Evidence for ICT Policy Action
Policy Paper 13, 2012

Lifting the veil on ICT gender indicators in Africa

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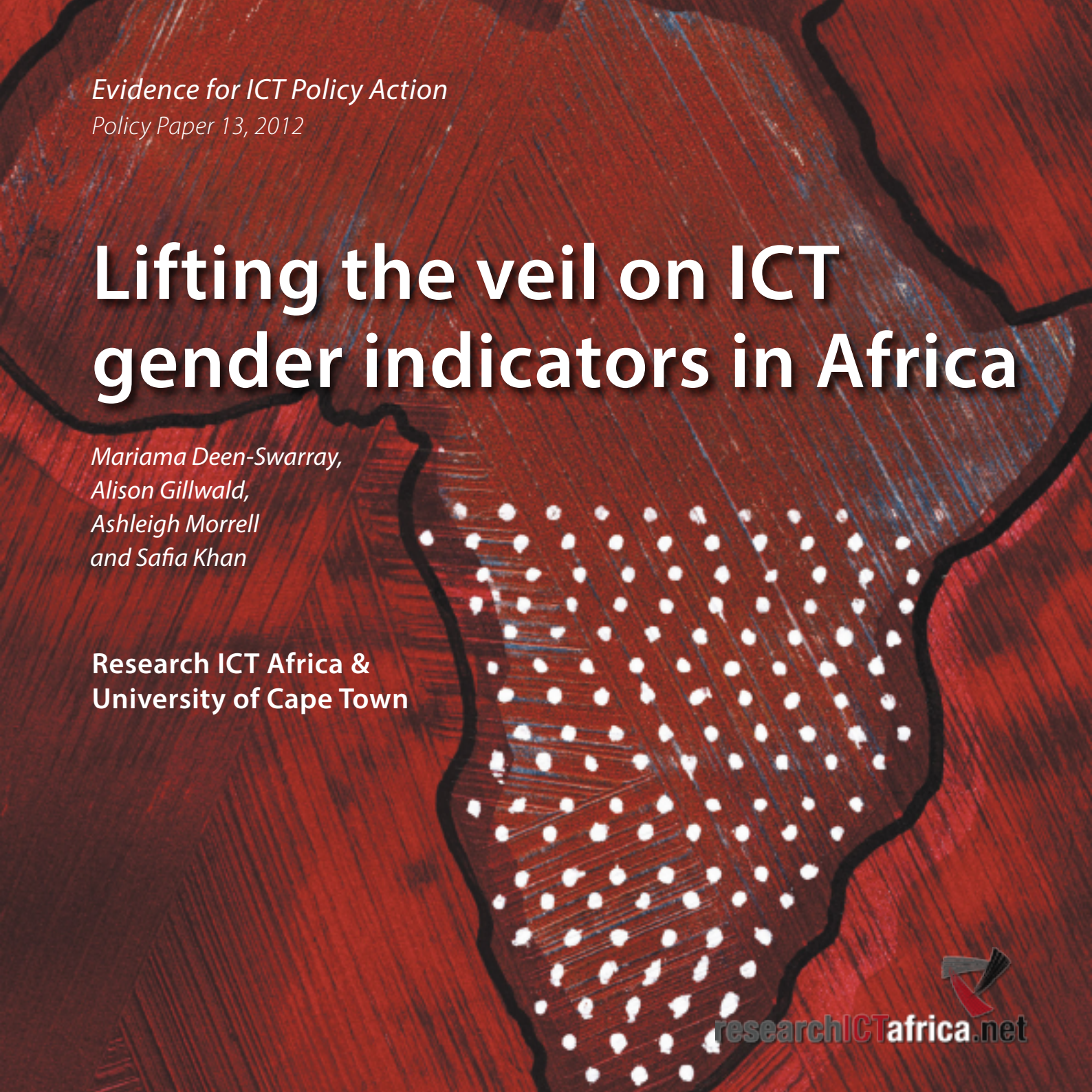

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Series Editor: Alison Gillwald

Copy-editing: Jacquie Withers

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Acknowledgements

This research is made possible by significant funding received from the International Development Research Centre (IDRC), Ottawa, Canada, and RIA network members express their gratitude to the IDRC for its support. The network consists of members in 18 African countries, and RIA researchers in 12 countries were able to participate in the 2012 supply- and demand-side reviews of their national ICT sectors. The 2012 national studies were led by the following RIA network members: Dr. Patricia Makepe (Botswana); Prof. Olivier Nana Nzèpa (Cameroon); Dr. Lishan Adam (Ethiopia); Dr. Godfred Frempong (Ghana); Prof. Tim Waema (Kenya); Francisco Mabila (Mozambique); Dr. Christoph Stork (Namibia); Fola Odufuwa (Nigeria); Louise Karamage (Rwanda); Dr. Alison Gillwald (South Africa); Mary Materu-Behitsa (Tanzania); and Ali Ndiwalana (Uganda).

RIA's 2012 Household and Individual ICT Access and Usage Surveys, and Informal Sector ICT Access and Usage Surveys, in 12 countries were led by Dr. Christoph Stork who, together with Mariama Deen-Swarray, was responsible for the preparation of the statistical data and data analysis for the 12 sets of national findings and the comparative analyses across the 12 countries.

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Abstract

Gender equality has been identified as critical to the realisation of knowledge societies. This has been reflected in policy commitments at both global and national levels. The increased take up of information and communication technologies (ICTs), particularly broadband, has increasingly been linked to economic growth and social inclusion. Yet, the uneven nature of such developments is widely known. In acknowledgement of this in relation to gender the World Summit on the Information Society in 2003 called on governments to find ways of providing opportunities for women to participate and empowering them to ensure their full and equal participation at all levels. Despite these rhetorical undertakings though there has been little systematic collection of sex disaggregated data on ICT access and use and even less that analyses the descriptive data that exists. Without such analysis, descriptive data is not only incomplete but can also mislead policymakers on the correct points of policy intervention aimed at encouraging greater gender equity in ICTs.

The conceptual framework of inclusivity provides a lens through which to explore the findings of the Research ICT Africa (RIA) 2012 household and individual access and use survey, in order to provide a descriptive and empirical analysis based on gender disaggregated data. The analysis seeks to unmask the gender dimension of the limited sex disaggregated ICT indicators available. Using the dataset from the 2012 survey, which was conducted across 12 African countries, the purpose of this paper is to look at the gap in ICT access and use, from a gender perspective, both at the country level and comparatively across countries. Building on the 2010 RIA gender and ICT report (Gillwald *et al.*, 2010), the paper seeks to examine whether the gap between men and women with regard to ICT access and use diminishes the greater the equality in education and income between men and women.

With the increased access to the internet through mobile phones by those at the bottom of the pyramid, which this study confirms is where women are concentrated, the skills barrier to accessing the internet has been lowered. While this has improved access, the unevenness in use and the skills to optimise the informational and educational, and indeed entertainment, value of the internet may be as wide as ever. Focusing on mobile phones, the study highlights the differences in ICT use patterns from a gender perspective and further explores empirically the factors that impact access to, and ownership and use of ICTs, particularly income and education. The methodology and questionnaire adopted for the data collection take into consideration the various factors that are likely to influence ICT access and use in developing nations, specifically addressing the issue of disaggregation. The gender split is integrated into the design of the study and methodology, facilitating gender analysis. In this way this study is able to contribute to the limited body of literature on African ICT access and use at the individual and household levels, using disaggregated data.

The descriptive findings show that women generally have less access to ICTs than men and this increases as the technologies and services become more sophisticated and expensive, requiring greater levels of income and education to access and to operate. The analysis demonstrates that gender disparities exist for mobile phone adoption in rural areas. In urban areas, differences in mobile phone adoption are a consequence of the differences in income and education. Internet adoption however, is affected by gender disparities in both urban and rural areas and women seem to be the last movers (or late adopters) of technology in this case.

Keywords: Gender, sex disaggregation, indicators, ICT policy, inclusivity, exclusivity

Acronyms and Abbreviations

EA	Enumerator Area
GDP	Gross Domestic Product
GSMA	Global System for Mobile Communications Association
ICT	Information and Communication Technology
ITU	International Telecommunications Union
PC	Personal Computer
PPP	Purchasing Power Parity
PPS	Probability Proportional to Size
RIA	Research ICT Africa
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational Scientific and Cultural Organisation
WSIS	World Summit on the Information Society
ZAR	South African Rand

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Introduction

The importance of gender equity to the realisation of knowledge societies is reflected in commitments made by nations at the World Summit on the Information Society (WSIS), both in Geneva (2003) and in Tunis (2005)[1]. The Geneva *Plan of Action* (WSIS, 2003) affirmed that development of ICTs provides enormous opportunities for women, and it committed signatories to the plan with the aim of ensuring that emerging information societies enable women's empowerment and their full participation on the basis of equality in all spheres of society and in all decision-making processes. Others have argued that in fact information societies and knowledge economies will not be realised until this is done. A knowledge society cannot be built successfully without harnessing the capacities and skills of all its members. The development of the human capital necessary to effectively operate a modern economy and society remains the biggest challenge for developing nations. In order to be able to meet their developmental needs and ensure their competitiveness in the global economy, developing countries will have to harness their human potential fully, from men and women alike.

In order to meet their developmental needs and ensure their competitiveness in the global economy, developing countries will need to harness their human potential fully, for men and women alike

A decade ago there was little sex disaggregated data to demonstrate disparities between men's and women's access to and use of ICTs, although no one contested that that was the case. Despite various attempts to quantify the digital divide since then, 10 years later there remains little rigorous and consistently collected data, beyond very limited census-type data by national statistical offices, on which to assess the progress made towards such WSIS objectives. As Jensen and Mahan (2007: 22) point out: "Gendered indicators ostensibly continue to be at the top of everyone's agendas," yet none of the major ICT or science and technology frameworks disaggregate data and indicators based on gender, and the major gender equality indexes also do not incorporate ICT and science and technology (Huyer and Hafkin, 2007).

In the absence of the sustained development and analysis of sex disaggregated indicators in relation to ICT, particularly in developing countries, pockets of rigorous research have emerged at the global (Huyer, 2008), and regional levels (Zainudeen and Iqbal, 2007; Zainudeen *et al.*, 2008; Gillwald *et al.*, 2010). Making use of the Research ICT Africa (RIA) household and individual user dataset from 2008 for his Africa gender digital divide analysis, Hilbert (2011) finds, in agreement with the traditional findings of literature, the overall correlation between gender and ICT use. In 11 of the 13 countries, a larger percentage of men than women use the internet (with the exception of Rwanda and Tanzania, in which women already represent the larger share). More significantly Hilbert goes on to confirm the findings by RIA in 2010 (Milek *et al.*, 2011), that when controlling for income and education – in Hilbert's case controlling for literacy, active work and being in the top 25% income group – the gender divide disappears in most African countries. The Grace network has developed a body of more qualitative research (Buskens and Webb, 2009) to enrich the understanding of the engendered nature of ICTs.

Being donor-funded, however, such research is sporadic and often constrained in its scope. Although the authors of these multi-country studies do collaborate with multilateral and UN agencies, there has not been a co-ordinated initiative at the global level until very recently to develop a standardised set of indicators[2]. This gap has been filled in the past few years by studies commissioned by industry associations, sometimes with considerable public grants, and global companies, launched in association with high-profile patrons such as former US Secretary of State Hilary Clinton, or the State Department more generally, and the Cherie Blair Foundation; and as a result such studies have

1 ITU (2007). For ITU resolutions taken on gender, see http://www.itu.int/ITU-D/gender/background/.

2 The Global Partnership on Measuring the Information Society, led by UNCTAD and ITU, is developing gender indicators as one of the final measurement activities prior to WSIS +10.

found considerable traction. Despite the developmental claims of these reports the sometimes explicit, sometimes implied contention is that reducing the gender gap will lead to accrued benefits in terms of market opportunities and, it is assumed therefore, in terms of national development (GSMA, 2012; Intel, 2013)[3]. While the findings of such reports are indicative of the inequalities between men and women across the globe, the reports are descriptive and incomplete in their lack of analysis. As a result the responses proposed and implemented tend to deal symptomatically with the problems of inequitable access to ICT rather than with the underlying problems.

Despite the methodological problems of these "global studies", they correctly confirm that access by women and men to ICTs remains highly inequitable. One of these "global" studies finds that compared to men, women in low- and middle-income countries are 21% less likely to own a mobile phone, and this gap widens slightly to 23% for women living in Africa (GSMA, 2012). A "global" study focusing on "women and the web" also shows, predictably, that women lag behind men; the study finds that the gap between men and women that go online across low- and middle-income countries stands at 25% and increases to 40% in the case of sub-Saharan Africa (Intel, 2013)[4].

However, the concept of the "digital divide", coined 15 years ago with the rise of mobile communications and the internet to refer to the inequalities encountered in access to ICTs traditionally and captured by supply-side indicators on penetration, has increasingly been expanded in more critical research to include not just access to but also use of ICTs by those marginalised in society and the economy. High level census or supply-side data fails to capture this dimension. It is only through more resource-intensive demand-side surveying and analysis and more qualitative research that gender inequity in this context can be understood. If countries are committed to building equitable information societies and knowledge economies, they will need to undertake such research, in order to develop not only sex disaggregated indicators but analysis of the data, making it possible to identify the real points of policy intervention to address the problem.

The inability of marginalised groups to access ICTs is compounded by the lack of opportunities and resources available

From the limited number of studies of this kind, including the findings that are discussed below, it is clear that the inability of marginalised groups to access ICTs is compounded by the lack of opportunities and resources available to fully benefit from ICTs. Benchmarking even access to, but particularly use of, ICTs across Africa has been almost absent until recently (RIA undertook such benchmarking exercises in 2003, 2006, 2009 and 2012). Yet this is critical to determining the status of ICT access and use; the progress being made to achieve equality in ICT access and use; and the success and failure of ICT policies designed to promote ICT uptake across the continent. Ignoring differences in ICT access and use may exacerbate gender inequity, as might acting on superficial, incomplete or case specific evidence. At a time when effective participation in society, economy and polity is increasingly dependent on ICTs, disparities in the skills and resources to use them optimally is a central policy challenge.

This paper investigates whether there is an inequitable access and use of ICTs between men and women across twelve African countries. The differences in access to infrastructure and amenities between rural and urban areas can amplify any pre-existing gender gaps. This paper descriptively and empirically analyses the access and use of

3 Although the focus of these reports is on the inclusion of women through improved ICT access, the reports' approach is neither developmental nor their methodologies sound. Generally their findings are based on limited market research-type assessments, and often on ITU estimated data, which is used with biblical conviction, that are not representative of the countries (or globe) they claim to be studying, particularly in relation to internet and broadband subscribers.

4 These results are, however, based on interviews from a limited number of countries with only two from Africa, and a sample of 1,020 across the entire globe. Suffice it to say there is almost no reference to, and certainly no in-depth engagement with, the few rigorous studies on gender and ICT that have been undertaken since WSIS in 2003 and in 2005 and particularly in the past five years.

ICTs between men and women, their individual education and income, as well as how this correlates with urban and rural divides across the twelve countries.

The findings align with global research: men tend to be more educated and earn more than women. This points to the persistence of gender as an exclusionary factor in the attainment of education and the ability to gain access to networks needed to generate income. Furthermore, the paper investigates the relationship between ICT access and use and income and education of individuals. Controlling for income and education enables the isolation of gender as a factor of exclusion. The findings support and explain the initial claim that the lack of factors such as education and income inhibits women's access to ICTs and thus excludes them from contemporary economies.

Therefore while a digital divide between men and women prevails across Africa, the cause of the divide is complex. Patriarchy and societal systems that favour men over women play a role in preventing women's access and use of mobile phones but there are circumstances, that usually arise beyond a certain threshold, that eliminate these gender gaps. This is the case in urban areas where mobile adoption is explained on the basis of education and income; not determined by gender. Use of the internet is in its infancy in many African states, and until a threshold is reached, women will continue to lag behind men in its use and adoption.

Research question

This study focuses then not only on the question of whether there are differences between the access to and use of ICTs by men and women in 12 African countries but also asks, if there are differences, what the factors are that might be contributing to these differences. The study builds on the findings of the 2010 RIA gender and ICT access and use study across 17 African countries. This study found that with similar backgrounds, and controlling for education and income, the sex differences were significant in only a few of the countries studied (Milek *et al*., 2011).

It is this masking effect on gender by factors of income and education that this paper aims to explore further. This paper adds to the previous study by analysing the gender gap in income and education. The key hypothesis being tested is whether the gender divide in terms of income, education, and ICT access and use diminishes with increased income and education equality between men and women, and whether it differs between urban and rural areas.

Factors emerging from the data that could not be answered with quantitative analysis were researched further through focus groups in six of the 12 surveyed countries. Focus groups allow for the correct points of policy intervention to be identified and thereby support policy directed at greater gender equity in relation to access to and use of ICTs.

Conceptual framework

ICT, gender, inclusion and development

That ICTs have the potential to play an important role in development – economic, political and social – is now well documented. At the macro-economic level, increased penetration of ICTs is associated with improved productivity in firms, and increases in broadband are associated in particular with economic growth. There are now a range of cases demonstrating how wider access to affordable mobile communications has enabled social inclusion through employment generation and improvements in social services and in livelihoods (De Silva *et al.*, 2009; Jensen, 2007). More recently the role of ICTs in enhancing political participation and resistance has been documented and analysed (Castells, 2012). We know that

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> gender-based constraints – including responsibilities for unpaid care and household work, social norms and gender roles, differences in women's access to and control over assets and finance, and unequal investments in the capabilities of girls and boys – limit women's choices relative to men's with regard to employment. (Heintz, 2012: p. 12)

Yet, some evidence can be found of access to ICTs breaking down the isolation of individuals, enhancing their chance of economic inclusion and thus "providing diverse avenues for women's social, political and economic empowerment" (UNDAW, 2003, quoted in Gillwald *et al.*, 2010).

