EFFECT OF COVID – 19 ON MOBILE MONEY IN UGANDA

By

Nabukeera Madinah (PhD)
Islamic University in Uganda
Faculty of management studies
Department of Public Administration
nabmadinah@gmail.com

Abstract

During the outbreak of COVID-19 in March 2020 in Uganda, government came up with tough measures to restrain the continuous spread of the Virus in the country. Among the measures put in place included total lockdown where most of the people were limited from moving from one place to another. As a result of the total lockdown, many people could not access their banks/ATM machines to withdraw money to meet their demands at home and were only left with Mobile money transactions. During the period of COVID-19, 15 transactions per month were made by every active mobile money account. Among the transactions made included mobile money-bank transfers, mobile money deposits, and merchant payments among others. Thus, this paper analyzes how the outbreak of COVID-19 affected Mobile money performance by comparing the period before and after the outbreak of COVID-19 in Uganda. A descriptive survey design was used in this study to examine how COVID-19 affected the performance of Mobile money in Uganda. This design concentrated on only quantitative approaches. The study focused only on secondary data which was obtained from Bank of Uganda from October 2019 to September 2020. The findings reveal that mobile money number of transactions had a positive insignificant effect on the value of transactions before COVID-19 period in Uganda (B coeff=18.73, P-value>0.05). However, since the effect was not significant, this implies that before the outbreak of COVID-19 (Oct 2019- Feb 2020), the growth in MM number of transactions had no influence on the value of MM transactions. The study recommended the telecommunication companies should lower the cost of their services like cost of MBs and voice bundles during the period when government imposes lockdown. This is based on the fact that most people were using mobile phones and internet to conduct their businesses and communicate with others during COVID-19.

Key words: Covid-19, Lockdown, Mobile Money agents, Customers, and data bundles.

1.0 Introduction

During the outbreak of COVID-19 in March 2020 in Uganda, government came up with tough measures to restrain the continuous spread of the Virus in the country. Among the measures put in place included total lockdown where most of the people were limited from moving from one place to another. As a result of the total lockdown, many people could not access their banks/ATM machines to withdraw money to meet their demands at home and were only left with Mobile money transactions. During the period of COVID-19, 15 transactions per month were made by every active mobile money account. Among the transactions made included mobile

money-bank transfers, mobile money deposits, and merchant payments among others[1]. Thus, this paper analyzes how the outbreak of COVID-19 affected Mobile money performance by comparing the period before and after the outbreak of COVID-19 in Uganda.

2.0 Purpose and objectives of the study

2.1 Purpose

Examine the effect of COVID-19 on mobile money performance in Uganda.

2.2 Specific objectives

i. Effect of number of transactions on value of transactions before and during COVID-19 period in Uganda.
ii. Effect of number of registered customers on value of transactions before and during COVID-19 period in Uganda.
iii. Effect of number of active customers on value of transactions before and during COVID-19 period in Uganda.
iv. Effect of number of Mobile money agents on value of transactions before and during COVID-19 period in Uganda.

2.3 Study hypotheses

The study sought to answer the following alternative hypotheses;

Ha1: Number of transactions had a significant effect on value of transactions before and during COVID-19 period in Uganda

Ha2: Number of registered customers had a significant effect on value of transactions before and during COVID-19 period in Uganda

Ha3: Number of active customers had a significant effect on value of transactions before and during COVID-19 period in Uganda

Ha4: Number of Mobile money agents had a significant effect on value of transactions before and during COVID-19 period in Uganda

3.0 LTERATURE REVIEW

[1] https://www.monitor.co.ug/uganda/business/finance/mobile-money-transactions-hit-one-billion--3412026

In December 2019, a novel strain of corona virus, that was labeled “disease X” by the World Health Organization (WHO) based on its rate and extent of spread as well as harsh consequences on social, economic and political dimensions of the world. Covid-19 was first identified in Wuhan, China, and continued to spread globally (Shereen, Khan, Kazmi, Bashir, & Siddique, 2020). The World Health Organisation (WHO), in March 2020 declared the COVID-19 outbreak to be a global pandemic (Organization, 2020). As much as the virus was spreading fast in contents such as Europe, South and North America and Asia in Africa it was slow in reaching compared to other parts of the world. Africa’s first COVID-19 case was recorded in Egypt on February 14, 2020. By October 24, 2020, there were 1,696,285 cases of COVID-19 in Africa, with 40,922 (2.4%) deaths and 1,394,094 recoveries (Matovu, Kabwama, Ssekamatte, Ssenkusu, & Wanyenze, 2021).

