# Guess who is not Using Mobile Money in Sub-Saharan Africa?

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#### Abstract:

Mobile money, which is a mobile-phone-based service, sends and/or receives money across a wide geographical area with just a touch of a mobile-phone button. This particular financial product was initially introduced in Kenya in the early part of 2007. Within the first six months of its introduction in Kenya, more than two million people enrolled for the service, partly because the utility emerged as a handy tool for urban migrants to send money back home to their families who resided in villages. This overwhelming response to the service was mainly because of its convenience, safety, and speed. Now, in Sub-Saharan African region, this particular utility is widely used even by businesses for a variety of financial transactions, e.g., paying money to creditors and receiving money from suppliers, paying utility bills, and paying salaries of employees. This research examines whether female-owned firms use mobile money for financial transactions of their businesses. The paper uses World Bank's Enterprise Survey Program Data Set from 2013 and 2016 to investigate this question for small and medium-sized businesses because it is the only data set known to have a set of questions on the adoption of mobile money by businesses in the region. The results indicate that female-owned firms are less likely to use mobile money than their male counterparts. These results are potentially of great significance because more than a third of small and medium-sized businesses in the region are owned by females, making them an important element of the economy in the region.

Key Words: Mobile money, Female-owned firms, Financial inclusion and Sub-Saharan Africa

# 1. Introduction:

The African Development Bank aims to achieve comprehensive access to financial services in the region. In particular, the Financial Sector Policy and Strategy that is put forth by The African Development Bank views digital-based-monetary solutions as the most encouraging approach for making financial services affordable to the poor. However, challenges remain to be addressed in various forms. One of the major challenges is innovation and adoption of pro-poor products and services that are coupled with delivery mechanisms that can deliver broad based financial services in economically viable ways. To address these challenges, *mobile money* can be a viable solution, which not only economical but also simple to adopt for users.

Mobile money is a mobile-phone based service that can store money and can transfer money across large geographical areas with speed, safety, and at an affordable price. This service has become extremely popular in Africa since the past decade. This service has transformed the lives of people in Africa who have little to none access to banks or to post offices or to other financial services for storing as well as sending and receiving money with certainty and on time before the launch of mobile money. The service was first introduced in Kenya in the early part of 2007 for workers, who lived in urban areas, to send money back home to their families who lived in villages. In the first six months, more than two million individuals signed up for the service and made it one of the fastest growing utility in the country.

There are various reasons for this stellar up take of the service in Kenya. In order to understand this overwhelming adoption of the service, we need to know employment structures in the country. A majority of males in Kenya live in urban areas because of their jobs, but their families live in villages to take care of their ancestral lands. So, when these urban-migrant workers want to send money back home to their families, they have few options, until the launch of mobile money. Banks and postal services have slim presence in urban areas, let alone in rural areas. Also, sending money back home by some other means such as via friends or cab drivers is not a reliable method for obvious reasons. Moreover, Western Union can be a formidable option, but it is very pricey. Therefore, when the service was introduced, it was welcomed by individuals, particularly who were urban migrants. Additionally, unlike banks or postal services, mobile-money-service providers offer services in mom and pop shops that are available on every nook and cranny. The service has also been introduced in various other African countries such as Tanzania, Uganda, Zambia, Benin, Cameroon, Guinea and Togo.

Nowadays, along with individuals, businesses have also started using mobile money in Africa, thus, making the service more ubiquitous than ever before. Businesses in the region use the service for a variety of financial transactions ranging from making/receiving payments to suppliers/customers to paying utility bills to paying salaries. A majority of businesses report that mobile money save their time in dealing with financial transactions and that they do not have to interrupt their business activities or leave their business premises in order to take care of their business-related financial transactions.

This paper studies the adoption of mobile money by female-owned firms in the region. For this study, the paper uses the World Bank's Enterprise Surveys Program data set for a number of countries in Africa—Kenya, Tanzania, Uganda and Zambia (2013), Benin (2016) and Cameroon, Guinea and Togo (2017). In these data sets, the Surveys specifically ask questions to businesses regarding the adoption of mobile money for various financial transactions. The rate of the adoption of the service at the individual level is more in Eastern-Sub Saharan African countries (Kenya, Tanzania, Uganda and Zambia, except in Benin) than in Western-Sub Saharan African countries (Cameroon, Guinea and Togo) (see Table 3). Part of the reason could be unlike in Eastern Sub-Saharan African countries, in Western-Sub Saharan African countries; mobile money has been recently introduced. Therefore, it may take some time to get the service rooted in the region.