There have been some studies on the uneven nature of the benefits that accrue to men and women from social engagement and economic participation, particularly to those living in remote rural areas in developing countries (Mottin-Sylla, 2005). This information has often tended to be anecdotal or among smaller communities. Some work is emerging on the impact of ICTs on women in the informal sector and in small, medium and micro enterprises in Africa, where households are increasingly dependent on such women's generally low levels of income (Moyo and Deen-Swarray, 2013). The sex disaggregated, nationally representative data on ICT access and use presented in this paper is extremely limited but essential to verifying or challenging underlying assumptions about ICTs, gender equity and development.

While RIA draws eclectically from many feminist schools of thought (see Hafkins, 2013) within a wider Gender and Development approach – which followed Women in Development (WID) and Women and Development (WAD) - for practical policy purposes it draws on what Nancy Hafkins calls the Efficiency approach. While the Efficiency approach has often been labelled neo-liberal, it has practical application in its call for the inclusion of women more actively into the economy in order to maxmise all the human resources of a country for the purposes of economic growth and development. Building on the inclusivity conceptual framework developed in the 2010 RIA paper (Gillwald *et al.*, 2010), in this paper we contend this is not incompatible with the developmental objectives of the research. We acknowledge that women are often exploited in this process of inclusion; as especially those women not able to employ other women to undertake domestic work, and/or childcare when they enter remunerative work, they carry this "triple burden". We recognise that policy and practices that share the weight of this burden across society need to be simultaneously explored and supported. However, we reject the notion that women should be confined to the limited and usually undervalued activities in the home in order to avoid this – or they should at the very least have the choice. Likewise, while ICTs on their own are unlikely to transform women's lives in unequal societies and economies, in the information era, where there is an absence of choice for such women, this should be of concern. It is in this context that the approach presented by Amartya Sen (1999) in his seminal work *Development as Freedom*, regarding the agency of women, has relevance. He contends that without capabilities there is no freedom, and that the agency of women is the critical element of successful development.

Common to all these approaches are the issues of exclusion and inclusion of women, whether in the family, society or the economy. Digital divide gender studies then are mainly concerned with the differential exclusion and inclusion of women and men from the world of ICT. As Sørensen (2002) argues, though, exclusion has been much more conceptualised than inclusion, which has often only been operationalised in terms of exclusion mechanisms. Girls continue to lag behind boys when it comes to computer skills and this is reflected in more advanced technologies, with the areas of computer design, technology science and engineering being predominantly male-dominated professions. This remains an enigma, with the question being raised as to "why women seem less interested in technology, and why many exemplars of new ICT artefacts seem to reflect masculine rather than feminine interests" (Sørensen, 2002: p. 11).

The relationship between gender and ICT is described by Sørensen "as an issue of their mutual shaping or co-construction" (2002: p. 8). Our study also adopts this perspective, focusing on the dynamic interplay between gender and ICT in the context of inclusion and exclusion. To better understand the dynamics in this issue of gender and ICTs the relationship needs to be explored empirically, which is one of the focuses of this study.

In general, quantitative studies of gender and ICTs are more optimistic than qualitative research on the subject. Sørensen (2002) states that inclusion into ICT is most commonly understood as a process of diffusion, with Rogers' (1995) inimitable S-curve as its standard outcome. This however overlooks a range of other factors that influence the differential uptake of ICT between men and women. Factors such as income, level of education, age and culture/ethnicity also affect the relationship between gender and ICT and therefore need to be taken into account to provide a better insight into exclusion and inclusion processes (Faulkner, 2002: Fortunati and Manganelli, 2002; MacKeogh, 2002; Oost, 2002).

The studies that have looked at exclusion and inclusion have only been successful in showing whether women are excluded or included from ICT and not in explaining inequity in society. The main challenge is ensuring a sustained participation of women in ICT. Sørensen (2002: p.28) proposes that the process of inclusion be defined as "conscious activities or sets of activities aimed to recruit people into and keep them within some system".

An application of the work of James Heintz (2012) on inclusive growth is also instructive in trying to conceptualise inclusions rather than exclusion. Using his economic inclusivity argument, one could argue that gender including is a significant aspect of the broader institutional setting within which public goods are provided and government revenues mobilised. Applying his contention about inclusive growth to ICT, one could argue that more research is needed on how the provision of public goods, or social goods, such as ICT can improve the gender equity in communication access and use and how these investments can be financed through the better mobilisation of resources, including, but not restricted to ICT (Heintz, 2012: p. 11).

This study aims to contribute to the ongoing gender and ICT debates by building on the conceptual framework of inclusivity as a lens through which to explore the findings of the survey, in order to provide a descriptive and empirical analysis based on gender disaggregated data. The analysis seeks to lift the veil on the gender–ICT relationship, which at the descriptive level is not only uninformative but potentially misleading. Furthermore, the analysis considers the gender digital divide not only through narrow, descriptive and supply-side indicators on access but also through issues of use, and the factors that determine the ability of individuals to optimise the use of such potentially enabling technologies.

Practically, the concept of exclusion is applied to the variables of education, income, age, and location. The significant softer variable of culture/ethnicity is indirectly captured in the country dummy used in the modelling. Focus groups are also being conducted on a number of issues relating to reasons for use and lack of use that cannot be captured in the quantitative data.

ICTs from pay phones, to mobile phones and particularly internet, are variable for inclusivity. Their availability and affordability as general purpose technologies are determined by the policy and regulatory environment and will influence equality or inequality of use in relation to the factors of inclusion listed above.

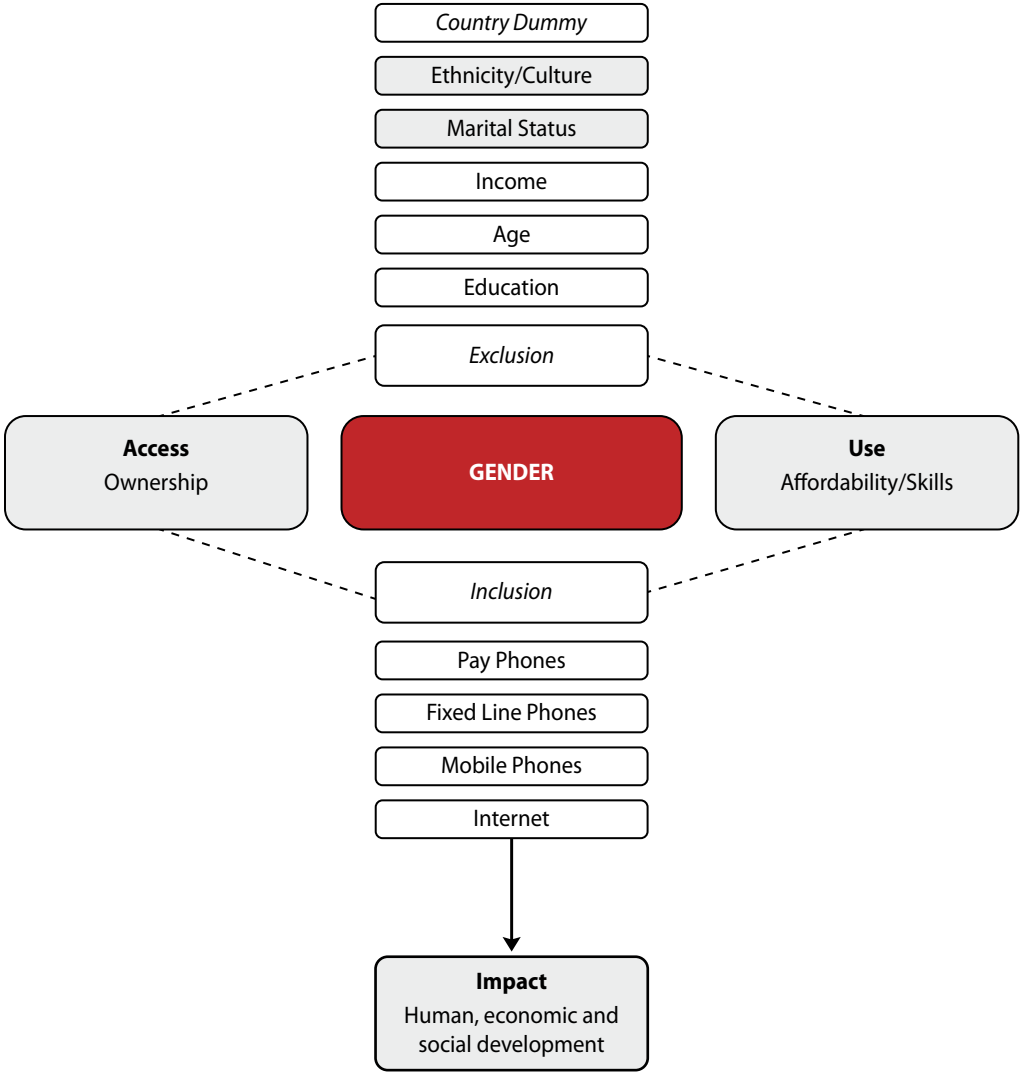

Figure 1: Conceptual framework for gender analysis of ICTs

Source: Adapted from Gillwald et al. (2010)

Methodology

The RIA 2012 household and individual access and use survey takes into consideration the various factors that are likely to influence ICT access and use in developing nations, specifically addressing the issue of disaggregation. The gender split is integrated into the design of the study and into the methodology, facilitating an analysis by gender. This study therefore contributes further to the few bodies of literature on African ICT access and use at the individual and household levels, using disaggregated data.

This study contributes to the debates discussed above by assessing the gender dimensions of access to and use of ICTs across 12 African countries, namely: Botswana, Cameroon, Ethiopia, Ghana, Kenya, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Tanzania and Uganda. The study provides an empirical basis for this assessment by analysing the data from households and individual surveys conducted by RIA between 2011 and 2012 in 12 countries in the region. The data is nationally representative at a household level[5] and for individuals 15 years or older. It builds on the 2008 RIA household survey of 17 African countries. The questionnaire administered was designed so as to allow data to be disaggregated across a number of variables including gender, income, age, and education, as well as a range of ICTs. This enables this paper to shed light on some of the discussions in the literature on gender and ICT.

The RIA 2012 household and individual access and use survey was conducted using enumeration areas (EAs) of national census sample frames as primary sampling units. The sampling was performed in four steps for households and five steps for individuals. The national census sampling frames were split into urban and rural EAs, and EAs were sampled for each stratum using probability proportional to size (PPS). Two listings were compiled for each EA, serving as sample frames for the simple random selections. Households were then sampled using simple random sampling. An individual 15 years or older (which could include a visitor staying for the night at the house) was then randomly selected and interviewed from each household.

The questionnaire used in the survey was divided into three parts, with the first, a household roster, focusing on information about all members of the household. The second section collected related information on the household. The last section focused on collecting individual information. While the first two sections were answered by the head of the household or someone that manages the household, section three was answered by the randomly selected individual.

This study employs both quantitative and a qualitative data in conducting the analysis. The quantitative data is analysed in the form of descriptive and empirical analysis. The descriptive results analyse the a priori gender differences in ICT access and use as well as in levels of education and income.

The quantitative data is further used to empirically explore the factors that impact the probability of ICT ownership and use, namely mobile phones and internet, using logistic regression models. These models allow the study to assess the probability of demographic variables affecting ICT use, and isolate the direction of this effect. The paper investigates the impact of other variables such as income and education on ICT access and use. Lastly, the factors that impact income as well as those that impact education are analysed using ordinary least square (OLS) regression models.

To further enrich this study, qualitative data in the form of focus group discussions were conducted in South Africa, Nigeria, Ghana, Cameroon, Uganda and Kenya (see Appendix B for a breakdown of focus groups by country). Data

5 See ICT Survey Methodology: http://www.researchictafrica.net/publications.php

to determine the impact of cultural and social factors, which is not available through the quantitative survey, was gathered in an effort to supplement the quantitative analysis. The qualitative aspect of this study allows us to gain further insight into some of the underlying factors influencing the access to and use of ICTs from a gender perspective.

The variables used in the empirical analyses are not exhaustive as other supply-side variables could also be contributing factors to the dependent variables assessed. For the purposes of future quantitative research, identifying potential instruments that could be used to capture cultural factors that influence access and use may be a valuable contribution to research in this area.

The a priori anticipated gender differences for the variables utilised in this study are presented in Table 1. See Appendix C for general statistics and the unweighted sample breakdown of the countries surveyed.

Table 1: Variables and the expected gender relationships

ICT	Characteristics of variable	Expected relationship	Comment
Mobile phone ownership	Individual owns a mobile phone = 1, otherwise = 0	♀ = ♂	No gender difference for mobile phone ownership is expected (Chabossou *et al.*, 2008).
Internet use	Use of internet = 1, otherwise = 0	♀ < ♂	Being often less employed and having somewhat low levels of e-skills (Schmidt and Stork, 2008), women are expected to have fewer opportunities to use the internet.
Income	Continuous, individual's income using US$ conversion rates	♀ < ♂	Women are expected to earn less than their male counterparts.
Education	Ordinal outcomes: 0 = No schooling; 1 = Primary; 2 = Secondary; 3 = Tertiary (diploma/certificate); 4 = Tertiary (Bachelors); 5 = Tertiary (Masters); 6 = Tertiary (PhD)	♀ < ♂	The historical trend of sending the male child to school while the girl child stays home, and the various traditional obligations imposed on women, make them generally less educated than men. Women are therefore expected to have lower levels of education.

Factors of exclusion

From the review of of the literature, it is hypothesised that income, education, age, marital status, culture/ethnicity and various country specific characteristics are some of the exclusion factors that hinder gender equity and the equitable access to and use of ICTs. This section looks at the income and education variables in more detail, presenting descriptive analysis of the gender differences based on the RIA 2012 dataset. It also looks at these variables empirically, identifying the factors influencing income and in particular the relationship between the gender variable and income as well as between education and income. The marital status, age and country dummy variables are included in the regression analysis, to understand their impact on income and education and how this is related to their impact on gender and ICTs.

Income

The income an individual earns and the combined income of a household have been identified in the literature to be key determinants of ICT adoption. The positive correlation between income and ICT access and use was evident in the study by Milek *et al.* (2011). The current study therefore focuses in this section on the income variable, to understand the relationship between sex and income, and whether women indeed have lower incomes.

In all countries women lagged behind men in terms of the average income recorded

The RIA 2012 data shows that, in general, the average income of individuals in the countries surveyed ranged from US$57 in Rwanda to US$595 in South Africa (purchasing power parity, or PPP, rates[6]). The income gap between females and males also varied and was wider in some instances, though in all countries women lagged behind men in terms of the average income recorded. The average age across countries ranged from 28 years (Kenya) to 40 years (Namibia), which is indicative of a working age group. Though there are in general low levels of access to a bank account, the study highlights the gender difference in this regard. There are more men with access to a bank account than women in all of the countries surveyed except Namibia. This further highlights some of the inequalities between the sexes.

6 Implied PPP conversion rate based on the 2012 IMF rate.

Table 2: General sample statistics of randomly selected individuals

Country	% females	Average individual income US$			Average income US$ PPP			Average age	% with a bank account		
		All	Male	Female	All	Male	Female		All	Male	Female
Botswana	59.1	270	340	222	460	579	378	34	48.4	52.4	45.6
Cameroon	51.9	72	94	52	145	189	104	33	10.9	10.8	10.9
Ethiopia	44.8	27	39	12	69	101	30	34	3.7	4.3	3.0
Ghana	55.1	87	117	63	183	244	134	34	29.4	35.5	24.5
Kenya	61.9	85	119	64	154	214	116	28	44.5	57.6	36.4
Mozambique	47.4	61	83	36	107	146	64	33	16.0	19.2	12.3
Namibia	56.8	194	279	130	270	387	181	40	56.3	51.1	60.3
Nigeria	46.9	102	151	47	171	252	78	34	30.5	39.8	20.0
Rwanda	49.9	28	36	21	57	72	42	30	16.3	17.4	15.2
South Africa	54.2	402	617	221	595	914	328	36	58.9	62.7	55.7
Tanzania	54.4	35	45	26	89	115	68	34	6.2	7.4	5.1
Uganda	44.0	52	59	42	126	144	102	31	15.2	18.7	10.7

Source: RIA Database (2012)

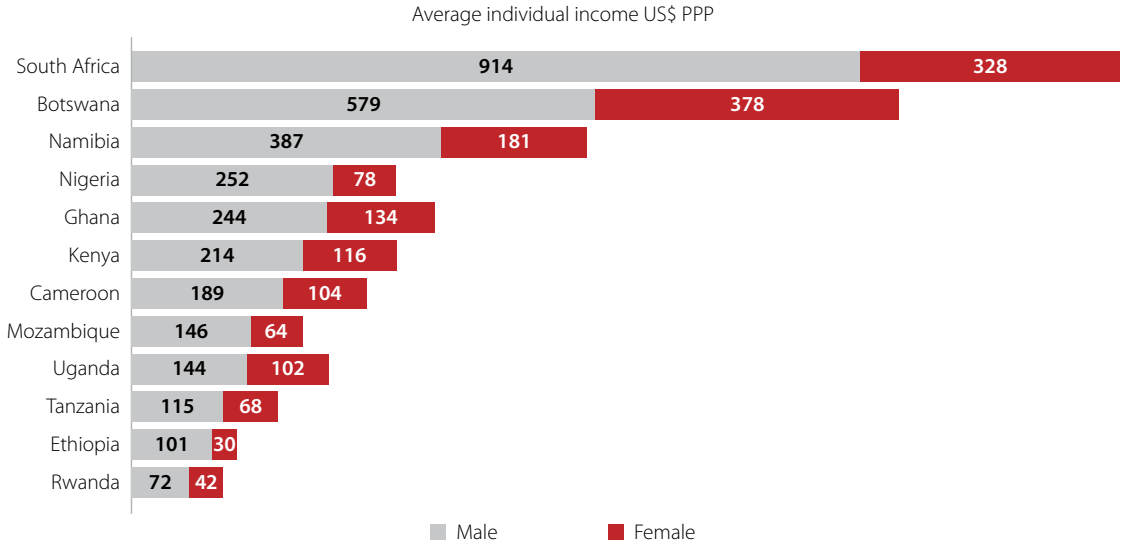

Figure 2: Average individual income in US$PPP disaggregated by gender

Source: RIA Database (2012)

