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## **What Drives Behavioral Intention of Mobile Money Adoption? The Case of Ancient Susu Saving Operations in Ghana**

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### **Abstract**

This study provides insights into the ancient *susu* savings operation in Ghana and the behavioral intention or willingness of *susu* collectors and users to adopt a mobile money (MM) platform as part of their savings practices. More specifically, this study investigates factors that determine one's intention to adopt the MM space as a savings channel, particularly in place of more traditional ways of saving among many people in West Africa. Using field survey data from market traders and *susu* collectors in several local markets in Ghana, and applying Innovation Diffusion Theory (IDT) and Technological Adoption Model (TAM) conceptual frameworks, this study has produced some interesting findings. Generally, among the *susu* collectors, we found perceived risk, education level, relative advantage, and the age of the collector to be statistically significant in influencing the behavioral intention of MM adoption. With respect to *susu* users, we found such factors as trialability, observability or awareness, compatibility or education attainment. The study also finds the influence of the physical presence of the *susu* collector to be statistically significant in influencing one's behavioral intention to accept MM. This, which was found to be the primary reason motivating *susu* users to honor their savings commitment, is potentially an important factor in explaining why respondents were not sure whether an MM platform would be an effective method of saving. These findings have important implications for MM uptake and the modernization of the *susu* operations in Ghana. While MM uptake remains significantly low, these findings suggest that the way to increase uptake is to create more awareness, embark on financial literacy programs, and reduce mistrust and perception of risk of the MM platform.

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*Keywords: Mobile Money, Susu, Adoption, Behavioral intention, Technology uptake*

# Susu Operations in Ghana

## Introduction

The *susu* savings scheme has for many years served as an important avenue for savings for low income and financially excluded people in countries across West Africa. On a daily basis, these *susu* operators 'walk' to their clients to collect small amounts of savings and return the full amount (minus a day's collection as a commission) usually at the end of each month. Even though there are about four types of *susu* schemes in the country including a type that looks like the well-known rotating savings and credit association (ROSCA), the most common one is where an individual *susu* operator reaches an agreement with a client (e.g., traders in the market, hawkers, barbers, hairdressers, etc.) on an amount, commission and intervals for collection, and then make daily (or weekly) rounds to collect the amount. These rounds occur sometimes on foot, bicycle, or motor bikes, and recorded on a simple card often kept by the client.

While the cost of putting small amounts of savings in far away bank accounts on daily or weekly bases is too high for low income earners, it has also been too expensive for formal savings banks to develop cost effective models to expand their physical reach into poor and rural areas, hence their exclusion (Osei-Assibey, 2009).

Despite the risks involved in the operation such as breach of trusts or being prone to robbery attacks, *Susu* (deposit) collectors have used this socio-financial infrastructure to help poor people save, giving credence to the fact that the poor can also save (Aryeetey, 1994). Furthermore, beyond leading to lower transaction costs (Ashraf, Karlan and Yin (2006), it is believed that *susu* collectors offer stronger social capital and micro-savers derive more social benefits than formal financial institutions can offer (Alabi *et al*, 2007). Ashraf, Karlan and Yin (2006) observe that people still demand deposit collectors because of a simple "planning fallacy" - some clients may want deposit-collection because they know they manage their time poorly, suffer from procrastination, are forgetful, are overly optimistic about their available time, or see deposit-collection as an easy way to ensure that they follow through with their intentions. This factor, among others, caused participants in an experimental study to increase their savings by about 25%, according to Karlan and Yin (2006).

However, with the rapid diffusion and penetration of mobile phones in developing countries and with the recent success stories of the M-PESA mobile money banking the poor in Kenya, many Savings and Loans (S&L) companies and Microfinance Institutions (MFIs) are harnessing the idea of adopting the mobile money (MM) transfer system in their deposit collection models to replace the traditional *susu* collection model in Ghana. There is also growing evidence that providing SMS text reminders to clients on MM saving platform encourages more savings among the poorest households in a number of countries (Karlan et al 2012). While this will significantly reduce transaction costs, and serves as a more secure and efficient way to deposit money, MM uptake remains low, and there is still no clear evidence to suggest that *susu* operators or users will be willing to accept mobile money in place of traditional *susu* operations. This study therefore seeks to investigate the determinants of behavioural intention or willingness to adopt MM money by both collectors and market traders who patronize *susu*. More specifically, the study seeks to investigate the following questions: What factors are influencing the use of SUSU as a store of value/micro-saving infrastructure? Are there any social or cultural practices that bind people to these services? And what factors determine the *susu* operators and users' willingness to accept or reject mobile money in place of the traditional *susu*?

The paper is organised as follows. Following this introduction, Section Two briefly describes *susu* operations in Ghana. Section Three presents the theoretical framework of the analysis while Section Four presents model specification and data collection methodology. Section Five presents the survey results and the findings from a regression analysis. Section Five concludes with policy implications of the findings.