The analysis of the adoption of mobile money by female-owned firms is critical for various reasons. In general, females form a major part of the work force in the region. This fact is very much reflected in the data sets in which more than one third of the firms are owned and managed by females. Also, mobile money increases access to finance and it boosts productivity. Moreover, the utility reduces money lost or stolen in financial transactions. Therefore, a study of adoption of mobile money by female-owned firms is an important aspect that surrounds proliferation of the service in the region because it finds out whether these firms get all the

benefits that are associated with mobile money. The empirical analysis uses a probit model. In the model, a dependent variable represents firms that are owned and managed by females. A key independent variable represents firms that have adopted mobile money for financial transactions. The model also controls for a large number of firm-level variables in order to reduce a selection bias. The empirical results show that firms that are owned by females are *less likely* to use mobile money than their male counterparts. This is a significant result because firms that use mobile money spend less time in financial transactions and can use that time for productive purposes. Also, firms that use mobile money appears to have more access to finance, thus, helps them in financial inclusion.

Contributions of the paper: To best of my knowledge, this is the first paper in the literature on the adoption of mobile money by firms that are owned and managed by female in Africa. As such the paper makes various contributions to the growing literature on mobile money: It analyses the adoption of mobile money by female-owned firms. It studies more than 5,000 firms in a number of African countries—Benin, Cameroon, Guinea, Kenya, Tanzania, Togo, Uganda and Zambia. The study has firms from all the sector and sizes of the economy, and thus making it the perfect representation of the economies under study.

The rest of the paper is organized as follows. The next section offers a literature review that also helps me to find out a literature gap. Section 3 offers an overview of the current state of the adoption of mobile money in the eight countries under study. Section 4 presents an empirical framework. Section 5 shows results and the last section concludes the paper with a few policy recommendations.

#### 2. Literature Review:

The growing literature on mobile money focuses on how mobile or cell phones help mobile money to proliferate in the region, how the people in the region experience improved access to financial services and what positive impacts mobile money has brought in the lives of the people. A majority of the studies are based on surveys that were conducted at local levels, oftentimes at a level of a municipality. One common theme emerges out of these surveys or studies: 1. An increasing number of people has mobile money accounts, 2. Mobile money has helped people to solve their day-to-day problems of access to money and financial transactions, 3. Mobile money has enhanced financial inclusion and 4. Banks have taken encouraging initiatives to team up with mobile-money service providers to increase their number of customers. In what follows is an overview of the literature that discusses the above-mentioned findings about mobile money in the African region. This discussion also helps me to identify a literature gap that this paper seeks to fill.

The literature informs that the main reason for the uptake of mobile money in Sub-Saharan Africa is the explosion of the adoption of mobile phones, which happens to be a basic platform for mobile money (Ivatury & Pickens, 2006; Jenkins, 2008; Mas & Morawczynski, 2009; Mbiti & Weil, 2011; Morawczynski, 2009). Since its launch in early 2007, mobile money attracted more than 2 million customers within a year in Kenya (Jenkins, 2008). There was a great demand for sending and receiving money before the introduction of mobile money, thus, when the service was introduced it dramatically transformed the landscape of money transfer. In Kenya, mobile money users sent more small

and regular remittances than users of other payment mechanism, which leads to a substantial increase in remittances (Morawczynski & Pickens, 2009). Recently, mobile money is also used for international remittances. According to one study by the World Bank, remittances within Africa cost almost 20 percent of the total amount send, which makes the African region as one of the top three most expensive corridors to send money. However, because of the proliferation of mobile money, people can send money within Africa for a fraction of the cost (Scharwatt & Williamson, 2015). Moreover, mobile money accounts can also be used as a safety feature for storing money, particularly when traveling across the region (Medhi, Ratan, & Toyama, 2009).

