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Mobile Telephony Access & Usage in Africa

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Methodology

Nationally representative household surveys in 17 African countries during the end of 2007 and the beginning of 2008.

The data is nationally representative on a household level and for individuals 16 years of age or older.

Table 4: RIA 2007/2008 household survey sample

	Major Urban	Other Urban	Total	Rural
Benin	432	336	333	1,101
Botswana	348	241	229	818
Burkina Faso	416	329	332	1,077
Cameroon	490	347	398	1,235
Côte d'Ivoire	502	312	298	1,112
Ethiopia	1,173	631	551	2,355
Ghana	473	324	295	1,092
Kenya	472	557	432	1,461
Mozambique	562	312	257	1,131
Namibia	311	294	280	885
Nigeria	895	1,012	844	2,751
Rwanda	415	333	330	1,078
Senegal	432	312	337	1,081
South Africa	779	465	527	1,771
Tanzania	634	393	463	1,490
Uganda	436	347	344	1,127
Zambia	405	212	264	881
Total	9,175	6,757	6,514	22,446

Adoption / Access

Nationally representative Probit results for each country using sampling weights

Positive Coefficients + = significant at 0.1 level, ++ = significant at 0.05 level, +++ = significant at 0.01 level
Negative Coefficients - = significant at 0.1 level, -- = significant at 0.05 level, --- = significant at 0.01 level

	Pseudo R2	Prob > chi2	I	A	G	T	S	P	V	R	SN	Constant
Benin	0.396	0.00	+++	++	No	+++	+++	+++	+++	---	no	---
Botswana	0.16	0.00	+	No	No	++	+++	No	Skip	--	+++	No
Burkina Faso	0.253	0.00	+++	---	---	+++	+++	+++	Skip	---	No	No
Cameroon	0.258	0.00	+++	++	No	+++	+++	+++	++	---	++	---
Côte d'Ivoire	0.292	0.00	+++	--	No	+++	+++	No	+++	---	+++	No
Ethiopia	0.452	0.00	+++	No	No	+++	++	No	+++	---	No	---
Ghana	0.158	0.00	No	-	No	+++	+++	+++	++	---	++	No
Kenya	0.258	0.00	+++	No	No	+++	+++	.++	+++	No	++	---
Mozambique	0.214	0.00	+++	No	+++	+++	+++	+++	No	---	No	---
Namibia	0.224	0.00	+++	No	No	+++	+++	No	No	---	No	No
Nigeria*	0.172	0.00	+++	--	No	+++	+++	No	+	No	++	No
Rwanda	0.244	0.00	No	No	No	Skip	+++	+++	Skip	---	No	---
Senegal	0.215	0.00	++	No	---	+++	+++	++	++	---	No	No
South Africa	0.171	0.00	+++	---	+++	+++	+++	No	No	---	No	No
Tanzania	0.172	0.00	+++	+	-	Skip	+++	+++	+	---	+++	---
Uganda	0.357	0.00	+++	+	No	+++	++	No	+++	---	No	---
Zambia*	0.2894	0.00	+++	No	No	Skip	+++	+++	+++	Skip	+++	---

Adoption

Probit model specification

Variable	Variable Name	Type of Variable	Expected sign	Comment
Dependent Variable	Mobile(M)	Dichotomous variable: Individual has a mobile or active SIM card = 1, 0 otherwise	Na	
Independent Variables	Income(I)	Continuous variable: Individual income in US$ based on end of year nominal exchange rates (source IMF)	positive	Income is assumed to be the main barrier to adoption
	Gender (G)	Dichotomous variable: female = 1, male = 0	Not significant	The assumption is that there is no gender difference when it comes to mobile adoption
	Age (A)	In years	Negative	Technology being a domain for the younger generation
	Tertiary (T)	Dichotomous variable: highest education being tertiary = 1, otherwise 0	Positive	Education should enable individuals to use mobile phones, while also being an indicator for income, model would drop variables if multi-collinearity persists
	Secondary (S)	Dichotomous variable: highest education being secondary = 1, otherwise 0		
	Primary (P)	Dichotomous variable: highest education being primary, remedial or traditional =1, otherwise 0;		
	Vocational (V)	Dichotomous variable: highest education bei vocational =1, otherwise 0		
	Rural (R)	Dichotomous variable: rural = 1, urban =0	Negative	Mobile network coverage is less in rural areas compared to urban (major urban and other urban) ones and less adoption is expected therefore
	Social Network (SN)	Dichotomous variable: social network (as church groups, sports clubs etc.) membership = 1, otherwise 0	Positive	Membership in social networks might increase communication need
	Constant	Captures various factors that either are constant for a country such as the price for mobile or fixed telephony or that serve as reference for dichotomous variables such as the educational variables and rural-urban location.	Negative	Captures no education, but also urban

