PERFORMANCE OF THE TELECOMMUNICATION COMPANIES IN UGANDA DURING COVID – 19 TIMES

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Abstract

As most of the countries globally battle with the effects of COVID-19, telecommunication companies have emerged as critical entities in providing connection between businesses and people. In Uganda, the telecommunication companies recorded a 3.3% year on year growth between the period of Sept 2019 and Sept 2020 in the subscription level despite a 3 million decline in subscribers between March 2020 and June 2020 attributed to the outbreak of COVID-19. Therefore, this study presents a comparative analysis to ascertain the performance of telecommunication companies before COVID-19 in 2019 and during COVID-19 in 2020. The comparative study utilized a descriptive design with only quantitative approaches. The study was based on only secondary data sources which involved online document review from Uganda Communications Commission (UCC). The documents reviewed included market performance quarterly reports published by UCC in 2021 and 2019. The analysis involved descriptive statistics, independent sample t-test, and correlation analysis. An independent sample t-test was used to find out if the observations on the variables were significantly different between the two periods and Pearson's correlation test was used to establish the strength, direction, and the significance of the relationship between the variables. Results indicated that there was a significant difference in the number of Fixed line subscriptions between 2019 and 2020 (mean difference=70147 subscriptions, P-value (0.0429) <0.05). The study concluded that there was a remarkable improvement in the performance of telecommunication companies during the period of COVID-19 despite some challenges. During the period of 2020, most of the telecommunication companies in Uganda registered an increase in mobile subscription, growth in fixed and mobile internet subscription, and increase in smartphone and featured phone users among others. The study suggests that the telecommunication companies should lower the cost of their services like cost of Mobile data and voice bundles during the period when government imposes lockdown.

Keywords: Covid-19, Telecommunication companies, Performance and Uganda

1.0 Background

As most of the countries globally battle with the effects of COVID-19, telecommunication companies have emerged as critical entities in providing connection between businesses and people. In Uganda, the telecommunication companies recorded a 3.3% year on year growth between the period of Sept 2019 and Sept 2020 in the subscription level despite a 3 million

decline in subscribers between March 2020 and June 2020 attributed to the outbreak of COVID-19[1]. Therefore, this study presents a comparative analysis to ascertain the performance of telecommunication companies before COVID-19 in 2019 and during COVID-19 in 2020.

2.0 Purpose and specific objectives

2.1 Purpose

The purpose of the study was to provide a comparative analysis on the performance of Telecommunication companies before and after the outbreak of COVID-19 in Uganda

2.2 Specific objectives

i. To examine the difference in the number of Fixed and mobile subscriptions between the period of 2019 and 2020 in Uganda.
ii. To examine the difference in the number of Data/Internet Subscriptions between the period of 2019 and 2020 in Uganda.
iii. To examine the difference in Mobile phone Distributions between the period of 2019 and 2020 in Uganda.
iv. To examine the difference in Voice Traffic (minutes of talk on phone) between the period of 2019 and 2020 in Uganda.
v. To examine the relationship between the average monthly Voice Onnet (minutes of talk per line per month) and Broadband (MBs per line per month) during the period of 2020 in Uganda

2.3 Study hypotheses

The specific objectives were guided by the following alternative hypotheses;

Ha1: The number of Fixed and mobile subscriptions had a significant difference between the period of 2019 and 2020 in Uganda

Ha2: The number of Data/Internet Subscriptions had a significant difference between the period of 2019 and 2020 in Uganda

Ha3: Mobile phone Distributions had a significant difference between the period of 2019 and 2020 in Uganda

[1] https://www.ucc.co.ug/wp-content/uploads/2021/01/MARKET-PERFOMANCE-REPORT-Q3-2020-Final-compressed.pdf

Ha4: Voice Traffic (minutes of talk on phone) had a significant difference between the period of 2019 and 2020 in Uganda