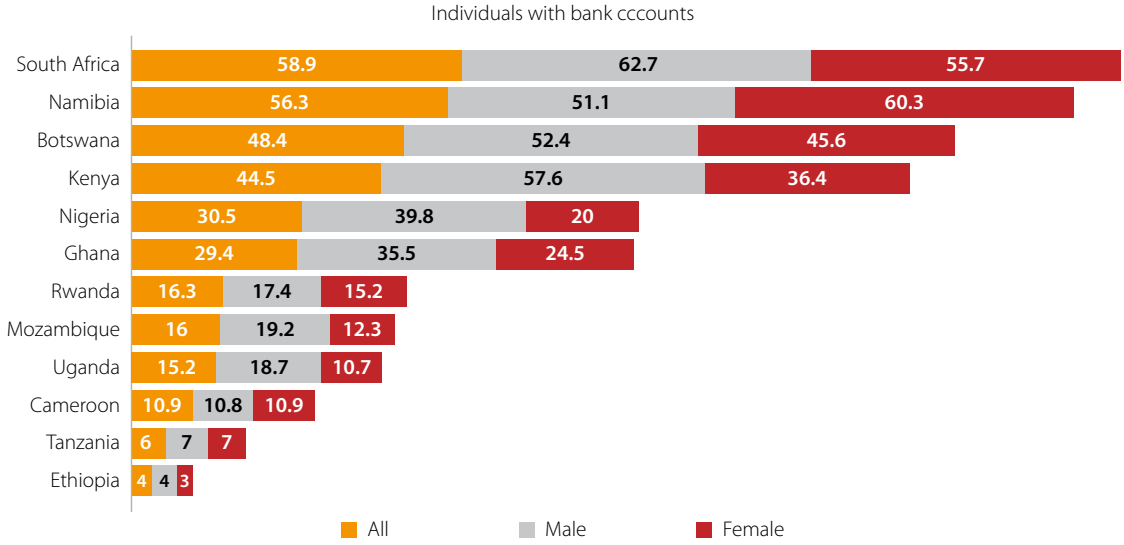

Figure 3: Access to bank accounts

Source: RIA Database (2012)

To understand some of the factors contributing to the gender differences in income, the study looks at individuals' reported "main activity" involved in during the six months prior to the survey. The results are presented in Figure 4 (below). The survey results show that there are more men than women who have reported to be in school, employed or self-employed. These results are similar across countries, particularly for the school and employed categories. In Ghana and Kenya, the results show that slightly more women than men are in the self-employment category (RIA Database, 2012). More women are among the unemployed, and a large number of them are housewives, or involved in unpaid housework. These findings reveal that women are generally less involved than their male counterparts in economically productive activities, and this could be a contributing factor to the lower levels of income among women found in Table 2 and Figure 2 (above).

Women are generally less involved than their male counterparts in economically productive activities

The focus group discussions held across some of the countries support these findings, especially in the case of Uganda and Nigeria, as well as in Kenya and Ghana to some extent. However, these discussions show that in urban areas (formal and informal) in South Africa, the gender-based inequalities in income and education are not truly a result of cultural practices and norms in society. In the rural areas, though, it was confirmed that such practices have greatly influenced the outcome of gender inequality. The general consensus in Ghana was that although this hypothesis was found to be true in rural settings, and slightly so in the informal urban areas, these cultural norms and practices are increasingly being eroded as modern practices set in and women are attain higher levels of education.

Nevertheless, an all-male focus group in Nigeria referred to "the mindset of women" as the main limitation to women having equal opportunities to men. The female respondents expressed contrary views, indicating that it is cultural practices and societal norms that have contributed to, and maintain, these gender-based inequalities.

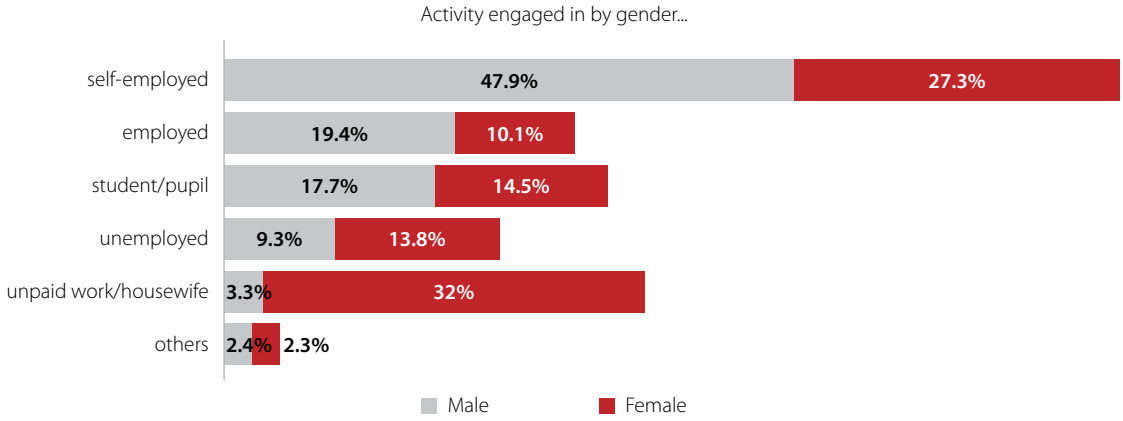

Figure 4: Main activity during past six months: gender comparison

Source: RIA Database (2012)

To further assess the gender differences in income, the study uses an Ordinary Least Square (OLS) regression to investigate the factors[7] that impact income. The expected relationship between these variables and the dependent variable "income" are presented in Table 3.

7 The list of factors used in this model is not exhaustive and the authors acknowledge that there could be other determining factors of income. While some of the factors possibly contributing to income earned are beyond the scope of this study, others are simply too difficult to measure quantitatively and therefore could not be included in the model. The variables reported on give an indication of the direction of their relationship to income.

Table 3: Relationship between independent variables and Income

Factor	Characteristics of variable	Relationship	Comment
Female	Dichotomous; female = 1, otherwise = 0	negative	The gender disparity in income makes it likely that a female makes less income than her male counterparts.
Rural area	Dichotomous; rural = 1, otherwise = 0	negative	Economic activities in rural areas are less formal compared to urban, making it more likely for individuals in rural areas to have lower income.
Age	In years	positive	The older one gets the more likely it is for one to earn more income.
Years of formal education	Discrete; number of years spent in school	positive	Education is expected to play a role in income, therefore the more educated an individual is, the more likely it is they have a higher income.
Years of work experience	Number of years spent working	positive	Income is expected to increase with work experience.
Married	Dichotomous; married = 1, otherwise = 0	positive	Being married is used as the reference point in the marital status variable and it is expected that all other variables will be negatively different from the married variable. The other variables are expected to have negative relationship with income as it is assumed that being married allows one to pool resources.
Single	Dichotomous; single = 1, otherwise = 0	negative	
Widowed	Dichotomous; widowed = 1, otherwise = 0	negative	
Divorced	Dichotomous; divorced = 1, otherwise = 0	negative	
Mobile phone ownership	Dichotomous; have a mobile = 1, otherwise = 0	positive	It is expected that having access to a mobile phone can increase one's business contacts, thus making it possible to have more income.
Use of internet	Dichotomous; use the internet = 1, otherwise = 0	positive	Having access to the internet is expected to provide an individual with more job opportunities, thereby increasing their chances of earning more income.
Country dummies	country = 1, otherwise = 0		This is a control for country specific differences, and Ethiopia is used as the reference category because it is the country with the least ICT access and use.

In rural areas, women are expected to earn 77% less than men and in urban areas this difference is 55%

This model reveals that the gender variable has a negative impact on income as expected. The negative relationship between being female and income earned, holding all else constant, indicates that women earn less than men (see appendix A1) - supporting the hypothesis that there is a gender gap in income with women on average earning less than men (in both urban and rural areas). However, women in rural areas earn less than men by a greater difference than women in urban areas. In rural areas women are expected to earn 77% less than men and in urban areas this difference is 55%.

To drill down further into the country specifics, the study analyses income by country (Table 4).

Table 4: Income by country

Variables	Uganda	Kenya	Tanzania	Rwanda	Ethiopia	Ghana	Cameroon	Nigeria	Namibia	South Africa	Botswana	Mozambique
Female	-**	-**	-***	-***	-***	-*	-***	-***	-**	-	-	-*
Rural	-	+	-***	-***	-***	-***	-	+	-***	-***	-***	-*
Age	+	+	-	+	-***	+*	+	+**	+***	+***	+***	+
Education	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***
Work experience	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***
Married	+***	+	+***	+***	+***	+***	+***	+***	+***	+**	+	+***
Widowed	+**	+	+	+***	+***	+	+	+*	+**	+	+	+**
Divorced	+*	-	+***	+***	+***	+*	+***	+*	+	-	+	+***
R-squared	0.2437	0.3176	0.2310	0.1874	0.4067	0.2965	0.2814	0.3791	0.4357	0.2798	0.3801	0.1635
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

**** indicates significance at the 1% level; ** indicates significance at the 5% level; * indicates significance at the 10% level*

Years of formal education has a positive and significant effect on income earned in all of the countries surveyed.

An interesting finding that emerged from the focus group discussions in South Africa is that it is quite common for wives and mothers to be the main breadwinners in their families; though the discussions reveal that more women tend to work in lower-income categories.

As expected, the study finds that living in a rural area means that lower income is earned compared to living in an urban area, except in Kenya and Nigeria, though the urban-rural divide in income is not significant in Cameroon and Uganda.

In relating this to our conceptual framework, with inclusion in ICT, income can be improved, which can ultimately enhance social and economic development. The findings on the gender disparities in income indicate that if ways are implemented to boost income among the female population, their wellbeing and contribution to society can be enhanced. The causal relationship between education and income further points to the importance of and need for ensuring equity in education.

Education

Education has been identified in the literature as one of the factors determining the inclusion and exclusion of marginalised groups in the economy and society. Education, as shown in the analysis above, has a significant impact on income. In addition, education is one of the variables that have been found to have an impact on ICT assess and use (Gillwald *et al.*, 2010). Schmidt and Stork (2009) also argue that skills allow people to participate more within the global information society and that certain kinds of skills are essential if one is to benefit fully from ICTs. Schmidt and Stork found that differences in skill levels contributed to access-related differences and that those lacking particular skills were likely to lag behind others in terms of using ICTs (Schmidt and Stork, 2009).

The gender disaggregated description of education of individuals in the sample shows that though tertiary education as the highest level attained is lower compared to levels of secondary and primary education attained, the gender gap is wide in most of the countries. There are fewer woman than men across all of the countries surveyed who indicated tertiary as their highest level of education, and this difference is wider in Ghana, Kenya, Nigeria, South Africa and Uganda. In the secondary and primary school categories, the majority of the countries also have more men than women completing these levels of education (see Figures 5–7, below). This emphasises the continued gap between men and women in education.

Fewer women have tertiary, secondary and primary education as their highest levels of education across almost all countries studied

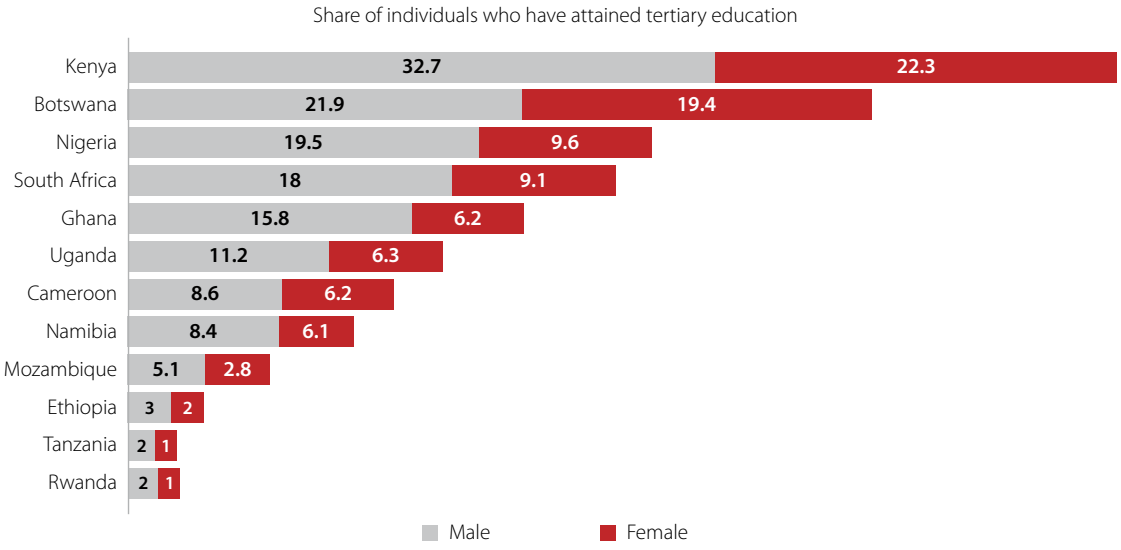

Figure 5: Share of individuals who have attained tertiary education

Source: RIA Database (2012)

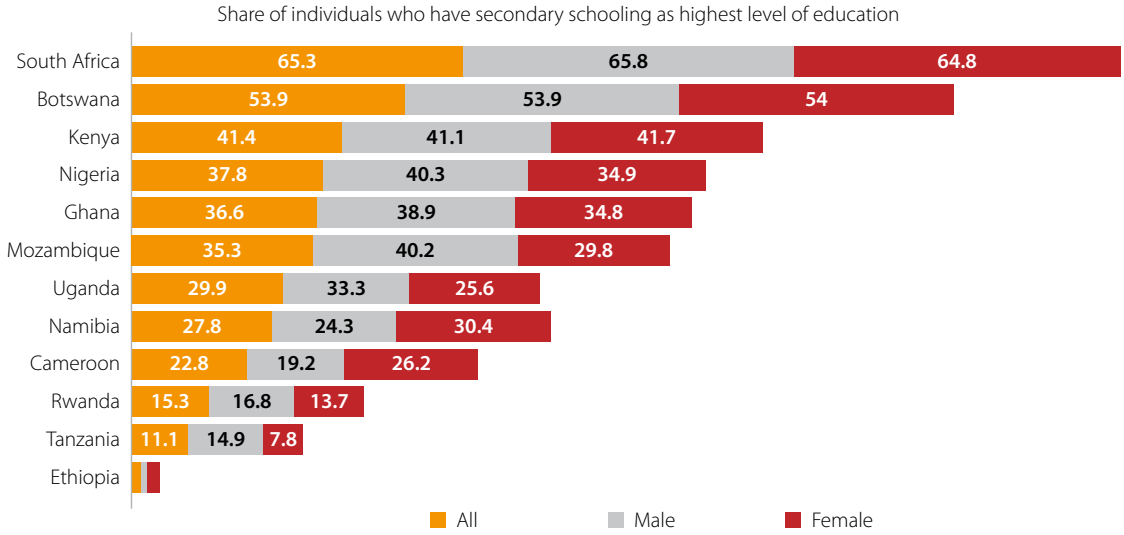

Figure 6: Share of individuals who have secondary schooling as highest level of education

Source: RIA Database (2012)

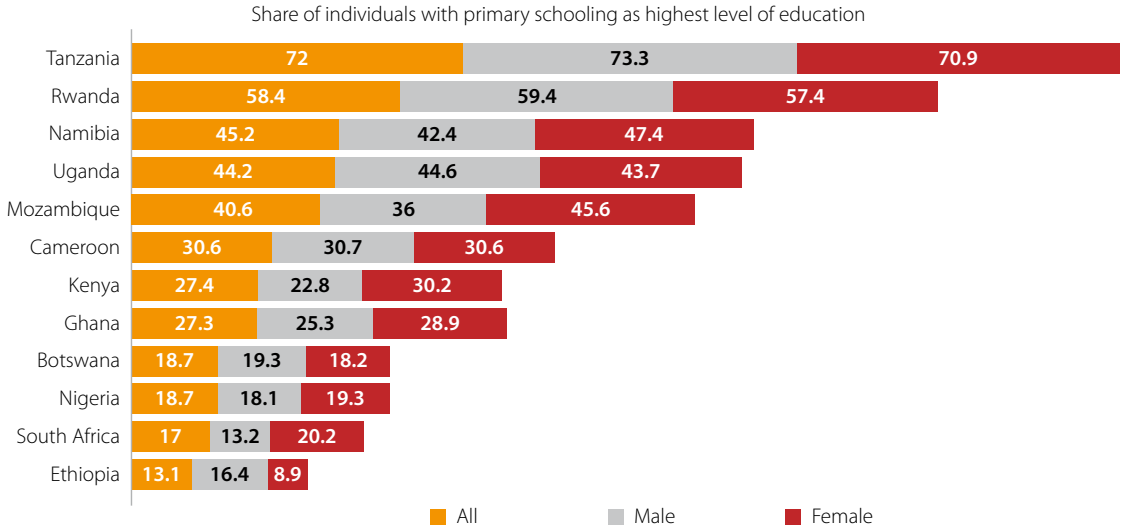

Figure 7: Share of individuals who have primary schooling as highest level of education

Source: RIA Database (2012)

Milek *et al.* (2011) noted that when education was controlled for, the gender variable had no significance in its relationship to the various ICTs modelled, indicating that the effects of the gender variable could have been masked in the education variable. This section of the paper therefore models education as an outcome variable to investigate the effect of gender and other variables on educational qualification in the countries studied.

