





EFFECT OF MOBILE BANKING ON THE BANKING BEHAVIOUR OF INFORMAL SECTOR WORKERS IN ACCRA, GHANA



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ABSTRACT

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Improving financial inclusion of informal sector workers is a major concern for economic development. The emergence of mobile banking and its increasing acceptability and use do present an opportunity to improve banking behaviour among informal sector workers. This study estimates the effect of mobile banking service on the banking behaviour of informal sector workers in Accra, Ghana. A probit regression model was fitted to a survey data of 296 respondents. The result indicates that although the introduction of mobile banking service has a positive effect on mobile banking, less than half of the respondents have changed their banking behaviour as a result of the introduction of mobile banking service. The respondents also perceived that the introduction of mobile money service has not led to a significant change in ineffective saving methods. Other factors that significantly influenced the banking behaviour were sex, age and income of the respondents. It is concluded therefore that, mobile banking service can improve financial inclusion among informal sector workers. However, an effective remedy should be established to address the emerging risks associated with the use of mobile banking service and to improve its security features.

Contribution/ Originality: This study contributes to existing literature by providing a quantitative estimation of the role of mobile banking in influencing banking behaviour among informal sector workers in Ghana.

1. INTRODUCTION

The understanding of the nexus between economic growth or economic development and a sound financial management system, has been established for decades now. This is not only limited to the developed economies but also to the developing countries like Ghana. However, there are a wide range of persons that are excluded from financial services due to unfavorable regulations and types of service. Financial inclusion has become a major consideration as the international community adopts the Sustainable Development Goals (SDGs). As defined by Kim (2016) financial inclusion as a situation where all working age persons have access to credit, savings, payments, and insurance from formal financial service providers. This means that financial exclusion arises when some persons do not have access to formal financial services.

Financial inclusion is important for sustaining development and economic growth (Osikena & Uğur, 2016). According to Kim (2016) the objective of ensuring a financially inclusive society is to ensure that financial services

are extended to areas regarded as unbanked in order to improve their standards of living, propel economic growth and development. Thereby, an improvement in inequality gap within a growing economy. For instance, [Fowowe \(2017\)](#) estimated that African firms that are not credit constraints experiences a faster growth than those with credit constraint. These make financing-gap a major challenge and concern to the development of the continent. [Ackah and Asiamah \(2014\)](#) explained that there is substantial evidence of the effect of financial services including savings in improving the status of the poor. Although the informal sector workers form the chunk of the working population, they are often discriminated against in formal financial institutions. Improving financial inclusion requires that financial services are delivered to customers at effective cost, convenient and sustainably ([Kim, 2016](#)). [Ackah and Asiamah \(2014\)](#) noted that despite Ghana's high number of banks, access to credit and its associated high cost have a downplaying effect on small scale enterprises in the country. Unfortunately, there is the lack of comprehensive measure of the level of financial inclusion in economies to allow for effective monitoring of policy initiatives. From [Bank of Ghana \(2017\)](#) there are an array of financial payment systems in Ghana. These include Real Time Gross Settlement (RTGS), Cheque Codeline Clearing (CCC), Ghana Automated Clearing House (GACH), E-zwich and Mobile Money. However, mobile money has gained increasing usage among informal workers over the years compared with other payment methods.

Mobile money is the provision of financial services via the mobile phone ([GSMA, 2010](#)). It is an electronic cash that is supported by an equivalent amount of the physical currency issued by the Bank of Ghana but stored in the mobile phone using the Subscriber Identification Module (SIM) as the identity of the account (Bank of Ghana, 2017). There are three main services provided under mobile money, and these are mobile banking, mobile transfers and mobile payments ([IOM & ACP, 2014](#)). Financial institutions are inspired to introduce mobile money services because the vulnerable and poor groups in the society are unable to access financial services provided through the traditional banking system ([Harelimana, 2017](#)). [Ouma, Odongo, and Were \(2017\)](#) and [Harelimana \(2017\)](#) explained that the introduction of mobile money have led to the integration of the unbanked population into the conventional financial system. Similarly, the empirical work of [Ouma et al. \(2017\)](#) showed that there is an increasing habit of not only savings decision but also, the amount of savings. On his part, [Harelimana \(2017\)](#) indicated that, the use of mobile money services is convenient and cost effective to the customers. [Asongu \(2015\)](#) explained that mobile money penetration is a pro-poor service since it leads to a reduction in income inequality. Customers that are far from traditional banking areas can now engage in mobile banking, transfer or receive money via the mobile money platform. The stress of going to the banking hall and queue for several hours is minimized and this has also placed much relief to both customers and staffs of formal banks. The implication is that the mobile money value chain has a relief to the financial sector players.

