withdrawals and deposits among many others. All these financial innovations contribute heavily in building customer base as well as capital base. Noyer (2007) posit that despite a growing literature developed on financial innovation; most studies so far undertaken are mainly innovations of securities on financial markets and commercial banks. Thus, no serious study has been done to show whether the innovations adopted especially by microfinance institutions would enhance profitability especially on deposit taking microfinance institutions. Motivated by this gap in literature, this article links financial innovation and profitability of Deposit-Taking Microfinance Institutions in Kenya. In doing so addresses the following five questions: 1) How widely do these micro financing institutions apply mobile banking? 2) Have these micro financing institution adopted the use of online banking? 3) Do these institutions apply Real Time Gross settlement and is this technology beneficial to the institution? 4) Have these institutions adopted ATM service s? 5) What is the effect of these applications on their profitability?

We find that many of the nine micro-financial institution that adopted financial innovations improved their profitability. In consistent with improved profitability the return on assets also shows that as a result of adoption of financial innovation there is constant improvement of this ratio as the period passes.

The objective of this paper is to analyze empirically whether deposit taking microfinance institutions which have adopted new innovations have improved their profitability. The rest of this paper is organized as follows. Section 2 reviews the literature. Section 3 presents the models for testing whether financial innovation has any effects on profitability. Section 4 reports the results of the tests. Section 5 gives implication of the research and the conclusions drawn.

## **2. Literature Review**

The rapid rate of innovation in the financial sector as well as the rising importance of the sector in modern economics has generated a research interest in financial innovation and its impact on financial performance of commercial banks. Indeed a broad descriptive literature that discusses recent financial innovations and that advances various hypotheses about them has arisen (Noyer, 2007). Furst et al. (2000b) using logit model based their study on internet banking in the 3rd quarter of 1999 to find out the characteristics of banks that offer internet banking. They concluded that the adoption of internet banking was dictated by urban area locations, affiliation to a holding company, higher fixed expenses and higher non interest income. The result of the study was that for the banks which offered internet banking, a great number of their service offerings were positively correlated to the size of the bank and the length of period of offering internet banking related services. Sullivan (2000) compared banks in the 10th Federal Reserve district (that is banks in Colorado, Kansas, Missouri, Nebraska, New Mexico, Oklahoma, and Wyoming) that used Internet web-sites for transactional services to banks that did not offer the service in the first quarter of 2000. The study established that internet based transactional services were larger in areas with educated populace. A higher proportion of the population being in the age brackets 18-64. The banks that were offering transactional Internet web-sites also had higher non interest income and non interest expenses. Dos Santos and Peffers (1995) examined the introduction of ATMs (Automatic Teller Machines) by American banks. They demonstrated that the competitive advantage and increased financial performance was associated

with the banks that initially adopted the technology. Some research studies have been conducted on financial innovations in Kenya; Kamotho (2009) studied mobile phone banking usage experiences in Kenya and observed that competition triggers creativity and innovation. Continuous innovation not only yields new products but rather promotes efficiency in the performance of activities hence lowering the transaction costs. This finding confirms the study done by Tufano (1989). Most of the existing empirical works have focused on the same handful of financial innovations (Tidd & Hull, 2003). Noyer (2007) states that despite a growing literature developed on financial innovation; these are mainly innovations of securities on financial markets. Thus there is need to extend the study to assess if the use of these innovations are beneficial to smaller financial institutions.

### 3. Models and Data Used

Both primary and secondary data were used in the study. Primary data was obtained through administration of questionnaires to the selected top management employees of the 9 microfinance institutions. Secondary data was obtained from financial statements of these institutions filed at The Central Bank of Kenya. The following models were used in the study: Descriptive statistics; mean and standard deviation are applied in assessing the applications of the financial innovations by these micro financial institutions. The return on asset based on operating income before depreciation, amortization and taxes plus interest income (OIBD)/assets. The assets and operating profits were measured in terms of Kenya shilling of 2013 purchasing power. The multi-linear regression model  $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$ , was applied to assess the effects of these financial innovations on profitability on the micro-financial institutions.