Table 5: Relationship between independent variables and Education

Factor	Characteristics of variable	Relationship	Comment
Household income	Continuous, household income using US$ conversion rates	positive	It is expected that the higher the household income, the higher the education level of the individual.
Female	Dichotomous; female = 1, otherwise = 0	negative	There has also been a gender disparity in education, with males being more favoured in this area. A negative relationship is therefore expected between being a female and attaining a higher level of education.
Rural area	Dichotomous; Rural = 1, otherwise = 0	negative	Rural areas often lack enough schools, and where there are schools they are often inadequately equipped. Agriculture is often the most common activity in rural areas, also making the odds of pursuing higher education less likely. This makes it likely that individuals living in rural areas will have attained lower levels of education.
Age	In years	negative	It is expected that the older one gets the less likely it is that one will pursue higher education.
Household head primary	Highest education of household head is primary = 1, otherwise = 0	positive	No education of the household head serves as the reference point. It is expected that in a household where the household head has attended school, this will increase the chances of an individual in the household attending school. The higher the education level attained by the household head, the higher is expected to be that attained by an individual in that household.
Household head secondary	Highest education of household head is secondary = 1, otherwise = 0	positive	
Household head tertiary	Highest education of household head is tertiary = 1, otherwise = 0	positive	

Married	Dichotomous; married = 1, otherwise = 0	negative	Being single is used as the reference point. The variables being married, widowed or divorced are expected to be significantly different in terms of the education level attained than in the case of being single, as such individuals might have other responsibilities.
Single	Dichotomous; single = 1, otherwise = 0	positive	
Widowed	Dichotomous; widowed = 1, otherwise = 0	negative	
Divorced	Dichotomous; divorced = 1, otherwise = 0	negative	
Country dummies	country = 1, otherwise = 0		This is a control for country specific differences, and Ethiopia is used as the reference category because it is the country with the least ICT access and use.

This section uses OLS to analyse the relationship between education and gender (the latter being the main independent variable).

Paradoxically, when looking at the urban and rural sub-populations combined the coefficient on the female variable is not statistically significant as one would expect. This appears to be contrary to the assumption of a gender gap in education; but this changes when the urban and rural populations are split up.

As expected, the income variable (household income) shows a positive and significant relationship with education, indicating that the more money a household has, the higher level of schooling an individual in that household could possibly have. A household with a higher income could imply that there is less pressure for children to start earning early on in their careers, thereby allowing them to further their education if they so desire. This was supported by the focus group discussions where it was found that individuals are sometimes forced to leave school as they have to supplement the household income to assist their families and support younger siblings.

Splitting the sample into rural and urban sub-populations illustrates interesting effects. The first is that in rural areas, women exhibit a higher level of education than men, when all else is held constant. In rural areas, widowed, divorced and married individuals all have less education than single people on average. In contrast, in urban areas there is no significant effect of being female on educational attainment. In both urban and rural areas, as age increases the educational attainment of the average individual is lower – this is because older people in the sample have a lower level of educational attainment.

Table 6: Education-Linear regression results by country, using sampling weights

Variables	Uganda	Kenya	Tanzania	Rwanda	Ethiopia	Ghana	Cameroon	Nigeria	Namibia	South Africa	Botswana	Mozambique
Female	+	+	+	+	-	-	+***	+**	+***	+	+	+
Rural	-**	+	-***	-**	-***	-***	-***	-***	-***	-	-	-***
Age	-***	-*	-***	-***	-***	-***	-	-***	-***	-***	-***	-***
Household income	+***	+**	+***	+***	+**	+***	+***	+***	+***	+***	+***	+***
Household head tertiary	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***
Household head secondary	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***
Household head primary	+**	-***	+***	+***	+***	+***	+***	+***	+***	-***	-	+***
Married	-***	+	-***	-	-***	-***	-***	-***	+	+	+	-***
Widowed	-***	-*	-***	-***	-***	-**	-***	-***	-*	-	-	-***
Divorced	-***	-	-***	-***	-***	-*	-***	-***	-	-	-	-
R-squared	0.3803	0.2643	0.4127	0.3215	0.5375	0.4963	0.4593	0.4113	0.4791	0.4565	0.4564	0.4001
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

**** indicates significance at the 1% level; ** indicates significance at the 5% level; * indicates significance at the 10% level*

From the focus group discussions conducted in South Africa, and in the Western Cape in particular, it emerges that male children are often taken out of school to fend for their families when there is a need, while females are allowed to stay in school. A different picture emerges in other regions, though, where preference is given to male children to pursue their education.

Marital status

The conceptual framework used in this paper includes marital status as one of the exclusion variables that impact on the access to and use of ICTs. The study therefore uses a descriptive analysis to show the marital status based on gender across the countries surveyed to better understand the demographic in this regard. Figure 8 below shows the marital status of individuals, based on gender, at the time of the survey. The results show that the majority of individuals were either married or single (as opposed to widowed or divorced), with Botswana, South Africa, Namibia and Rwanda recording more single than married individuals, while Ethiopia, Nigeria and Uganda record the highest share of individuals that are married. Interestingly, the results show that there are more single males than females in all of the countries surveyed.

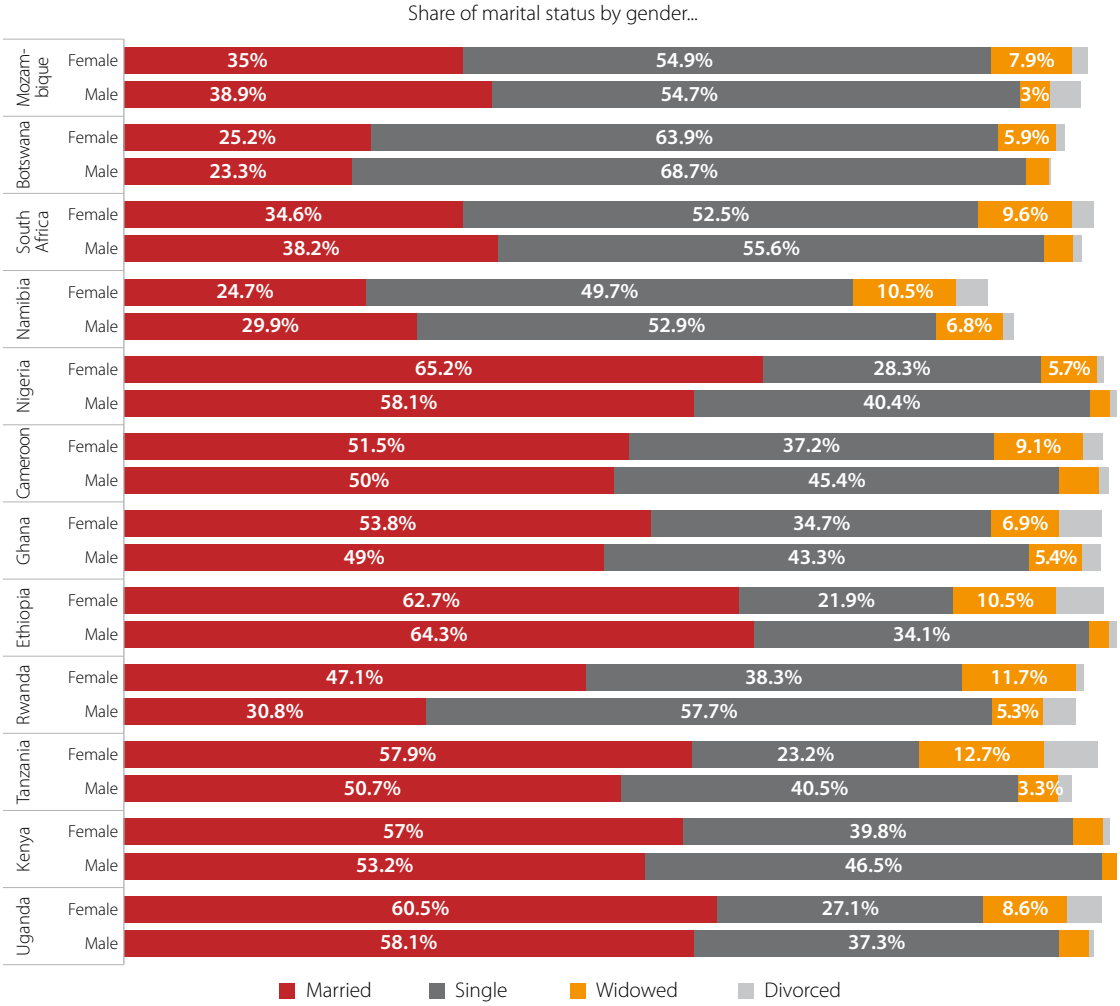

Figure 8: Martial status, by gender

Source: RIA Database (2012)

How one's marital status affects the inclusion or exclusion of women in society is explored in each of the models analysed in this study. In the analysis on income, being single shows a negative relationship compared to being married, indicating that single individuals tend to have lesser income than those who are married.

How marital status can contribute to exclusion is further revealed in the results from the analysis on education. The findings show that an individual who is single has a better chance of gaining a higher level of education than one who is married. The focus groups also revealed that individuals who are married have other responsibilities, which prevent them from pursuing higher levels of education.

Factors of inclusion

The literature and background to this study highlight the need for inclusion of women into every sector in society, to ensure full and equitable participation of citizens, consumers, producers and owners. The conceptual framework identifies key ICT indicators that, if they can be affordably accessed, can enhance social and economic inclusion. These include mobile phone, internet, computers and pay phones (and fixed and broadband services where they exist).

Table 7 (below) shows the independent variables and their expected relationships to the dependent ICT variables. This study primarily focusses on the gender differences in mobile and internet access and use. .

Table 7: Relationship between independent variable and ICT outcome variables

Factor	Characteristics of variable	Relationship	Comment
Income	Continuous, individual's income using US$ conversion rates	positive	Income is assumed to be one of the main barriers to ICT access and use.
Rural area	Dichotomous; rural = 1, otherwise = 0	negative	There is often less signal coverage in rural areas and it is also often difficult to find internet cafés or other means of accessing ICTs.
Age	In years	negative	The younger generation is assumed to be more comfortable with the various ICTs than the older generation.
Years of formal education	Discrete; number of years spent in school	positive	Education is expected to provide the skills and know-how for using ICTs, and hence it is expected that the more years of education an individual has, the more likely they are to access and use ICTs.
Years of work experience	Number of years spent working	negative	ICTs are a more recent phenomenon, and it is assumed that those with longer work experience are much older; thus, as with age, years of work experience are expected to have a negative relationship with ICTs.
Unemployed	Dichotomous; unemployed = 1, otherwise = 0	negative	One who is unemployed is expected to have lesser access to ICTs.
Employed	Dichotomous; employed = 1, otherwise = 0	positive	One who is employed is expected to have greater access to ICTs and to be more likely to make use of them.
Self-employed	Dichotomous; self-employed = 1, otherwise = 0	negative	It is assumed that those who are self-employed will have limited access to use of ICTs, in particular the internet and computer.
Grant recipient/ pensioner	Dichotomous; grant recipient/pensioner = 1, otherwise = 0	negative	It is assumed that those who are on grant or pension may not be able to afford a mobile phone and may have little access to internet and computer facilities.

Student	Dichotomous; student = 1, otherwise = 0	negative (ownership); positive (use)	Being constrained by income, students are expected not to have personal ownership of ICTs; however, being in an educational environment, they are expected to have better use of ICTs.
Single	Dichotomous; single = 1, otherwise = 0	negative (ownership); positive (use)	Being married serves as the reference point in the marital status category, and it is expected that a married individual will have more resources than someone who is not married but, due to other commitments, may have little time to use the internet or a computer.
Widowed	Dichotomous; widowed = 1, otherwise = 0	negative	
Divorced	Dichotomous; divorced = 1, otherwise = 0	negative	
Country dummies	country = 1, otherwise = 0		This is a control for country specific differences, and Ethiopia is used as the reference category because it is the country with the least ICT access and use.

Mobile phones

Though ownership of mobile phones has increased in recent years in low- and middle-income countries, the gender gap persists in this area, though this study finds that this is now more so in terms of *use* than *access*. There is now general consensus that the wide adoption of mobile phone technology makes such technology a tool for social and economic development and a means whereby women can be empowered. The increase in mobile phone penetration and the emergence of various mobile operators have created jobs in many countries. In India alone, the mobile phone industry has created about 3.6 million jobs (directly or indirectly) (Bhavnani *et al.*, 2008, p. 13, cited from Ovum, 2006). However, how many of the job opportunities created have been filled by women is not clear, although the gender breakdown of telecom workforces in those developing countries where data is available suggests that such job opportunities are predominantly taken by men (StatsSA, 2013).

In analysing the attitudes of women, by different income segments, to mobile phone ownership, those at the bottom of the pyramid were found not to be interested in purchasing a mobile phone as they are unaware of its benefits (GSMA, 2012). A study by RIA and Intelecon (2013) found that individuals at the bottom of the pyramid in South Africa have a relatively high rate of mobile phone ownership compared to those in other African countries. It was found that those at the bottom of the pyramid in South Africa, including women, for the most part want to use the mobile phone in the same way as those at higher levels of the pyramid, but only at a lower cost. Working rural women, on the other hand, acknowledge the benefits of mobile phone access but are often constrained by income, while school-going women were found to be avid users of mobile phones, though primarily for socialising (GSMA, 2012).

The uptake of mobile phone technology in Africa has increased dramatically, as evident in the RIA 2012 survey. In comparison to the 2008 figures, there has been a tremendous increase in mobile phone ownership among the adult population (see Figure 9, below). Though the share of adult individuals with mobile phones in Ethiopia (18%), Rwanda (24%) and Tanzania (36%) can still be considered relatively low, these figures went up by about 15% in each case between 2007/08 and 2011/12. Although the ownership of mobile phones among the adult population in Ghana remained fixed, that of South Africa and Botswana went up, reaching above 80%.

The breakdown of mobile phone ownership by gender shows a similar trend. The increase in mobile phone ownership across all of the countries surveyed is reflected in increases in both sexes, except in Ghana (see Figure 9, below). The adoption of mobile phones among women supersedes that of men in Botswana in particular; and also in Namibia and Cameroon, though by a lesser extent. However, in all of the other countries surveyed, the share of men that own a mobile phone continues to be higher than women.

The share of men that own a mobile phone continues to be higher than women

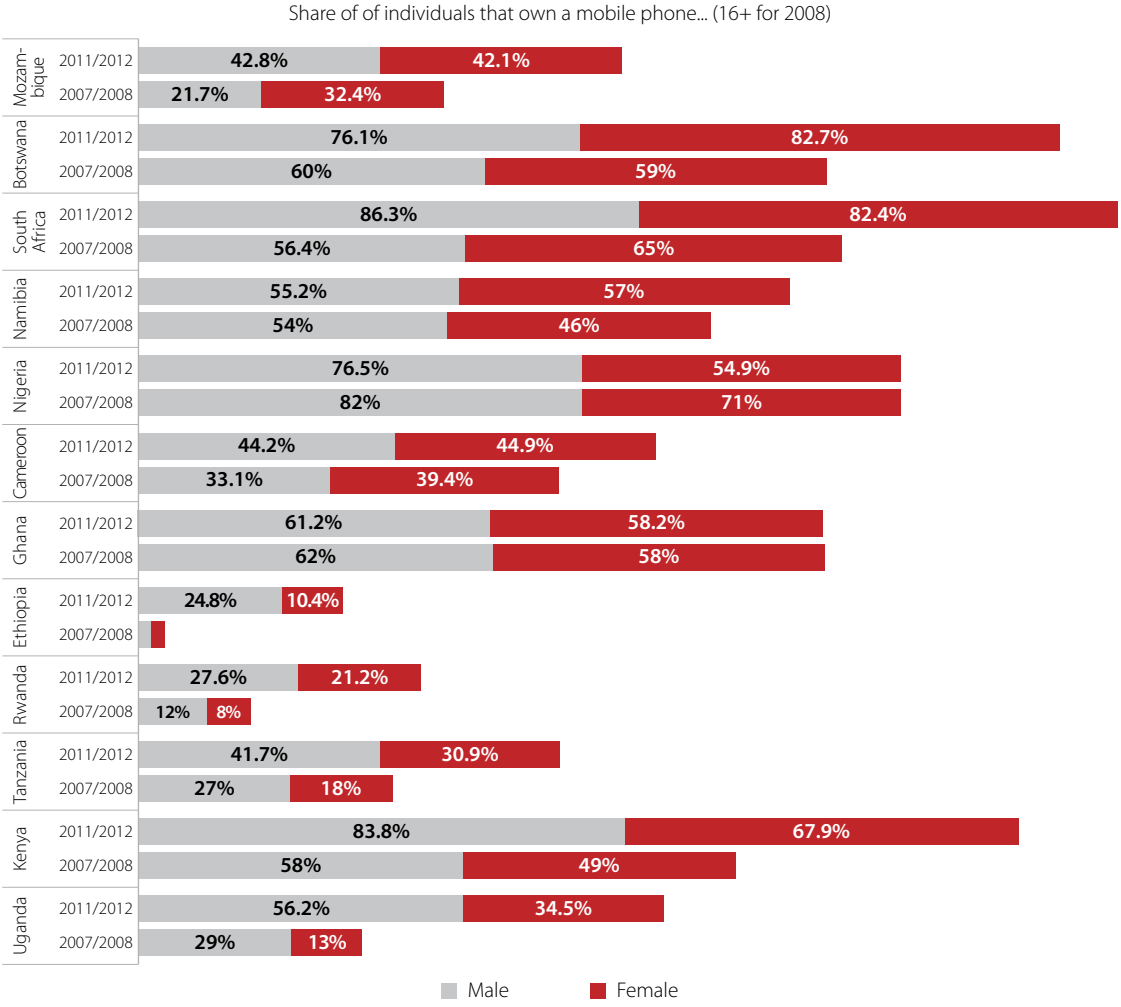

Figure 9: Mobile phone ownership compared across countries, by gender

Source: RIA Database (2008; 2012)

Note: Nigeria data in 2007/2008 was based on estimate

In order to explore mobile phone ownership/access further and to understand better the factors that influence mobile adoption in general and across countries, this study uses a logit regression model. The model includes a gender variable as the main explanatory variable to isolate its impact on mobile phone adoption (the outcome variable). This follows and builds on the Probit models used by Chabossou *et al.* (2008) and Milek *et al.* (2011) in explaining mobile adoption. The model for the entire population showed that when controlling for income and education (using dummy variables to capture individual country differences), the relationship between mobile phone ownership and the gender variable is negative and significant.