Ha5: There was a significant relationship between the average monthly Voice Onnet (minutes of talk per line per month) and Broadband (MBs per line per month) during the period of 2020 in Uganda

3.0 Literature Review

Covid-19 lockdown that started March, 2020 in Uganda paved way for increased digitalization and dependence on online messaging especially social media to support reconnection with family and friend but also work remotely. In 2021 social media platform celebrated increased new accounts as many countries around the world Uganda inclusive continued with lockdown as a measure to avert the spread of Covid-19 with increased need to maintain the social relationships hence making social media inescapable in everyday lives hence enabling telecommunication make a lot of profits since they are data suppliers in Uganda. Government of Uganda through ministry of education instructed higher institutions of learning, secondary and primary schools to ensure that learners are educated online hence empowering the telecommunication companies. The unplanned unprecedented adoption of mobile financial services (MFSs) contributed to 562 million shillings translating into 40 new line connections in per 100 residents. The extraordinary growth in the mobile money businesses for all telecommunications companies contributed to 20 billion dollars (UCC, 2021).

It's evidenced for the first time in electoral history in Uganda electronic media outpaced the traditional mass rallies with use of online campaign material than use of printed campaign materials. This provided a boost in the regional telecommunication outlets hence influencing political strategies including presidential candidates reaching out on electoral commission through the use of live broadcasts which was provided by telecommunications in Uganda. A total revenue grew from 27.7 million in December 2020 to 28/3 million by end of March 2021 and 28 million subscribers since pre-Covid-19 and frequent penetration of 7 lines for every 10 customers. Device promotion increase by 80% and active mobile money accounts increased by 66%, agent network grew from 235,790 to 254,930 by March, 2021 and domestic voice services increased to 15.5 billion billed minutes up from 14.8 by December 2020 (Awobamise, Jarrar, & Okiyi, 2021; UCC, 2021).

According to Uganda Communication Commission (UCC) telecommunication companies in Uganda recorded Ushs 1.144 trillion by October-December 2020 up from Ushs 1,095 trillion July-September 2020. Gross revenue stood at US$ 1bn in 12 months by end December, 2020 and first time the telecom sector crossed US$ I bn mark (UCC, 2021). The fixed and mobile subscription hit 1.3 million in quarter under review Covid-19 lockdown from 2019 to December 2020, 3 million subscribers between April-June 2020. The 1.2 million new internet connections hence 98% new internet connections. Communication companies have exhibited consistent resilience amidst increased demand although two telecom (Smart telecom and Africel) operators were forced to close down due to the effects of Covid-19 (Burkitt-Gray, 2021). The sector has permed well during Covid-19 and its related challenges since many are low cost operators yet providing services universally in the breadth and length of the country and empowered technological advancement (Abd-Elrahman & Kamal, 2020; UCC, 2021).

Telecommunication sector provided the backbone of infrastructure for national connectivity and international connections and domestic transmission of voice and data connectivity which has facilitated transport signals among the rural and town, network access. The international networks are supported by fibre-optic or microwave terrestrial network, submarine cables and satellite communication while domestic used copper wires or cable modem links, wireless (2G,3G,4G and 5G) or fibre-optics. The work from home, home quarantine, maintaining a social distance and other Covid-19 taskforce measures in the country spiked the performance of the telecommunication network usage through their traffic by 30% increase hence the sector coped with limited disruption hence the Covid-19 surge boosted the sector. Due to out-of-home consumption couple with social distancing and mandated closure of cinemas immediately boosted the telecommunication section since people needed to connect to each other and content viewing on television channels changed (Abd-Elrahman & Kamal, 2020; ITU, 2020).

The sector has seen tremendous technological advances as a result of Covid-19 due to the increased need for digitalization and continued demand for internet usage catalyzed by public health measures to avert the spread of Covid-19 pandemic among Uganda's population since the health sector is dilapidated and couldn't handle the growing numbers of patients (IFC, 2020). However the risks in communication poses a risk with is a hazard due to shared communication on social media concerning who is exposed, infected and died and how people responded and

perceived the information amidst uncertainty (Awobamise et al., 2021; Malecki, Keating, & Safdar, 2021).

