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Internet Use, Welfare, and Well-Being: Evidence From Africa

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Abstract

Traditional consumer theory assumes that welfare is derived at the point where goods are purchased. More recent theories however argue that what matters is dependent on what happens after goods are purchased. Such information requires surveys that are specifically designed for the purpose. Accordingly, Internet use data are few and far between in developing countries. Recently, however, such data have become available for 11 African countries and my intention in this article is to use them to assess welfare more realistically across the countries in question. Among the questions asked are do the patterns of use favor one set of countries over others or are the observations more random in character? Which use mechanisms are most important across the sample and why? How do these results compare with those of a developed country such as the United States?

Keywords

welfare analysis, survey evidence, information technology

Introduction

For a very long time, welfare (or quality of life) in economics has been measured by the (nature and) amount of goods consumed. Implicitly, this practice has assumed and continues to assume that welfare is conferred to consumers at the point where goods are purchased and utility is gained. More recent theories, however, such as Sen's (1985) functionings approach, suggest that what also matters to well-being is the use to which goods and technologies are put *after* purchase. It is one thing, for example, to adopt a product but its ultimate value depends, inter alia, on how and how intensively it is used after purchase. Such information however is difficult to obtain and requires survey methods to collect. In the case of information and communication technology (ICT) in developing countries, surveys of this kind are few and far between and those that do exist, relate, as far as I am aware, entirely to mobile phones.¹ Recently, though, rigorously collected and detailed Internet data for 11 African countries have become available and they shed quite some light on the issues at hand.²

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Figure 1. Alternative models of consumption and well-being.

Note. > = traditional model. >> = use-based model.

Source: James (2013).

The task below is accordingly to present such data and where possible to explain them. Among the questions that are asked in this regard are do the patterns of use favor one particular group of African countries over others? Which use mechanisms are most important across the sample countries? How do these results compare with those of a developed country, such as the United States? Which variables (such as income and education) correlate most closely with observed Internet use? Before setting out to answer these and other questions, however, I begin with a brief description of the basic model and show how it compares with traditional theory. This is followed by a short description of the survey itself. The analysis proper then takes place by averaging across rows and columns of the basic data that are presented as an extended table. Stepping outside this framework, I examine next the effect of Internet use on social capital in different countries and calculate a macro adjustment to the data. With an eye to possible policy implications, the final section investigates the major constraints on Internet use in the sample countries.

The differences between the traditional economic approach and the use-based model can be summarized as in Figure 1. In the former, access to the Internet takes place exclusively by means of ownership and utility is somehow derived therefrom (with no attention paid to what is actually done with it). The latter, by contrast, examines both owning and nonowning users (such as visitors to a cybercafe) and is directly concerned with the ways in which Internet use provides actual benefits to both groups (and the inequality or equality of the distribution of such benefits).³

Table 1 shows the variety of ways in which the Internet is accessed in the two illustrative countries, Uganda and Tanzania. From the point of view of nonowning users, what are jointly most important are community and commercial access points (with the latter taking the form generally of cybercafes). In both countries, these forms of access together account for nearly 30% of all locations. Note that this is only a minimum estimated amount of nonowning users. For there may be others who share or rent this technology at other people's places and at their places of work and education. Note further that sharing is known to take place in mobile phone use, thus further expanding the pool of possible nonowning users.⁴

Table 1. Nonowning Users of Internet Facilities (Illustrative Countries).

Location	Uganda % of Total Locations Where Internet Used	Tanzania % of Total Locations Where Internet Used
Home	5.6	15.5
Work	13.2	14.1
Place of education	12.3	7.7
Another person's home	13.0	7.6
Community Internet access	10.3	9.9
Commercial Internet access	17.8	19.9
Any place via mobile phone	19.5	23.7
Any place via another mobile access device	8.2	1.5
	100	100

Source. Research ICT Africa (2011).