Table 8: Mobile phone ownership – Logit regression results for each country, using sampling weights

Variables	Uganda	Kenya	Tanzania	Rwanda	Ethiopia	Ghana	Cameroon	Nigeria	Namibia	South Africa	Botswana	Mozambique
Income	+***	+**	+***	+	+***	+***	+***	+***	+**	+***	+**	+
Female	-**	-*	-	-	-***	+	+	-*	+	+	+***	+**
Rural	-	-	-***	-***	-***	-***	-***	-	-**	-	-**	-***
Education	+***	+***	+***	+***	+***	+***	+***	+***	+***	+**	+***	+***
Age	-	+	+	-	-	-	-	-	-	-*	+*	+
Student	-	-	-**	-***	-	-	+*	-*	-	-***	-	-
Grant/ pension	+	-**	+**	+	-	-	+**	+*	-	-	-***	+
Employed	+***	+	+*	+**	+*	+***	+	+	+**	+**	+	+***
Self-employed	+*	-	-	-	-	+*	+*	+	+	+	+	+**
Married	+	+	+	+**	+	+**	+	-**	+	+	+	-
Divorced	+	-	+	-***	+	-	-	-***	+**	+	-	+
Widowed	+	+	-	-***	-	+	+	-	-	-	-***	+
Pseudo R2	0.2244	0.2407	0.2338	0.2277	0.3297	0.2466	0.3751	0.3349	0.2048	0.1264	0.3317	0.2484
Chi-squared	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

**** indicates significance at the 1% level; ** indicates significance at the 5% level; * indicates significance at the 10% level*

With increasing income, and a higher level of education, the probability of an individual owning a mobile phone is higher than without

Rural and urban populations are considered to be heterogeneous. The models were thus estimated separately using the same explanatory variables for the rural and urban populations. Through these models it is clear that for mobile phone adoption the gender variable is not significant in urban areas, and is significant in rural ones. This indicates that women in rural areas face a gender gap for mobile phone adoption. In both, urban and rural models, the income and education variables are found to have a positive and significant relationship with mobile adoption, supporting the findings by Milek *et al.* (2011). This illustrates that with increasing income, and a higher level of education, the probability of an individual owning a mobile phone is higher than without.

According to this model gender does not seem to have a significant influence on the mobile phone ownership of urban dwellers. The focus group discussions across most of the countries confirm this, as women indicated that having a mobile phone is not a problem that they currently face. Women can either buy their own phone or get a phone through their spouses/partners. The challenge as gathered from these discussions is in the type of phones some of them get, often not the highly sophisticated ones since they cost more than what they can afford. This in turn constrains the range of activity that women can carry out on their phones.

In general, the focus groups in rural areas indicated that cultural biases, which favour men over women, continue to exist. The respondents claim that these biases extend to marriage where the man is the head of the family and therefore has full control over the affairs of the home. Whilst the focus groups showed gender difference in terms of ownership, patterns of mobile phone use among men and women in rural areas were similar.

Affordability and use of mobile phones

The above section established that there was no significant difference between genders regarding the ownership of mobile phones in urban areas. However, there are costs attached to the use of mobile devices. We now look at the patterns of affordability of use by gender. We already saw that income and education are the drivers of mobile phone ownership, it will therefore be interesting to uncover whether there is a gender divide regarding the affordability of mobile use.

The gender divide in affordability of employing ICTs is shown in Figure 10 (below), which looks at the average monthly expenditure on mobile phone use. The gender disaggregated breakdown reveals that on average women spend less than men on mobile phone use in all of the countries surveyed, with the exception of Ethiopia, Rwanda and Tanzania. Spending less on the use of one's mobile phone can be as a result of the lower income women have, which constrains how much they can allocate to mobile use. This is turn can limit the way they make use of their mobile phones (see Figure 12, below).

This was evident in the focus group discussions, where it was found that female respondents, particularly in Kenya, Nigeria and Uganda had received the phones from their spouses or partners. Among the formal urban group in Kenya, for example, some of the female respondents claimed that they received the "old phones" of their partners when the latter upgraded to a more sophisticated one. This in most cases gives men control over these devices; as one male respondent stated: "I got a phone for my wife and when I realised that she was misusing it I took it away from her and sold it" (Kenyan respondent in an informal urban area). "My husband provides me with airtime on a weekly basis," said a Ugandan female respondent from a rural area.

The constraints that women face as a result of low or lack of personal income is reflected in their reduced ability to access and use of mobile devices. The fact that some women have to rely on their male partners for mobile phones and airtime can also be a hindrance to their access and use of the device.

The constraints that women face as a result of low or lack of personal income is reflected in their reduced ability to access and use mobile devices

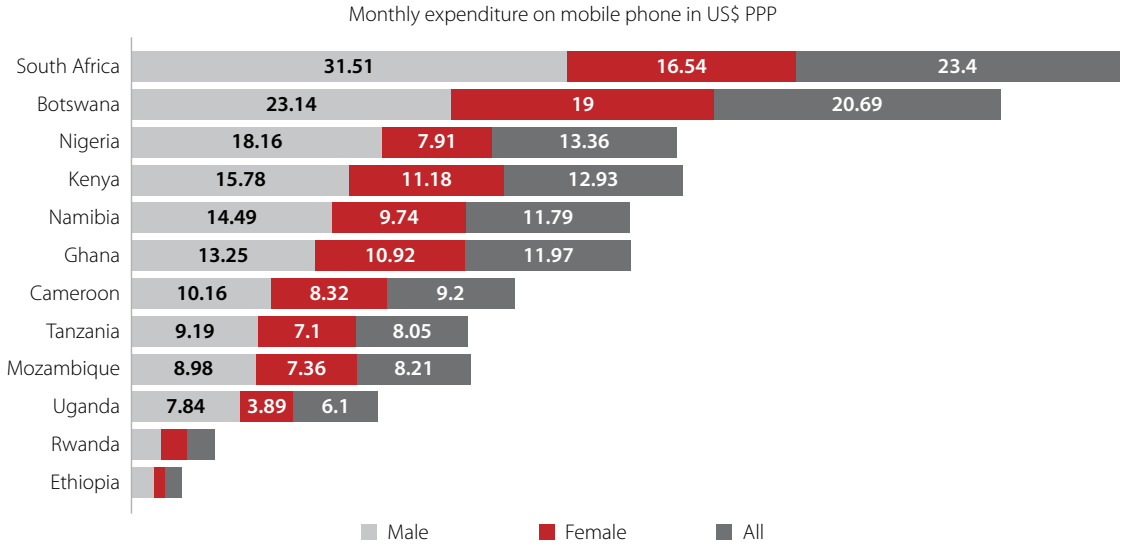

Figure 10: Monthly expenditure on mobile phone, in US$ PPP

Source: RIA Database (2012)

The literature on access to and use of mobile phones has testified to utility in general. The GSMA (2012) study showed that four in 10 women interviewed in specific low- and middle-income countries claim they enjoy increased economic or professional opportunities, while nine in 10 say they feel safer and more connected because of their mobile phones.

Women still lag behind in terms of owning internet-enabled mobile phones

Mobile phones have become the new tool for accessing the internet (Stork *et al.*, 2013) by virtue of their ease of use, portability and convenience. The share of individuals with internet enabled mobile phones is growing in many countries. The data shows that in most of the countries surveyed, except in Tanzania and Rwanda, women still lag behind in terms of owning internet enabled mobile phones (Figure 11). This might be due to the issue of affordability, as cost of phones and mobile phone services remain relatively expensive for many across the continent.

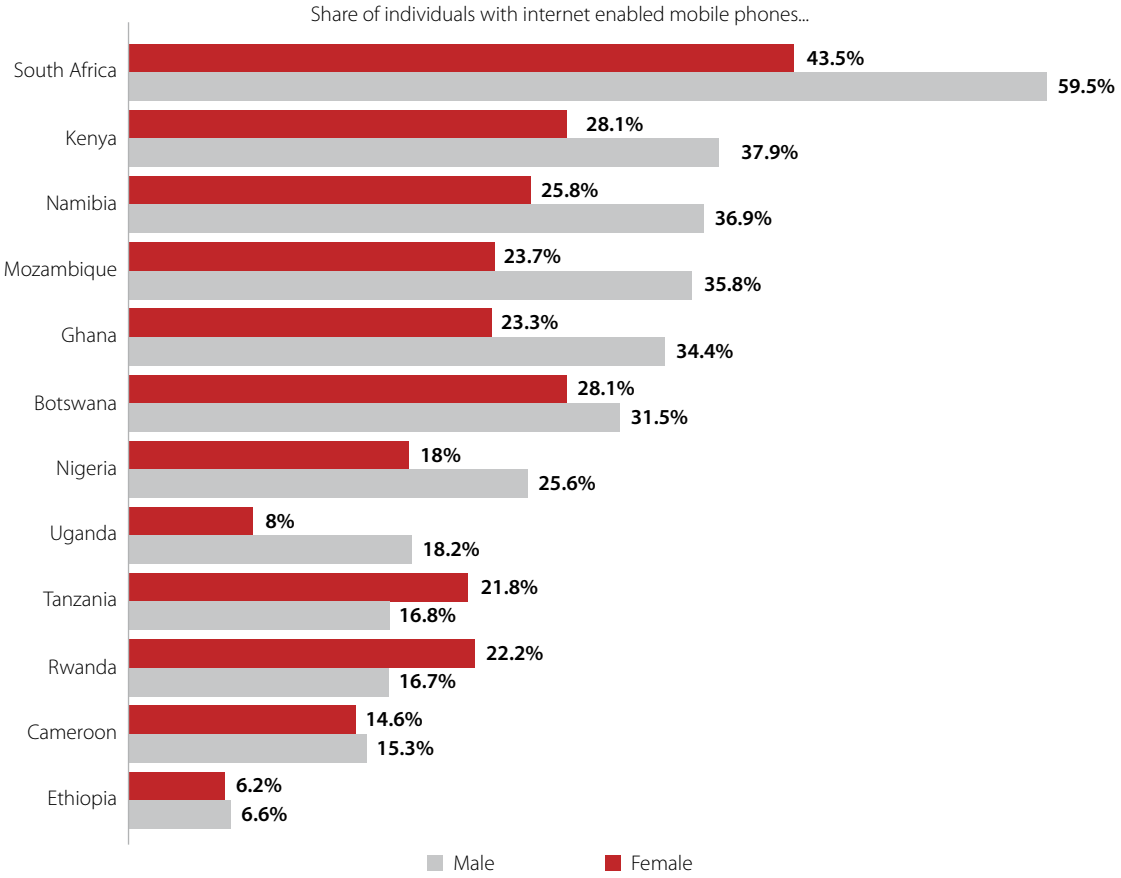

Figure 11: Share of individuals with mobile phones capable of browsing the internet

Source: RIA Database (2012)

Figure 12 (below) shows some of the ways in which mobile phones are being used and how this differs by gender. Though there are differences in which activities more women use their mobile phones for than men, these differences are only slight. The results show that some of the more advanced and sophisticated activities – such as downloading applications, browsing the internet, playing games, reading/writing emails – are more common among men than women, while the more basic activities (missed call/please call me, sending/receiving texts, sending/receiving money) are more used by women than men. This highlights that there is a gender divide in the use of mobile phones and could be a result of underlying factors such as skills, education or income, which in turn affects affordability. The relatively more advanced uses of mobile phones usually require more data, more financial resources and higher levels of skill. This was not the case in rural areas, where men and women conduct similar activities on their mobile phones as the focus groups revealed.

Some of the more advanced and sophisticated activities are more common among men than women

The qualitative research in South Africa depicts a different dynamic, especially in the urban areas, where men seem to be mostly interested in basic communication services on their phones. The female participants were more interested in chatting (mainly on Whatsapp) and accessing the internet from their mobile phones. One female participant in particular explained how smartphones had changed her parenting techniques as she was able to "google" informative answers on teenage pregnancy for her daughter. A new mother stated that she used her phone to check her baby's health results recorded on the hospital's website.

The more formal urban areas in Ghana also had women as active users of ICTs for various activities and not just for calls and other basic communication. Similarly, the focus group discussions in Nigeria indicated that women mostly in the formal urban areas use their phones for more than just basic communication. Women in this category claim that they use their phones to "do business", "chat", "browse", "interact with friends via Facebook", "ping", or as a "personal productivity tool in planning events and setting reminders or alarms". Though the group in the informal urban area showed that women do use their phones for browsing and social networking, activities such as "performing calculations", "reading" etc. were more common among men.

This further supports the findings that it is not gender per se that hinders women from making full use of ICTs. Women in formal urban areas are most likely more technologically sophisticated, exposed to ICTs and more likely to be gainfully employed or engaged in entrepreneurial activities. In such cases the qualitative findings show that their use of ICTs is not as limited as women in informal urban or rural areas.

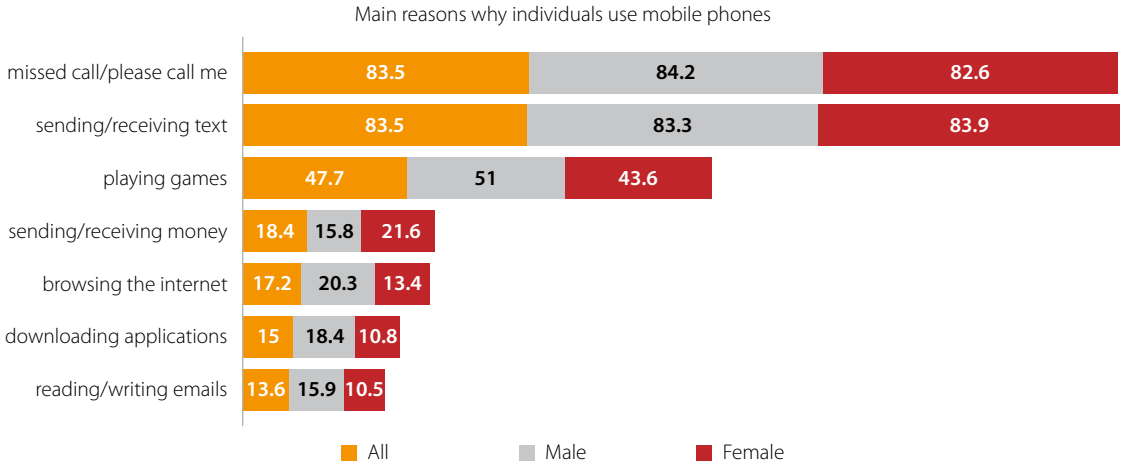

Figure 12: Main reasons why individuals use mobile phones

Source: RIA Database (2012)

The reasons expressed (see Figure 13) by those who do not own a mobile phone for not having one, do not indicate much difference between the sexes. However, slightly more women than men claim that they do not own a mobile phone because they cannot afford one. Here again, the issue of affordability as a limiting factor or hindrance to inclusion is indicated. However, these results are merely descriptive based on the survey conducted by RIA and can therefore be seen as indicative.

Focus groups also confirmed that the high cost of airtime and the lack of screen space are major constraints on mobile phone use. While the availability of electricity has improved in urban areas, participants in rural areas even in South Africa, which is highly electrified by continental standards, continue to identify lack of access to electricity as a limiting factor to their use of mobile phones as they often have to pay about ZAR5.00 (US$0.50) for a full battery charge, which is an added cost to their mobile expenses. To deal with the high cost of voice calls, respondents indicated that they convert airtime to data to use social networks such as Whatsapp and Facebook Zero. Both poorer and younger men and women cited this strategy to overcome the high cost of communication.

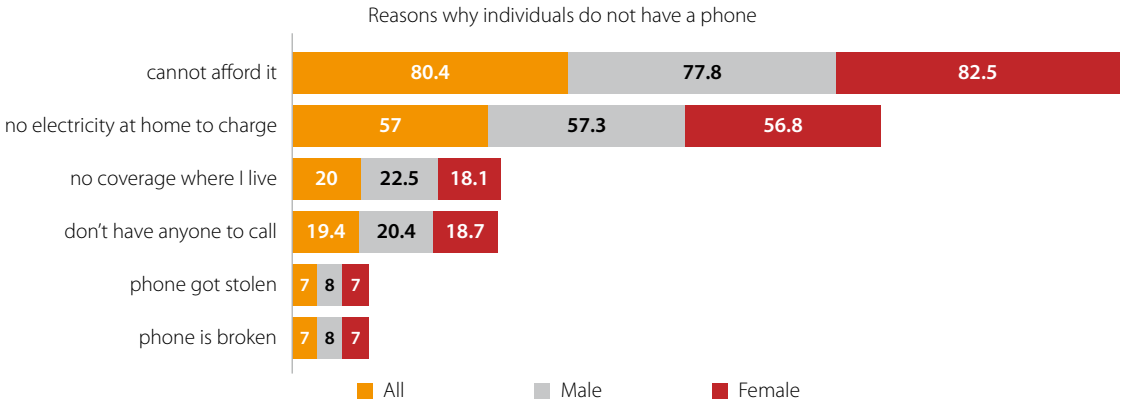

Figure 13: Reasons why individuals do not have a mobile phone

Source: RIA Database (2012)

Internet

Access to and use of the internet by women is said to boost their income, increase their sense of empowerment and increase equity (Intel, 2012). However, there are still many women who are not aware of the internet and its benefits, and others who simply do not have the know-how or technical skills. Despite the increase in internet use in recent years, there are still over 4 billion of the world's population that do not have access, the majority of whom are women. The literacy gap is believed to be a contributing factor to internet use in the developing world. In sub-Saharan Africa, the adult literacy rates stands at 59%, with an adult literacy rate of 68% among men and 51% among women (UNESCO, 2013).