4.0 Methodology

The comparative study utilized a descriptive design with only quantitative approaches. The study was based on only secondary data sources which involved online document review from Uganda Communications Commission (UCC). The documents reviewed included market performance quarterly reports published by UCC in 2021 and 2019. The analysis involved descriptive statistics, independent sample t-test, and correlation analysis. The descriptive statistics involved studying the behaviors of the variables through exploring their means, standard deviations, minimum and maximum value. To perform the comparative analysis, an independent sample t-test was used to find out if the observations on the variables were significantly different between the two periods. Concerning correlation analysis, Pearson's correlation test was used to establish the strength, direction, and the significance of the relationship between the variables.

5.0 Key study Findings

The findings presented in this chapter include; descriptive statistics, independent sample t-test results, and correlation results.

5.1 Descriptive statistics of the study variables

The findings on descriptive statistics of the variables are presented in table 1.

Table 1: Descriptive statistics of the variables

Variables	N	Minimum	Maximum	Mean	Std. Dev	Normality Test (P-value)
Fixed line subscriptions (2019Q1 to 2019Q4)	4	85710.0	203132.0	157990.000	54730.8230	.377*
Fixed line subscriptions (2020Q1 to 2020Q4)	4	85738.0	90774.0	87843.250	2440.7036	.329*
Mobile subscription in million (2019Q1 to 2019Q4)	4	24.6	26.6	25.550	.8226	.880*
Mobile subscription in million	4	25.4	28.4	26.975	1.3376	.822*

(2020Q1 to 2020Q4)						
Fixed internet subscriptions (2019Q1 to 2019Q4)	4	9597.0	32370.0	15760.000	11093.2815	.007
Fixed internet subscriptions (2020Q1 to 2020Q4)	4	27351.0	34596.0	30713.750	2972.9494	.635*
Mobile internet subscriptions in million (2019Q1 to 2019Q4)	4	14.4	16.9	15.450	1.0472	.508*
Mobile internet subscriptions in million (2020Q1 to 2020Q4)	4	18.8	21.4	19.800	1.2193	.359*
Smart phone users in million (2019Q1 to 2019Q4)	4	5.3	6.6	5.750	.5802	.143*
Smart phone users in million (2020Q1 to 2020Q4)	4	7.0	7.9	7.350	.4041	.492*
Feature phone users in million (2019Q1 to 2019Q4)	4	16.0	17.2	16.375	.5679	.086*
Feature phone users in million (2020Q1 to 2020Q4)	4	17.1	17.9	17.475	.3500	.894*
Voice Traffic (billion minutes of talk) (2019Q1 to 2019Q4)	4	12.6	17.1	14.653	1.9050	.962*
Voice Traffic (billion minutes of talk) (2020Q1 to 2020Q4)	4	13.1	14.8	14.018	.7425	.836*
Average Voice Onnet (minutes of talk per line per month) (2020Q1 to 2020Q4)	4	160	177	165.50	7.853	.106*
Average Broadband (MBs per line per month) (2020Q1 to 2020Q4)	4	582	867	733.00	116.850	.742*
Shows that the variable is normally distributed at 5% level of sig. (Null hypothesis assumes normal distribution of variables)						

Source: Own computations based on data from UCC (2021)

The findings presented in table 1 show that the variables with a p-value greater than 0.05 level of significance were normally distributed (*) in different quarters for the period of 2019 and 2020. This implies that most of the variables did not have underlying variations, thus were appropriate for comparative and correlation analysis.

5.2 Findings on specific objectives

The findings presented in this section are in light with the specific objectives of the study.

5.2.1 Analyzing the difference in the number of Fixed and mobile subscriptions between the period of 2019 and 2020 in Uganda

The study analyzed whether the number of Fixed line subscriptions (subscription for traditional phones like landline phones) and Mobile subscriptions significantly differed during the period before (2019) and after the outbreak of COVID-19 (2020) in Uganda. The findings are presented in table 2 and table 3.