Uganda reported its first Covid-19 case in March 2020 and started implementing a response to curb the spread. The government of Uganda introduced prevention measures to curb the spread of the pandemic these included closure of schools, colleges and universities; prohibition of gatherings of 10 or more people; country-wide travel restrictions and a curfew running between 19:00 and 06:30 h, among other measures. The extremist measure that Uganda introduced was a lock down of the country that happened in two phases one in March 30, 2020 and in June 6,2021(GoU, 2020). Although these measures were eased as the infections reduced but they had caused a lot of damage on the economic performance of the country.

The ongoing global COVID-19 pandemic has sparked an economic crisis that could surpass the global financial crisis of 2008-2009, this is because of the containment and mitigation measures adopted to limit the spread of the virus that came at the cost of reduced economic activity in many countries (Katusiime, 2021a, 2021b). The COVID-19 pandemic caused a significant global economic shock, triggering the deepest global economic recession in nearly a century (OECD, 2020; Palmer & Small, 2021; Sepulveda, Stall, & Sinha, 2020) and African countries Uganda inclusive have been more severely impacted due to their limited health care capacity, larger informal sectors, shallower financial markets, and poorer governance among other things (Katusiime, 2021b).

As the pandemic continues to affect economic operations many countries Uganda inclusive, their governments are forced to develop appropriate policy responses that address the unintended

negative economic consequences related to the COVID-19 pandemic such use of mobile money. Due to the emphasis to reduce physical contacts among people as it is considered as the major cause of Corona (Covid-19). Governments of many counties in the world, Uganda inclusive have encouraged the use of mobile money a tool of transfer of cash payments among people. This is because mobile money reduces contact with physical cash by facilitating safe and efficient money transfer and payments services, thus contributing to the limiting of the risk of spreading COVID-19 via cash (Katusiime, 2021a, 2021b).

The financial sector in Uganda has undergone rapid transformation over the last two and half decades (Mawejje & Francis Munyambonera, 2016; Mawejje & Lakuma, 2017; Mawejje & Lakuma, 2019). Before, Uganda operated under a system of direct controls on prices and flows of goods and capital in the market economy. But in the early 1990s, following a decade of political instability and economic decline, the government implemented macroeconomic reforms such as encouraging the involvement of the private sector, increased market intermediations among others aiming at returning the economy onto a sustainable growth backed by the assistance from international donors, including the International Monetary Fund and The World Bank .

The impact of these reforms has made a significant reduction in poverty leading to a high and sustained economic growth, earning the country recognition as one of the fastest growing economies on the African continent. Despite these achievements, access to formal financial services in Uganda remains low, though with signs of improvement for instance only 29 percent of the adult population had deposit accounts in formal regulated financial institutions in 2014 compared to nearly 43 percent as at June 2019 (Katusiime, 2021b). Due to inadequate performance of the of the microeconomic reforms implemented by the government its partners largely attributed to the adoption and evolution of mobile money services in Uganda which helped to expand financial services to populations that were previously excluded.

Due to inadequate performance of the of the microeconomic reforms implemented by the government its partners largely attributed to the adoption and evolution of mobile money services in Uganda which helped to expand financial services to populations that were previously excluded. Mobile money services were introduced in Uganda in March 2009 and currently six mobile money schemes, namely; MTN mobile money, M-Sente, Airtel money, Ezee money, M-

cash, and Africell money supported by five operators who collaborate closely with five regulated commercial banks whose role is largely to hold a customer's funds in escrow accounts and to release those funds on demand. With time the service has evolved from person-to-person transfers and storage of electronic value to include other services, such as a way to check bank balances; pay bills, salaries, social benefits and taxes; send cross-border remittances; transfer from a bank account to a mobile wallet; purchase mobile phone airtime; extend micro-finance services and facilitate village savings and loans accounts amongst other services ((Katusiime, 2021b).

Mobile money operation regulated through legal instruments provided in the Financial Consumer Protection Guidelines 2011 and the Bank of Uganda Mobile Money Guidelines 2013 and the main objective of the regulation is to protect users' funds. The outbreak of COVID-19 pandemic, governments worldwide have increased policy support for digital (mobile money) financial services by waiving fees to enable lockdowns and social distancing measures that have been put in place to mitigate the spread of COVID-19. The Ugandan government and business sector have implemented short-term policies to facilitate increased access to mobile services. Even at the international level, the G20 Finance Ministers' and Central Bank Governors' action plan on COVID-19 specifically promotes digital financial inclusion to support economic recovery and it is one of the two key priorities of the G20's financial inclusion action plan for the coming three years - which includes the forcibly displaced as an underserved and vulnerable group to be targeted.