Willingness to pay of non-users

	Average willingness and ability to pay for a mobile handset US$	Average expected cost of a mobile handset US$	New users at various handset prices: 20 US$	15 US$	10 US$
Benin	7.45	11.44	124,972	487,176	677,715
Botswana	19.14	27.38	119,014	196,496	228,203
Burkina Faso	8.92	12.84	427,032	1,242,397	1,451,446
Cameroon	15.11	22.16	864,053	1,728,316	1,865,876
Côte d'Ivoire	29.70	30.06	3,057,420	3,539,351	3,914,283
Ethiopia	6.06	64.19	1,436,628	1,637,668	2,644,673
Ghana	14.02	23.15	1,283,271	1,469,652	1,841,837
Kenya	16.98	26.68	2,857,406	4,160,498	5,658,430
Mozambique	4.00	23.25	6,457	79,895	287,147
Namibia	24.64	25.12	162,992	192,395	232,584
Nigeria*	5.65	12.57	356,907	1,004,573	2,527,884
Senegal	19.55	25.43	1,336,691	2,169,548	2,301,775
South Africa	17.44	32.41	2,549,812	3,251,782	3,991,768
Tanzania	10.89	17.3	1,422,927	2,102,510	3,272,065
Zambia*	17.42	22.43	682,864	1,061,607	1,598,555

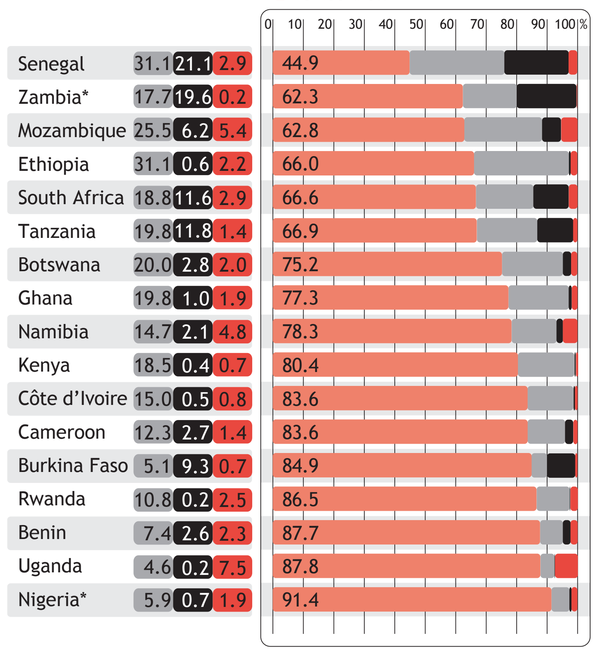
Income Elasticity / Usage

Mobile expenditure - Robust regression results for each country using sampling weights

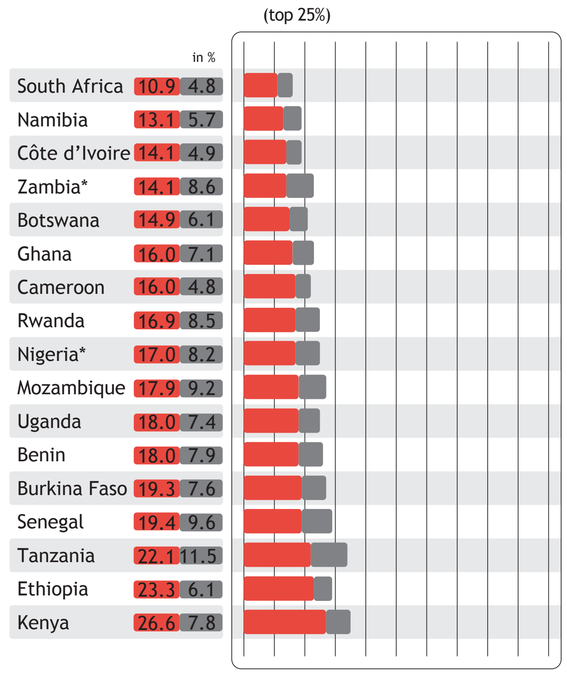
Only significant coefficients are being displayed:
* = significant at 0.1 level, ** = significant at 0.05 level, *** = significant at 0.01 level