Research into mobile banking has become an emerging case for researchers. [Thulani, Chitakunye, and Chummun \(2014\)](#) estimated that the use of mobile money, especially for sending and receiving remittances is predominant among the rural unbanked areas of Zimbabwe. [Ky et al. \(2017\)](#) explained that mobile money services have led to a reduction in risky and inappropriate informal saving options such as saving in livestock or jewelry, or saving under mattress or friends. [Tsemame \(2015\)](#) found that mobile money is used for the payment of bills, send and receive money. Amidst the expectations of mobile money services, research to provide evidence on the effect of mobile technology and mobile money services on transforming the lives of the poor is limited ([Ky et al., 2017](#)). This is typical for Ghana. For instance, [Cudjoe, Anim, and Nyanyofio \(2015\)](#) indicated that although there are reported positive effects of mobile banking on customers' banking behaviour across the globe, such conclusions cannot be reached on Ghana due to the lack of empirical studies. This raised an important question on the role of mobile banking in influencing banking behaviour especially among informal sector workers.

2. METHODOLOGY

2.1. Study Area

This research was conducted in the Accra Metropolitan Assembly (AMA). AMA is located in the Greater Accra region and serves as the national capital of Ghana. The assembly covers an area of 139.67 square kilometers and consists of ten different sub-metropolitan district councils with about 72 communities. Because it is the national capital, the assembly serves as the hub of economic and financial activities in the country. In addition to hosting location branches, almost all financial institutions have their national headquarters located in Accra. The residents of the assembly engage in primary, secondary and tertiary occupations. About 42% of the assembly's population are migrants, thus, were not born in the assembly. About 75% of the residents have mobile phones. The high mobile phone usage in the assembly is an indication of high mobile money service subscription in the area. Similarly, the private informal sector is the major employer, employing about 74% of the people in the assembly.

2.2. Sampling Procedure and Sample Size

In this study, a two-stage sampling procedure was adopted. In the first stage, purposive sampling was used to select private informal sector workers in AMA. The informal sector workers were selected for this study because of the high dominance in AMA and the observed patronage of mobile banking of this group of workers. In the second stage, simple random sampling was used to select the informal sector workers from the assembly. Therefore, all private informal sector workers in the assembly would have equal chance of being selected for this study.

To ensure appropriate representation of the sample for this study, the single population proportion approach suggested by Cochran (1977) was used. This is presented by Equations 1 and 2:

$$n = \frac{z^2 * \hat{p}(1 - \hat{p})}{\epsilon^2} \quad (1)$$

Where z is the z score, given as 1.96, ϵ is the margin of error and this is given as 0.05, \hat{p} is the population proportion which is given as 74% (0.74).

Therefore,

$$n = \frac{1.96^2 * 0.74(1 - 0.74)}{0.05^2} = 295.66 \quad (2)$$

Given this information, 296 informal sector workers were selected for this study.

2.3. Data Collection and Analysis

The study uses a survey data that was collected in 2018 by the researchers. As suggested, a survey was conducted through questionnaire administration. The questionnaire for this study was designed by the researchers with inputs from other researchers whose research domain is mobile banking. The questionnaire contained both open and closed ended questions and was pre-tested before the final survey. This enhanced the validity and reliability of the instrument. The data was analysed using probit regression model (see Equation 3) to examine the effect of mobile banking services on the banking behavior of the respondents.