The COVID-19 pandemic has affected almost every sector globally, significantly reducing consumer demand for products and services. Governments worldwide have allocated more than $13 trillion to counter these devastating economic impacts and stabilize economies. However, in business sector national lockdowns necessitated the increase in mobile money services to sustain livelihoods, leading to an increase in the number of new mobile money account registrations and operating costs (Kipkemboi & Bahia, 2019). For instance, the GSMA State of the Industry Report on Mobile Money 2021, indicated an overall growth in mobile money in 2020. The report further revealed that the financial statements of a number of mobile operators released in May 2021 disclose that in the financial year 2020-2021, mobile money transaction volumes and value expanded even though the mobile money revenues declined in some cases. More to that, mobile

money during the covid-19 pandemic crisis has proven to be a helpful tool for promoting resilience by facilitating safe and efficient money transfer and payments services.

Due to that, Workers are able to receive wages, the humanitarian sector is able to disburse humanitarian assistance, the agricultural sector keeps value chains open and users of off-grid solar services can ensure that their phones are fully charged(Muthiora, Awanis, Clifford, Chadha, & Kipkemboi, 2020). Additionally, the outbreak of covid-19 has led to the increase in the number of registered mobile users in the country. And this has strong positive association between economic activity and mobile money usage in both the short and long run horizons in both representations for example in Uganda the number of registered mobile users during covid-19 crisis increased by one million accounts that results 0.02 percentage point increase in mobile money usage at the 5% level (Katusiime,2021). As economic activity increases, households and businesses demand safer and ever faster payment platforms such as mobile money technology which enables e-commerce for small business owners and entrepreneurs who use mobile money as a key part of their business (Katusiime, 2021b).

Likewise, the covid-19 crisis has resulted into a positive effect of inflation on mobile money use, since in Uganda mobile users do not receive interest on their electronic account balances and bear the risk of loss of value through inflation. This may raise concerns from businesses and consumers afraid that rising inflation will erode their future purchasing power. But economists believe that a moderate amount of inflation is considered as a sign of healthy economy because the economy grows through increased competition, innovations that lead to demand increase in the economy and this backed by findings reveled about Uganda's economic reform since 1986 that Uganda's economy is combined with high levels of economic growth with low levels of economic growth (Kuteesa, Tumusiime-Mutebile, Whitworth, & Williamson, 2010; Whitworth & Williamson, 2010).

The increase in the usage of mobile money services during the covid-19 pandemic has led to many informal business transactions into the formal financial systems in Uganda. This implies that the increased adoption of mobile money has increased access to and use of formal financial institutions like banks, by the unbanked mobile money users in Uganda. This is emphasized further by Lwanga Mayanja and Adong (2016) that having many registered mobile money accounts increase the like hood of having some house hold savings, since in Uganda the mobile

money business is jointed with participating banks to provide mobile products such as savings. This will increase on the investment's levels of Uganda as a country.

Although, most of regulatory interventions introduced by the government to curb the spread of covid- 19 infections led to increased usage of mobile money services in the country and was accompanied by so many positive outcomes to the economy performance of the sector as shown above. However, the massive increase in usage of, mobile services in the country has also had negative impacts on the mobile money business as well as the whole economy. For example, fee waivers or elimination of fees had adverse implications on mobile money provider revenues, more so where such measures persisted. For instance, in Uganda, MTN Uganda has removed charges on P2P transactions below UGX 30,000 and all merchant payment transactions.

Airtel has waived charges on all P2P and merchant payment transactions (Muthiora et al., 2020). As a result, in the reduction in the revenue for a service provider also leads further to a decrease in taxable income and, therefore, directly impacts the income and revenue sources of the state thus affecting the developmental programs of the nation. More so, the unexpected influx in usage has resulted in an increasing operating cost of managing these platforms and capital expenditures incurred in increasing capacity (S. Andersson-Manjang & Naghavi, 2021; S. K. Andersson-Manjang, 2021; Frieling, 2021). Also, providers of mobile money services in such situations may be unable to offer safe reliable services as the risks of financial crime and fraud become too expensive to manage, providing a haven for fraudsters and criminals.