The proliferation of mobile phones and mobile money has a tremendous potential to bring positive changes in the region in the form of sustainable growth and economic opportunities for a large number of unbanked people (Hughes & Lonie, 2007; Ivatury & Pickens, 2006; Mas & Ng'weno, 2012; Medhi et al., 2009). Jack and Suri (2014) study the impact of a reduced transaction cost on sharing of risks. They show that income shocks lower consumption by 7 percent for people who do not use mobile money, however, consumption of mobile money users remain unaffected.

A crucial step in the mobile money ecosystem was collaboration between banks and mobile-money service providers. Mbiti and Weil (2011) find that the increased use of the service lowered the use of informal-savings mechanisms, and increased the propensity to save via formal bank accounts. Furthermore, mobile money helps individuals to increase their savings (Demombynes & Thegeya, 2012; Jack & Suri, 2011).

The adoption of mobile money by businesses is a recent phenomenon. Mostly, businesses use mobile money for various financial transactions. One study looks at the characteristics of the firms that use the service. for example, Gosavi (2015) studies the characteristics of firms that use mobile money in Eastern Sub-Saharan Africa. She shows that older firms and medium and large-sized firms are more likely to use the service than others. Also the firms that use mobile money are more likely to have bank accounts. Mobile money has also demonstrated to have a positive impact on communities that are surrounded by businesses. Plyler, Haas, and Ngarajan (2010) use ethnographic methods in three communities and show that mobile money vitalizes small business growth and thereby enhances the dissemination of money in those communities.

## Contributions of the paper:

While the existing literature exclusively focuses on the household use of mobile money with a few exceptions, this paper is the first—to best of my knowledge—that focuses on adoption of mobile money by female-owned firms in eight African countries that offers an empirical analysis on this topic. This paper makes three important contributions to the

<sup>1</sup> The World Bank, "African Migrants Could Save US\$ 4 Billion Annually On Remittance Fees, Finds World Bank", 28 January 2013, available at: http://www.worldbank.org/en/news/press-release/2013/01/28/african-migrants-could-save-US4-billion-annually-remittance-fees-finds-world-bank

growing literature on mobile money: 1. It provides empirical analysis of the usage of mobile money by female-owned firms, 2. The study has more than 5,000 firm-level observations from 8 African countries and 3. It studies firms from all the sectors—retail, service, and manufacturing and sizes—small, medium, and large.

# 3. The State of Mobile Money Adoption in the Region:

This section offers an overview of the present state of the adoption of mobile money in eight countries—Kenya, Tanzania, Uganda and Zambia (Eastern Sub-Saharan countries) and Benin, Cameroon, Guinea and Togo (Western Sub-Saharan countries) (see Table 3). The countries are divided into two categories because the data set for Eastern Sub-Saharan countries is from 2013 and for Western Sub-Saharan countries is from 2016. The service was originally started in Kenya in the early part of 2007 to cater the demand of urban migrants to send money back home for their families in villages. Within first two months, more than two million individuals signed up for the service. A phone company—Vodafone—that introduced the service was also taken up by a surprise because they had no idea about this overwhelming uptake of the service.

Although Kenya is touted as a country where mobile-money service originated, Tanzania, where the service started in 2008, is also catching up. Currently, Tanzania has four service providers with average transaction value of \$29, the same number for Kenya is \$19<sup>2</sup>. In 2014, service providers in Tanzania started an account-to-account interoperability, which allowed the users to send and receive money even though they belong to different service providers<sup>3</sup>. Interoperability is critical for both—competition among service providers and convenience of customers.

In Uganda, mobile money was introduced in the early part of 2009. Currently, the country has five service providers and the users are increasing at a steady pace. Service providers and financial institutions in the country are working together to increase and educate the customer base because access to mobile money will not automatically translate into usage<sup>4</sup>.

The story of mobile money adoption is not different in Zambia than it is Kenya and Uganda. Since four years of introduction of the service, according to the reports of the Apex Bank of Zambia, the number of mobile money accounts has outpaced the number of bank accounts<sup>5</sup>. These surprising numbers certainly help us understand the need for a safe, fast and cheap source of financial transactions in developing countries.