In general the adoption of internet use in Africa has been rather slow, mainly as a result of limited connectivity across many countries and the very high cost of services where they are available. However the emergence of mobile internet and the wider adoption of mobile phones has contributed somewhat positively to this trend. As shown in the RIA 2012 survey results, internet use in the countries surveyed has increased to 15.5% in 2012 from less than 10% in 2008. The results further show that 8.5% of those using the internet did so first on their computer, while 7% used it first on their mobile phone (RIA Database, 2012).

Internet use in the countries surveyed increased to 15.5% in 2012 from less than 10% in 2008

Internet use in all of the countries in general and by gender increased between 2008 and 2012 (see Figure 14). However, in almost all of the countries surveyed, there are more men using the internet than women, except in Cameroon and

Tanzania (but with very little difference). This highlights the fact that internet use though low at the national level of the 12 countries, is even more so for women than men.

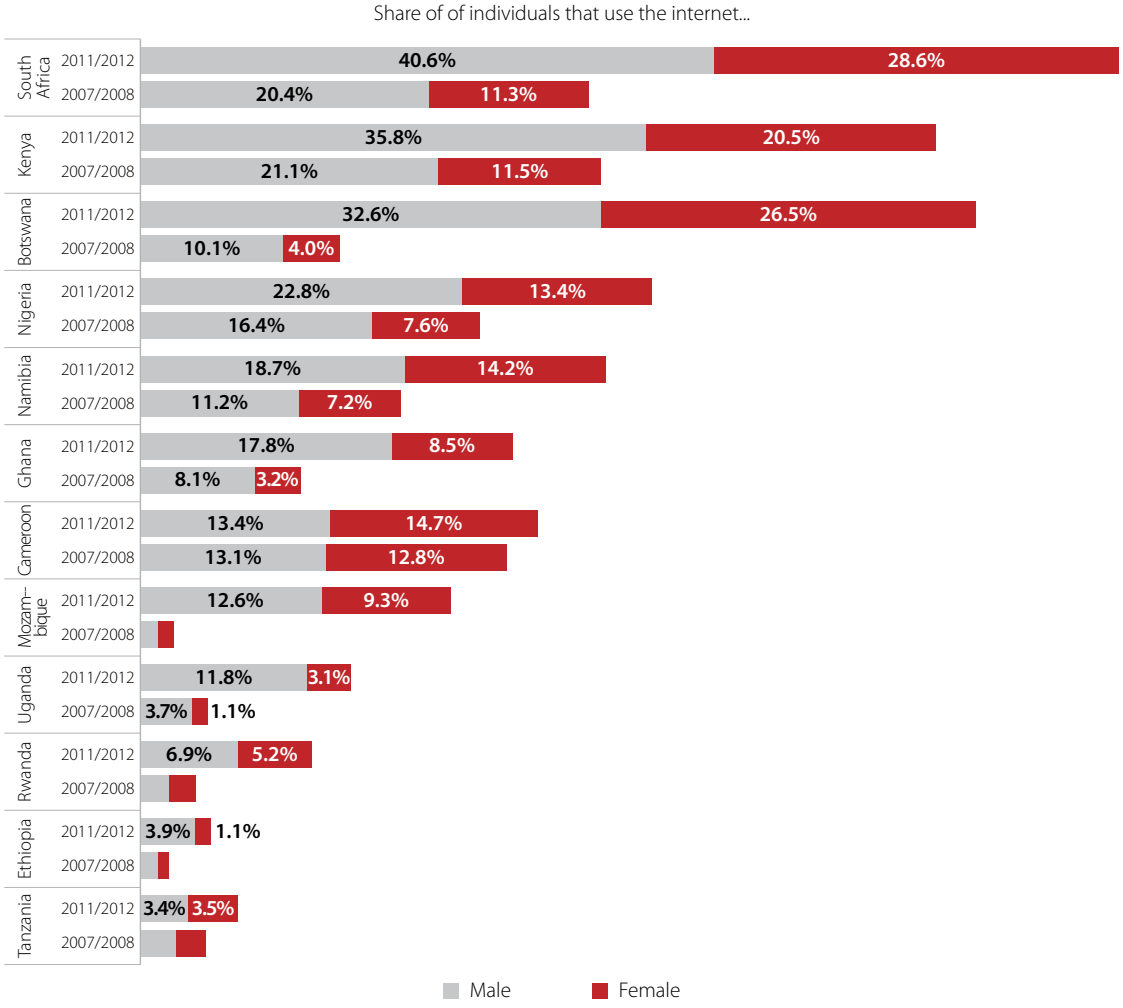

Figure 14 - Percentage of women and men 15 years or older that are using the internet (16+ for 2008)

Source: RIA Database (2008; 2012)

The results in Table 9 show that, in seven of the 12 countries surveyed, more men than women first used the internet on a mobile phone. On the other hand, the study finds that in slightly over half of the countries there are more women than men who first used the internet on a computer.

Table 9: Where internet was first accessed

Country	Share of individuals using the internet that first used it on...			
	a mobile phone		a computer	
	Male	Female	Male	Female
Botswana	34.7%	24.8%	65.3%	75.2%
Cameroon	17.4%	18.3%	82.6%	81.7%
Ethiopia	74.0%	34.7%	26.0%	65.3%
Ghana	32.1%	25.0%	67.9%	75.0%
Kenya	41.6%	31.3%	58.4%	68.7%
Mozambique	58.1%	48.4%	41.9%	51.6%
Namibia	49.3%	50.5%	50.7%	49.5%
Nigeria	47.7%	68.6%	52.3%	31.4%
Rwanda	36.0%	20.6%	64.0%	79.7%
South Africa	29.9%	42.8%	70.1%	57.2%
Tanzania	53.6%	54.6%	46.4%	45.4%
Uganda	76.9%	46.7%	23.1%	53.3%

Source: RIA Database (2012)

There has been a shift in the location from where individuals access the internet. Whereas in 2008 the number of users accessing the internet from home was only about 10%, the 2012 survey results show that this figure now stands at 36.2% and men slightly more so than women. Using the internet from an internet café still remains predominant, though this figure dropped, with more access shifting to using the internet from home, work, place of education and another person's home. Interestingly though the results show that more women access the internet from an internet café, though the difference is not very significant. Slightly more women continue to use the internet from an academic institution than their male counterparts (see Figure 15). Noteworthy, though not included in the figure below, is the share of individuals that indicated they access the internet through their mobile phones in the 12 months prior to the survey. About 73% in total of individuals stated that in the previous 12 months they had used the internet via a mobile phone. The gender breakdown shows that close to 74% of men and 71% of women use the internet on their mobile phones (RIA, 2012). This could be a contributing factor to the shift from accessing the internet via a public place (internet café).

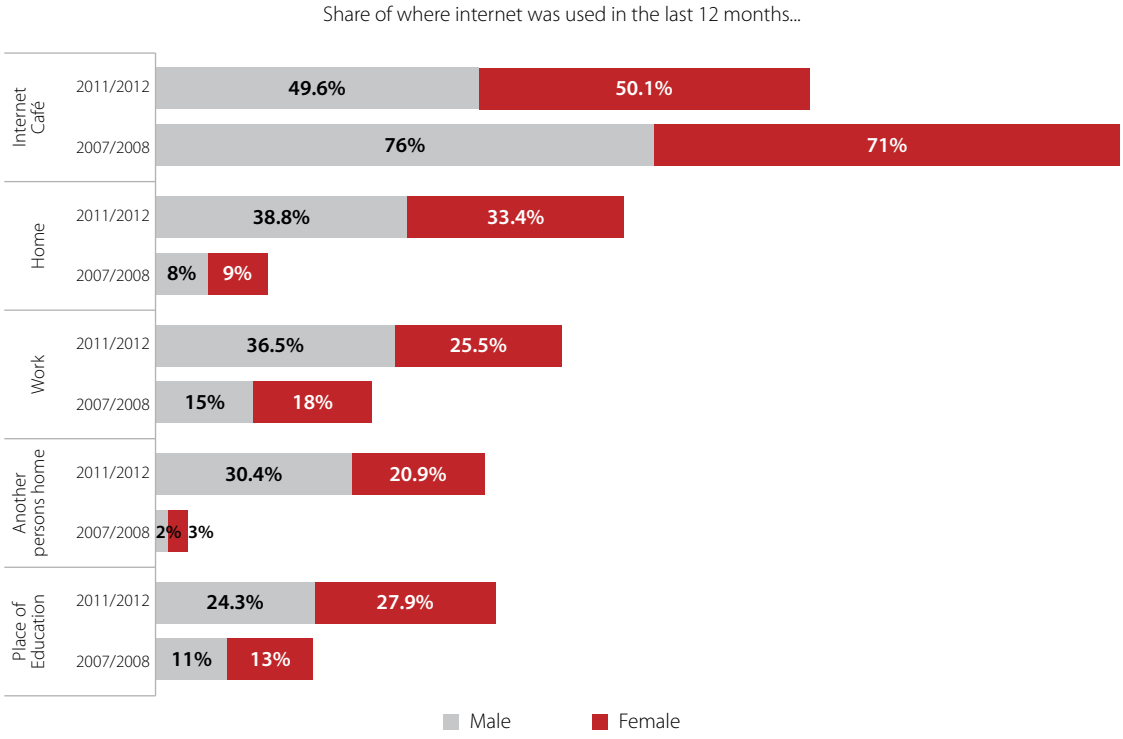

Figure 15: Share of where internet was used in the past 12 months

Source: RIA Database (2008; 2012)

Almost a third of the women surveyed access social networking sites from their mobile phones

The use of social networks has been one of the contributing factors to the recent increase in internet use. More individuals are accessing social networking sites from their mobile phones only, with the share of women doing so (30.8% of the female population) being more than men (26.9%). The results however show that there are still more males signed up for social networking sites and having email addresses than females (RIA Database, 2012). However, the fact that almost a third of the women surveyed access social networking sites from their mobile phones is encouraging and supports the importance of mobile phones in the effort to get more women digitally connected.

The focus groups RIA conducted also indicate the contribution that mobile phones and social networks have made to internet use among both sexes, and more so among women. The female participants in the South African focus groups were found to be more frequent users of social networking sites and accessed the internet mostly from their mobile phones. The reason behind this as indicated by female participants, was that "it is cheaper compared to accessing the internet at internet cafés, which charge ZAR10.00 an hour", and they also found "mobile phones more convenient to use than internet cafés". In some of the other countries, the issue of privacy was also expressed as one of the major reasons why individuals would rather access the internet on their mobile phones than from an internet café.

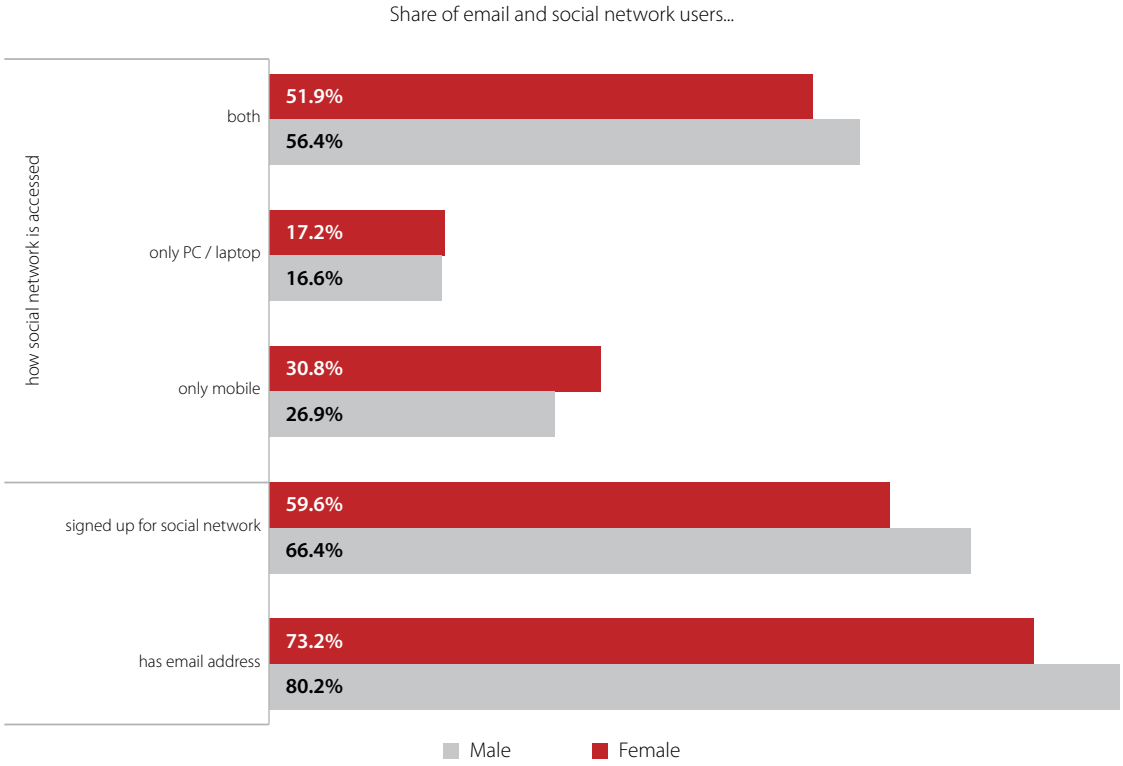

Figure 16: Share of individuals using emails and accessing social networks

Source: RIA Database (2012)

The gender divide in internet use is analysed through a logit regression model that looks at the factors that influence internet use.

Table 10: Internet use – Logit regression results for each country, using sampling weights

Variables	Uganda	Kenya	Tanzania	Rwanda	Ethiopia	Ghana	Came-roon	Nigeria	Namibia	South Africa	Botswana	Mozam-bique
Income	+	+***	+**	+	+	+	+**	+***	+***	+***	+***	+***
Female	-***	-**	+	-	-***	-	+	-	-	-	-	-
Rural	-*	+	-*	-**	-	-	-***	-	-***	-***	-	-***
Age	+	-	-	+*	-	-*	+	-***	-	-***	-	-***
Education	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***	+***
Student	+	+	+	+	-	+	+**	+	+**	+***	+***	-
Employed	+*	-*	+*	+	+	+	+	+	-	+**	+	+***
Self-employed	+	-**	+	+	+	-	-	-	-	+***	-	+
Married	-	-***	+	+	-	+	-**	-	+	-	+	-
Divorced	-	+	-	-	-	+	-	+	-	-	-	+
Widowed	-**	-***	+	-**		+	-	+	-*	+**	+	-***
Pseudo R2	0.2409	0.3085	0.2162	0.3775	0.2663	0.2493	0.3152	0.2690	0.3137	0.2657	0.2244	0.3896
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

**** indicates significance at the 1% level; ** indicates significance at the 5% level; * indicates significance at the 10% level*

Being a woman reduces one's probability of using the internet

When variables such as income, education, age, employment status, work experience, marital status and country differences were controlled for in the model, the female variable showed a negative and significant impact on internet use. This finding indicates that, while holding all else constant, being a woman reduces one's probability of using the internet (see Appendix A).

Unlike mobile adoption, internet use is less likely for women in both urban and rural areas

Splitting the sample into rural and urban shows that, unlike mobile adoption, internet use is less likely for women in both urban and rural areas. In all cases, the income and education variables are found to have a significant and positive impact on the probability of internet use. These findings support those found by Milek *et al*. (2011). Only Rwanda and Ghana do not report significant effects for the probability of internet use in urban areas, implying that all other countries evaluated show a relationship between urban dwelling and the probability of internet use. For rural areas, the only country that shows a significant negative relationship on the impact of internet use is Uganda. Individual country regressions show that for most countries rural dwelling status has a negative impact on the probability of internet use.

Figures 17 and 18 (below) reveal some descriptive statistics on how those using the internet have increased their contacts with specific groups; and, for those not using the internet, what their challenges are. More women than men claim to have increased their contacts with the people they share the same hobbies/recreational activities and religious beliefs with through their use of the internet. On the other hand, more men than women indicated that using the internet increased their contact with people who share their political views, with family and friends, and with colleagues.

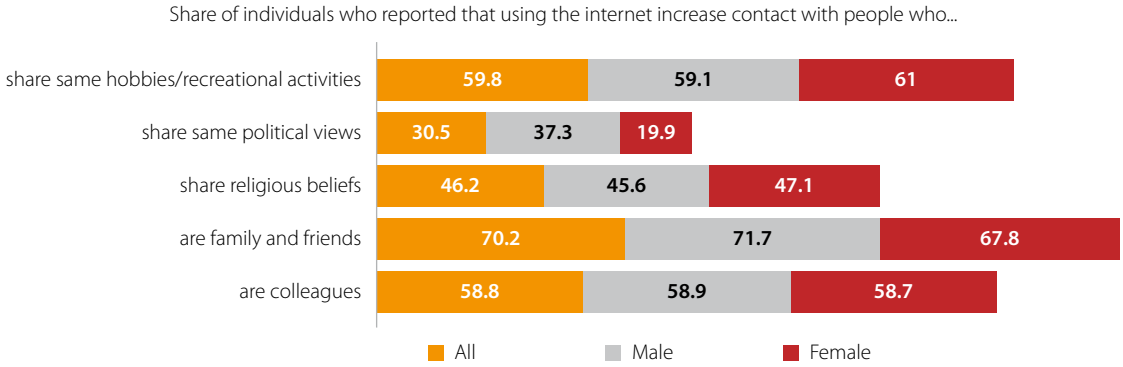

Figure 17: Share of individuals who claim that using the internet has increased their communication

Source: RIA Database (2012)

The negative relationship between being female and the probability of internet use may be attributed partly to the lack of awareness and knowledge about the internet as depicted in the figure below.