In conclusion, the positive novelty in mobile money use in Uganda is largely driven by economic activity and the COVID-19 pandemic while negative innovations are largely explained by financial innovation, the exchange rate and mobile money tax. Based on the potential benefits of mobile money, we recommended that governments subsidize the development of local mobile money infrastructure and adopt policies that create an enabling environment for the development, adoption and continued usage of mobile money in Uganda. And most importantly, the COVID-19 pandemic should teach regulators the need to act with consciously during a crisis. For the sake of mobile money services, there was need for the government of Uganda to carry out research before determining any price elasticity of demand for mobile money services in the market. And also engage in a dialogue between the regulators and service providers is critical to

ensure that the consequences of any regulatory action are carefully considered, even as the providers make concessions in standing in solidarity with their customers in difficult times.

4.0 Methodology

A descriptive survey design was used in this study to examine how COVID-19 affected the performance of Mobile money in Uganda. This design concentrated on only quantitative approaches. The study focused only on secondary data which was obtained from Bank of Uganda from October 2019 to September 2020. The study performed normality tests to establish whether the data possessed no underlying variations. Later regression analysis was performed to get answers on the study hypotheses.

4.0 Findings on study objectives

The first section involves normality tests while the second section focuses on regression analysis.

4.1 Normality test

This section examines whether the study variables were normally distributed for different months before and during COVID-19 in Uganda. The normality tests are examined using Shapiro-Wilk test at 5% level of significance as shown in Table 1.

Table 1: Test for normality of the variables (Oct 2019 – Sept 2020)

Variables	**Shapiro-Wilk**		
	Statistic	df	Sig.
Number of Transactions (millions)	.939	12	.480
Value of Transactions (Billion UGX)	.934	12	.429
Number of Registered Customers (millions)	.944	12	.549
Number of Active Customers (millions)	.975	12	.958
Number of mobile money Agents (Thousands)	.513	12	.000
Note: *Null hypothesis Assumes normal distribution of variables*			

Source: Author's own computations based on data from BoU (2021)

Table 1 presents the Shapiro-Wilk test to examine whether the variables were normally distributed from Oct 2019 to Sept 2020. Looking at the column for P-values/Sig., the variables namely; Number of Transactions, Value of Transactions, Number of Registered Customers, and Number of Active Customers had P-values which were above 0.05 level of significance. This indicates that their observations/data were normally distributed from Oct 2019 to Sept 2020.

However, the Number of mobile money Agents had a P-value which was below 0.05 level of significance, thus indicating that its observations/data were not normally distributed from oct 2019 to sept 2020.

4.2 Effect of Mobile money number of transactions on value of transactions before and during COVID-19 period in Uganda

This section presents two regression models to show how the number of transactions affected value of transactions before and during COVID-19 period in Uganda.

4.2.1 Effect of Mobile money number of transactions on value of transactions before COVID-19 period in Uganda (Oct 2019- Feb 2020)

This section presents the model findings on how Mobile money number of transactions affected value of transactions before COVID-19 period in Uganda. The results are presented in table 2 below.

Table 2: Regression findings on the effect of Mobile money number of transactions on value of transactions before COVID-19 period in Uganda (Oct 2019- Feb 2020)

Source	SS	df	MS	Number of obs	=	5
				F(1, 3)	=	1.65
Model	142756.591	1	142756.591	Prob > F	=	0.2892
Residual	259654.309	3	86551.4363	R-squared	=	0.3548
				Adj R-squared	=	0.1397
Total	402410.9	4	100602.725	Root MSE	=	294.2

ValueofTransactionsBi~n	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
NoofTransactionsmillion	18.72868	14.58298	1.28	0.289	-27.68087	65.13824
_cons	1850.287	3875.765	0.48	0.666	-10484.13	14184.7

Source: Author's own computations based on data from BoU (2021)

The findings reveal that mobile money number of transactions had a positive insignificant effect on the value of transactions before COVID-19 period in Uganda (B coeff=18.73, P-value>0.05). The findings show that an increase in number of MM transactions by 1 million every month before Covid-19, would result into an increase in value of MM transactions by 18.7 billion UGX. However, since the effect was not significant, this implies that before the outbreak of COVID-19

(Oct 2019- Feb 2020), the growth in MM number of transactions had no influence on the value of MM transactions.

The adjusted R-squared findings indicate that MM number of transactions accounted for 13.97% of the total variations in value of transactions before COVID-19 period. This indicates that before the outbreak of COVID-19 in Uganda, very few of the changes/variations in the value of transactions could be explained by number of transactions in Uganda.