Probit regression is a binary model that allows to estimate economic relations that involved two exclusive alternatives. The choice of the probit model is because, the choice of changing banking behavior by saving is binary, either an informal sector worker saves money or not. Given:

$$y^* = x_i\beta + e \quad (3)$$

Where y^* is defined as 1 if the informal sector worker saves money and 0 if does not save money, x_i defined the socioeconomic factors that influence the saving behaviour of the workers and β measures the parameter of the various factors. y can be defined for this latent value as shown by Equation 4:

$$y = 1 \text{ if } y_i^* > 0 \quad \text{or} \quad y = 0 \text{ if otherwise} \quad (4)$$

The probability of choosing saving money over non-saving is presented by Equation 5:

$$p_i = \text{prob}[Y_i = 1|X] = \int_{-\infty}^{X_i'\beta} (2\pi)^{-1/2} \exp(-\frac{t^2}{2}) dt = \Phi(X_i'\beta) \quad (5)$$

Empirically, the probit model that was estimated is given by Equation 6:

Saving behaviour

$$\begin{aligned} &= \beta_1 \text{Age} + \beta_2 \text{Sex} + \beta_3 \text{Income} + \beta_4 \text{Education} + \beta_5 \text{Perceived risk} \\ &+ \beta_6 \text{Bill payment} + \beta_7 \text{Transfer money} + \beta_8 \text{Business} \\ &+ \beta_9 \text{Medium of saving} + \beta_{10} \text{Mobile recharge} + \varepsilon \end{aligned} \quad (6)$$

Table 1 presents the description of the variables and demographic characteristics of the respondents.

Table-1. Definition of variables.

Variable	Definition
Age	Total number of years from birth
Sex	Dummy: (1) if male and (0) if female
Income	Total monthly income of a respondent in Ghana cedis
Education	Total number of years of formal education
Perceived risks	Dummy: (1) if the respondents perceived mobile banking as high risk and (0) if otherwise
Bill payment	Dummy: (1) if the respondents use mobile banking for bill payment and (0) if not
Transfer money	Dummy: (1) if the respondents transfer money through mobile banking and (0) if not
Business transaction	Dummy: (1) if the respondents uses mobile banking in business transaction and (0) if not
Medium saving	Dummy: (1) if the respondents uses mobile banking as a medium of saving and (0) if not
Mobile recharge	Dummy: (1) if the respondents uses mobile banking for buying airtime and (0) if not

3. RESULTS AND DISCUSSIONS

3.1. Changing Banking Behaviour

Kelly and Palaniappan (2019) and Hanafizadeh, Behboudi, Koshksaray, and Tabar (2014) assert that customer behaviour or intention is an antecedent effect of both perceived usefulness and perceived ease of use of mobile banking service. For Ahmed (2016) perceived value is considered the most significant determinant of a customer’s decision to adopt mobile banking service. In this study, the respondents were asked whether the introduction of mobile banking had led to a change in their banking behaviour or otherwise. Also, the frequency of saving money using the mobile money platform was questioned. The results are shown in Table 2. This shows that the introduction of mobile money has not led to a change in the saving behaviour of majority of the informal sector workers, as 65.1% of the respondents did not start saving because of the introduction of mobile banking. This is contrary to the finding of Aldiabat, Al-Gasaymeh, and Rashid (2019) who concluded in their study on the effect of mobile banking application on customer interaction in the

Jordanian banking industry that mobile banking application enables customers manages their finances better. The implication is that if financial inclusion is defined primarily on the basis of savings, then the introduction of mobile banking has only improved financial inclusion by about 35%. Among those who engaged in savings through mobile money, 41.46% representing the highest percentage save almost on irregular basis while 40.24% of the respondents who save money through mobile money does so on almost daily basis. The remaining 18.3% save almost on weekly basis.

Table-2. Changing banking behaviour

Response	Frequency	Percentage
Save money		
Yes	82	34.89
No	153	65.11
Frequency of saving		
Almost daily	33	40.24
Almost weekly	15	18.29
Irregular	34	41.46

Source: Field survey, 2018.