The Benefits of Use

Even if nonowners are included in a sample, as noted previously, there remains the vital question of how users actually benefit from the Internet. Traditional economic theory is not very helpful in this respect because it assumes that welfare or well-being occurs at the point where the technology is purchased (from where a certain measure of utility is derived). As Sen (1985) and others have persuasively argued, however, "What matters for well-being is not just the characteristics of commodities consumed, as in the utility approach, but what use the consumer can and does make of commodities. For example, a book is of little value to an illiterate person (except perhaps as cooking fuel or as a status symbol) To make any sense of the concept of human well-being in general, and poverty in particular, we need to think beyond the availability of commodities and consider their use: to address what a person does (or can do) with the commodities . . . that they come to possess or control" (Todaro & Smith, 2011, p. 16).

The purpose of this article, accordingly, is to move in the direction thus proposed, by studying the patterns of use in 11 African countries as described in a detailed new survey. First, however, I briefly discuss the method used in the survey, which was conducted by "Research ICT Africa," a South African research institution.

Survey Methodology

There are several levels on which the method adopted by the survey can be described as impressive. In the first place, there is a diverse range of 11 African countries, running from the very poor to those among the richest on the continent (see Table 2). The selected countries are also dispersed by region including East, West, and Southern Africa. At the level of each country, moreover, the survey is based on relatively large numbers of respondents, as shown in Table 3.

In a related fashion, the data are gathered with the use of national statistical methods that help to ensure nationally representative information (e.g., national census sample frames and enumerator areas). Note, finally, that the survey covers an impressively large number of ways in which the Internet is used to convey benefits to users in the countries concerned.

The Basic Data

The bulk of the data collected in the country surveys can be presented in Table 4 with the columns representing the 11 countries and the rows showing the extent to which the Internet is used in a range

Table 2. Correlating Internet Use With Selected Variables.

Country	Use Score	Per capita Income (\$)	Tertiary Enrollment	Fixed Broadband Internet Access Tariff (\$ a month)
Namibia	65.6	7,500	5.9	47.2
Uganda	61.7	1,300	3.0	194.4
Ghana	60.7	3,100	3.3	44.4
Nigeria	58.8	2,600	4.3	104.0
Kenya	52.9	1,800	3.0	39.8
Botswana	52.7	16,200	4.6	62.2
Tanzania	51.4	1,500	0.7	63.6
Cameroon	49.0	2,300	4.9	88.6
South Africa	45.5	11,100	15.2	26.9
Rwanda	43.5	1,400	1.7	88.0
Ethiopia	34.5	1,100	1.6	486.5
Correlation with use	—	.09	-.006	-.54

Source. CIA World Factbook; World Bank, Indicators; *The Little Data Book on Information and Communication Technology*; Research ICT Africa, own calculations.

Table 3. Number of Households Interviewed by Country.

Botswana	900
Cameroon	1,200
Ethiopia	1,600
Ghana	1,200
Kenya	1,200
Namibia	900
Nigeria	1,600
Rwanda	1,200
South Africa	1,600
Tanzania	1,200
Uganda	1,200

Source. Research ICT Africa (2011).

of different mechanisms. The cell in the first row and column, for example, indicates that 50.7 of Internet users in Uganda employ this technology for getting information about goods and services. The information contained in Table 4 can be summarized and made easier to interpret by aggregating over rows and columns, beginning with the latter in Table 5.

Use Patterns and Explanations

Averaging across columns. Table 5 shows the result of averaging across columns. It records a ranking of the most intensively used mechanisms covered by the sample. At 83.1%, e-mailing is on average the most common of the uses to which the Internet is put in the sample countries. This is probably not surprising since e-mail can be used for communication as well as seeking out information. The second most important mechanism, by contrast, is solely concerned with gathering information, involved as it is with finding or checking facts.

Perhaps the most striking aspect of Table 5, however, is the role played by entertainment-related mechanisms of use. In particular, four such mechanisms appear in the top 10 entries in the table, namely, social networking, downloading movies, reading online newspaper, and playing

Table 4. The Basic Data % Who Sometimes Engage in Mechanism.