4.2.2 Effect of Mobile money number of transactions on value of transactions during COVID-19 period in Uganda (Mar 2020- Sept 2020)

The study also assessed how the MM number of transactions affected value of transactions during COVID-19 period in Uganda. The findings are presented in table 3.

Table 3: Regression findings on the effect of MM number of transactions on value of transactions during COVID-19 period in Uganda

Source	SS	df	MS	Number of obs	=	7
				F(1, 5)	=	232.82
Model	8053039.92	1	8053039.92	Prob > F	=	0.0000
Residual	172948.317	5	34589.6633	R-squared	=	0.9790
				Adj R-squared	=	0.9748
Total	8225988.24	6	1370998.04	Root MSE	=	185.98

ValueofTransactionsBi~n	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
NoofTransactionsmillion	47.88414	3.138231	15.26	0.000	39.81706	55.95122
_cons	-6147.26	900.4168	-6.83	0.001	-8461.855	-3832.665

Source: Author's own computations based on data from BoU (2021)

The results in table 3 show that MM number of transactions had a positive and significant effect on value of transactions during COVID-19 period in Uganda (B coeff=47.9, P-value<0.05). It is evident that an increase in MM number of transactions by 1 million every month during COVID-19 period would result into an increase in value of transactions by 47.9 billion UGX. This implies that during COVID-19 period, MM number of transactions had a strong influence on the value of MM transactions.

However, the Adjusted R-square findings indicate that MM number of transactions accounted for 97.48% of the total variations in value of MM transactions during COVID-19 period. This implies that during COVID-19, MM number of transactions would highly predict value of MM transactions as compared to the period before COVID-19 in Uganda.

4.3 Effect of number of registered customers on value of transactions before and during COVID-19 period in Uganda

The study sought to examine the effect of number of registered customers on the value of transactions before and during COVID-19 period in Uganda. Two regression models were analyzed to compare whether the effect differed before and during COVID-19 period.

4.3.1 Effect of number of registered customers on value of transactions before COVID-19 period in Uganda (Oct 2019- Feb 2020)

The study made an attempt to establish how the growth in the number of registered customers affected value of transactions before COVID-19 period in Uganda. The findings are presented in table 4.

Table 4: Model findings on the effect of the number of registered MM customers on value of transactions before COVID-19 period in Uganda

Source	SS	df	MS			
				Number of obs	=	5
				F(1, 3)	=	0.78
Model	82644.0144	1	82644.0144	Prob > F	=	0.4434
Residual	319766.886	3	106588.962	R-squared	=	0.2054
				Adj R-squared	=	-0.0595
Total	402410.9	4	100602.725	Root MSE	=	326.48

ValueofTransactionsBill~n	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
NoofRegisteredCustomersMi	351.7365	399.455	0.88	0.443	-919.5076	1622.981
_cons	-2678.921	10794.26	-0.25	0.820	-37031.08	31673.24

Source: Author's own computations based on data from BoU (2021)

The findings reveal that before the outbreak of COVID-19, the number of registered MM customers had a positive but insignificant effect on value of transactions (B Coeff=351.7, P-value>0.05). This implies that before the outbreak of COVID-19 in Uganda, the positive growth in value of MM transactions was not determined by the growth in the number of registered MM customers.

The coefficient of determination (R-squared) results indicate that only 20.5% of the variations in value of transactions would be explained by the number of registered customers before the outbreak of COVID-19 in Uganda. This implies that registered customers would predict very few of the value of transactions before the outbreak of COVID-19 in Uganda.

4.3.2 Effect of number of registered number of customers on value of transactions during COVID-19 period in Uganda (Mar 2020- Sept 2020)

The study assessed how the number of registered customers influenced the value of transactions during COVID-19 period in Uganda. The findings are presented in table 5.