3.2. Effect of Mobile Money on Ineffective Saving Options

A major banking behaviour of informal sector workers is saving in sources other than formal banking source. Individuals with low access to formal financial institutions, also known as the unbanked, often rely on informal savings methods that are unsafe, inconvenient and unreliable (Batista & Vicente, 2017). These includes saving with friends and relatives, saving in assets such as animals and jewelry and saving in the rooms (under the bed or in a pot). While some of these informal savings mechanisms may be convenient, individuals cannot rely on them in the event of emergencies because of their higher risk characterization (Skogqvist, 2019). Some others do not save money at all simply because they are unable to access formal banks.

This section describes the effect of mobile banking on the customers' behaviour of shifting from such informal savings. Table 3 shows that 18.7% of the respondents indicated that the introduction of mobile banking has led to a complete elimination of saving with friends and relatives while the highest percentage (39.6%) indicated that the effect of mobile banking on saving with friends or families is very low. Contrary to expectations, 82.1% and 17.9% of the respondents indicated that the effect of mobile banking on the decision to save in assets is very low and low, respectively. Thus, none of the respondents indicated the effect is high, very high or complete reduction. This means that despite the introduction of mobile banking technology, informal sector workers continue to save their incomes in the form of assets.

On saving in the room, only 13.6% indicated that the introduction of mobile money has led to a high reduction in saving in the room while the remaining 86.4% either indicated that there is a low or very low reduction in saving in the room. The study of Nandhi (2012) also shows that there is a decline in dependence on risky informal methods by mobile banking customers who were previously dependent on these practices for lack of affordable and safe savings options. This is further affirmed by the finding of Skogqvist (2019). that saving in a mobile money account was more convenient and efficient than even saving in a formal financial institution such as a bank because of the flexibility it brings with its usage.

Table-3. Effect of mobile banking on ineffective saving options.

Level of effect	Effect on ineffective saving methods (%)		
	Friends/Relatives	Save in assets	Save in room
Very low	39.6	82.1	59.2
Low	20.9	17.9	27.2
High	6.4	0.0	13.6
Very high	14.5	0.0	0.0
Complete reduction	18.7	0.0	0.0

Source: Field survey, 2018.

3.3. Effect of Mobile Money on Changing Saving/Banking Behaviour of Informal Sector Workers

Table 4 shows the results on the effects of mobile banking on the banking behaviour of informal sector workers. This involved the estimation of a probit model. The dependent variable is the saving or banking behaviour of the respondent, thus, whether or not informal sector workers have shifted from informal saving methods described in Table 3 to formal saving through mobile money. From the result, all factors except education had significant effect on the banking behaviour of the respondents.

The effect of sex is positive and significant at 1%. The marginal effect is 0.015. This implies that male informal sector workers have a 0.015 probability more of changing their banking behaviour from informal saving to formal saving than the female workers. This is contrary to the researcher's expectation (but consistent with the finding of Skogqvist (2019)) since it was expected that females may have lesser formal banking opportunities and would harness the opportunities and alternatives provided by mobile banking. This contradicts the findings of Anang, Dawuda, and Imoro (2015) who argued that men may have lesser probability to save since they have to provide the financial needs of the household at all time. One explanation for these results can be understood by looking at the sociocultural settings in Ghana where men are the main financial decision makers at household level, and most of the savings accounts in the households are mostly held in the man's name. The socio-cultural order dictates for women to always seek the permission of their husbands before making financial decisions. Men do control also, productive assets in Ghana, and are able to generate incomes that allow them to have enhanced savings.

The effect of age is significant and negative with a marginal effect of 0.008. This implies that the younger informal workers have a high probability using mobile money services than the older workers. This is consistent with the researchers' expectations that the youths are not technology stacked, therefore, may be willing to change their banking behaviour than the elderly. Consistently, Ky et al. (2017) estimated that age and age squared had positive and negative significant effect on the saving behaviour of customer of developing countries. Anang et al. (2015) explained that the elder may have extra responsibilities, hence may save to avoid unforeseen emergencies that would require the needs of the family.

The effect of income on banking behaviour is significant and positive. This indicates that informal sector workers with higher incomes have a higher probability of changing their banking behaviour than those with smaller incomes. This is consistent since income is a positive function of saving since the income holder is able to meet the basic needs with some reserve for saving as the income level increases. Similarly, high-income earners are risk averse and would prefer to save monies in formal places to avert losses. This is consistent with the finding of Ayenew (2014). Relatedly, Mpiira et al. (2013) also concluded that the likelihood of participating in savings group increases with income.

