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Determinants of the use of Mobile Banking in Africa: Case of Burkina Faso

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Abstract

Since a few years, the banking sector in Africa has been transformed. The main factors that explain this transformation include the deleting of the regulatory measures of financial services, the effects of the globalising world and in particular the evolution of information technologies. It is now possible to offer alternative channels of distribution of services such as ATM and vending machines, credit cards and the mobile phone. The operators in the banking sector argue that the mobile bank would provide new opportunities for profits, cost reductions and a delivery of better services for customers. The objective of this paper is to analyse the determinants of the use of mobile banking in Burkina Faso. Taking into account the main variable of a qualitative nature, we used the logit model to perform the different estimates. Apart from the quality variables, gender, age, locality, it is that all the variables are significant to the thresholds of 1%, 5% and 10%.

Keywords: Adoption, Mobile Banking, Africa, Costumer

1. Introduction

The mobile phone which was a rare device in many developing countries at the beginning of the century now seems to exist everywhere. Between 2000 and 2017, the number of mobile phones used in the world has increased from less than a billion units to about seven billion. The mobile phone revolution transforms the means of subsistence, helps to create new economic activities and modifies the way we communicate. The mobile telephone network is already the biggest "machine" that the world has ever known, and now this machine is used to create development opportunities on a scale never imagined before. During this second half of the decade of the new millennium, to exploit the maximum the possibilities offered mobile telephone is a challenge that will also mobilize the governments very well, the private sector in the world of development (World Bank, 2012).

In Africa and particularly in Burkina Faso, unlike the use of counters of automatic distribution and the credit card which has become a common practice among the consumers of Burkina Faso, the mobile bank remains very little used. In effect, the banking service on the Internet the most currently used is limited to the consultation of the balance and movements of transfers and levies. Yet, some banks offer via the mobile phone several services such as credit transfers, direct debits, the opposition on check or on credit card stolen or lost and the stock exchange transactions in real time. In other words, the customer can perform banking transactions at any time without going through the agency (Kopicki and Miller, 2008).

This fact, each wave of innovations in the technologies of the information and communication technology (ICT) has been the carrier of a strong industrialization and computerization of the process which have disrupted the activities of back-office and the organization of the information systems banking (IF).

It is in this framework that we aim by the present study to understand: what are the factors that could determine the use of online banking services by the consumers of Burkina Faso? What changes must be made to the existing models of acceptance of technologies to explain the behaviour of the consumer of Burkina Faso in the face of the advent of banking services on the Internet?

The main purpose of this article is to analyse the determinants of the penetration of mobile banking in Africa especially in Burkina Faso.

In a specific way, it is to determine the characteristics of the exogenous use of mobile banking which could influence the decision of the individual and to analyse its behaviour on the likelihood use of the service mobile banking.

2. Review of the Literature

The literature review of this study focuses on the theoretical review and the empirical review of the subject.

2.1 Theoretical Inputs of the Use of Information Technologies: Mobile Telephone

• Waverman and Alii (2005) find a positive impact on the use of the mobile banking on economic growth in an environment of competition. Ten mobile phones for additional 100 people in a country in developing cause a growth of 0.6 percentage points of GDP per head about two times more than in the developed countries. These results are consistent with the postulate that the phone mobile denies plays, in the less developed economies, the same crucial role played by the fixed telephone in a more affluent economy during the years 1970 and 1980.

• Lee et al (2009) examine as to them the impact of mobile telephone on the economy in sub-Saharan Africa, where a significant asymmetry has been observed between the penetration of fixed lines and that of mobile telephone, in favour of the latter. The findings of this study show that the expansion of the mobile phone is a determining factor for the rate of economic growth of the countries of this area.

• The Theory of Reasoned Action (Fishbein and Ajzen, 1975) is characterized by the basic structure Attitude - Intent - behaviour and also highlights that built subjective standards. It has been widely applied to study the behaviour of consumers in the field of information technologies and the models developed show a strong predictive validity and fit very well to the empirical data (Davis, 1989; Ajzen, 1991; Taylor and Todd, 1995).