Country Mechanism	Country										
	Uganda	Kenya	Tanzania	Rwanda	Ethiopia	Ghana	Cameroon	Nigeria	Namibia	South Africa	Botswana
Getting information about goods or services	50.7	53.4	65.1	35.5	35.1	53.9	63	62.9	70.3	49.8	50.7
Getting information related to health and health services	64.1	69.8	57.8	27.8	49	78.8	53.9	71.9	66.9	39.5	65.2
Getting information from government organizations	52.9	56.8	43.1	72.5	34.2	53.4	45.4	60.3	56.3	31.5	50.5
Interacting with government organization	39.5	28.7	33.8	26.2	13.5	35.8	28.2	47.9	48.5	22.4	35.3
Sending or receiving e-mail	88	89.1	89.3	90.8	64.7	96.2	89.8	83.5	77	68.3	77.1
Telephoning over the Internet (VoIP)	54	26.8	14.6	10.4	13.3	45.7	40.4	32.2	47	24.1	28
Posting information or instant messaging	68.7	80.8	68.8	80.4	52.9	84.5	67.7	75.4	50.4	61.7	71.3
Purchasing or ordering goods and services	39	17	18	19.9	0.9	18	16.4	39.6	39.3	25.4	21
Internet banking	11.1	13.4	23.7	10.4	0	19.9	10.8	24.7	42.4	32.4	22.9
Education or learning activities (formal)	74.9	61.5	50.2	26.9	35.5	87.3	47.9	69.8	69.3	52	56.5
Playing or downloading video games or computer games	72.4	71.8	63.9	28.8	34.2	83.4	50.9	65	79	50.3	56.3
Downloading movies images, music, watching TV or video, or listening to radio or music	81.4	76.2	80.6	39.1	39.3	86.5	50.7	63.4	83.7	59.7	66.6
Downloading software	55.4	53.3	51	34.4	28.9	74.5	27.5	44.3	61.1	40.3	43.1
Reading or downloading online newspapers or magazines, electronic books	66.8	64.8	53.8	57.4	75.3	45	39.5	60.7	84.6	43.7	69.8
Participating in distance learning for an academic degree or job training	57.2	24.7	29	18.4	6.9	32.3	34.4	30.8	54.3	28.7	26.3
Getting information for school- or university-related work/researching a topic	73.7	63.4	50.1	60.3	40.8	66.6	53.3	73.2	76.9	56.5	60.2
Looking for free education content, such as free courses	71	64.9	40.9	32.2	22.7	37.5	58.4	54.6	71.6	43.3	53.3
Collaborating online on documents (e.g., Google and OCS)	70.2	51.5	50	42.8	41	55.6	59.2	64.3	63.6	50.2	46.6
Social networking or video-sharing websites	69.8	82.6	58.9	81.1	37.5	81.8	72.4	76	81.1	70.6	72.5
Finding or checking a fact	72.8	77	80.2	75.6	64.1	77.4	70.8	75	88	60.9	80

Note. VoIP = Voice over Internet Protocol; OCS = Office Communications Server.

Table 5. Averaging Over Columns (%).

Mechanism	Averaging Over Columns (%)	Ranking
Sending or receiving e-mail	83.1	1
Finding or checking a fact	74.8	2
Social networking	71.3	3
Posting information or instant messaging	69.3	4
Downloading movies, etc.	66	5
Getting information for school or university work	61.4	6
Reading or downloading online newspapers, etc.	60.1	7
Playing or downloading video games	59.6	8
Getting information related to health	58.7	9
Education or learning	57.4	10
Collaborating online	54.1	11
Getting information on goods	53.7	12
Getting information from government organizations	50.6	13
Looking for free education	49.9	14
Downloading software	46.7	15
Interacting with government organizations	32.7	16
Participating in distance learning	31.2	17
Telephoning over VoIP	30.6	18
Purchasing or ordering goods and services	23.1	19
Internet banking	19.2	20

Note. VoIP = Voice over Internet Protocol.

videogames. On first appearance, the prominence of entertainment-related uses may seem somewhat paradoxical in as much as this form of use is seen as the preserve of those with high incomes and advanced Internet skills. But on further reflection, there do appear to be some alternative explanations for this finding.