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### Overview of Susu Operation and Mobile Money Penetration in Ghana

The term SUSU is one of Africa's most ancient forms of informal banking. Much like many places in the world, the concept of traditional or informal finance is not new in Africa. Savings and credit groups have operated for centuries as the "Susu" of Ghana, "chit funds" in India, "tandas" in Mexico, "arisan" in Indonesia. Even though its true origin is unknown, SUSU is believed to have originated from Ghana in Akan<sup>1</sup> language which literally means "small small" and can be taken to represent the pooling of money resources from numerous sources to get a larger sum. Today in Ghana, the term Susu is used in reference to individual savings collectors and rotating savings and credit associations (ROSCA). The Susu collectors provide informal means for many Ghanaians, particularly the urban poor, to save and access their own money and also gain limited access to credits needed to start up small venture projects that in many cases benefit the entire community. These Susu operators help people within the lowest income brackets to save small amounts since the cost of putting limited amounts of savings in a far away bank accounts on a daily or weekly basis is too high to make sense for poor people. Besides, it has been too expensive for formal savings banks to develop cost effective models to expand their physical reach into poor and rural areas or handle large volumes of low-value payment and savings transactions - hence Susu operations in these areas.

As a long standing traditional saving and credit scheme in Ghana, the SUSU collectors offer very flexible financial services, patronized mainly by small traders at the market, micro-entrepreneurs selling from roadside stalls, and households with meagre incomes from farm or other labour work. The operations of the Susu collectors principally involve reaching an agreement on an amount, commission, and intervals for the collection of contributions from savers. Collectors make daily (or weekly) rounds - sometimes on foot, bicycle or motor bikes - to collect the amount from each customer or client over the agreed period. The lump sum amount to be paid at the end of the period depends on the agreement reached and the type of Susu operator groups a customer joins. Even though there are about four types of Susu types in the country including a type that looks like the well known *rotating* savings and credit association (ROSCA), the most common one in the sub-region is where individual Susu operators collect daily amounts set by each of their clients (e.g., traders in the market, barbers, hairdressers etc) and return the accumulated amount at the end of the month, minus one day's amount as a commission.

The SUSU system functions as a financial management service, where depositors commonly use the accumulated funds as working capital to restock their supplies. According to economist Aryeetey (1994), by pledging to set aside savings for their Susu collector, market women protect their savings from the incessant appeals from family and friends for financial assistance-as traders often carry their daily sales with them to their houses. There is therefore no doubt that these Susu groups have used this socio-financial infrastructure to help poor people save minute amounts of money and accumulate them over a period for specific goals such as acquisition of land, cattle and for payment of school fees in the developing world. However, the Susu operation is bedeviled with a plethora of challenges that range from underdevelopment, fragmentation, disorganisation and weak linkages with other financial sectors as well as lack of transformation and modernization of their operations since its inception (Osei-Assibey, 2011). The Susu contract does not involve any legal documentation or paperwork, except for a piece of card/book where daily collections are recorded. They are primarily based on trust through personal or business relationships. These obvious operational inefficiencies have culminated in high transaction costs that have restricted scale and limited the scope of operations, and thus do not contribute to solving the saving needs of the large unbanked population within the informal sector.

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<sup>1</sup> SUSU is also found among the Yorubas and Igbos in Nigeria as "ESusu" and "iSusu" respectively, while it is called "Nago" in Ivory Coast and Yesyesas and Jojuma in Togo.

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With the rapid diffusion of technological infrastructure and advancement, the issue is how the Susu operation can leverage modern technology to reduce these costs and inefficiencies and still make savings easier for the urban poor. Today, mobile phones are already being used by many to make payments, send money to family members and store monetary value safely in Ghana. However, while mobile phone penetration was more than 25 million as at December 2012, only 4.1 million actually subscribed to mobile money. Beyond the fact that MM uptake and usage remain low, active users remain even lower. The three main telephone companies in Ghana that currently provide mobile money services: MTN, Airtel and Tigo, have the following subscriber base in 2012: MTN Mobile Money - 5% (active users of 2 million accounts), Tigo Cash -13% (active users of 1.2 million accounts) and Airtel Money - 2% (active users of 900,000 accounts). This low uptake is despite the excitement around mobile money in the payments space across many developing countries, which according to anthropologist Bill Maurer (2012) is due to three convergence factors: interest among financial and telecommunication companies, increasing awareness of MM in global south, and the increasing attention given to microfinance.

### Theoretical Framework of Adoption

Although the theoretical and empirical literature on mobile money is growing in recent times, evidence of the social willingness to accept and use mobile money as a dematerialized store of value to replace pre-existing, long-standing micro-saving systems remains scarce. However, various theories have been proposed in the last couple decades to examine factors underlying adoption or intention to use a new technology. Notable among such theories are Roger's (1962) innovation diffusion theory (IDT) and Davies' (1989) technology acceptance model (TAM).

#### ***Innovation Adoption Theory***

According to Rogers (1962), Innovation Diffusion Theory (IDT) seeks to explain how, why, and at what rate new ideas and technology spread through societies and cultures. Rogers who popularized the theory in *Diffusion of Innovations* (1962), defines innovation as "an idea, practice or object that is perceived as new by an individual or another unit of adoption", while diffusion is "the process by which an innovation is communicated through certain channels over time among the members of a social system" (1995).

Rogers further pointed out that the diffusion of an innovation occurs through a five-step process - which also goes through a series of communication channels over a period of time among the members of a similar social system. This process was first outlined as awareness, interest, evaluation, trial, and adoption. However, Rogers later reformulated the adoption process to knowledge, persuasion, decision, implementation, and confirmation. Due to the individualistic nature of the decision stage, Rogers notes that it is the most difficult stage to acquire empirical evidence (Rogers 1962). At this stage, the individual considers the concept of the change in practice, weighs the advantages/disadvantages of using the innovation, and decides whether to adopt or reject the innovation.