	R^2	Prob >F	Income	Age	Gender	Work Phone	Pulic Phone	Fixed Line	Rural	Social Network
Benin	0.399	0.000	0.35***			1.07***	-0.27***			
Botswana	0.298	0.000	0.46***		-0.26**					
Burkina Faso	0.206	0.000	0.33***				0.28*	0.35***		
Cameroon	0.22	0.000	0.27***		-0.32**		-0.22*	0.54*	-0.4*	
Côte d'Ivoire	0.196	0.000	0.36***	-0.02*		0.45**		0.37*	0.34*	
Ethiopia	0.353	0.000	0.29***	-0.01**					-0.47***	0.23*
Ghana	0.145	0.000	0.47***	-0.01**						
Kenya	0.251	0.000	0.33***	-0.02***		0.44***		0.47***		
Mozambique	0.189	0.000	0.11**	-0.03***	-0.72**			1.04***		
Namibia	0.449	0.000	0.43***		-0.23*	0.37**				
Nigeria	0.458	0.000	0.71***		0.24***			-0.41*	0.24***	
Rwanda	0.339	0.000	0.55***				0.66***			
Senegal	0.266	0.000	0.43***				0.247*			
South Africa	0.477	0.000	0.47***	-0.02***		0.2**	-0.2***	0.3***		
Tanzania	0.127	0.000	0.33***					0.84**		
Uganda	0.292	0.000	0.39***					0.48**	-0.24*	0.43**
Zambia	0.378	0.000	0.52***	-0.01**				0.69***		

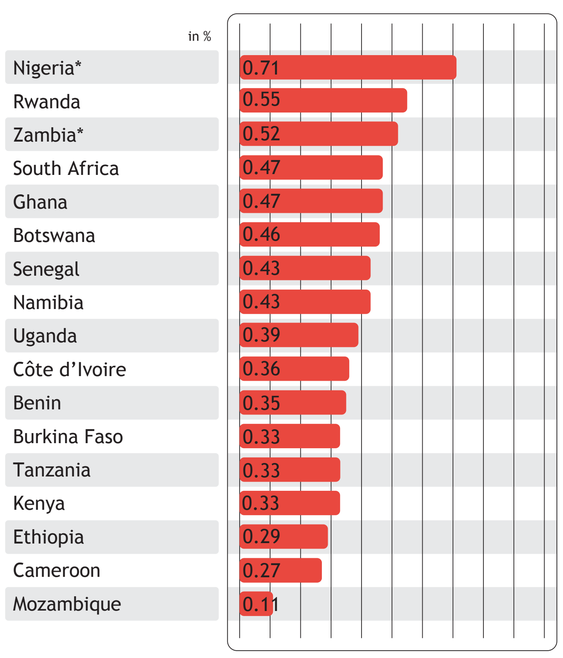
If calls were cheaper what would you do?