• Taylor and Todd (1995) apply the theory of planned behavior of Ajzen (1991) in the context of the use of information technologies and conclude that the subjective standards and the perceived behavioural control contribute strongly to the explanation of the intent. They have also demonstrated the significant effect of self-efficacy on the perceived behavioural control.

• Social Cognitive Theory of Bandura (1986) has been at the basis of the work of Thompson, Higgins and Huff (1999) to predict the use of individual computers. The latter have conferred another role to the variable auto efficiency which is a direct effect on the behaviour of use.

Several research studies have applied these theories in the specific context of the bank online. The results confirm the relevance of the concepts mentioned above to explain the determinants of the use of banking services on the Internet. On the other hand, several other empirical research qualitative and quantitative surveys were conducted to study the adoption of the bank online and have highlighted new explanatory variables of the use of banking services on the Internet.

2.2 Using of the Mobile Banking in Burkina Faso: Empirical Review

Burkina Faso has made notable progress in the field of infrastructure, particularly in ICT. Despite the widespread poverty in the country, a good part of the population of Burkina Faso use mobile phones (Garmendia and Torres, 2011). Although the country has adopted the institutional key as one of the reforms, such as the liberalisation of the market and access to private capital in order to allow for the expansion of the use of ICT, Burkina Faso is still faced with many challenges in the implementation of ICT.

In the working document of the World Bank, Garmendia and Torres (2011) have pointed out the inadequacy of infrastructure and the relatively high prices for the use of ICT by report to other African countries. The lack of skills and knowledge on how to use the technology and support have been set forth as additional factors in relation to the challenges of ICT in Burkina Faso (AGRA, 2013, p. 24). 1996 was the year where the population of Burkina Faso had begun to use mobile phones. It has been made thanks possible to funding from the society Telmob, which was the first mobile phone company in the country (Anago, 2004). In 2005, the penetration of the mobile in Burkina Faso is high at 5.3% users of citizens, whereas in 2009; the number had increased to 29% (Garmendia and Torres, 2011). In 2009, only 11.9% of the population over the age of 16 in Burkina Faso has had access to a bank account, while almost 30% of the same population had a mobile phone (Comninos et al. 2009, p. 3).

Of our days, the rate of penetration of the mobile in Burkina Faso amounts to 43% (EHNA, 2015). Burkina Faso is considered as a high-growth markets for telecommunications in Africa. Already in 2010, the penetration of the mobile was relatively high, more than 4 million inhabitants, on 16 million, had a mobile phone (Nordblom, 2010). In 2012, the mobile operator Airtel, in collaboration with Ecobank, has launched the service of payment M-ligdi, or M-money, to improve access to financial services between the Burkinabe. In Burkina Faso, as in many other developing countries, only people with high incomes, have access to formal financial services. Thus, most of the

people in developing countries have already been dependent on informal channels risky and expensive. With the introduction of mobile financial services, the value of money transfers made through mobile phones should increase in a manner significant to contribution to the continued to increase the confidence in these services in collaboration with the growing number of providers offering services of m-payment (APO, 2012).

3. Methodology

The emphasis here is on the point of the objectives defined in the introduction as well as the assumptions made. The methodology will be the subject of the presentation of database, which will enable us to make the estimates, and the presentation of the model defined.

3.1 Reminder of the Objectives and Assumptions Made

The main objective of this study mentioned in the introduction, is to analyse the determinants of the penetration of mobile banking in Africa, especially in Burkina Faso.

In a specific way, it is to determine the characteristics of the exogenous use of mobile banking which could influence the decision of the individual and to analyse its behaviour on the likelihood of use of the service mobile banking.

As assumptions we enumerate two following points:

H1: The determinants of penetration of mobile banking have an influence on the use of services Mobile Banking of an individual in Burkina Faso.

H2: The use of the Service Mobile Banking of an individual depends on its socio-economic and geographical situation.