Rogers (1995) subsequently defines five intrinsic characteristics of innovations that influence an individual's decision to adopt or reject an innovation which include relative advantage, compatibility, complexity, and trialability and observability. Relative advantage is defined as the degree to which an innovation is considered as being better than the practice it supersedes. This concept has been found to be one of the best predictors of the adoption of an innovation. Compatibility refers to the degree to which innovation is regarded as being consistent with the potential end-users' existing values, prior experiences, and needs. Complexity is the end-users' perceived level of difficulty in understanding innovations and their ease of use. Trialability refers to the degree to which innovations can be tested on a limited basis. Observability is the degree to which the results of innovations can be visible by other people. These characteristics are used to explain end-user

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adoption of innovations and the decision-making process.

Bagozzi, *et al.* (1992), however, argues that because new technologies such as personal computers are complex and an element of uncertainty exists in the minds of decision makers with respect to the successful adoption of them, and that people form attitudes and intentions toward trying to learn to use the new technology prior to initiating efforts directed at use, actual usage may not be a direct or immediate consequence of such attitudes and intentions. According to this study, attitudes towards usage and intentions to use may be ill-formed or lacking in conviction, or else may occur only after preliminary attempts to learn to use the technology evolve.

### **Technology Adoption Model**

Another alternative theory in technological adoption, which has also received a lot of theoretical and empirical support in recent times, is the Technology Acceptance Model (TAM) (Chin & Todd, 1995, Igbaria, *et al.*, 1997; Venkatesh & Davis, 2000; Horton, *et al.*, 2001, Tobbin, 2011; Lee, *et al.*, 2011). TAM is an information systems theory that models how users come to accept and use a technology (Davis *et al.*, 1989). The model suggests that when users are presented with a new technology, two main factors influence their decision about how and when they will use it. These factors are Perceived usefulness (PU) - this was defined by Davis (1989) as "the degree to which a person believes that using a particular system would enhance his or her job performance", and Perceived ease-of-use (PEOU) - Davis defined this as "the degree to which a person believes that using a particular system would be free from effort".

Both the IDT and TAM have been continuously studied and modified, expanded or upgraded with additional constructs.<sup>2</sup> For example, Barnes and Huff (2003) extended IDT by including perceived trust as new constructs. Also, Tan and Teo (2000) included perceived risk; subjective norm and self-efficacy. Pedersen *et al.* (2001), posit that the TAM should be extended to include subjective norm and behavioural control factors. In recent times, a number of studies have tempted to integrate the two studies in explaining adoption since according to such studies TAM and IDT are similar and complementary among some factors and that each one of them on its own cannot adequately explain acceptance/adoption or rejection of any new technology (Wu and Wang 2005; Lee *et al.*, 2011). Furthermore, there is evidence to suggest that the integration of these two theories could provide an even stronger model than either one standing alone (Wu & Wang, 2005; Chen, *et al.*, 2002, Lee *et al.*, 2011 and Tobbin, 2011).

### **Model Specification and Hypothesis**

Although IDT and TAM are models formally designed to study adoption of mobile phones, studies on the adoption of mobile money, which can be seen as an extension of previous studies on mobile banking and payment systems, have also benefitted from an application of these models. Tobbin (2011) therefore argues that the determinants of adoption in mobile banking and the mobile payment environment should be applicable to mobile money. Following the previous literature review, the present study proposes an integrated conceptual model of a technology adoption process (in this case, an adoption of mobile money transfer technology by Susu operators and users) based on the IDT and TAM theoretical frameworks. Figure 1 shows a conceptual framework of the adoption process suggested by Rogers (1995) and Davies (1989). I argue from the previous studies

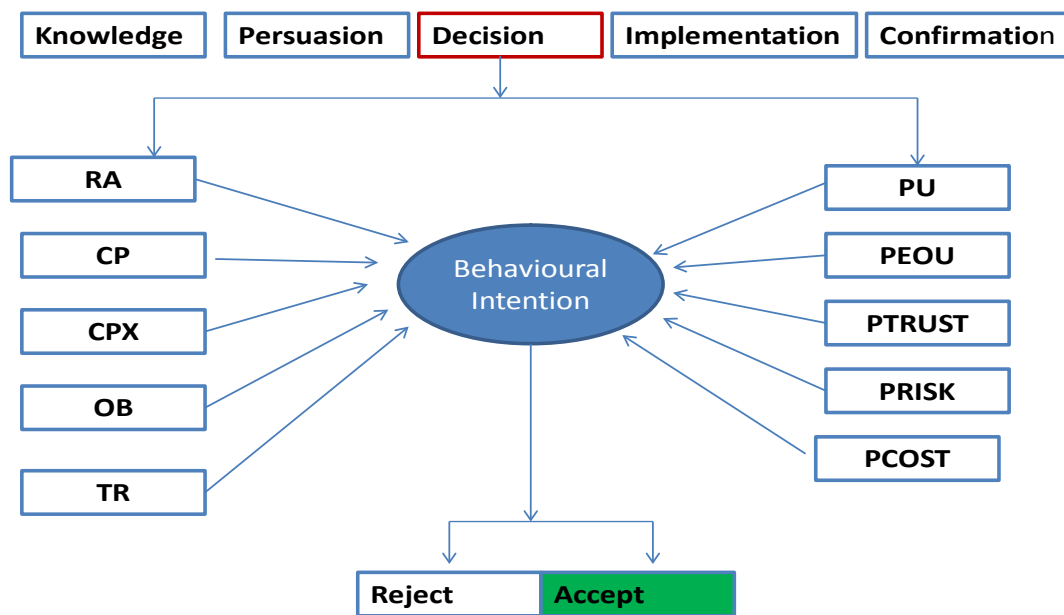
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<sup>2</sup> The two major upgrades for TAM are the TAM 2 (Venkatesh & Davis 2000 & Venkatesh 2000) and the Unified Theory of Acceptance and Use of Technology (or UTAUT, Venkatesh *et al.* 2003). A TAM 3 has also been proposed (Venkatesh & Bala 2008).