Table 2: Independent sample t-test results analyzing the difference in the number of Fixed line subscriptions between 2019 and 2020.

Two-sample t test with equal variances

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
Fix~2019	4	157990	27365.41	54730.82	70901.05	245079
Fix~2020	4	87843.25	1220.352	2440.704	83959.55	91726.95
combined	8	122916.6	18344.61	51886.4	79538.5	166294.7
diff		70146.75	27392.61		3119.451	137174

diff = mean(Fixed_lines~2019) - mean(Fixed_lines~2020) t = 2.5608
Ho: diff = 0 degrees of freedom = 6

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.9786 Pr(|T| > |t|) = 0.0429 Pr(T > t) = 0.0214

Source: Own computations based on data from UCC (2021)

The two-sample comparative analysis in table 2 reveal that there was a significant difference in the number of Fixed line subscriptions between 2019 and 2020 (mean difference=70147 subscriptions, P-value (0.0429) <0.05). The findings indicate that the Fixed line subscriptions were higher during 2019 with an average of 157990 subscriptions per quarter compared to the period of 2020 where it stood at an average of 87843 subscriptions per quarter. The decline in the number of Fixed line subscriptions in 2020 was attributed to COVID-19 measures like ban on movements where several organizations and companies which are the major users stopped operating well.

Table 3: Independent sample t-test results analyzing the difference in the number of mobile phone subscriptions between 2019 and 2020.

Two-sample t test with equal variances

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
Mob~2019	4	25.55	.4112988	.8225975	24.24106	26.85894
Mob~2020	4	26.975	.6687987	1.337597	24.84658	29.10342
combined	8	26.2625	.45235	1.279439	25.19286	27.33214
diff		-1.425	.7851486		-3.346189	.4961894

diff = mean(Mobile_subs~2019) - mean(Mobile_subs~2020) t = -1.8149
Ho: diff = 0 degrees of freedom = 6

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0597 Pr(|T| > |t|) = 0.1195 Pr(T > t) = 0.9403

Source: Own computations based on data from UCC (2021)

The results from the comparative analysis presented in table 3 revealed that there was no significant difference in the number of mobile phone subscriptions between 2019 and 2020 (mean difference=1.4 million subscriptions, P-value (0.1105)>0.05). The findings indicate that the number of mobile phone subscriptions remained the same between 2019 and 2020. This implies that due to the closure of several businesses and sectors during COVID-19 period in 2020 could have affected new mobile subscriptions because of decline in economic activities.

5.2.2 Comparative analysis examining the difference in the number of data/internet Subscriptions between the period of 2019 and 2020 in Uganda

The study made an attempt to find out if the number of fixed internet and mobile internet subscriptions significantly differed between the period of 2019 and 2020 in Uganda. The findings are presented using independent sample t-test in table 4 and table 5.

Table 4: Two sample t-test analysis examining the difference in the number of fixed data/internet subscriptions between the period of 2019 and 2020 in Uganda

Two-sample t test with equal variances

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
F~s_2019	4	15760	5546.641	11093.28	-1891.886	33411.89
F~s_2020	4	30713.75	1486.475	2972.949	25983.12	35444.38
combined	8	23236.88	3879.726	10973.52	14062.78	32410.97
diff		-14953.75	5742.372		-29004.83	-902.673

diff = mean(Fixed_inter~2019) - mean(Fixed_inter~2020) t = -2.6041
Ho: diff = 0 degrees of freedom = 6

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0202 Pr(|T| > |t|) = 0.0404 Pr(T > t) = 0.9798

Source: Own computations based on data from UCC (2021)

The findings in table 4 show that that there was a significant mean difference in in the number of fixed data/internet Subscriptions between the period of 2019 and 2020 in Uganda (mean difference=14954 internet/data subscriptions, P-value (0.0404) <0.05). The findings show that there were more fixed data/internet subscriptions during the period of 2020 compared to 2019. The growth in fixed data/internet subscriptions could have been as a result of majority of the organizational employees who were working from home and coordinating activities on the cable phones.