One of them begins with the recognitions that entertainment is a relatively time-intensive activity and that time is a comparatively abundant resource in developing countries, especially among those with the lowest income levels. Becker (1965) for example, assumes that “the value of an hour equals average hourly earnings” and thus that there is a “one-to-one correspondence between earnings and the value of time.” Time is thus much more valuable in rich as against poor countries, a consideration which helps to explain the many efforts (such as frozen foods and microwave ovens) made in the former to economize on this factor.

A second reason has to do with the age structure in Internet use and in this regard one should bear in mind that according to the International Telecommunications Union (ITU) 45% of users of this technology are drawn from those of less than 25 years of age. This percentage is almost certainly higher for entertainment-related uses, which, in the form of say, computer games, relies heavily on a relatively young audience. The point is then that in Africa (as most elsewhere in the developing world) the population is biased strongly toward younger ages. In 2009, for example, 43% of Ethiopia’s population and 45% of Nigeria’s were under the age of 15 (Todaro & Smith, 2011). In Europe, on the other hand, only about 15% of the population is under this age.

The previous discussion suggests that it may be worthwhile to compare Internet use patterns in rich and poor countries. To this end, Table 6 presents the top 10 uses in the United States and Kenya (a country from the sample that was arbitrarily selected for the comparison).

Apart from the appearance of e-mail in first or second position in the two countries, there is not much overlap between the entries in the two columns. A major difference seems to be that in the

Table 6. Ranking of Top 10 Mechanisms: United States and Kenya.

Kenya (%)	United States (%)	
Sending/receiving e-mail	89.1	Using a search engine 91
Social networking or video sharing	82.6	Sending or receiving e-mail 88
Posting information or instant messaging	80.8	Looking for information about hobby 84
Finding or checking a fact	77	Checking the weather 81
Downloading movies, etc.	76.2	Looking for information about a good or service you are thinking of buying 78
Playing or downloading video or computer games	71.8	Getting news 78
Getting information related to health	69.8	Going online just for fun or passing the time 74
Looking for free education	64.9	Buying a product 71
Reading or downloading online newspaper or magazines, etc.	64.8	Visiting a government website 67
Getting information for school- or university-related work/researching a topic	63.4	Using a social networking site like Facebook 67

Source. PEW Internet (2012); Research ICT Africa (2011).

Table 7. Averaging Over Rows (%).

Country	Average of Rows (%)	Ranking
Namibia	65.6	1
Uganda	61.7	2
Ghana	60.7	3
Nigeria	58.8	4
Kenya	52.9	5
Botswana	52.7	6
Tanzania	51.4	7
Cameroon	49.0	8
South Africa	45.5	9
Rwanda	43.5	10
Ethiopia	34.5	11

Source. Based on Research ICT Africa (2011).

United States, the Internet is not as predominantly used for entertainment as in Kenya. In the former country, this technology is used mainly for getting information. Ironically, therefore, the country most in need of improved information is getting less of it. In a strictly neoclassical welfare framework, however, one cannot make interpersonal judgments about preferences even if in some cases the government may have to (e.g., in education).⁵ In such cases, policy makers might well conclude that entertainment is a less developmental activity compared to providing information on health, nutrition and so on.

Averaging across rows. The results of averaging across rows are shown in Table 7 that contains a ranking of all 11 countries according to the mechanisms that have already been described.

This information conveys welfare significance because it tells us about the inequality of use between countries; whether, for example, it is more or less equal than the inequality of countries according to adoption. In one case, it would ameliorate such inequality and in the other case worsen the problem. Even a glance at Table 7, however, is enough to indicate that there is no strong relationship between per capita income and Internet use. For there are poor countries (such as Uganda) near the top of the list and rich ones (such as South Africa) near the bottom (see a list of countries

ranked by income per capita in Table 2). This impression of randomness is more rigorously confirmed by correlation analysis that finds a low correlation coefficient between income and Internet use (see Table 2).