<sup>&</sup>lt;sup>2</sup> http://www.cgap.org/data/infographic-tanzanias-mobile-money-revolution

³ https://www.gsmaintelligence.com/research/?file=5176a26de119933587cb93811eb81be4&download

<sup>&</sup>lt;sup>4</sup> http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/06/m4dmobilemoney.pdf

<sup>&</sup>lt;sup>5</sup> http://www.pcadvisor.co.uk/feature/enterprise/mobile-money-accounts-surpass-bank-accounts-in-zambia-3516124/

Although, in Cameroon, the service was launched in 2008 by a single service provider, it took some time for the service to take its roots in the country. Currently, the country has four service providers and the number of users are growing at a constant pace (see Table 3). The service offers all the standard features of mobile- money service—payment of various bills and disbursements.

Benin is a low-level income country in Sub Saharan Africa with a population of around 11 million. The service was launched in the country in late 2013 and is regulated by the regional regulators located in Senegal. There are currently three mobile-money service providers with about 600 registered agents of the service in the country and about 500,000 mobile money users, out of which only 10% are active (CGAP, 2015)<sup>6</sup>.

## 4. Econometric Methodology:

In order to develop the model under study, the paper focuses on the characteristics of females and various reasons given by these female users for using mobile money. The male and female users of mobile money have relatively the same expectations from the service. For example, Ndiwalana, Morawczynki, and Popov (2010) in their survey results on the adoption of mobile money by individuals from Kenya show that rankings provided by males and females (respondents' male to female ratio is 67:33 and 56.2 percent have a post-secondary education) on importance of various proposed financial transactions are by and large identical for both gender groups. The respondents would like to have services such as payments for transportation, hospital/clinic bills, utility bills, and market purchases on their mobile-money services. The only sticking point in the survey regarding the proposed financial transactions is the "send money to myself" option is ranked 14<sup>th</sup> by males and 19<sup>th</sup> by females. As far as age groups are concerned, respondents who are younger than 20 years have ranked betting and lottery higher (10<sup>th</sup>) as oppose to other age groups that have ranked the similar option in the bottom.

Mobile money offers a few additional benefits to the female users, though. In her field research of 14 months in two locations in Kenya, Morawczynski (2009) interviewed urban migrants, who send money back home, and their rural recipients. Her study focuses on the impact of mobile money on the livelihoods of the people who receive this money. Responses of female users in the Kibera area reveal that a mobile money service—M-PESA—acts as "secret savings" for them. They state that these secret savings are not only handy in case of funding emergencies such as hospital visits but also useful in case of buying groceries and for paying school fees. The women further say that they like to keep money outside of their homes because they fear that their husbands may find these saving and take away that money from them. Additionally, they claim that they prefer mobile money to banks because it is more accessible, in that they do not have to travel into town to deposit or withdraw money. Also, they can check account balances anytime on mobile phones without even their husbands noticing them. Many

<sup>6</sup> CGAP, 2015 URL: https://www.cgap.org/blog/benin%E2%80%99s-expansion-digital-finance

female respondents also intend to start a small business—selling vegetables—with their mobile money savings. Thus, these so-called "secret-mobile-money savings" have potential to not only fund emergencies in families, but also to nurture entrepreneurial skills in women, thereby making them financially independent.

There is additional evidence that mobile money leads to an increase in savings and financial independence among women. The survey findings of M-PESA users in Kenya show that because remittances in the form of mobile money are invisible, family members, especially women, may be in a position to retain more money than ever before (Jack & Suri, 2011). In addition, Demombynes and Thegeya (2012) also find that the service empowers women by providing them with an independent place—to store and manage their finances—that is not only private but also well beyond the reach of their family members.

Responses from women in a field survey conducted by Morawczynski (2009), highlight a few drawbacks of the service, though. Because urban migrants use mobile money to send money back home, their number of family visits to villages has gone down considerably. The women, in turn, grew unhappy with such an outcome, seeing as their husbands were no longer around to assist them with the farming or with raising the kids. A decrease in family visits may also render urban migrants "lonely," and encourage them to find a "city wife." The undesirable consequences of having a city family may then lead to a reduction or complete elimination of money being sent back home.

I have used the aforementioned attitudes of the women—ranging from secret savings to a fear of having a "city wife"—toward the mobile money adoption at the individual levels to their adoption of the service in businesses. *I argue* that the appeal of mobile money at the individual level for women is mainly because of its secrecy and privacy in transactions and secret savings. However, when women start a business of their own, they can no longer maintain any secrecy with financial transactions of their firms. This may in turn be able to result in less adoption of the service than their male counterparts. Therefore, I argue that firms that are owned by females are less likely to adopt the mobile money in their firms as opposed to their male counterparts. This rationale leads to the following hypothesis and model.