### 4. Results of the Study

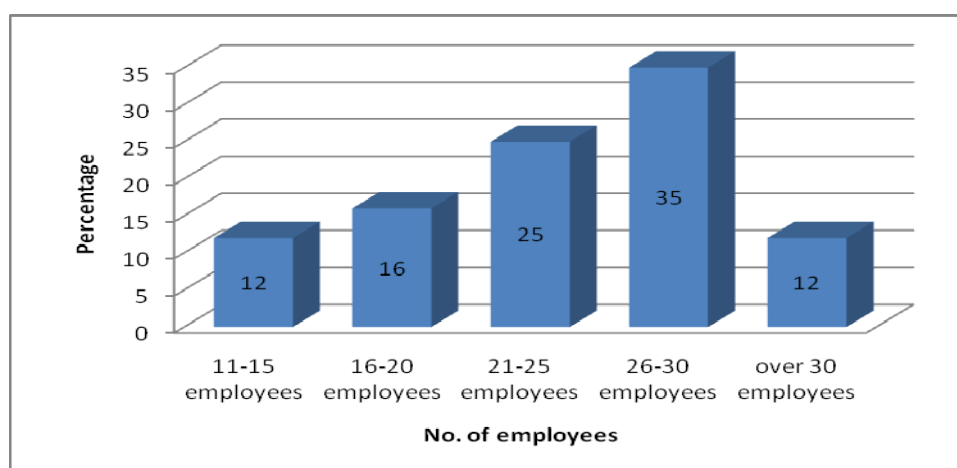
#### 4.1 Length of Operation and Work Force

The Table 1 shows the number of firms that were picked for study and how long they had been operational during the time of study.

**Table 1 Studied Firms**

Firms	Period of operation	Percentage
4	6-10 years	45%
3	2-5years	33%
2	Under 2 years	22%
<b>9</b>		<b>100%</b>

The Figure 1 shows that 35% of the firms had 26-30 employees, 25% of the firms had 21-25 employees, and 16% had 16-20 employees while 12% had 11-15 employees and over 30 employees.



**Figure 1** Number of Employees in the Microfinance Sector

#### 4.2 Usage of Mobile Banking Applications

The results show 75% of the microfinance firms use mobile applications such as m-pesa in their service provision only 25% did not have mobile applications.

**Table 2** Effect of Mobile Banking on Profitability

Statement	N	Mean	Standard deviation
M-banking help MFIs reach new customer segments	9	4.4029	0.6653
M-banking reduce costs for MFIs and for customers	9	4.3658	0.8688
M-banking help MFIs serve existing customers better	9	4.0517	0.7541
If MFIs share the costs associated with m-banking, it will be much more affordable on a per institution basis.	9	4.2154	0.6857
MFIs can act as agents on behalf of m-banking service. This can help both the MFI and its customers to become familiar with the system and bring in additional revenue.	9	4.1357	0.6648
M-banking can reduce operational costs for MFIs and that these costs can be passed on to customers in the form of lower interest rates.	9	4.1234	0.9876

Results show that the respondents agreed on the factors indicated above.

#### 4.3 Usage of Online Banking

The respondents were asked to indicate whether their organization provided internet online banking to its clients this gave the results below.

55% of the microfinance firms provided online applications services while 45% did not have online applications.

**Table 3** Effect of Online Banking on Profitability

Statement	N	Mean	Standard deviation
MFIs that provide extensive online banking services tend to perform better than those who lag behind.	9	4.1544	0.7548
Online banking helps MFIs improve their earnings ability as measured by return on equity and improve asset quality.	9	4.2651	0.3271
There exist a positive relationship between online banking and bank performance since online banking has brought services closer to bank customer's hence improving performance.	9	4.3257	0.4567
Online banking has increased the profitability of banks	9	4.4779	0.8655
Online banking has enabled banks meet their costs and earn profits even in the short span of time.	9	4.3265	0.9876

The results in the Table 3 shows that the application of on line banking in each area had increased profitability.

#### 4.4 RTG Usage

The study revealed that 60% of the organisations were using RTGs while 40% of the organisations did not have RTGS applications.