Perceived risks had negative significant effect on the banking behaviour of the respondents. This implies that workers who perceived that there is high risk associated with mobile banking innovations have lesser probability of changing their banking behaviour. This implies that the informal sector workers are risk averse and would not save their monies at any source they feel is not safe.

The primary objective of this section was to estimate the effect of mobile money on the banking behavior of the informal sectors workers. The factors under consideration are the mobile money services provided. Significant in

the result are bill payment, transfer of money, business transaction, medium of saving and mobile recharge. The results indicate that informal sector workers who use mobile banking for paying bills, transfer of money and recharge airtime had lesser probabilities of changing their banking behaviour. In other words, these mobile money services have a negative implication for the saving or banking behaviour of the workers. Thus, these workers would not engage in informal savings.

On the other hand, using mobile money for business transaction and as a medium of saving had positive effect on the saving behaviour of the respondents. This was expected business saving money through mobile banking may reduce the income available for saving in informal sources. Nandhi (2012) observed that the ability to save have increased for many customers who uses mobile banking. Ky et al. (2017) also found that the adoption of mobile banking increases the probability of saving for unpredictable purposes and healthcare in developing countries. Pathak and Mishra (2019) as in Malek and Mat (2011) posits that the attitude developed after using the facility of mobile banking depends upon prior experience and technology. This is further affirmed by Skogqvist (2019) and Batista and Vicente (2017) that mobile money use has a positive and statistically significant effect on the likelihood to have a savings product, to save for an emergency and to save for a future event.

For Patel (2013) users are ready to adopt mobile banking service, but exercise fears of password integrity, privacy, data encryption, and hacking. Sharma and Singh (2011) also noted that consumer face several problems like security, standard of services provided by the bank and mobile operation in using mobile banking.

Table-4. Effect of mobile money on changing saving/banking behaviour of informal sector workers.

Variable	Coef.	Std. Err.	z	P>z	Marginal effect
Sex	-0.366***	0.057	-6.40	0.000	0.015
Age	47.237***	12.198	3.87	0.000	0.008
Education	-0.067	0.092	-0.73	0.466	0.014
Income	-0.145***	0.040	-3.62	0.000	0.001
Perceived risks	-1.295***	0.386	-3.35	0.001	0.019
Bill payment	-44.819***	12.088	-3.71	0.000	0.022
Transfer money	-78.942***	20.286	-3.89	0.000	0.038
Business transaction	0.002	0.048	0.04	0.966	0.112
Medium saving	85.666***	23.230	3.69	0.000	0.054
Mobile recharge	-118.15***	31.850	-3.71	0.000	0.067
Constant	303.226	82.018	3.70	0.000	
Chi square	217.710***				

Note: *** indicates significance at 1%.

4. CONCLUSIONS AND POLICY IMPLICATIONS

Financial exclusion is a major challenge for informal sector workers, especially those with limited income or financial inflows. Banking behaviour of the informal sector workers therefore can be influenced by increasing use of mobile banking service. In this study, the effect of mobile banking on the banking behaviour of informal sector workers was analysed using a probit regression model. The result indicates that the medium of saving and business transaction services of mobile money have positive influence on the banking behaviour of the respondents, while bill payment, transfer of money and mobile recharge services have a negative and significant effect on banking behaviour of informal sector workers in Accra, Ghana. The socioeconomic factors that also influenced the banking behaviour of the customers include sex, age and income. The respondents also perceived that the introduction of mobile money service has not led to a significant change in ineffective saving mechanisms such as saving in the room.

The result established that mobile banking improves saving behaviour of informal sector workers. Considering the role of saving in the financial sector, this could be a potential source of revenue for financing the development challenges facing the informal sector. However, to enhance savings through mobile banking, more efforts have to be

made by the mobile service providers to enhance the security features of the mobile banking technology. This could therefore attract the high-income earners to save through mobile banking system.

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