Table 5: Two sample t-test analysis examining the difference in the number of mobile data/internet subscriptions between the period of 2019 and 2020 in Uganda

Two-sample t test with equal variances

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
Mobile..	4	15.45	.5236093	1.047219	13.78364	17.11636
Mobile..	4	19.8	.6096447	1.219289	17.85984	21.74016
combined	8	17.625	.9023283	2.55217	15.49133	19.75867
diff		-4.35	.8036376		-6.31643	-2.38357

diff = mean(Mobile_inte~2019) - mean(Mobile_inte~2020) t = -5.4129
Ho: diff = 0 degrees of freedom = 6

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0008 Pr(|T| > |t|) = 0.0016 Pr(T > t) = 0.9992

Source: Own computations based on data from UCC (2021)

The results from the comparative analysis in table 5 reveal that there was a significant mean difference in the number of mobile data/internet subscriptions between the period of 2019 and

2020 in Uganda (mean difference= 4.4 million subscriptions, P-value(0.0016) <0.05). The results clearly show that telecommunications registered more mobile internet subscriptions during the period of 2020 which averaged to 19.8 million per quarter compared to 2019 with an average of 15.5 million internet subscriptions per quarter. The growth in mobile internet subscription in 2020 was a result of the outbreak of COVID-19 where most of the people were communicating and conducting business via social media and business Apps because of COVID-19 restriction measures.

5.2.3 Comparative analysis examining the difference in mobile phone distributions between the period of 2019 and 2020 in Uganda.

The study attempted to investigate if the number of smartphone and featured phone users significantly differed between the period of 2019 and 2020 in Uganda. The findings are presented in table 6 and table 7.

Table 6: Two sample t-test examining the difference in the number of smartphone users between the period of 2019 and 2020 in Uganda

Two-sample t test with equal variances

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
Sma~2019	4	5.75	.2901149	.5802298	4.826725	6.673275
Sma~2020	4	7.35	.2020726	.4041452	6.706915	7.993085
combined	8	6.55	.343823	.9724784	5.736988	7.363012
diff		-1.6	.3535534		-2.465114	-.734886

diff = mean(Smart_phone~2019) - mean(Smart_phone~2020) t = -4.5255
Ho: diff = 0 degrees of freedom = 6

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0020 Pr(|T| > |t|) = 0.0040 Pr(T > t) = 0.9980

Source: Own computations based on data from UCC (2021)

The findings from the study revealed that there was a significant difference in the number of smartphone users between the period of 2019 and 2020 in Uganda (mean difference=1.6 million smartphone users, P-value (0.0040)<0.05). The implication of the findings is that there were more smartphone users during the period of COVID-19 (2020) averaging to 7.4 million per quarter compared to the period of 2019 with an average of 5.8 million smartphone users per quarter. The growth in the number of smartphone users during the period of 2020 was associated

with the total lockdown where most of the people could socialize as well as conduct business using smartphones.

Table 7: Two sample t-test examining the difference in the number of featured phone users between the period of 2019 and 2020 in Uganda

Two-sample t test with equal variances

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
Fea~2019	4	16.375	.2839454	.5678908	15.47136	17.27864
Fea~2020	4	17.475	.175	.35	16.91807	18.03193
combined	8	16.925	.258947	.7324128	16.31269	17.53731
diff		-1.1	.3335416		-1.916147	-.2838531

diff = mean(Feature_pho~2019) - mean(Feature_pho~2020) t = -3.2979
Ho: diff = 0 degrees of freedom = 6

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0082 Pr(|T| > |t|) = 0.0165 Pr(T > t) = 0.9918

Source: Own computations based on data from UCC (2021)

The results from the comparative analysis in table 7 indicate a significant difference in the number of featured phone users between the period of 2019 and 2020 in Uganda (mean difference=1.1 million users, P-value(0.0165)<0.05). The results imply that there was an increase in the number of featured phone users during the period 2020 with an average of 17.5 million users per quarter compared to 2019 with an average of 16.4 million users per quarter. The growth in unemployment and poverty during the COVID-19 period increased the demand for featured phones compared to smart phones.