Other promising determinants of Internet use are computer skills and computer literacy. After all, some uses are more difficult than others and the requisite skills may not be taught at either primary or secondary levels of the education system. In any event, moreover, “not knowing how to” is the main constraint given by respondents for nonuse of the Internet. Following Schmidt and Stork (2008), tertiary enrollment was chosen as the relevant proxy variable, but here again the correlation is low and difficult to explain. What does seem to correlate reasonably well ($-.54$) with use however is the height of broadband Internet access tariffs and unlike the others this result fully conforms to what one would expect. The question of what determines price becomes an important and complex one. At least in the case at one extreme end of the country experience (see Table 2), however, the answer seems relatively clear. I am referring to Ethiopia and the explanation is to be found in the regulatory situation of that country. In particular,

Ethiopia has Africa's last big telecoms monopoly. The absence of competition has seen a country of more than 80 m lag badly behind in an industry that has generally burgeoned alongside economic growth

Ethiopia's authoritarian leaders are as keen as any on the economic benefits of modern telecoms but fear the political ramifications (*The Economist*, August 24, 2013).

At the other extreme, Namibia has seen a falling price of Internet access due to favorable development in the policy and regulatory environment.

A Macro Welfare Adjustment

The data presented thus far are lacking in a macro dimension (i.e., in information at the economy-wide level). For that purpose, what also needs to be known is the percentage of Internet users at the macro level. For example, say 50% of users are involved in using this technology to contact friends and family. What also needs to be known however is the percentage of users of the Internet that actually exist in the economy. Assume that figure is also 50%. Then, 25% of the adult population as a whole use the Internet to contact friends and family and thereby increase social capital.

Such a procedure can be extended to all countries in the sample as shown in Table 8. Perhaps the most striking effect of adding the percentage of users of the Internet to the first row of the table can be seen by comparing Uganda and Kenya.

Both countries show much the same percentage of those using family and friends to increase social capital. But Kenya enjoys a much higher percentage of the population (26.3) that is actually using the Internet. As a result, Kenya has a much higher position than Uganda after, rather than before, the macro adjustment has been made.

The Impact of Internet Use on Social Capital

The survey whose data are being used collects information specifically on the effect of Internet use on social capital. This is relevant to welfare since many people feel that such an effect will be positive and hence that welfare will be increased. According to Quan-Haase and Wellman (2004), for example, the Internet can be thought of as an extra means of communications to foster extant social relationships and to follow norms of civic engagement. For the World Bank (2008), “Information technology directly lessens the costs associated with imperfect competition. In this way, information has the potential to increase social capital- and in particular bridging social capital which connects actors to resources, relationships and information beyond their immediate

Table 8. A Macro Welfare Adjustment.

	Uganda	Kenya	Tanzania	Rwanda	Ethiopia	Ghana	Cameroon	Nigeria	Namibia	South Africa	Botswana
% Using family and friends to increase social capital	89.3	87.1	57.8	52.7	65.6	68.7	79.9	58.2	75.7	72.5	66.3
% Using the Internet	7.9	26.3	3.5	6.0	2.7	12.7	14.1	18.4	16.2	33.7	29.0
Macro Internet use of friends and family (%)	7.1	22.9	2.0	3.2	1.8	8.7	11.3	10.7	12.3	24.4	19.2
Country ranking	8	2	10	9	11	7	5	6	4	1	3

Source. Research ICT Africa.

Note. Ranking is from highest to lowest.

environment.” “In all of these ways the participants will tend to benefit from increased social capital thus achieved” (James, 2009). Table 9 sets out the findings from the survey regarding the impact of Internet use on various dimensions of social capital.

Unlike those in the rest of the article, the results shown in Table 9 bear quite a striking resemblance to what was found for mobile phones using the same survey in a separate study (James, 2013). For one thing, in both cases, family is the most important vehicle through which the Internet affects social capital. Again like mobile phones, moreover, there is a preponderance of neighboring East African countries (Uganda, Kenya, and Tanzania) among the leading group of four. On the other hand, two countries from this region (Ethiopia and Rwanda) occupy the last two places, so it is difficult to talk of an “East Africa” effect. This is clearly another area where further research is needed. Such research would do well to recognize that in other cases involving the social impact of the Internet, Uganda and Kenya also distinguish themselves in a positive sense. According to a South African technology research firm, for example, companies in Uganda and Kenya lead the way in blogging, interactions, and online advertisements on Facebook, twitter, MySpace, and other social media (*The Observer*, October 6, 2010).