#### Hypothesis:

In a business setting, female-owned firms are less likely to use mobile-money services than their male counterparts.

Regression Model:

Prob (Mobile Money Use<sub>ij</sub> | 
$$FC_{ij}$$
)
$$= \Phi(\beta_0 + \beta_1 Female - owned Firms + \beta_2 FC_{ij}) + \gamma_i country dummy + \varepsilon_{ij}$$

Where, the dependent variable is a dichotomous variable for firms that use mobile money. This variable will be "1", if firms use mobile money and will be "0," otherwise. The key independent variable of interest is whether a firm is owned by a female, making it a dichotomous variable. In order to derive this variable, the paper uses a specific question from

the Surveys—"Are there any females owners in the firms." It follows a method to identify female-owned firms that is applied in papers that also use the World Bank's Enterprise Surveys Program data set (Aterido, Beck, & Iacovone, 2011; Bardasi, Sabarwal, & Terrell, 2011; Hansen & Rand, 2014).

The model also has a vector of standard-firm-level controls—size, age, sector, legal status and bank accounts—to reduce a selection bias. Thus, the probability of the " $i\ th$ " firm that uses mobile money for its financial transactions in the " $j\ th$ " country depends upon whether it is owned by females and various firm-level characteristics denoted by  $FC_{ij}$ . The model also uses a country fixed effect to control for time invariant variables among countries.

#### 5. Results:

The probit-regression results for the adoption of mobile money are indicated in Table 1 (See Table 1). The paper uses data sets from two different time frames (2013 and 2016) and the results are displayed in the column 1 and column 2 respectively. The regression coefficient of the key independent variable—firms that are owned by females—is negative for the four Eastern Sub-Saharan African countries—Kenya, Tanzania, Uganda and Zambia. The regression results for the four Eastern Sub-Saharan African countries clearly indicate that female-owned firms in this region are less likely to use mobile money than their male counterparts. However, for the remaining four Sub-Saharan Africa countries— Benin, Cameroon, Guinea and Togo—the regression coefficient is not statistically significant but has a negative sign. Thus, for the remaining four African countries, a female-owned firm does not make it more or less likely to use mobile money. A part of the reason for these mixed results can be found in the number of years of the availability of the service and awareness of the same. Mobile money was introduced in Eastern Sub-Saharan Africa in 2007 through 2009, which is almost a decade ago. Therefore, people in those countries have sufficient time to know and adopt the service. However, in the remaining four African countries, mobile money was introduced in the later part of 2012. Hence, it may take some time for the service to take its root and penetrate into the society.

Firms-level control variables show mixed results for Eastern and Western Sub-Saharan Africa as well. For the Eastern Sub-Saharan African countries, as far as a size of female-owned firms is concerned, medium and large firms are less likely to use the service than small firms. Also, these female-owned firms are more likely to have bank accounts, which indicate that the service compliments the banking services. However, for Western Sub Saharan African countries, medium-sized firms that are owned by females are more likely to use the service than small firms. Also, firms with the sole proprietorship are less likely to use the service than firms with the limited liability.

# Results:

Table 1: Results of mobile money adoption by female-owned firms

Dependent variable (binary): Use of mobile money by firms for financial transactions (Eastern Sub-Saharan Africa countries: Kenya, Tanzania, Uganda, and Zambia, 2013)

(Other African countries: Benin, Cameroon, Guinea and Togo, 2016)

Independent Variables	Eastern Sub-Saharan Africa Column 1	Other Sub-Saharan Africa Column 2
Key independent variable:	-0.175	-0.151
Female-owned firms	(1.97)*	(-0.94)
Firm Level Control Variables		
Medium-aged (5 to 10 years)	0.063	-0.248
	(0.62)	(-1.31)
Old-aged (10 to 99 years)	0.115	-0.093
,	(1.26)	(-0.57)
Firm Size [dummy, the omitted size is small firms (5 to 19 workers)]		
Firm size: medium (20 to 99	-0.263	0.265
workers)	(3.86)**	(2.04)**
Firm size: large (more than	-0.416	0.212
100 workers)	(3.88)**	(1.31)
Sector type [dummy, the omitted sector is services sector]		
Sector type: manufacturing	-0.098	-0.183
	(1.23)	(-1.31)
Sector type: retail	-0.098	0.008
	(1.14)	(0.07)
Firms with bank accounts	0.188	-0.113
	(2.24)*	(-0.72)
Firm's legal status [dummy, the omitted type is limited liability]		
Firms with sole proprietorship	-0.076	-0.445
-	(1.07)	(-3.66)***
Firms with partnership	0.036	-0.055
	(0.38)	(-0.14)
Country Dummy	YES	YES
Pseudo R-Squared	0.1687	0.074
N	2552	752