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that IDT and TAM are extremely similar in some elements and supplement one another (Wu, 2004, Tobbin 2011). In that regard, I argue further that the five innovative characteristics (compatibility, complexity, relative advantage, trialability and observability) and TAM constructs such as perceived usefulness and perceived ease of use can serve as important determinants of acceptance or rejection of MM in the Susu operation. Other determinants considered are perceived trust, transactional cost and perceived risk.

**Figure 1: Conceptual Framework of Adoption Process of New Technology (Mobile Money)**



**Notes: RA=Relative Advantage, CP=Compatibility, CPX=Complexity, OB=Observability, PU=Perceived Usefulness, PEOU=Perceived Ease-of-Use, PTRUST=Perceived Trust, PRISK=Perceived Risk, PCOST=Perceived Transaction Cost**

Source: Author

While this study does not intend to test these two theories, IDT and TAM, the empirical model specification and the choice of explanatory variables are based on the conceptual framework outlined above. Employing a Logistic Regression model, we specify a binary response model for a *susu* user's/collector's decision to either accept/adopt or reject mobile money transfer technology in their operations.

A Logistic regression model is expressed in terms of the odds ratio, which relates the probability of the event occurring to the probability of the event not occurring. Thus, we specify a simple binary response Logistic model as:

$$Y_i^* = \mathbf{x}_i\beta + \varepsilon$$

Where, Y takes the value one (Y=1), if a collector is willing to adopt mobile money technology as a micro-saving mediated platform in place of the traditional saving system, and zero (Y=0) otherwise. Additionally, Y takes the value one (Y=1), if a *susu* user is willing to accept mobile money platform as a means of saving or sending his daily saving to the collector/operator, and zero (Y=0) This is shown below as:

$$Y^* = \begin{cases} 1, & \text{if } Y^* < 0 \text{ (Willingness to accept)} \\ 0, & \text{Otherwise (Reject)} \end{cases}$$

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The variable  $x_i$  is a vector of explanatory variables comprises some relevant constructs in the TAM and IDT conceptual model. Proxy variables were solicited for.

### **Hypothesis**

Based on the peculiar nature of the Susu operations with its traditional features, we adapt some of the constructs as explanatory variables and hypothesize as follows:

**PU & RA:** PU is defined as the degree to which an individual believes that a particular system would enhance his or her job performance within an organizational context (Davis 1989). This ties in well with perceived relative advantage (RA) which studies have consistently found to have positively affected the users' intention to use systems across different participants (Shih, 2007; Lee, 2007, Lee *et al*, 2011). RA is defined as the degree to which an innovation is considered to be better than the practice it supersedes. This construct has been found to be one of the best predictors of the adoption of an innovation. It is therefore believed that when users perceived higher relative advantages, they perceive a higher level of systemic usefulness (Lee *et al*, 2011). Accordingly, we hypothesized:

*H1: When Susu Collectors and Users perceive MM to be useful and have relative advantage over Susu, they are more likely to accept it.*

**PEOU & Compatibility:** Davies *et al.*, (1989) defines as the degree to which an individual believes that using a particular system would be free of effort. Agarwal and Prasad (1999) on the other hand asserted a positive relationship between an individual's prior compatible experiences and the new information technology acceptance. They found that the extent of prior experience with similar technologies was positively associated with an ease of use belief about an information technology innovation. Recent studies (Lee *et al.* 2011) found that compatibility had a positive effect on PEOU of a technological system. According, we hypothesized that

*H2: Susu collectors and users who are conversant with mobile phones and text messaging are more likely to accept MM in the susu operations.*

*H3: Susu Collectors and users who are literate and can easily understand the functions of mobile phones are more likely to accept MM.*

**Complexity:** Complexity is the end-users' perceived level of difficulty in understanding innovations and their ease of use. Several empirical studies have found that the more complex the end users perceived a new technology, the lower the users' intention to use the system (Lin, 2006; Lee, 2007, Tobbin 2011). Accordingly, we hypothesize that

*H4: Susu operators who perceive the use of MM transfer as a saving channel to be complex and thus not feasible are more likely to have a negative behavioural intention to accept MM.*

**Perceived Trust:** While PEOU has been identified as an antecedent to perceived trust in prior e-commerce adoption research, this was seen as not applicable to MM transfer (Gu *et al*, 2009; Tobbin, 2011). MM transfer platform, like all business transactions, require some element of trust and reliability. Potential adopters of MM need to have a belief that the network is reliable and that they can trust the system at least more than their existing practices of saving and transferring money. This is because people are more averse to losing things they use more than they are inclined to gaining things that are unfamiliar (Karlan 2010). Accordingly, we hypothesize that