Although these countries have similar scores on the first row, Uganda has a much lower score on the national percentage using the Internet and the outcome shows an overall score for this country that is only one third of Kenya’s. On the other hand, South Africa and Botswana score best on Internet use and this changes their overall performance in a favorable (for them) direction. Given the relatively high income levels of these two countries, an inegalitarian tendency is imparted at the macro level to the initial result of using the Internet for contacting friends and family.⁶

Constraints on Internet Use

In this final section, data that were collected in the survey on constraints to Internet use in the countries concerned are employed. One important question is whether these data tend to confirm or question the previous finding that the Internet access price correlates fairly closely with the use of this technology. Table 10 shows five barriers that are thought to constrain Internet use in all 11 countries, with a ranking for each one (1 denotes the best performance in a column and 5 the worst).

By quite a wide margin expense shows up as the dominant constraint, followed by the speed of the Internet and then the three more sociological variables such as local content and lack of people to communicate with (the last-mentioned factor, one should note, stands in sharp contrast to the experience with mobile phones where a shortage of people to communicate with was not readily apparent). The dominance of the price constraint serves to confirm the finding noted above of a moderate inverse correlation between Internet access tariffs and the use to which the technology is put in the sample. Note though that the correlation is far from perfect. On one hand, there are countries such as Uganda, which is plagued by high Internet tariffs but manages to achieve the second highest use score. On the other hand, there are countries such as South Africa which enjoys the lowest price but comes third from last on the use score. Explaining outliers such as these would seem like a profitable area for future research.

The seriousness of the price constraint becomes easier to understand when a comparison is made between African and other country levels of this variable. In particular, “For the few who accessed ICT networks at home—or more frequently in the workplace, educational institutions, or cybercafes—their usage was constrained by the high costs of communications, not least of all as a result of the high cost of international bandwidth. The average retail price for basic broadband in sub-Saharan Africa is US \$ 366, per Mbps/m, compared to US \$ 40 in Europe and India” (Gillwald, 2010, p. 82).

From a policy point of view, therefore, attention should be most obviously paid to lowering prices, especially in countries where these are high relative to others in the sample. What seems clear, though, is that a purely economic approach to this issue would not suffice.⁷ As Gillwald rightly puts it:

Table 9. Internet Use and Social Capital.

Country	Uganda	Kenya	Tanzania	Rwanda	Ethiopia	Ghana	Cameroon	Nigeria	Namibia	South-Africa	Botswana	Average Columns
Form of Social Capital												
Does your use of the Internet increase your contact with:	67.3	77.5	56.3	75.4	63.0	65.6	58.6	57.2	72.6	50.9	63.8	64.6
- Those who share your hobbies	42.4	30.8	36.8	2.6	11.4	31.1	14.0	40.3	19.0	24.0	35.5	26.2
- Those who share your political views	68.0	48.9	59.5	18.2	29.9	59.6	48.3	50.9	27.2	40.6	44.2	45.0
- Those who share your religious beliefs	89.3	87.1	57.8	52.7	65.6	68.7	79.9	58.2	75.7	72.5	66.3	70.3
- Friends and family	83.9	72.4	64.7	73.6	40.9	73.4	54.9	49.6	53.1	58.1	61.5	62.3
- Colleagues	70.2	63.3	55.0	44.5	42.1	59.7	51.1	51.2	49.5	49.2	54.3	
Average rows	1	2	4	10	11	3	7	6	8	9	5	
Rank												

Source: Research ICT Africa.

Table 10. Constraints on Internet use.