Source: Based on author's calculations of the World Bank's Enterprise Surveys Data (2013 and 2016) Note: p < 0.05; \*\* p < 0.01

#### 6. Conclusions:

Africa, which is a continent with fifty countries, has majority poor countries that have a frustratingly low rate of inclusion of financial services. According a World Bank report, only one third of the population in Africa has accounts in banks and the number of ATMs is 5 per one million people. Thus, access to financial services and inclusion of the people in the financial sector remain a challenge and a vexing problem for the governments in the continent. However, in the recent years astronomical increases in the number of cell phone users and a mobile-phone based utility—mobile money—have helped the continent to mitigate some of the challenges. For example, mobile money has helped speed and safety of financial transactions at individual levels. Now, this utility has also helped business in the region in a variety of ways—a reduction in time for financial transactions, a reduction in theft of money, an increase in financial access, an increase in productivity of firms. Thus, mobile money has emerged as a solution to a wide range of problems that the African continent has faced for a long period of time.

This paper specifically analyzed the adoption of mobile money by female-owned firms in eight Sub-Saharan African countries. This analysis is important because more than a third of businesses in the region are owned by females, thus, it makes these firms a very critical component of the economy. To do the analysis, the paper used the World Bank's Enterprise Surveys Program data set from two years—2013 and 2016. After controlling for a large number of firm-level characteristic, the empirical results showed that female-owned firms in Eastern Sub-Saharan Africa were less likely to use mobile money than their male counterparts. This result is of a significant importance because there are numerous advantages of adoption of mobile money by businesses—financial inclusion and improved productivity. These advantages range from a reduction in time for financial transactions through increased productivity to increased financial inclusion. Because a large number of firms in the region are owned by females, these firms are not able to take advantages of this utility, thus, putting them in a disadvantageous position compared with other firms.

To this end, governments in the region can play an important role to increase the adoption of mobile money by female-owned firms. For example, governments can educate females about the advantage of mobile money for their businesses. Governments can also offer monetary incentives in the form of tax credits for using the utility by female-owned firms. Additionally local agencies or not-for-profit organizations can form a group of firms that use mobile money and can make use of this group to talk to local businesses that are owned by females.

<sup>&</sup>lt;sup>7</sup> The World Bank's World Development Indicators, 2016.

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Table 2: Population in the countries under study:

Year/Country	2012	2013	2014	2015
Benin	10,049,792	10,322,232	10,598,482	10,879,829
Cameroon	21,659,488	22,211,166	22,773,014	23,344,179
Guinea	11,628,767	11,948,726	12,275,527	12,608,590
Kenya	42,542,978	43,692,881	44,863,583	46,050,302
Tanzania	48,645,709	50,213,457	51,822,621	53,470,420
Togo	6,745,581	6,928,719	7,115,163	7,304,578
Uganda	35,400,620	36,573,387	37,782,971	39,032,383
Zambia	14,786,581	15,246,086	15,721,343	16,211,767

Source: World Bank Development Indicators, 2016

Table 3: The number of mobile-money users:

Country	2012	2013	2014	2015
Benin	n/a	364,154	1,097,021	n/a
Cameroon	622,144	1,903,390	3,619,589	n/a
Guinea	50,000	172,736	613,047	641,881
Kenya	21,060,000	25,326,333	25,249,200	31,642,400
Tanzania	26,871,176	31,830,289	41,380,791	53,843,917
Togo	n/a	364,154	1,097,021	n/a
Uganda	8,870,873	14,243,379	18,800,416	21,102,851
Zambia	1,404,822	2,497,720	4,806,479	4,917,204

Source: CGAP, 2015