Table 5: Model findings on the effect of number of registered MM customers on value of transactions during COVID-19 period in Uganda

Source	SS	df	MS	Number of obs	=	7
				F(1, 5)	=	12.86
Model	5923367.05	1	5923367.05	Prob > F	=	0.0158
Residual	2302621.18	5	460524.237	R-squared	=	0.7201
				Adj R-squared	=	0.6641
Total	8225988.24	6	1370998.04	Root MSE	=	678.62

ValueofTransactionsBill~n	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
NoofRegisteredCustomersMi	1045.681	291.5688	3.59	0.016	296.1794	1795.182
_cons	-22715.34	8442.732	-2.69	0.043	-44418.07	-1012.602

Source: Author's own computations based on data from BoU (2021)

The regression findings in table 5 indicate that the number of registered MM customers had a positive and significant effect on the value of transactions during COVID-19 period in Uganda (B Coeff=1045.7, P-value<0.05). The findings reveal that growth in number of registered MM customers by 1 million every month would result into an increase in value of transactions by 1045.7 billion UGX during COVID-19 period. This implies that growth in registered customers during COVID-19 period would highly increase the value of MM transactions.

Concerning Adjusted R-squared, the findings show that 66.4% of the variations in value of MM transactions were explained by the number of registered customers during the COVID-19 period. This implies that growth in registered number of MM customers during COVID-19 period would highly predict the value of mm transactions as compared to the period before COVID-19.

4.4 Effect of number of active customers on value of transactions before and during COVID-19 period in Uganda

The study ascertained the effect of the number of active MM customers on the value of MM transactions before and during COVID-19 period in Uganda to establish whether there was a difference.

4.4.1 Effect of the number of active MM customers on value of transactions before COVID-19 period in Uganda (Oct 2019- Feb 2020)

An investigation was made to establish the influence of the number of active MM customers on value of transactions before COVID-19 period in Uganda. The findings are presented using linear regression in table 6.

Table 6: Model findings on the effect of the number of active MM customers on value of transactions before COVID-19 period in Uganda

Source	SS	df	MS	Number of obs	=	5
				F(1, 3)	=	0.57
Model	64340.3262	1	64340.3262	Prob > F	=	0.5048
Residual	338070.574	3	112690.191	R-squared	=	0.1599
				Adj R-squared	=	-0.1202
Total	402410.9	4	100602.725	Root MSE	=	335.69

ValueofTransactionsBill~n	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
NoofActiveCustomersmillio	222.4692	294.4228	0.76	0.505	-714.5154	1159.454
_cons	3132.011	4889.723	0.64	0.567	-12429.27	18693.29

Source: Author's own computations based on data from BoU (2021)

The findings in table 6 indicate that the number of active MM customers had a positive but insignificant effect on the value of transactions before COVID-19 period in Uganda (B Coeff=222.5, P-value>0.05). The findings imply that before COVID-19 period, the growth in the value of MM transactions was not depending on the growth in the number of active MM customers.

In terms of R-squared, it is observed from the regression findings that only 16% of the total variations in value of transactions could be accounted for by the growth in the number of active customers before COVID-19 period. This implies that the growth in the number of active

customers would predict very few of the value of MM transactions before outbreak of COVID-19 in the country.

4.4.2 Effect of the number of active MM customers on the value of MM transactions during COVID-19 period in Uganda (Mar 2020- Sept 2020)

The study also investigated how the value of MM transactions was affected by the number of active MM customers during COVID-19 period in Uganda. The findings are presented in table 7.

Table 7: Model findings on the effect of the number of active MM customers on the value of MM transactions during COVID-19 period in Uganda

Source	SS	df	MS	Number of obs	=	7
				F(1, 5)	=	5.26
Model	4216397.62	1	4216397.62	Prob > F	=	0.0704
Residual	4009590.62	5	801918.124	R-squared	=	0.5126
				Adj R-squared	=	0.4151
Total	8225988.24	6	1370998.04	Root MSE	=	895.5

ValueofTransactionsBill~n	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
NoofActiveCustomersmillio	1215.408	530.0493	2.29	0.070	-147.1273	2577.943
_cons	-14536.04	9637.699	-1.51	0.192	-39310.53	10238.45

Source: Author's own computations based on data from BoU (2021)

The model findings in table 7 above show that the number of active MM customers had a positive and insignificant effect on the value of MM transactions during COVID-19 period in Uganda (B Coeff=1215.4, P-value>0.05). This indicates that the growth in the value of MM transactions was not depending on the growth of the number of active MM customers.

However, the results from the coefficient of determination show that 41.5% of the variations in the value of MM transactions would be accounted for by the number of active MM customers during COVID-19 period which is slightly above that of the period before COVID-19. This implies that more of the value of MM transactions would be predicted by the growth in the number of active MM customers during COVID-19 period compared to the months before COVID-19 measures were imposed.