*H5: Susu users who think they can trust their susu collector more than MM platforms or have very little trust for MM platforms are less likely to have behavioural intention to accept/use MM.*

**Perceived Risk:** Perceived Risk is defined as a consumer's belief about the potential uncertain negative outcomes from the mobile money transaction. Bauer *et al*, (2005) have argued that consumers' desire to minimize risk supersedes their willingness to maximize utility and thus their subjective risk perception strongly determines their behavior. Accordingly, we hypothesize that

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*H6: Susu operators who perceived a high risk of losing their job once MM takes over the collection process are less likely to have a behavioural intention to adopt MM in their operations.*

**Observability:** This is the degree to which the results of innovations can be visible by other people. Available evidence suggests that observability had a positive impact on users' attitude toward the system and their intention to use the system (Lee, 2007, Lee et al., 2011). Thus we hypothesize that *H7: Susu collectors or users who are aware of the existence of MM or have seen people using it to store or receive money are more likely to have a behavioural intention to accept MM.*

**Triability:** This is the extent to which an innovation may be experimented with on a limited basis before making an adoption (or rejection) decision (Agarwal & Prasad, 1997). This has been found to have direct influence on behavioural intentions (Brown *et al*, 2003; Tobbin 2011). Accordingly, we hypothesize that

*H8: Susu collectors or users who have used MM either to send or receive money are more likely to accept MM in place of susu.*

### Research Methodology and Data Sampling Procedure

For the purposes of taking a representative sample and ensuring reliable survey results, we sampled 16 local markets spread across the two most populous region in Ghana: the Greater Accra region and the Ashanti region. Accra, as the capital city of Ghana, was chosen to represent the southern and coastal belts while Kumasi in the Ashanti region was selected to represent the middle and the northern belt of the country. Besides Kumasi being the second largest city in Ghana and playing host to a market believed to be the biggest in West Africa with its attendant brisk business activities, the city's unique central location makes it a traverse point for migrants and traders from all parts of the country. The region also displays a mixed character of modern and traditional values, extreme poverty and wealth, highly educated and illiterate populations, as well as a significant representation of both informal and formal financial institutions.

In selecting the markets, we employed a purposive sampling technique given considerations to size and the state of market development and location. In Accra, for instance, we selected markets to include Makola, Kantamantu and Abgogbloshie, all in the central business district (CBD). Others were Madina Market, Kaneshie, Dome-Kwabanya and Haatso (North Legon) markets, all in the suburbs, as well as, Ashaiman market which is in the periphery of the city. In Kumasi, we selected the Central market, Asafo and Kejetia, all in the CBD. In the suburbs, we selected markets such as Asawasi, Bantama and Ash-town, in the periphery of the city we selected the Old-Tafo market which is patronized not only by urban dwellers but also nearby villagers. The selection of the *susu* users and collectors was randomly done by using a systematic sampling frame. After randomly selecting the starting point, every other store/kiosk owner in a row within the markets was selected for an interview. With regard to the operators, a list of phone numbers was obtained from the umbrella organization, Ghana Susu Collectors Cooperative (GSCC), and applied the same sampling method call and book an appointment for interview. Focusing on the perspectives of the *susu* collectors and users in the various markets, structured questionnaires, interviews and focus group discussions were the main tools used to obtain data. About 200 market traders and 150 *susu* collectors from all the markets were randomly selected for the interviews. One focus group discussion was also held in Accra involving 10 collectors and users. We collected information on respondent's basic demographic characteristics, such as gender, educational level, income etc as well as information on mobile phones and mobile money.

#### **Preliminary Results: Susu Collectors**

A total of 90 usable questionnaires administered to approximately 150 Susu operators were obtained from the markets in Accra and Kumasi. This was made up of 41.1% females and 58.9%



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males. In this sample the *susu* operators are dominated by the age group of 18-25 year olds with 33.3% and 27.6% above 40 years. This is not surprising as *susu* operations involve a lot of physical activity – primarily walking – which require energetic and youthful collectors to be able to carry out the collection duties on a daily basis. However, we also found that most of these operators do not own the business themselves; there are more elderly owners behind the operations, who because of the physical nature of the job, hire these younger employees to do the collection. Besides, although 98.9% of the operators have had some formal education, the great majority (about 70%) have the highest educational attainment either at the secondary school level or below. The following are other major findings from the survey:

The average amount of money per client that the *susu* operators collect in a given day varies somewhat across the survey respondents. The majority of operators (61.6%) collect between GHC1 and GHC5 at a time from their clients (exchange rate: US\$ 1 = GHC 1.85). The number of *susu* operators decreases as the amount of money collected from clients increases. This suggests how relatively small their daily savings are. The smallest percentage of *susu* operators in this survey (5.8%) contribute GHC20.