**Table 4 Effect of Real time Gross Settlements (RTGS) on Profitability**

Statement	N	Mean	Standard deviation
RTGS present more benefits in funds transfers and payments	9	4.6524	0.8651
RTGS significantly reduce risks inherent in the Automated Clearing House (ACH) payment system.	9	4.5625	0.3265
RTGS throughput is a significant predictor of financial performance of MFIs.	9	2.3741	0.5554
With RTGS acting as substitute payment and transfer system options, it would be expected to increase profits	9	4.3873	0.4124
An increase in the turnover of RTGS annually would result into a decline in the annual turnover recorded by the automated clearing house.	9	4.3651	0.8647

The results show that the respondents strongly agreed that RTGS present more benefits in funds transfers and payments  $m = 4.6524$  and RTGS significantly reduce risks inherent in the Automated Clearing House (ACH) payment system  $m = 4.5625$ . The respondents agreed that With RTGS acting as substitute payment and transfer system options, it would be expected to increase profits  $m = 4.3873$  and An increase in the turnover of RTGS annually would result into a decline in the annual turnover recorded by the automated clearinghouse  $m = 4.3651$ .

#### 4.5 ATM Service Usage

The respondents were asked to indicate whether their institution provide ATM services. The results show that majority of the microfinance firms (60%) did offer ATM service provision while 40% did not offer ATM services.

**Table 5 Effect of Automated Teller Machine (ATM) on Profitability**

Statement	N	Mean	Standard deviation
Financial institutions charge fees to use their ATM, making the transactions very profitable for the host banks.	9	4.6233	0.8101
The use of ATM has cut service staff in traditional banks, impacting employment in the industry.	9	4.5215	0.3261
The ATM initiative has a positive effect on profitability and efficiency.	9	4.4572	0.9517
ATM have eliminated the need to enter a bank for basic transactions and allow access to accounts on machines located at strategic places and this increases more transactions.	9	4.7658	0.5628
MFIs that provide ATMs services tend to perform better than those who lag behind.	9	4.0325	0.9654

Results show that most respondents strongly agreed that ATM have eliminated the need to enter a bank for basic transactions and allow access to accounts on machines located at strategic places and this increases more transactions  $m = 4.7658$  Financial institutions charge fees to use their ATM, making the transactions very profitable for the host banks  $m = 4.6233$  and the use of ATM has cut service staff in traditional banks, impacting employment in the industry. The respondents agreed that the ATM initiative has a positive effect on profitability and efficiency  $m = 4.4572$  and MFIs that provide ATMs services tend to perform better than those who lag behind  $m = 4.0325$ .

#### 4.6 Distribution Statistics

From the Table 6, it is seen that some MFIs have very low and or negative ROA for the last five years,

however, there are those which have consistent positive ROAs. Notably, for most MFIs, there is progressive improvement on ROA as observed from 2009 to 2013. Although only 33% of MFIs have positive ROA while all the others have negative ROA this situation may be attributed to other factors other than financial innovations.

**Table 6 Distribution Statistics**

Return on Assets (ROA)					
Microfinance	2009	2010	2011	2012	2013
Faulu Kenya DTM Limited	-0.1	-0.3	0.2	0.52	0.7
Kenya Women Finance Trust DTM Limited	4.3	1.6	1.5	0.93	0.94
SMEP Deposit Taking Microfinance Limited	5	0.3	0.9	2.24	0.69
Remu DTM Limited			-11.6	-8.6	-6.3
Rafiki Deposit Taking Microfinance			-3.5	-2.4	-0.35%
UWEZO Deposit Taking Microfinance Limited			-13.6	-12.3	-11.3
Century Deposit Taking Microfinance Limited				-1.4	0.2
SUMAC DTM Limited	2.60	3.30	5.30	6.00	8.30
U&I Deposit Taking Microfinance Limited				0.2	0.35

#### 4.7 Relationship between Financial Innovations and Profitability of DTMFI

The study sought to test the effect of financial innovation on profitability of Deposit-Taking Microfinance Institutions in Kenya. This was done through Correlation and regression analysis. A Pearson correlation was run to establish how the variables were related to each other.