About 7.7% more women than men stated that they do not use the internet because they do not know what it is and about 3% more stated that they do not know how to use the internet. Slightly more women than men also mentioned that they do not make use of the internet because it is too expensive and they also have no interest or do not find it useful. These reasons are indicative of the exclusion factors, namely education (knowledge/skills) and income (affordability), which have been cited as being among the main reasons why internet services are not being used. In each case there are more women than men attesting to these reasons.

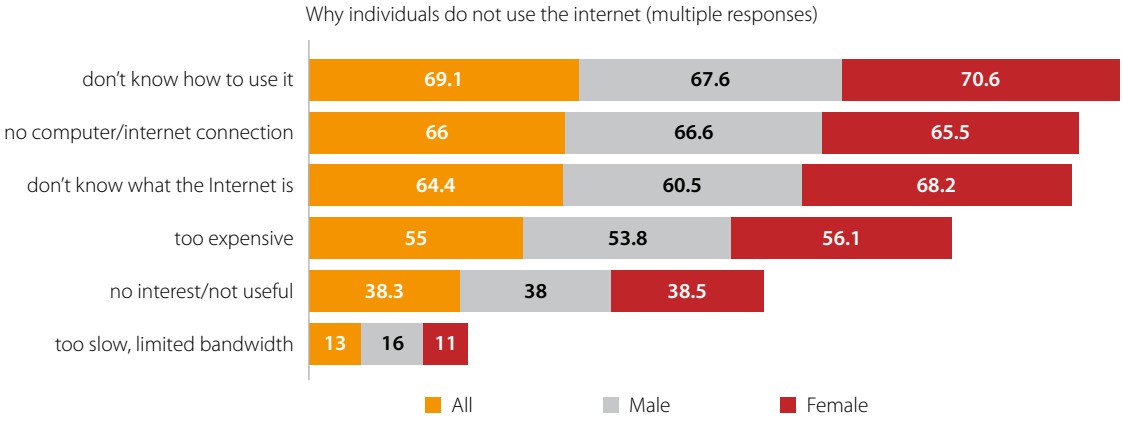

Figure 18: Main reasons why individuals do not use the internet

Source: RIA Database (2012)

Lack of awareness and lack of knowledge were found to be the major barriers to internet use, especially among women

The focus group discussions in Kenya showed that it was mainly the lack of internet skills and the low literacy levels in general (more so among female participants) that were major barriers to internet use. The findings from the focus group in a rural area in Nigeria revealed that women do not know much about the internet and, hence, do not make use of it. This emphasises the issue of lack of awareness, lack of knowledge and the inability of individuals to use the internet, which seems to be on a larger scale for women.

Computers

Computer use is still relatively low across African countries and the number of individuals who own a computer is even lower. The RIA 2012 survey results show that computer use among individuals is above 10% in only four of the countries surveyed. Only in South Africa is computer use close to 30%, while in Kenya it is slightly above 20%. There are more men than women making use of computers in all of the countries surveyed with the exception of Ethiopia (at per), Tanzania and Rwanda (slightly more women), with the gender gap much wider in Kenya and South Africa. Of those individuals who use a computer, some claim to have a personal desktop or laptop computer (Figures 19–21).

There are more men than women making use of computers in most of the countries surveyed

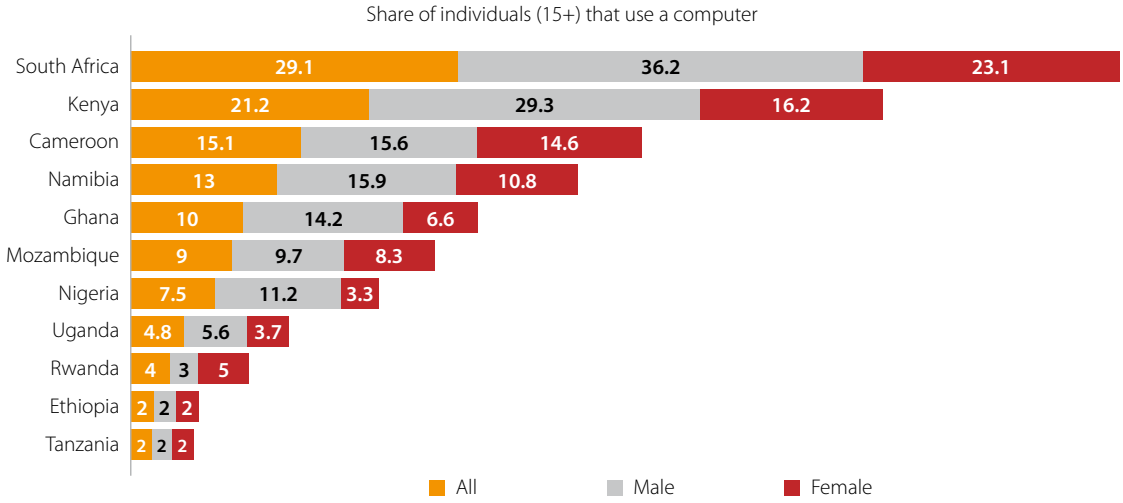

Figure 19: Share of individuals (15+) that use a computer

Source: RIA Database (2012)

The wide gender gap in Kenya can be confirmed to some extent by the findings from the focus group discussions, in particular in the informal urban and rural areas, where men were found to have the main control of devices in the household, including computers. In the informal urban group in Uganda, the general consensus was that "women owned nothing in the house since the men worked for and bought everything in the home". This no doubt can be a contributing factor to the use of computers among women as the computer is often thought of as a household device.

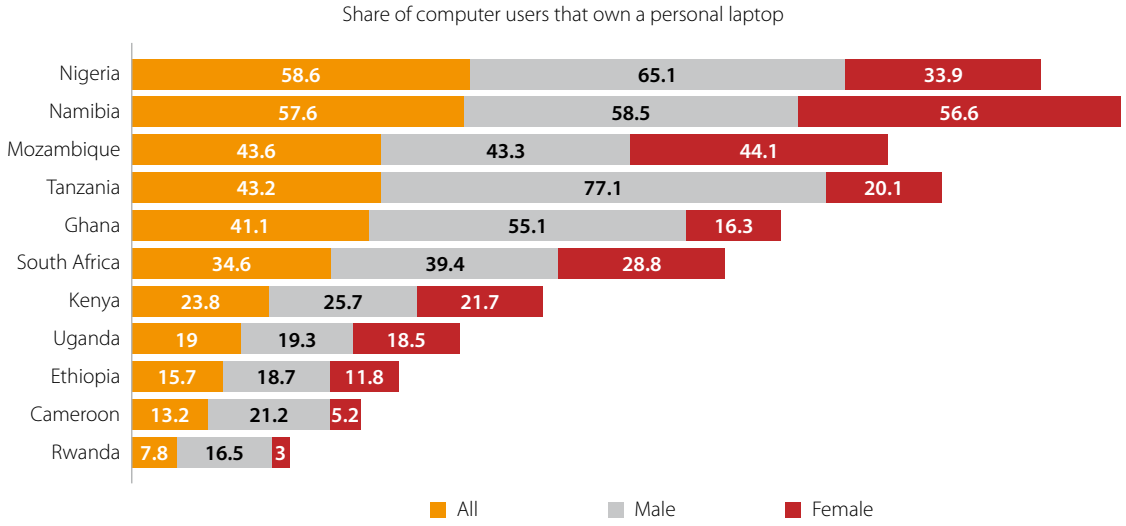

Figure 20: Share of computer users (15+) that own a personal laptop

Source: RIA Database (2012)

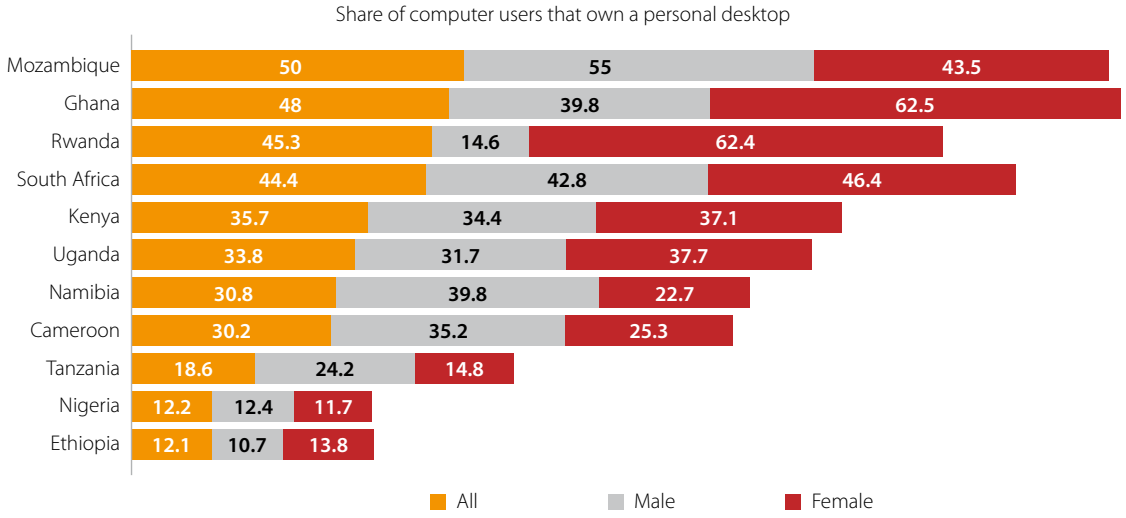

Figure 21: Share of computer users (15+) that own a personal desktop

Source: RIA Database (2012)

Figure 22 (below) shows that the gender gap in terms of where individuals access computers is generally not very pronounced. However, the results show that there are more men than women using a computer in all of the identified locations except the library, where more women than men indicate that is where they access a computer.

In terms of the activities for which computers are being used (see Figure 23, below), with the exception of browsing the internet, where the results show that use is similar among men and women, there are more men than women using a computer to carry out word processing, work on spreadsheets, do programming, do remixing and play games. This gap is wider in the more technical activities such as programming and remixing content found online. This is indicative of the findings that higher skills are a contributing factor to ICT use and that lack of e-skills can constrain the extent to which ICTs can be used and the efficiency with which they can be used (Schmidt and Stork, 2009). The gender gap in education as shown in this study, could be a contributing factor to the way in which men and woman use ICTs and in this case computers.

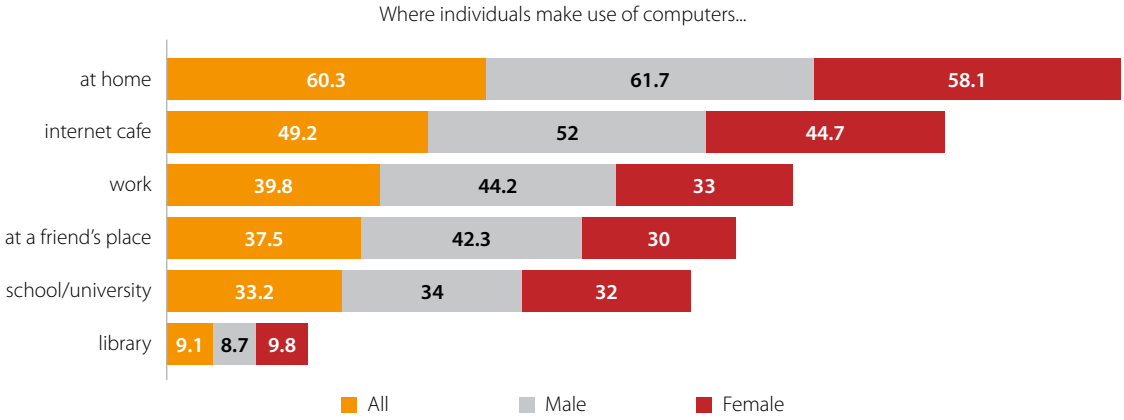

Figure 22: Where individuals make use of computers, across 11 African countries

Source: RIA Database (2012)

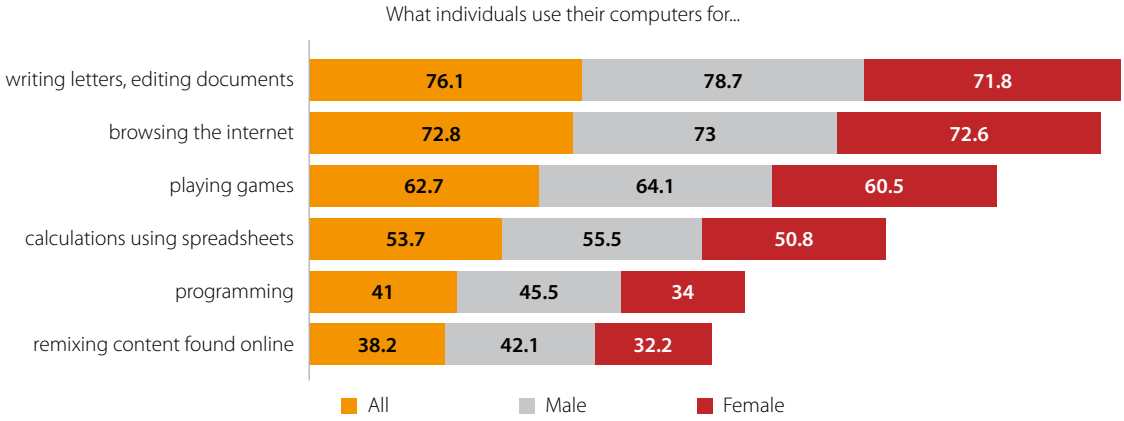

Figure 23: Main reasons why individuals use computers, across 11 African countries

Source: RIA Database (2012)

Pay phones

While public pay phones were a critical part of the combined communications access strategy of those at the bottom of the pyramid in the 2008 RIA individual user survey, dependence on public pay phones is on the decline in many regions. Table 12 (below) presents an analysis of the use and prevalence of public pay phones in Africa.

Though the results do not show much difference by gender in the use of public phones, there are slightly more men that claimed to have accessed a public pay phone than women. The focus group discussions in all of the countries support the dwindling trend of public pay phone use. In most of the countries one can hardly find functional pay phones, and where they still exist they are few and far between. Individuals (male and female alike) also claim that they find no privacy in using public pay phones, especially with the increase in mobile phone ownership and use. Some claim that they only use pay phones if they do not have credit on their mobile phones.

The survey results show that the telephone kiosk or umbrella operator, which has become very common in most African nations with the emergence of mobile phones, appears to have replaced the use of the formal telephone booths operated by fixed line operators. Affordability appears to be slightly more of a challenge among women, as the results show that more women than men claim that they use public pay phones because it is cheaper and that the price of calls drives them to make use of a particular community/public pay phone.

More women than men claim that they use public pay phones because it is cheaper

Table 11: Use of pay phones

		Public pay phones	
		Male	Female
Use of a pay phone in the past three months		18.0%	14.7%
How often do you use a public phone?	More than once a day	5.4%	7.0%
	Every day or almost every day	8.0%	9.8%
	At least once a week	36.3%	35.9%
	At least once a month	29.1%	30.0%
	Less than once a month	21.1%	17.3%
Type of public phone most used	Telephone booth (fixed line operator)	15.6%	16.6%
	Telephone kiosk, umbrella operator	82.6%	82.5%
Main reasons for using a public pay phone	Do not have a fixed line phone at home	6.9%	8.8%
	Do not have a mobile phone	29.8%	27.6%
	Use it because it is cheaper	31.0%	37.2%
	Easier than having to recharge airtime mobile	15.1%	14.0%
	Difficulties charging the battery of mobile phone	14.5%	8.7%
What makes you use a particular community/public pay phone?	Price of calls	36.6%	45.3%
	Convenience (e.g. close to my house)	53.0%	46.3%
	Security	3.4%	3.5%

Source: RIA Database (2012)

Conclusion

This study looks at the gender digital divide not only through narrow, descriptive and supply-side indicators on access but also through issues of use. The study analyses the digital divide by uncovering the underlying reasons for the inequalities that exist between men and women's access to ICTs. Furthermore it analyses the differences in use, which either enable or constrain individual's ability to benefit from ICTs. The analysis is derived from the inclusivity and exclusivity theory, defining ICTs as inclusive factors and income and education as exclusionary factors.

This sex disaggregated overview indicates that women and men are not equally able to access and use ICTs and this is compounded by the high cost of services and the increasingly high levels of complexity required to communicate effectively in the economy and society. Women generally have less access to ICTs and this increases as the technologies and services become more sophisticated and expensive, requiring greater levels of income and education to access and to operate. The analysis of the data demonstrates that the reason for this relates to the fact that women are more concentrated among lower income groups, lower education levels and in rural areas, or – stated more generally – at the base of the pyramid.

Women generally have less access to ICTs and this increases as the technologies and services become more sophisticated and expensive, requiring greater levels of income and education to access and to operate

In analysing both mobile and internet access and use, the descriptive statistics as well as simple logistic models indicate that inequalities between men and women's access and use of ICTs persist in most countries analysed.

The study first showed that women on average have lower incomes than men, holding all else constant. This result holds for the whole population: for women in urban areas as well as those in rural ones.

The study then showed that women in urban areas do not have significantly different educational attainment than men in urban areas on average. However, a gender gap with respect to education is observed for women in rural areas.

Mobile phone use when evaluated on the basis of the entire population shows that the female sex is a negatively significant variable, that is, a gender effect is observed. However, when urban and rural areas are split up and analysed separately, it is only in rural areas that the gender effect is a significant determinant of mobile phone use. Women, in rural areas, are less likely than men to use mobile phones. For urban areas gender is not a significant determinant of mobile phone use.