3.2 Presentation of the Database

The database is the result of an investigation carried out in Burkina Faso in 2015, in the framework of a study on the mobile banking in Burkina Faso. It is an investigation by random sampling with national coverage which is call to a method of sampling. We have here a sample of 503 individuals spread over the whole of the national territory of Burkina Faso.

The overall sample size for the survey initially focuses on 509 individuals whose 8 live in the villages, 37 in a rural environment, 222 in a city council and 242 in a chief place of region.

3.3 Presentation of the Model

First, we construct a binary variable Y which is 1 if the individual uses of the service mobile banking and 0 if it does not use.

Then we can associate with this variable Yi, a value yi* which corresponds to its usefulness when it chooses to use the service mobile banking. This variable Yi* depends on the socio-economic characteristics of the individual (noted XI), and an error term (εi), either yi* = Xiβ εi.

The usefulness is a variable of the fact of the presence of the error term εi. Then we can define a criterion of choice of the individual: if the usefulness that it withdraws from the connection is greater than a certain value (A), then he will choose to adopt the use of the mobile service banking via a telephone network, but if its usefulness is less than this value, it chooses not to subscribe.

This gives then:

$$\begin{cases} \mathbf{Yi = 1 \text{ si } Yi} > A \\ \mathbf{Yi = 0 \text{ si } Yi \leq A} \end{cases}$$ With $\boldsymbol{Yi}=\mathbf{1}$ If the individual uses the service mobile banking, $\boldsymbol{Yi}=\mathbf{0}$ If not.

The realization of Yi (observable) comes from an underlying model, expressed by the latent variable (not observable) Yi*.

The decision rule becomes:

$$\boldsymbol{P}(\boldsymbol{Yi}=\mathbf{1}) = \boldsymbol{P}(\boldsymbol{Xi\beta}+\mathbf{Ui}>\mathbf{A}) = \mathbf{1}-\mathbf{P}(\mathbf{Ui}\leq\mathbf{A}-\mathbf{Xi\beta})$$

$$\boldsymbol{P}(\boldsymbol{Yi}=\mathbf{0}) = \boldsymbol{P}(\boldsymbol{Xi\beta}+\mathbf{Ui}\leq\mathbf{A}) = \mathbf{P}(\mathbf{Ui}\leq\mathbf{A}-\mathbf{Xi\beta})$$

P (Yi=1) refers to the probability that the individual adopts the use of mobile service banking and P (Yi=0) the probability that it does not adopt.

The choice is focused on the logit model simply because of the independent variable to qualitative character (use of service mobile banking).

Taking into account a few exogenous variables, the linearized model can be written as follows:

Using = a0 + a1Quality + a2Sex + a3Age + a4Locality + a5Level of instruction + a6Expenditure +a7Number of SIM + a8Amount of money sent + a9Amount of Money Received + εi

Use of service Mobile banking is an endogenous variable of the model. It allows you to know, is what the individual uses the service mobile banking or not.

- The quality of the telephone network allows us to have an idea on the good quality of the telephone network in order to facilitate the use of service mobile banking,
- The variable type is decomposed into masculine and feminine gender.
- The variable age of the consumer includes four modalities, including individuals who have less than 16 years, those who have between 16 and 30 years, the category of 31 and 55 years and those who have more than 55 years.
- The variable locality, as', consists also of four modalities. There are individuals who live in the villages, there are those who come from an urban community, other come from a rural community and there are those who live in a chief place of regions. The variable locality, determines the geographical position of the individual.
- The variable statement contains up to eight modalities, ranging from individuals who are not designated up to the higher level. It determines the level of education of the individual who uses the service mobile banking.
- The variable average expenditure represents the average spending per month that the individual uses in the service mobile banking. Expenditures will of less than 1000 francs to more than 20 000 francs per month.
- Number of SIMs used refers to the number of chips of the consumer.
- Amount of transfer of monies sent, this variable represents the overall amount of money transfer sent each month by the individual who uses the service mobile banking.
- Amount of transfer of monies received; is the overall amount of money transfer received each month by the individual.
- εi: represents the error term.