Country	Uganda	Kenya	Tanzania	Rwanda	Ethiopia	Ghana	Cameroon	Nigeria	Namibia	South Africa	Botswana
Use Constraint											
Lack of interesting content	5	5	5	5	5	5	5	5	5	4	3
Lack of local language content	4	4	4	4	4	3	4	4	4	5	5
Too slow	3	3	3	2	2	1	3	1	2	2	2
Too expensive	1	1	1	3	1	2	1	2	1	1	1
Too few people to interact with	2	2	2	1	3	4	2	3	3	3	4

Source: Based on Research ICT Africa.

adopting stronger political economy approaches to policy reform, approaches that analyze the interaction of the state and the market to facilitate the implementation of reform, would go some way toward explaining why the reform paradigm, which promotes competition, dilutes incumbents' monopoly-wielding power, and adopts universal service policies that do not distort the incentives of the market actors, has only been adopted piecemeal, limiting its efficacy. Such an approach would lay greater emphasis on the role of institutions and the interplay among them. This would allow a greater understanding of what enables or inhibits their effectiveness to translate a market-based reform paradigm into action. (Gillwald, 2010, p. 80)⁸

It is worth noting that a similar conclusion was reached in the lengthy debate over appropriate technology for developing countries. While simple economic logic seemed to dictate the use of labor-intensive technology in labor-abundant, capital-scarce economies, actual practice rarely jelled with this prescription and even state-owned enterprises tended to choose in favor of relatively complex, capital-intensive alternatives. Part of the reason, it appeared, had to do with the dominance of political over economic logic (Stewart, 1983).

Conclusion

Using a detailed recent survey of Internet use in 11 African countries, this article has explored the implications for welfare of moving from a consumption theory of ownership and utility to one based on use and benefits. To a large extent, the implications were explained in terms of the analysis of a basic data set with the 11 countries shown on the one axis and Internet use mechanisms on the other. This showed not only the leading use mechanisms across countries but also the leading country beneficiaries across mechanisms. As far as the former are concerned, the outcome is that a high percentage of Internet use is concerned with entertainment as compared to a selected developed country whose inhabitants seemed more concerned with obtaining basic information of various kinds. The pattern of leading countries however proved more difficult to interpret, as it displayed virtually no correlation with the familiar variables of income and education. The only reasonable correlation was achieved in the case of broadband Internet access tariffs, placing the explanatory focus firmly on telecom markets and regulation. This is clearly an area where considerable further research is needed.

I also examined the effect of Internet use on social capital—that is, on whether and to what extent social ties were enhanced between the relevant parties. The results obtained in this regard are very similar to those calculated in the same way for mobile phones in a separate article using the same survey. In both cases, for example, the interpersonal relationship most influenced by information technology was between family and friends. Again like mobile phones, moreover, the leading countries were drawn almost overwhelmingly from East Africa. The reasons for this however are not clear and open up yet another area for further research. More generally, the results presented in this article should be interpreted less as firm conclusions and more as a tentative future research agenda.

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Notes

1. See, for a review of the mobile phone studies, James (2013).
2. Research ICT Africa is a South Africa-based organization that conducts research on ICT policy and regulation (see researchICTafrica.net). I am grateful to this institution for granting me access to their data set.

The underlying method is available at ResearchICTAfrica.net (“Household, Small Business and Public Institutional e-Access and Usage Survey,” 2011). The results of the survey are available on request from the author. The questionnaire itself is available at ResearchICTAfrica.net.

3. In my scheme, the distribution of benefits constitutes an important part of welfare. Many studies show that relative use is an essential part of how people value consumption.
4. See James (2009).
5. In education, for example, governments have frequently to confront the issue of rationing scarce Internet time to different groups and have therefore to formulate criteria for such a purpose.
6. In the case of mobile phones, by contrast, the relatively poor countries score well on overall use, which favors equality at the macro level.
7. A promising approach at the micro level is to bring low-cost, off-the-grid broadband access to rural Kenya and hopefully to other African countries. “The technology making the project possible is called dynamic spectrum analysis, which enables wireless devices to opportunistically tap into unused radio spectrum in the television frequency band, as well as solar-powered based stations As television has begun to switch from analog to digital around the world, even more of this spectrum can be used to fulfill those needs” (Garnett & Otieno, 2013).
8. Recall also the earlier citation from the *Economist*, which emphasizes the role of politics in the Ethiopian telecom market.

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