Regarding the extent to which they use mobile phones as part of their business, 39.5% of the operators reported that they often call their clients when they are not able to meet them in order to collect the daily *susu* contribution. While 40.7% also sometimes call their clients, 4.7% reported that they never call their clients. When the *susu* operator is unable to visit clients on a given day in order to make the collection, 30.7% reported that their clients call them often to inquire about their absence while 52.3% reported that their clients sometimes call them in order to find out why they were unable to turn up. This implies that the use of mobile phone is quite widespread among *susu* operators. When asked what the main constraints on their operations are, about 32% mentioned a lack of cooperation or consistency on the part of their clients in making the daily contribution as agreed. However, a significant proportion (30%) cited commuting—or walking—to and from their clients every day. For example, one operator speaking in the local language (Akan) complained during one of our interviews that *“this work is so difficult and tiring; sometimes you can walk miles to one customer only for him/her to say that he could not pay because of bad sales for the day.”*

On the specific issues about MM uptake and willingness to adopt MM in their operations, we received very interesting responses from the operators. First, while about 83% of the respondents claimed to be aware of MM as a means of transferring money, exactly half (50%) do not think that it is feasible to employ such a technology in the *susu* business. Second, notwithstanding the responses above, more than 62% are actually willing to adopt MM, if made available, although more than one-third (34%) perceived it to be a potential threat to their business. Some of these concerns about MM uptake were also expressed during a focus group discussion. For example, some operators believed that the process would be too complicated particularly for the market women whose education and knowledge of mobile phones are limited. Besides, the issue of network quality and the frequency of going outside of a coverage area or experiencing network loss could hamper the operation and discourage savings. For example, one *susu* collector said, *“What will happen if in the process of a client sending his/her contribution the network vanishes on the mobile phone, or the phone got stolen. Won’t somebody steal the money?”* In his view, such an incident could discourage savings or lead to diminished trust along the line.

Others were also not sure what role they are likely to play in the event of MM adoption in *susu* operations. However, a few were optimistic and are looking forward to it since they believe MM could enhance their operations by reducing the number of walk ins and outs they embark on daily basis and reduce the time they spend commuting between clients in order to make daily collections. However, as one operator suggested, if this should happen, they should be made agents of the telecom companies so that they can continue to earn a livelihood.

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Table 1: Descriptive Statistics of the Variables in the Collectors Model and Hypothesized Signs

Variable name	Description	Percent (mean)	Expected Sign
Education	Highest level of education		
Age of the collector		(3.45)	-
Willingness to adopt/accept	1, if the collector is willing to use MM, 0 otherwise	0.62	
Gender	1, if female, and 0 male	0.41	-/+
Location	1, if Accra, 0 Kumasi (rural)	0.70	+
Registered	1 if the collector is registered with any government agency, 0 otherwise	0.68	+
(PEOU/Compability)	1, if the collector uses mobile phone to call or text clients often, 0 otherwise	0.8	+
Provision of Extra Services	1, if the collector engages client other than susu such as granting loan, social issues etc, 0 otherwise	0.59	-
Transportation	1, if the collector walks or uses bicycle to reach clients, 0 if he uses car, motor bike or public transport	0.68	+
Observability (Awareness)	1, if the collector is aware of MM, 0 otherwise	.80	+
Trialability (Use MM before)	1, if the collector has received or sent money through MM in the past, 0 otherwise	.27	+
Perceived Usefulness (PU)	1, if the collector perceives MM as a good medium of transferring money and that it is feasible in the Susu operations, 0 otherwise	.50	+
Expected Role	1, if collector thinks that it will play a role such as an agent for MM in Susu, 0 if there will not be any role to play	.69	+
Perceived Risk (Job lost )	1, if the collector thinks MM will take over their job, 0 if no or uncertain about it	.34	-

Source: Field Survey, August 2012

### **Preliminary findings: Susu Users**

The study administered a total of 200 questionnaires on Susu users (i.e., traders on the various selected markets) but obtained 172 usable responses. Of these, 84% are females and 16% are males. This is reasonable because the majority of the people who sell in the markets in Ghana are women. In terms of age distribution, the majority (41.7%) of the Susu users are more than forty years old. About 17% have had no formal education at all while close to 60% highest level of education is at the primary or basic level. In regard to the average daily income of these Susu users, 65.7% of them make less than GHC50 (US\$25) a day, followed by 25.9% who makes between GHC50 and GHC200. This indicates that the Susu users are largely small income earners. The following are other major findings from the survey:

In regard to their daily contributions, the survey responses indicate that *susu* users contribute a minimum of fifty Ghana pesewas (GHC 0.50) and a maximum of GHC200 with a mean payment of just a little over GHC8.

Among the major reasons for which respondents use *susu* savings rather than formal and semi-formal banking institutions, 42.2% of *susu* users reported that their income is too low and thus they

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can only save small amounts at a time. Besides, 14.9% of *susu* users found *susu* savings more convenient when compared to formal banking institutions. One market woman reports *"I have known susu since my childhood when my mother used to sell in this market. Susu helped her to save small amounts of money every day without having to go to the bank; and so I am following her footsteps."*

On the thorny issue of trust, while about 93% of *susu* users trust their *susu* collectors, about 55% reported that they feel quite apprehensive if they do not see their collectors every day. While 93.5% of respondents own a mobile phone themselves, only 36.5% have ever sent an SMS using their mobile phone. The proportion is much smaller (2.4%) when asked whether they have ever transferred money via their mobile to someone else, although a little over 7% received either money or talk time credit on their mobile phones. Of those who answered in the affirmative, 55.6% reported that it is convenient to transfer money via mobile phone while 22.2% find it easy to do so as well.