5.2.4 Comparative analysis on the difference in Voice Traffic (minutes of talk on phone) between the period of 2019 and 2020 in Uganda

An investigation was made to ascertain whether the Voice Traffic (minutes of talk on phone) significantly differed between the period of 2019 and 2020 in Uganda. The findings are presented in table 8.

Table 8: Independent sample t-test examining the difference in Voice Traffic (billion minutes of talk) between the period of 2019 and 2020 in Uganda

Two-sample t test with equal variances

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
Voi~2019	4	14.6525	.9524913	1.904983	11.62125	17.68375
Voi~2020	4	14.0175	.3712451	.7424902	12.83603	15.19897
combined	8	14.335	.4882037	1.380849	13.18058	15.48942
diff		.635	1.022283		-1.866436	3.136436

diff = mean(Voice_Traff~2019) - mean(Voice_Traff~2020) t = 0.6212
Ho: diff = 0 degrees of freedom = 6

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.7213 Pr(|T| > |t|) = 0.5573 Pr(T > t) = 0.2787

Source: Own computations based on data from UCC (2021)

The findings from the comparative analysis in table 8 revealed that there was no significant difference in voice traffic (minutes of talk on phone) between the period of 2019 and 2020 in Uganda (mean difference=0.64 billion minutes of talk, P-value (0.5573)>0.05). The findings imply that the average minutes of talk spent on phone during the period of COVID-19 was almost the same as that of 2019. The minutes spent on phone during the period of COVID-19 did not increase since the businesses and economic activities were down, hence few people would be on phone.

5.2.5 Relationship between the average monthly Voice Onnet (minutes of talk per line per month) and Broadband (MBs per line per month) during the period of 2020 in Uganda

The study sought to establish whether the average monthly minutes per line were associated with the average monthly mobile bundles (MBs) per line during the period of COVID-19. The findings are presented using Pearson's correlation analysis at 5% significance level.

Table 9: Correlation analysis examining the association between the average monthly Voice Onnet (minutes of talk per line per month) and Broadband (MBs per line per month) during the period of 2020 in Uganda

		Voice Onnet (minutes of talk per line per month)	Broadband (MBs per line per month)
Voice Onnet (minutes of talk per line per month)	Pearson Correlation	1	.609
	P-value		.391
	N	4	4
Broadband (MBs per line per	Pearson Correlation	.609	1

month)	P-value	.391	
	N	4	4

Source: Own computations based on data from UCC (2021)

The correlation findings from table 9 reveal that voice Onnet (minutes of talk per line per month) had a positive moderate but non-significant relationship with broadband (MBs per line per month) during the period of 2020 in Uganda (r=0.609, P-value (0.391)>0.05). The findings may imply that the growth in the usage of mobile bundles was not in one way or another depending on the increase in voice Onnet or minutes on phone. The findings further imply that people would not load MBs and minutes at the same time on their phones during the period of COVID-19 in Uganda.

6.0 Conclusions

The study concludes that there was a remarkable improvement in the performance of telecommunication companies during the period of COVID-19 despite some challenges. During the period of 2020, most of the telecommunication companies in Uganda registered an increase in mobile subscription, growth in fixed and mobile internet subscription, and increase in smartphone and featured phone users among others.

7.0 Recommendations

The study suggests that 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, maintaining relationships, building and maintaining social capital and communicate with family and friends during COVID-19. This will go a long way to increasing usage of internet, inclusivity, and increase in profit making and achieving sustainable development goals (SDGs).

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