4.5 Effect of the number of Mobile money agents on value of transactions before and during COVID-19 period in Uganda.

The study also made an attempt to establish how the growth in the number of Mobile money agents affected the value of MM transactions before and during COVID-19 period in Uganda.

4.5.1 Effect of the number of Mobile money agents on value of transactions before COVID-19 period in Uganda (Oct 2019- Feb 2020)

An attempt was made to find out the influence of the number of Mobile money agents on the value of MM transactions before COVID-19 period in Uganda. The findings are presented in table 8.

Table 8: Model findings on the effect of the number of Mobile money agents on the value of transactions before COVID-19 period in Uganda

Source	SS	df	MS	Number of obs	=	5
				F(1, 3)	=	0.29
Model	35777.2524	1	35777.2524	Prob > F	=	0.6261
Residual	366633.648	3	122211.216	R-squared	=	0.0889
				Adj R-squared	=	-0.2148
Total	402410.9	4	100602.725	Root MSE	=	349.59

ValueofTransa~n	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
NoofAgents1000s	-24.50245	45.28575	-0.54	0.626	-168.6219	119.617
_cons	12121.45	9790.216	1.24	0.304	-19035.39	43278.29

Source: Author's own computations based on data from BoU (2021)

The findings in table 8 reveal that the growth in the number of Mobile money agents had a negative and insignificant effect on the value of MM transactions before COVID-19 period in Uganda (B Coeff=-24.50, P-value>0.05). This implies that the growth in MM agents before COVID-19 could not determine the decline in the value of MM transactions.

In relation with R-squared, the findings indicate that only 8.9% of the variations in value of transactions would be accounted for by the growth in the number of Mobile money agents before COVID-19 period. This indicates that growth in the number of Mobile money agents would predict very few of the decline in the value of transactions before the outbreak of COVID-19 in Uganda.

4.5.2 Effect of the number of Mobile money agents on the value of transactions during COVID-19 period in Uganda (Mar 2020- Sept 2020)

The study further made an investigation to establish the effect of the number of Mobile money agents on the value of transactions during COVID-19 period in Uganda. The results are indicated in table 9.

Table 9: Model findings on the effect of the number of Mobile money agents on the value of transactions during COVID-19 period in Uganda

Source	SS	df	MS	Number of obs	=	7
				F(1, 5)	=	1.94
Model	2301351.79	1	2301351.79	Prob > F	=	0.2222
Residual	5924636.44	5	1184927.29	R-squared	=	0.2798
				Adj R-squared	=	0.1357
Total	8225988.24	6	1370998.04	Root MSE	=	1088.5

ValueofTransa~n	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
NoofAgents1000s	10.72097	7.692867	1.39	0.222	-9.05418	30.49611
_cons	4894.687	1949.005	2.51	0.054	-115.3894	9904.763

Source: Author's own computations based on data from BoU (2021)

The regression findings show that the growth in the number of Mobile money agents had a positive and insignificant effect on the value of transactions during COVID-19 period in Uganda (B Coeff=10.7, P-value>0.05). The implication of the findings is that the growth in the number of MM agents could not determine the growth in the value of transactions during COVID-19 period in Uganda.

In terms of Adjusted R-squared, the findings indicate that 13.6% of the variations in the value of MM transactions would be explained by the number of MM agents during COVID-19 period. This implies that the growth in the number of MM agents during COVID-19 period would predict more value of MM transactions compared to base period without COVID-19.

5.0 Conclusions

The conclusions are presented in the summary table below to make comparison on how MM performance was affected before and during COVID-19 period.

Objective	Beta Coeff, R-squared and P-value before COVID-19	Beta Coeff, R-squared and P-value during COVID-19	Conclusion
Effect of number of transactions on value of transactions before and during COVID-19 period in Uganda	B=18.7, R^2=35.5%, P>0.05	B=47.9, R^2=97.9%, P<0.05	The number of transactions would predict more of the value of MM transactions during COVID-19 period compared to the period before COVID-19 in Uganda
Effect of the number of registered customers on value of transactions before and during COVID-19 period in Uganda	B=351.7, R^2=20.5%, P>0.05	B=1045.7, R^2=72.0%, P<0.05	The number of registered customers would predict more of the value of MM transactions during COVID-19 period compared to the period before COVID-19 in Uganda
Effect of the number of active customers on the value of transactions before and during COVID-19 period in Uganda	B=222.5, R^2=16%, P>0.05	B=1215.4, R^2=51.3%, P>0.05	The number of active customers would predict more of the value of MM transactions during COVID-19 period compared to the period before COVID-19 in Uganda
Effect of the number of Mobile money agents on value of transactions before and during COVID-19 period in Uganda	B=-24.5, R^2=8.9%, P>0.05	B=10.7, R^2=28%, P>0.05	The number of MM agents would predict more of the value of MM transactions during COVID-19 period compared to the period before COVID-19 in Uganda

6.0 Recommendations

The government should reduce on the taxes imposed on telecommunication companies especially on mobile money transactions since this may help reduce on the charges imposed on the people during the MM transactions. The study revealed that MM transactions were convenient for most of the people during the lockdown as compared to Banks.