Table 1. Variable "Use of service mobile banking "

Use	Frequency	Percentage	Cumulation
0	361	70,92	70,92
1	148	29,08	100
Total	509	100	100

Source: Our own calculations from the database

4. Results and Interpretations

This part is the subject of the results of descriptive statistics and the econometric results of the studied model.

4.1 Descriptive Statistics

According to the results, we can say that on the 509 individual respondents, there has 148 people who use the service mobile banking and 361 who do not use.

Table 2. Age variable

Ages	Frequency	Percentage	Cumulation
<16	14	2,75	2,75
16-30	244	47,94	50,69
31-55	220	43,22	93,31
>55	31	6,09	100
Total	509	100	

Source: Our own calculations from the database

14 persons respondents are under 16 years of age, a proportion of 2.75%. 244 were between 16 and 30 years, either 47, 94 %, 220 have between 31 and 55 years, 43.22 % and 31 individuals have more than 55 years.

Table 3. Locality variable

Locality	Frequency	Perrcentage	Cumulation
In the village	8	1,57	1,57
In the rural community	37	7,27	8,84
In the urban community	222	43,61	52,46
In a chief place of region	242	47,54	100
Total	509	100	

Source: Our own calculations from the database

According to the result on the locality, there are 8 people who live in a village, 37 individuals are living in a rural community with a percentage of 7.27%. 222 individuals are in an urban community, with a percentage of 43.61% and 242 people live in a chief place of region.

Table 4. Type variable

Type	Frequency	Percentage	Cumulation
Men	339	66,60	66,60
Women	170	33,40	100
Total	509		

Source: Our own calculations from the Database

The total number of individuals of the male sex respondents is of 339 a proportion of 66, 60%. One of the persons of the female sex rises to 170, either a percentage of 33.40%.

Table 5. "Level of instruction" variable

Level of instruction	Frequency	Percentage	Cumulation
None	41	8,06	8,06
illiterate	43	8,45	16,50
Primary school	55	10,81	27,31
Secondary 1	114	22,40	49,71
Secondary 2	82	16,11	65,82
Superior 1	64	12,57	78,39
Superior 2	93	18,27	96,66
Superior 3	17	3,34	100,00
Total	509	100	

Source: Our own calculations from the database.

On the 509 people surveyed, 41 people are not pronounced, 43 people are illiterates or 8.45%, 55 are in primary school with a percentage of 10.81%. 196 individuals are at the secondary level is 38.51. And 174 people are at the top level.

Table 6. "Average spending for mobile services" variable

Expenditure	Frequency	Percentage	Cumulation
Less than 1000 F	66	12,97	12,97
Between 1000 F and 5000F	196	38,51	51,47
Between 5000 and 10 000F	95	18,66	70,14
Between 10 000F and 20 000F	83	16,31	86,44
More than 20 000F	69	13,56	100
Total	509	100	

Source: Our own calculations from the database.

According to the table, 66 people spend less than 1000F for the use of service mobile banking. 196 individuals spend between 1000F and 5000F, is 18, 66%. 95 spend an average of 5000F and 10000F. 83 spend between 10 000F and 20 000F on average per month. And 69 people spend more than 20000F.

Table 7. Nombers of SIM Cards

Nombers of SIM cards	Frequency	Percentage	Cumulation
1 SIM	96	18,86	18,86
2 SIM	175	34,38	53,24
3 SIM	169	33,20	86,44
4 SIM	45	8,84	95,28
5 SIM and more	24	4,72	100
Total	509	100	

Source: Our own calculations from the database.

96 people on 503, either 18, 86 % use only a SIM card. 175 individuals use two sim cards at the time, either a percentage of 34, 38 %. 169 individuals use 3 chips at a time. 45 People use 4 chips at a time. And a minority of persons both 24 use 5 chips and more.