The Table 7 shows the correlation results of the study on the variables. According to the correlation, the range of the output is between -1 to 1. A positive value indicates that the variables are positively related while a negative value indicates that the variables are negatively related.

**Table 7 Relationship between Financial Innovations and Profitability**

	Profitability	online banking	mobile banking	RTGS	ATM services
Profitability	1	0.446	0.06	0.236	0.282
Online banking	0.446	1	0.32	0.096	0.03
Mobile banking	0.06	0.3	1	0.491	0.242
RTGS	0.236	0.096	0.491	1	0.682
ATM services	0.282	0.03	0.242	0.682	1

From the findings shown online banking and DTMFI profitability are positively related (0.446), RTGS is positively related with the DTMFI profitability (0.236) and Mobile banking (0.060). ATM services were positively related with DTMFI profitability (0.282). The use of online banking by the DTMFI was positively related with mobile banking (0.320), RTGS (0.096) and ATM services (0.030). The use of Mobile banking was positively related with RTGS (0.491) and ATM services (0.242). Lastly the adoption of ATM services had a positive relation with RTGS (0.682). This indicates any of the financial innovation had a positive correlation with the profitability of DTMFIs and the financial innovations had positive correlations among themselves. This indicates that DTMFIs increased the use of the innovations simultaneously.

#### 4.8 Regression Analysis

To study the effect of financial innovation on profitability of Deposit-Taking Microfinance Institutions in Kenya, the study run a linear multiple regression test to establish the effects of each of the innovations. The

findings are discussed in the following sections.

The findings shown in Table 8 indicate the extent of variations on the profits which are explained by the independent variables. The R square value is 0.618. This means that the independent variables explain 61.8% of the variations in profits. The rest 38.2% are explained by other factors.

**Table 8 Model Summary**

R	R Square	Adjusted R Square	Std. Error of the Estimate
.786a	.618	.480	.42097

The results in Table 9 show that the independent variables are statistically significant in predicting the profits or affecting the profits of the DTMFI. The study established a significant value of  $p = 0.022$  showing a statistical significance relationship.

**Table 9 ANOVA**

	Sum of Squares	df	Mean Square	F	Sig..
Regression	3.160	4	.790	4.458	.022
Residual	1.949	11	.177		
Total	5.109	15			

Predictors: (Constant) online banking, mobile banking, RTGS and ATM services

The findings in Table 10 show the coefficients of the regression were all significant in predicting the profits of the DTMFI since all the  $p$  values were less than 0.05. The resulting regression equation was:

$$Y = 5.485 + 0.630\beta_1 + 0.771\beta_2 + 0.656\beta_3 + 0.175\beta_4$$

The findings indicate that when all the factors are held constant the profits will be constant at 5.485. When all the factors are held constant one unit use of Online banking increases the profits by 0.630 units. When all the factors are held constant a unit increase in the use of mobile banking increases the profits by 0.771 units. Similarly, a unit increase in the use of RTGS holding other factors constant increases the profits by 0.656 units. The use of ATM services holding the rest factors constant increases the profits by 0.175 units. This shows that the use of financial innovations have had a great impact on the profitability of DTMFI.

**Table 10 Regression Coefficients**

	Unstandardized coefficients	Std. Error	Standardized coefficients	T	Sig.
	B		Beta		
(Constant)	5.485				
Online banking	.630	.127	.098	.498	.029
Mobile banking	.770	.237	.094	.326	.041
RTGS	.656	.191	.781	3.437	.006
ATM services	.175	.095	.475	1.845	.047

## 5. Summary and Conclusion

Study results indicated that the independent variables (mobile banking, online banking, RTGS and ATM services) explain and can predict profitability of DTMFIs. The profitability of these firms has improved following the use of these financial innovations.

### 5.1 Area of Further Study

Further study should be extended in this area with aim of targeting large financial institutions listed in the stock markets especially in Nairobi Securities Exchange with the view of how investigating how financial innovations may influence stock prices.

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