People should be encouraged to save with telecommunication companies (for instance MoKash) such that they are in position to get access to their funds in situations of COVID-19 since mobile transactions are convenient and easily accessible.

Reference

Andersson-Manjang, S., & Naghavi, N. (2021). State of the industry report on mobile money 2021. In: GSMA.

Andersson-Manjang, S. K. (2021). The Mobile Money Prevalence Index (MMPI): A Country-Level Indicator for Assessing the Adoption, Activity and Accessibility of Mobile Money. *Activity and Accessibility of Mobile Money (September 20, 2021)*.

Frieling, L. (2021). Mobile money: the savior for developing.

GoU. (2020). Uganda's Emergency Response to the COVID-19 Pandemic: A Case Study. *https://thinkwell.global/wp-content/uploads/2020/09/Uganda-COVID-19-Case-Study-_18-Sept-20201.pdf, retrieved, 23, October, 2021*.

Katusiime, L. (2021a). COVID 19 and Bank Profitability in Low Income Countries: The Case of Uganda. *Journal of Risk and Financial Management, 14*(12), 588.

Katusiime, L. (2021b). Mobile Money Use: The Impact of Macroeconomic Policy and Regulation. *Economies, 9*(2), 51.

Kipkemboi, K., & Bahia, K. (2019). The Impact of Mobile Money on Monetary and Financial Stability in Sub-Saharan Africa. *GSMA Report*.

Kuteesa, F., Tumusiime-Mutebile, E., Whitworth, A., & Williamson, T. (2010). Uganda's Economic Reforms: Insider Accounts: Oxford University Press.

Lwanga Mayanja, M., & Adong, A. (2016). *A pathway to financial inclusion: mobile money and individual Savings in Uganda*. Retrieved from

Matovu, J. K., Kabwama, S. N., Ssekamatte, T., Ssenkusu, J., & Wanyenze, R. K. (2021). COVID-19 Awareness, Adoption of COVID-19 Preventive Measures, and Effects of COVID-19 Lockdown Among Adolescent Boys and Young Men in Kampala, Uganda. *Journal of Community Health*, 1-12.

Mawejje, J., & Francis Munyambonera, E. (2016). Tax revenue effects of sectoral growth and public expenditure in Uganda. *South African Journal of Economics, 84*(4), 538-554.

Mawejje, J., & Lakuma, E. (2017). *Macroeconomic effects of mobile money in Uganda*. Retrieved from

Mawejje, J., & Lakuma, P. (2019). Macroeconomic effects of Mobile money: evidence from Uganda. *Financial innovation, 5*(1), 1-20.

Muthiora, B., Awanis, A., Clifford, K., Chadha, S., & Kipkemboi, K. (2020). Mobile money recommendations to central banks in response to Covid-19. *The Global System for Mobile Communications*.

OECD. (2020). Building a resilient recovery-Emerging stronger from the COVID-19 pandemic. *https://www.oecd.org/coronavirus/en/html, retrieved, March, 2020*.

Organization, W. H. (2020). Coronavirus disease 2019 (COVID-19): situation report, 73.

Palmer, A. N., & Small, E. (2021). COVID-19 and disconnected youth: Lessons and opportunities from OECD countries. *Scandinavian Journal of Public Health*, 14034948211017017.

Sepulveda, E. R., Stall, N. M., & Sinha, S. K. (2020). A comparison of COVID-19 mortality rates among long-term care residents in 12 OECD countries. *Journal of the American Medical Directors Association, 21*(11), 1572-1574. e1573.

Shereen, M. A., Khan, S., Kazmi, A., Bashir, N., & Siddique, R. (2020). COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses. *Journal of advanced research, 24*, 91.

Whitworth, A., & Williamson, T. (2010). Overview of Ugandan economic reform since 1986. *Uganda's economic reforms: Insider accounts*, 1-34.