Table 8. Amount of Money Transfers sent

Amount	Frequency	Percentage	Cumulation
None	298	58,55	58,55
Less than 1000F	24	4,72	63,26
Between 1000F and 5000F	21	4,13	67,39
Between 5000F and 10000F	31	6,09	73,48
Between 10000F and 20000F	24	4,72	78,19
More than 20000F	111	21,81	100
Total	509	100	

Source: Our own calculations from the database.

On the table above, 298 individuals are not pronounced on the amount of transfer of money sent monthly. 24 individuals, either a 4.72% to send fewer 1000F per month. 21 people send between 1000F and 5000F. 111 individuals, either 21.81 send more than 20000F per month.

Table 9. Amount of Money Transfers received

Amount	Frequency	Percentage	Cumulation
None	251	49,31	49,31
Less than 1000F	18	3,54	52,85
Between 1000F and 5000F	33	6,48	59,33
Between 5000F and 10000F	28	5,50	64,83
Between 10000F and 20000F	31	6,09	70,92
More than 20000F	148	29,08	100
Total	509	100	

Source: Our own calculations from the database.

We have here, 251 individuals who are not pronounced on the amount of transfer of money received on a monthly basis. 18 individuals, either a 3.54% receive less than 1000F per month at work the service mobile banking. 33 people receive between 1000F and 5000F via the mobile banking. 148 individuals, either 29, 08 send more than 20000F per month.

4.2 Econometrics Estimates

Table 10. The results of estimates of the LOGIT model gives us the following table:

VARIABLES	Logit coeff
Quality	0.133
	(0.152)
Type	-0.280
	(0.252)
Age	-0.0280
	(0.203)
Locality	0.0641
	(0.182)
Level of instruction	0.226***
	(0.0669)
Expenditure	0.195*
	(0.108)
Nomber of SIM	0.337***
	(0.118)
Amount sent	0.199***
	(0.0615)
Amount received	0.185***
	(0.0542)
Constant	-4.843***
	(1.131)
Observations	509

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Our calculations from the basis of survey data.

The estimates of the variables in a whole, are all significant at thresholds of 1%, 5% and 10%, except the variables quality, gender, age, community who are not.

The quality of telephone networks is not significant on the use of mobile services banking, but it has a positive effect of 13.3%. We can say that the quality of networks has no major impact on the use of mobile banking in Burkina Faso.

The kind of individuals is not of the same significance on the use of service mobile banking. But it has a negative effect of 0.280 on the endogenous variable.

The age is not significant on the main variable (use of services Mobile Banking). The locality is not as significant on the main variable.

The level of instruction is significantly positive of 1% on the use of service mobile banking in Burkina Faso. In other words, the higher the level of education increases, more individuals are interested in the service mobile banking.

The expenditures in the telephone service impact positively the use of mobile services banking of 10%. We can say that the more the telephone expenses of the individual increases, the more it has a tendency to use the service mobile banking.

The number of SIM used by the individual impacts also positively of 1% on the use of service mobile banking. That is to say, more up-to-the number of chips of the individual of Burkina Faso is large, the more he uses the service mobile banking.

The amount of transfer of money received by the individual investigated is positively significant to 1% on the use of service mobile banking. The greater the amount of transfer of money received by the individual increases, the more he is interested by the service mobile banking.

Finally the amount of transfer of money received by the individual investigated is the same positively significant to 1% on the use of service mobile banking. The greater the amount of transfer of money received by Burkina Faso investigated increases, it uses the service mobile banking.

5. Conclusion

The explanatory variables of the use of the services of mobile banking have been identified by applying an analysis of thematic content using the Stata software. The analysis of content has allowed us to detect the main determinants explaining the use or non-use of the services of mobile banking in the context of Burkina Faso.

These factors seem to correspond to the existing concepts in the literature. Although it did not emerge from the variables specific to the context of Burkina Faso, we were able to put emphasis on the most important aspects from the point of view of the consumer of Burkina Faso. It is indeed interesting to note that the knowledge of the Bank, the quality of the telephone network and the cost are the units and the most remarkable in this studies.

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