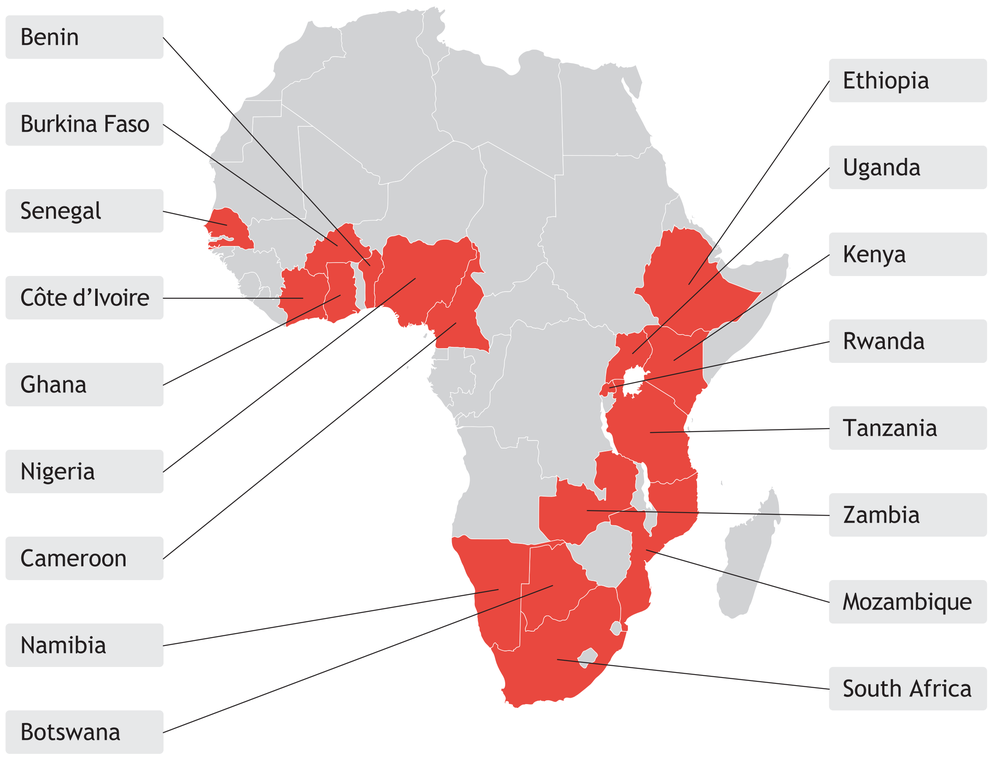


Share of mobile expenditure per month in terms of individual income.



Income elasticity: percentage change in mobile expenditure for 1% change in income.





Digital Divide: Urban-Rural

Households with working fixed-line phones

	National Major	Urban	Other Urban	Rural
Rwanda	0.10%	1.20%	0.00%	0.00%
Uganda	0.30%	1.60%	2.00%	0.00%
Tanzania	0.90%	2.80%	2.50%	0.20%
Mozambique	1.70%	7.30%	1.30%	0.00%
Cameroon	1.80%	3.50%	3.50%	0.00%
Kenya	2.30%	11.40%	0.90%	1.40%
Ghana	2.60%	6.30%	4.60%	0.30%
Nigeria*	2.70%	9.70%	5.70%	1.20%
Benin	4.60%	15.50%	6.80%	0.60%
Burkina Faso	4.70%	18.30%	16.70%	0.30%
Côte d'Ivoire	4.80%	10.80%	7.10%	1.30%
Ethiopia	7.60%	46.00%	22.70%	2.90%
Botswana	11.00%	7.80%	17.00%	8.70%
Senegal	11.70%	21.50%	19.20%	0.60%
Namibia	17.40%	34.10%	29.60%	7.90%
South Africa	18.20%	38.90%	18.50%	2.10%
Zambia*	2.44%	5.20%	7.55%	0.00%

Digital devide

Digital Divide Income

ICT Knowledge and use, and mobile access across disposable income categories

	16+ knowing what the Internet is		16+ using the Internet		Owning a mobile phone or active SIM card	
	lower three disposable income quartile in ppp terms	top disposable income quartile in ppp terms	top disposable income quartile in ppp terms	lower three disposable income quartile in ppp terms	lower three disposable income quartile in ppp terms	top disposable income quartile in ppp terms
Benin	17%	33%	6%	16%	17%	63%
Botswana	14%	52%	2%	19%	53%	83%
Burkina Faso	6%	17%	2%	10%	19%	50%
Cameroon	35%	54%	10%	25%	28%	74%
Côte d'Ivoire	12%	31%	4%	14%	33%	63%
Ethiopia	6%	18%	0%	3%	1%	11%
Ghana	26%	27%	5%	8%	53%	79%
Kenya	25%	52%	9%	32%	42%	79%
Mozambique	2%	10%	1%	3%	20%	49%
Namibia	16%	60%	4%	25%	37%	86%
Nigeria*	35%	52%	10%	22%	74%	93%
Rwanda	4%	13%	1%	4%	4%	26%
Senegal	37%	71%	9%	14%	29%	77%
South Africa	42%	75%	7%	38%	54%	84%
Tanzania	6%	16%	1%	4%	14%	46%
Uganda	4%	15%	1%	7%	12%	46%
Zambia*	39%	60%	1%	13%	36%	84%