As a key determinant for the adoption of MM services, this study reveals that only 36.5% of the respondents would be comfortable texting their *susu* contribution via mobile phone to *susu* collectors. As to whether they are willing to do so in the future, about 41% are willing to transfer their *susu* savings via a mobile phone to the *susu* operators.

Of the remaining 59.1% who are unwilling to transfer their *susu* contribution via mobile phone, 61.8% reported that they either do not have enough knowledge or are not conversant with some of the functions of mobile phones. A trader laments that: *"ever since I bought my phone there are only two things I can use the phone to do, make calls and pick calls that is all – how can I then send money with it?"* Others (14.6%) are skeptical as to whether their *susu* contributions would be delivered to the *susu* operator. Close to 8% also think that they may forget to send their *susu* contribution if MM is adopted.

As to whether the level of education of the *susu* user has some association with their willingness to adopt MM as part of *susu* services, the results show that about 75% of the illiterate traders and 61 % of primary school dropouts are unwilling to accept MM adoption. This implies that the higher one's educational level, the more willing he/she will be to accept the use of MM.

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**Table 2: Descriptive Statistics of the Variables in the Users Model, and Hypothesized Signs**

Variable	Description	Percent (Mean)	Expected Sign
Gender	1, if female and 0, if male	0.84	+/-
Education Attainment	1, if respondent had at least SHS, 0 if it has no education or highest education is primary or JHS level	0.24	+
Bank Account	1, if a respondent has a bank account, 0 otherwise	0.66	+
Perceived Trust	1, if user will trust the operator more than MM, 0 otherwise	0.88	-
Perceived Ease of Use (PEOU)/	1, if a respondent will be comfortable texting their saving to the operator, 0 otherwise	0.37	+
Operator Presence Matter	1, if a respondent seeing the operator in person influence his/her daily contributions, 0 otherwise	0.64	-
Relative Advantage (Other benefits)	1, if respondent receives any other benefit from operator like loans, 0 otherwise	0.22	-
Complexity/PEOU Knowledge of SMS	1, if a respondent has ever used mobile phone to send SMS text or is comfortable of using text messages, 0 otherwise	0.34	+
Trialability (Use MM before)	1, if the respondent has ever received or sent money through MM in the past, 0 otherwise	0.09	+
Aware of MM (Observability)	1, if respondents is aware of MM money transfer, 0 otherwise	0.76	+
Willingness to accept/reject MM	1, if a respondent will be willing to use MM in sending susu to operator, 0 otherwise	0.38	+
Income	Natural Log of average income of the user in a month	(3.57)	+
Number of Years	Natural log of average years a respondent has been using susu	(1.25)	-

Source: Field Survey, August 2012

### **Logistic Regression Results**

The estimates as presented in Table 3 below show the results of logistic regression estimations of the determinants of willingness to accept or reject mobile money by susu collectors and susu users among market traders. The model fitting information such as goodness of fit, the overall percentage correct and Chi-square test show that the two models are appropriately specified. The findings are generally consistent with the study hypotheses and the existing theoretical literature - innovation diffusion theory and the technology acceptance model- reviewed. Although the present study is of a different methodology and focus, several of the findings are consistent with the previous TAM and IDT research (Lee 2007; Gefen et al., 2003; Tobbin 2011; Lee *et al*, 2011). Generally, in the first estimation, that is, the susu collectors' model, we found Expected Role, Perceived Risk, Education and Age of the collector to be statistically significant to influence the behavioural intention of the adoption of MM.

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**Table 3: Results of Logistic Regression of Susu Collectors' Willingness to Adopt MM**

	Coefficient	Standard	Error Significance
Age square	7.291	4.892	0.136
Age of the collector	-55.996*	34.277	0.102
Perceived Risk (job takeover)	-3.309**	1.229	0.007
Expected Role (RA)	1.853*	1.161	0.101
Perceive Usefulness	0.752	0.88	0.393
Observability (Awareness)	-0.782	1.177	0.507
Transportation	1.036	0.977	0.289
Provision of Extra Services	-2.807**	1.031	0.006
PEOU (Text and Call clients often)	3.22*	1.957	0.1
Trialability (Use MM before)	5.708	5.340	.285
Registered	0.758	0.942	0.421
Ownership	-0.087	1.303	0.947
Gender	-1.626	1.332	0.222
Education	1.274**	0.474	0.007
Constant	96.985*	58.463	0.097
Number of observation	90		
Overall Percentage Correct	90.9		
Nagelkerke R-square	.747		
-2 Log likelihood	41.271		
Chi-square	53.13		0.000

Source: Field Survey, August 2012

NB: \*: significant at 1% level, \*\*: Significant at 5% and significant at 10% level

In contrast, in the second estimation - that is the Susu user's willingness to accept MM model, we found Trialability, Observability, Compatibility, Education attainment, as well as the influence of the physical presence of the susu collector to be statistically significant in influencing one's behavioural intention to accept MM in place of a pre-existing saving channel. With regard to education, we found a positive and significant impact on willingness to accept among both susu collectors and users. This implies that the higher one's educational level, the more compatible the individual will perceive the usefulness of MM and thus have a positive intention to adopt. This result is consistent with other previous studies (Tobbin 2011; Medhi et al., 2012) that have found illiteracy (which also relates to financial illiteracy) to be an important barrier to people's propensity to adopt MM. Since most of the Susu users in the local markets have a low level of education, and MM involves the use of technology, it is not surprising we found a very low MM uptake among them. Even among the collectors who happened to have a relatively higher average education level than the susu users, PEOU or knowledge in mobile phone and SMS texting was found to have a negative impact on their behavioural intent to adopt.