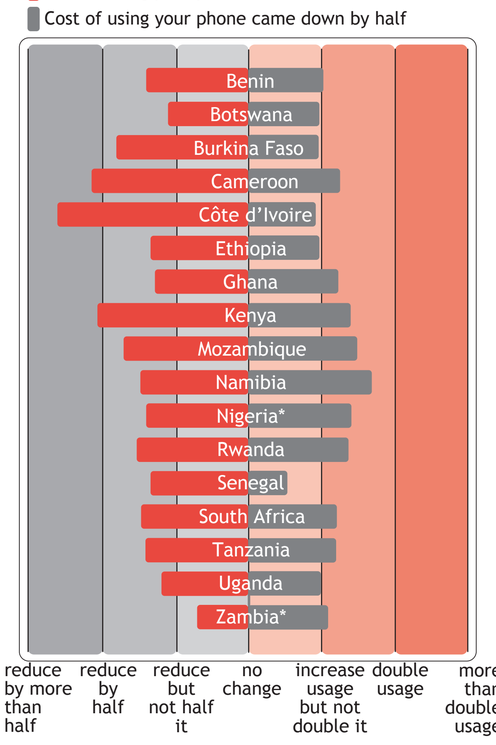
Mobile penetration

	Monthly average mobile expenditure in US$	Current market in US$ million	16+ with mobile phone or active SIM		16+ with more than one SIM card	Number of duplicated SIM Cards	Total Number of active SIM cards	Share of Prepaid users
Benin	8.33	11.38	1,365,851	30.2%	496,917	1,173,454	2,047,486	95.96%
Botswana	10.18	6.67	654,737	59.5%	61,670	129,323	722,390	99.28%
Burkina Faso	5.84	10.77	1,844,701	27.2%	380,945	943,819	2,408,616	96.69%
Cameroon	7.14	21.29	2,979,597	36.5%	240,473	600,756	3,440,472	88.04%
Côte d'Ivoire	12.52	63.13	5,042,524	41.8%	762,295	1,741,585	6,037,870	91.77%
Ethiopia	3.81	5.29	1,387,910	3.2%	8,379	17,282	1,410,159	88.31%
Ghana	10.44	78.23	7,491,378	59.8%	832,341	1,969,676	8,691,409	99.83%
Kenya	10.41	112.11	10,772,696	52.0%	2,796,971	5,932,015	13,984,190	98.89%
Mozambique	6.26	30.47	4,865,758	25.7%	143,404	286,808	5,012,287	98.89%
Namibia	11.41	7.14	625,707	49.3%	39,090	83,807	670,424	89.95%
Nigeria*	10.88	686.54	63,101,014	77.3%	12,265,752	26,381,512	77,954,949	99.33%
Rwanda	6.02	3.13	520,259	9.9%	16,170	32,340	536,429	94.77%
Senegal	11.00	27.54	2,502,300	39.8%	125,251	291,243	2,705,744	99.70%
South Africa	15.88	320.49	20,185,135	62.1%	2,200,647	4,845,907	22,938,052	78.64%
Tanzania	7.44	30.79	4,138,338	21.5%	602,730	1,301,997	5,070,790	96.95%
Uganda	5.75	16.81	2,924,095	20.7%	526,378	1,097,654	3,505,813	97.84%
Zambia*	10.55	25.96	2,459,961	45.5%	110,683	253,279	2,605,368	99.7%

Mobile willingness and ability to pay

	16+ without mobile phone or active SIM card		Number of 16+ without a mobile phone or active SIM willing and able to spend monthly: 1US$ or more	2 US$ or more	5 US$ or more	Average monthly WTP in US$	Monthly untapped market in US$ million
Benin	69.8%	3,162,099	2,797,101	1,402,507	161,217	2.94	8.26
Botswana	40.5%	446,140	311,446	199,511	66,192	4.28	1.47
Burkina Faso	72.8%	4,929,897	4,371,694	1,875,892	430,952	3.13	13.71
Cameroon	63.5%	5,177,393	3,452,460	1,855,275	550,724	3.75	13.14
Côte d'Ivoire	58.2%	7,033,592	4,485,498	3,645,855	1,677,528	6.86	31.44
Ethiopia	96.8%	42,497,353	10,231,145	3,104,395	74,428	1.53	25.68
Ghana	40.2%	5,036,815	2,849,435	1,953,135	984,279	9.34	38.40
Keny	48.0%	9,941,748	5,866,299	5,235,785	1,245,083	3.30	25.69
Mozambique	74.3%	14,078,222	1,407,840	1,199,765	376,037	2.96	6.70
Namibia	50.7%	644,056	275,364	247,254	71,171	4.88	1.35
Nigeria*	22.7%	18,541,687	7,989,151	6,234,941	5,128,000	6.09	65.25
Rwanda	90.1%	4,735,492					
Senegal	60.2%	3,779,221	3,428,481	1,294,681	502,730	3.28	11.33
South Africa	37.9%	12,331,758	7,604,512	5,551,777	2,209,625	4.34	36.27
Tanzania	78.5%	15,066,652	5,560,959	4,750,935	1,064,087	2.61	21.42
Uganda	79.3%	11,174,801					
Zambia*	54.0%	2,944,732	1,933,833	1,310,576	329,922	3.45	8.2

Average reaction to cost of using your phone came down by half or going up double



* The data for Zambia and Nigeria are national extrapolations but not nationally representative. In Zambia the selection probabilities had to be estimated since enumerator ID information was not unique. In Nigeria the sample was drawn only from 6 of 36 provinces.

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Conclusion

- Countries differ in their levels of ICT adoption and usage and also in the factors that influence adoption and usage.
- Income and education vastly enhances mobile adoption but gender, age and membership in social networks have little impact.
- Income is the main explanatory variable for usage.
- Mobile expenditure proofs to be inelastic with regard to income, ie as income increases mobile expenditure increases to a lesser extent indicating its importance in individual budgets.
- The correct policy and regulatory measures can boost mobile access and usage. Avoiding sector and service specific levies and additional taxes will result in lower recovery costs and therefore lower prices. Lower prices would allow millions of people currently unable to afford to access mobile services to do so and those currently restricting their usage as a result of the high cost of services to use services more extensively and effectively. This is likely to produce greater profits for companies overall and Governments will as a consequence have even more money in their coffers due to taxes on greater operator revenues.

Key policy interventions

Regulatory measure to increase access and usage of mobile services:

- Increasing Coverage: Licence fees for infrastructure investment should cover the administrative and usage costs of national resources only. The current high cost of licences in most countries used to generated funds for state coffers translate in high prices for consumers as operators recover their licence costs. Countries need to look at incentives to encourage networks rollout not disincentives.
- Wider Access: Access prices can be reduced by exempting telecommunication equipment, in particular mobile handsets and services from import duties and additional taxes.
- Allow more Usage: Policy measures to increase the competition within the industry are the best mechanism to reduce usage costs. In a competitive environment the operator can choose to compete on price or on service quality. Regulatory measure can improve competition on price by creating price transparency.
- Price Transparency: Contract and prepaid tariffs vary across operators to an extent that a product to product comparison is impossible for consumers. Non- transparent pricing, including rapidly changing promotions and misleading media campaigns, make it difficult for end-users to make informed decisions. This prevents operators from having to compete on prices and leads to higher average prices. Establishing price transparency on the basis of published monthly usage baskets will make the cost to the end-user transparent and force operators to compete on price or service quality.
- Cost-based Interconnection rates: Above cost interconnection charges are often used by dominant operators to restrict small operator from gaining market share. High interconnection charges make off-net calls expensive and punishes consumer or small operator. Cost based interconnection rates (or benchmarked on cost base) increase the competition between operators and hence lead to lower usage cost.
- Licences for Low ARPU business models: Regulators should award additional licences to applicants that are able to offer low ARPU business models, preferably below US$2.