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**Table 4: Results of Logistic Regression of Susu Users' Willingness to Accept MM**

Variable	Coefficient	Standard Errors	Significance
Education Attainment	1.082**	0.529	0.041
Gender (Male)	0.082	0.601	0.892
Trialability (Experience with MM)	3.691**	1.244	0.003
# of Years of Usage of Susu	-0.062	0.181	0.732
Observability (Awareness)	1.294**	0.64	0.043
PEOU (Knowledge in SMS)	0.485	0.526	0.357
Relative Advantage (Other benefit)	-0.461	0.629	0.464
Relative Advantage (Operator Presence Matter)	-1.747***	0.456	0
Perceived Trust	-2.148***	0.57	0
Bank account	-0.464	0.474	0.327
Constant	1.006	1.134	0.375
Number of observation	172		
Overall Percentage	80.5		
Nagelkerke R-square	0.537		
-2 Log likelihood	139.538a		
Chi-square	84.7		0.000

Source: Field Survey, August 2012

NB: \*: significant at 1% level, \*\*: Significant at 5% and significant at 10% level

Closely related to the educational finding is the issue of awareness or observability. The level of awareness of MM by a susu user has a positive and significant impact on behavioural intention or willingness to adopt MM. This suggests that the more one is aware or has the opportunity to observe MM, the higher the propensity to adopt MM. This implies that awareness creation and financial education are key drivers of MM adoption. Furthermore, perceived trust and perceived risk are found to be barriers to propensity to adopt MM or having a negative influence on behavioural intent of adoption. While perceived risk has a negative and significant impact on behavioural intentions among susu collectors, among the users issues of trust appear to be a key barrier to MM adoption. The perception of risk here relates to the collector's fears of losing a job in the event that MM is adopted in the operation and so this finding is not surprising. On the other hand, perception of trust among the potential users appears to have the strongest influence on propensity to adopt since it is significant - at 1% level of significance. This is because many of the respondents were concerned about the safety of their savings if for example the network fails in the middle of sending money or phones get lost etc. They appear to trust their susu collectors to ensure the safety of their money more than a mediated human-devoid technology.

The issue of trust was also somewhat reflected in the findings that the sheer presence of a susu collector is socially significant to the susu user. We found this variable to have a significant but negative impact on susu user's willingness to adopt MM. Many of the market women interviewed in the field were of the opinion that quite apart from trust, the daily presence of their susu collector motivates them to honor their savings commitment and so they were not sure whether an MM platform is capable of doing the same. One of the market traders interviewed said that *"truly, there are times I have to borrow to make my savings since I do not want the operator to feel that I am not a serious client or to avoid his rebuke"* Another person also said that *"sometimes I tend to forget all about making my daily payments but once my operator shows up I remember and quickly pay"* The majority think MM will lead to a diminished interest in savings commitments.

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Other variables found to be drivers of MM are expected role and the age of the collector. Susu collectors, who believed that MM adoption can still offer them an opportunity to be agents for telecom operators, were more likely to adopt if it is deployed in their operation. This they believe is a way of assuaging their risk of losing their very lucrative job of deposit collection. The results also suggest that the younger the collector the more likely he or she will have a positive behavioural intent. In other words, the negative but significant results on age suggests that older age is a barrier to adoption, probably due to the complexity of usage and loss aversion since most of the older people have long been exposed to susu and do not wish to lose this ancient and familiar tradition to new and uncertain technology.

### Concluding Remarks

The study provides some insights into the ancient susu saving operation in Ghana and the behavioural intention or the willingness of collectors and users to adopt MM platform in operations. More specifically, the study investigates factors that determine one's intention to adopt mobile money as a saving channel, particularly in place of a more traditional way of saving among many people in West Africa. Using field survey data from traders and susu collectors from various markets in Ghana, and applying Innovation Diffusion Theory (IDT) and Technological Adoption Model (TAM) conceptual frameworks, the study reports a variety of interesting findings as follows:

Generally, among the *susu* collectors, we found perceived risk, education level, relative advantage, and the age of the collector to be statistically significant in influencing the behavioral intention of MM adoption. With respect to *susu* users, we found such concepts as trialability, observability or awareness, compatibility or education attainment, as well as the influence of the physical presence of the *susu* collector to be statistically significant in influencing one's behavioral intention to accept MM. These findings have important implications for MM uptake and the modernization of the *susu* operations in Ghana. While MM uptake remains significantly low, these findings suggest that the way to increase uptake is to create more awareness, embark on financial literacy programs, and reduce the mistrust and perception of risk of the entire MM platform.

Although these findings are largely consistent with many previous studies on MM adoption, some of the findings are quite striking and may require further empirical research. For instance, the finding that the daily physical presence of their *susu* collector is the primary reason that motivates *susu* users to honor their savings commitment is potentially an important factor in explaining why respondents were not sure whether an MM platform would be an effective method of saving. The issue, then, is to what extent does the human factor matter vis-a-vis technology in encouraging saving among low income earners in developing countries.

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