Further, with respect to internet use, it was shown that gender significance holds in urban and rural areas. Women in both areas are less likely than men to use the internet. The benefits to residing in an urban area that was apparent for mobile phone use do not hold (as yet) for internet use among women in urban areas.

It is not gender per se that is preventing women from accessing inclusionary factors such as ICTs, but rather that it is exclusionary factors

These results indicate that in urban areas it is not gender per se that is preventing women from accessing inclusionary factors such as ICTs, but rather that it is the exclusionary factors - income and education - that prevent women from accessing these tools. In rural areas conventional gender systems still hold.

In general, more men than women make use of computers to perform specific activities with the gap widening the more technical these activities become.

The use of pay phones has taken a different direction, moving away from fixed line operated phone booths towards telephone kiosk/umbrella operators, which mainly work with mobile phones. Women, to a certain extent more so than men, indicate that they continue to use public phones mainly because of affordability issues.

This study confirms in the adoption models that education and income have a positive impact on ownership and use of ICTs. The study also identifies the gender divide in these two key determinants (i.e. income and education) of inclusion in terms of ICT use and access. It is mainly this underlying gender gap, in income and education, that contributes to the exclusion of women in the ICT domain.

It is not women's access to ICTs that needs to be the sole focus of policy interventions, but the income and education gap that persists between genders

These results have critical policy implications as it is not women's access to ICTs that needs to be the sole focus of policy interventions, but the income and education gap that persists between genders. Thus, by targeting income and education inequality, one is effectively targeting the digital divide.

The relationship between development and the nature of development and gender equity in relation to ICT access and use need to be better understood. As this research has started to do, research in this area must go beyond simple correlations between ICT gender equity, ICT penetration and growth or other development measures, to understand the variations observed across countries and the interventions required to ensure greater inclusion of women. Subsequent research aims to analyse the above-mentioned gender gaps. The qualitative component of the study indicated that if women are given the opportunity and have equal access, they could be more active and frequent users of ICTs.

To a large extent, gender inequities in access to and use of ICTs cannot be addressed through ICT policies *per se*. They require policy interventions in other areas that would allow women and girls to enjoy the benefits of ICTs equally. Increased educational opportunities are likely to address some of the issues relating to women's relatively low levels of employment. This in turn will increase the income that women have to spend on ICT services, allowing them to participate more effectively in society and the economy. As large numbers of women are among those most marginalised from ICTs, they are likely to benefit from any more general sectoral interventions that extend services to lower income groups through low-cost business models or targeted universal service fund allocations or effective price regulation.

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Appendix A: Regression models and results

A.1 Income

Individual income is calculated as the sum earned from salary/wages, self-employment, property or agricultural activities, pension, transfer payments and/or scholarships. The logarithm of the income variable was used as it is expected to yield a more robust regression result as opposed to its linear form. The income model was run as an Ordinary Least Square (OLS) regression and the various tests were conducted to ensure that the model is robust.

A.1.1 Income - Entire population

Linear regression

Number of obs	= 13672
F(19, 13652)	= 107.15
Prob > F	= 0.0000
R-squared	= 0.3488
Root MSE	= 1.3371

lnIncome	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.0094167	.0023963	3.93	0.000	.0047196	.0141138
female	-.6987762	.055733	-12.54	0.000	-.8080206	-.5895318
rural	-.2129045	.061367	-3.47	0.001	-.3331923	-.0926167
WorkExp	.0412341	.0031925	12.92	0.000	.0349763	.0474919
yearsformal	.0777476	.0066669	11.66	0.000	.0646797	.0908156
divorced	.7784571	.1116627	6.97	0.000	.5595828	.9973314
widowed	.5733759	.1167731	4.91	0.000	.3444845	.8022673
married1	.6746006	.0667072	10.11	0.000	.5438454	.8053559
Uganda	.2870851	.1186515	2.42	0.016	.0545119	.5196583
Kenya	.9127289	.1096477	8.32	0.000	.6978043	1.127653
Tanzania	.1803592	.080802	2.23	0.026	.0219763	.3387422
Rwanda	.2593626	.0837874	3.10	0.002	.0951278	.4235974
Ghana	.8069714	.0889698	9.07	0.000	.6325783	.9813645
Cameroon	.9053836	.0769966	11.76	0.000	.7544598	1.056307
Nigeria	.8473289	.0909773	9.31	0.000	.6690008	1.025657
Namibia	1.434039	.0983248	14.58	0.000	1.241309	1.626769
SouthAfrica	1.634469	.1083806	15.08	0.000	1.422028	1.84691
Mozambique	.5678461	.0994157	5.71	0.000	.3729777	.7627146
Botswana	1.831738	.1118108	16.38	0.000	1.612573	2.050902
_cons	1.648073	.1089562	15.13	0.000	1.434504	1.861642

A.1.2 Income - Rural

Linear regression

Number of obs	= 4993
F(18, 4974)	= 53.03
Prob > F	= 0.0000
R-squared	= 0.3316
Root MSE	= 1.2963

lnIncome	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.0066024	.0033356	1.98	0.048	.0000632	.0131416
female	-.7721842	.0773676	-9.98	0.000	-.9238588	-.6205096
WorkExp	.0360018	.0040892	8.80	0.000	.0279852	.0440184
yearsformal	.0496383	.0095857	5.18	0.000	.030846	.0684306
divorced	.8967107	.1571716	5.71	0.000	.588585	1.204836
widowed	.5923104	.1504952	3.94	0.000	.2972735	.8873473
married1	.7337185	.0955411	7.68	0.000	.5464158	.9210213
Uganda	.5064408	.143477	3.53	0.000	.2251627	.787719
Kenya	1.243201	.1521012	8.17	0.000	.945016	1.541387
Tanzania	.294024	.1081912	2.72	0.007	.0819215	.5061265
Rwanda	.3249544	.11123	2.92	0.003	.1068946	.5430141
Ghana	.8819136	.1336907	6.60	0.000	.6198209	1.144006
Cameroon	1.052792	.1119272	9.41	0.000	.8333654	1.272219
Nigeria	1.185193	.1217159	9.74	0.000	.9465758	1.42381
Namibia	1.287026	.140107	9.19	0.000	1.012354	1.561697
SouthAfrica	1.761751	.1756718	10.03	0.000	1.417356	2.106145
Mozambique	.740461	.1411573	5.25	0.000	.4637305	1.017192
Botswana	1.763598	.1958865	9.00	0.000	1.379574	2.147622
_cons	1.560242	.127595	12.23	0.000	1.310099	1.810384

A.1.3 Income - Urban

Linear regression

Number of obs	= 8679
F(18, 8660)	= 101.24
Prob > F	= 0.0000
R-squared	= 0.3811
Root MSE	= 1.3581

lnIncome	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	.0151929	.0026907	5.65	0.000	.0099185	.0204674
female	-.5526395	.0712194	-7.76	0.000	-.6922465	-.4130326
WorkExp	.0542019	.0044901	12.07	0.000	.0454002	.0630036
yearsformal	.1134138	.0071283	15.91	0.000	.0994407	.1273869
divorced	.516548	.1432136	3.61	0.000	.2358153	.7972807
widowed	.5248378	.1722804	3.05	0.002	.1871273	.8625484
married1	.5121423	.079496	6.44	0.000	.3563113	.6679734
Uganda	-.0853741	.3031567	-0.28	0.778	-.6796334	.5088851
Kenya	.3472701	.1332887	2.61	0.009	.0859925	.6085477
Tanzania	.086768	.0833436	1.04	0.298	-.0766052	.2501413
Rwanda	.2817018	.1048178	2.69	0.007	.0762339	.4871696
Ghana	.61086	.0851878	7.17	0.000	.4438718	.7778483
Cameroon	.630357	.078033	8.08	0.000	.4773939	.7833202
Nigeria	.3545341	.0896825	3.95	0.000	.178735	.5303331
Namibia	1.68852	.0876319	19.27	0.000	1.516741	1.8603
SouthAfrica	1.29347	.106452	12.15	0.000	1.084799	1.502141
Mozambique	.216715	.1103133	1.96	0.049	.0004747	.4329554
Botswana	1.614366	.1033226	15.62	0.000	1.411829	1.816903
_cons	1.40831	.1157803	12.16	0.000	1.181353	1.635267

A.2 Education

A.2.1 Education – Entire population

Linear regression

Number of obs	= 13718
F(21, 13696)	= 510.65
Prob > F	= 0.0000
R-squared	= 0.5369
Root MSE	= 3.756

yearsformal	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	-.0569433	.0071136	-8.00	0.000	-.0708869	-.0429998
female	.2813292	.1813921	1.55	0.121	-.0742242	.6368827
rural	-1.701691	.2033739	-8.37	0.000	-2.100332	-1.303051
HHincome	1.15e-08	2.71e-09	4.25	0.000	6.21e-09	1.68e-08
HHheadTertiary	8.166376	.254928	32.03	0.000	7.666683	8.66607
HHheadSecondary	5.321315	.1982744	26.84	0.000	4.93267	5.709961
HHheadPrimary	1.313011	.1557443	8.43	0.000	1.00773	1.618291
widowed	-3.293006	.3327806	-9.90	0.000	-3.945302	-2.640711
divorced	-2.569373	.3237334	-7.94	0.000	-3.203935	-1.934811
married1	-1.860683	.2066894	-9.00	0.000	-2.265823	-1.455543
Uganda	5.681493	.25669	22.13	0.000	5.178345	6.184641
Kenya	6.789067	.2568973	26.43	0.000	6.285513	7.292621
Tanzania	4.522765	.1745019	25.92	0.000	4.180717	4.864812
Rwanda	3.04619	.1662156	18.33	0.000	2.720384	3.371995
Ghana	4.490653	.2248173	19.97	0.000	4.04998	4.931326
Cameroon	2.833802	.2381045	11.90	0.000	2.367085	3.30052
Nigeria	4.410896	.2814807	15.67	0.000	3.859155	4.962637
Namibia	4.754193	.218481	21.76	0.000	4.325941	5.182446
SouthAfrica	6.584051	.1908873	34.49	0.000	6.209886	6.958217
Mozambique	4.520383	.2453322	18.43	0.000	4.039499	5.001268
Botswana	5.841642	.2459568	23.75	0.000	5.359533	6.323751
_cons	6.016576	.2681728	22.44	0.000	5.49092	6.542231

A.2.2 Education – Rural

Linear regression

Number of obs	= 5271
F(20, 5250)	= 356.29
Prob > F	= 0.0000
R-squared	= 0.5717
Root MSE	= 3.5409

yearsformal	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	-.043371	.0081107	-5.35	0.000	-.0592714	-.0274706
female	.4621412	.2211828	2.09	0.037	.0285309	.8957514
HHincome	1.65e-08	3.91e-09	4.21	0.000	8.81e-09	2.41e-08
HHheadTertiary	8.668334	.3748914	23.12	0.000	7.933391	9.403277
HHheadSecondary	5.970317	.264625	22.56	0.000	5.451542	6.489092
HHheadPrimary	1.882648	.1972704	9.54	0.000	1.495916	2.26938
widowed	-3.371788	.3927518	-8.59	0.000	-4.141745	-2.601831
divorced	-2.72717	.4047756	-6.74	0.000	-3.520698	-1.933641
married1	-1.854292	.2884331	-6.43	0.000	-2.419741	-1.288844
Uganda	5.94607	.2928663	20.30	0.000	5.37193	6.52021
Kenya	7.179751	.3230425	22.23	0.000	6.546453	7.813048
Tanzania	4.618254	.2203095	20.96	0.000	4.186356	5.050152
Rwanda	3.455715	.1927845	17.93	0.000	3.077777	3.833652
Ghana	4.857879	.325068	14.94	0.000	4.220611	5.495148
Cameroon	2.319262	.3120861	7.43	0.000	1.707443	2.93108
Nigeria	4.577861	.3737982	12.25	0.000	3.845061	5.310661
Namibia	4.67542	.296248	15.78	0.000	4.094651	5.25619
SouthAfrica	7.500121	.2641047	28.40	0.000	6.982366	8.017876
Mozambique	4.356647	.3358312	12.97	0.000	3.698278	5.015016
Botswana	6.535659	.4040085	16.18	0.000	5.743635	7.327684
_cons	3.449886	.27789	12.41	0.000	2.905106	3.994666

A.2.3 Education – Urban

Linear regression

Number of obs	8447
F(20, 8426)	172.45
Prob > F	0.0000
R-squared	0.3947
Root MSE	3.9708

yearsformal	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	-.077322	.0130162	-5.94	0.000	-.102837	-.0518071
female	-.1121579	.2937812	-0.38	0.703	-.6880411	.4637253
HHincome	7.62e-09	3.35e-09	2.27	0.023	1.04e-09	1.42e-08
HHheadTertiary	7.597743	.3245919	23.41	0.000	6.961463	8.234023
HHheadSecondary	4.463155	.2799866	15.94	0.000	3.914312	5.011997
HHheadPrimary	-.0170854	.2485242	-0.07	0.945	-.5042538	.470083
widowed	-2.970685	.6186322	-4.80	0.000	-4.183356	-1.758014
divorced	-1.987452	.519287	-3.83	0.000	-3.005382	-.9695218
married1	-1.725305	.2761992	-6.25	0.000	-2.266724	-1.183887
Uganda	3.653293	.4042963	9.04	0.000	2.860773	4.445813
Kenya	4.482068	.4411189	10.16	0.000	3.617367	5.346769
Tanzania	3.404228	.2333056	14.59	0.000	2.946891	3.861564
Rwanda	.999167	.3179305	3.14	0.002	.3759451	1.622389
Ghana	2.963039	.2747758	10.78	0.000	2.424411	3.501667
Cameroon	1.915172	.331356	5.78	0.000	1.265633	2.564711
Nigeria	3.015081	.3826273	7.88	0.000	2.265038	3.765125
Namibia	3.76245	.2564158	14.67	0.000	3.259812	4.265088
SouthAfrica	4.878535	.2204755	22.13	0.000	4.446349	5.310721
Mozambique	3.706609	.3055452	12.13	0.000	3.107665	4.305552
Botswana	4.22812	.2741944	15.42	0.000	3.690632	4.765609
_cons	8.438678	.4922705	17.14	0.000	7.473707	9.403649

A.3 Mobile Phone Adoption

A.3.1 Mobile Phone Adoption – Entire population[1]

Logistic regression — Number of obs = 15065; Wald chi2(23) = 1320.13; Prob > chi2 = 0.0000; Log pseudolikelihood = -1.290e+08; Pseudo R2 = 0.3477

mobile	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
MaxIndIncomeUSD	.0045097	.0011553	3.90	0.000	.0022453	.0067741
female	-.3163889	.0900398	-3.51	0.000	-.4928637	-.1399142
age	-.0037244	.0038619	-0.96	0.335	-.0112936	.0038449
rural	-.6417238	.0933336	-6.88	0.000	-.8246543	-.4587933
yearsformal	.2153872	.0121796	17.68	0.000	.1915156	.2392588
Student1	-.4543275	.1602234	-2.84	0.005	-.7683596	-.1402954
GrantPension	.0350821	.2641905	0.13	0.894	-.4827217	.5528859
Employed1	.8203577	.1949578	4.21	0.000	.4382475	1.202468
SelfEmployed	.3003185	.1245833	2.41	0.016	.0561398	.5444973
married1	.0504482	.1103634	0.46	0.648	-.1658601	.2667565
widowed	-.2058344	.2048206	-1.00	0.315	-.6072754	.1956067
divorced	-.2224499	.2765573	-0.80	0.421	-.7644922	.3195924
Uganda	.0244474	.1818425	0.13	0.893	-.3319574	.3808521
Kenya	.6877096	.1969807	3.49	0.000	.3016346	1.073785
Tanzania	-.1423526	.1454835	-0.98	0.328	-.427495	.1427897
Rwanda	-.486041	.1379904	-3.52	0.000	-.7564972	-.2155847
Ghana	.6164349	.1649147	3.74	0.000	.2932081	.9396617
Cameroon	.1252238	.1434064	0.87	0.383	-.1558475	.4062951
Nigeria	.9032693	.1526234	5.92	0.000	.604133	1.202406
Namibia	.5310817	.1798389	2.95	0.003	.178604	.8835594
SouthAfrica	1.138432	.1895935	6.00	0.000	.766836	1.510029
Mozambique	-.12627	.1539481	-0.82	0.412	-.4280027	.1754627
Botswana	.7287417	.2010907	3.62	0.000	.3346112	1.122872
_cons	-1.531607	.2037135	-7.52	0.000	-1.930878	-1.132336

1 Forced convergence

A.3.2 Mobile Phone Adoption – Rural

Logistic regression — Number of obs = 5794
Wald chi2(22) = 707.70
Prob > chi2 = 0.0000
Log pseudolikelihood = -80967927 — Pseudo R2 = 0.3336

mobile	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
MaxIndIncomeUSD	.0035978	.001387	2.59	0.009	.0008793	.0063163
female	-.4207127	.1201208	-3.50	0.000	-.6561452	-.1852802
age	-.005499	.0051905	-1.06	0.289	-.0156722	.0046742
yearsformal	.2119037	.0167	12.69	0.000	.1791724	.244635
Student1	-.3279756	.2228748	-1.47	0.141	-.7648021	.1088509
GrantPension	.0231316	.4009754	0.06	0.954	-.7627658	.809029
Employed1	.843328	.289054	2.92	0.004	.2767926	1.409863
SelfEmployed	.2910375	.1591776	1.83	0.067	-.0209449	.6030199
married1	.19931	.1529396	1.30	0.193	-.1004462	.4990661
widowed	.0916273	.2678003	0.34	0.732	-.4332516	.6165063
divorced	.2311917	.3427603	0.67	0.500	-.4406061	.9029895
Uganda	.288086	.2389809	1.21	0.228	-.1803079	.7564799
Kenya	1.06276	.2725191	3.90	0.000	.5286324	1.596887
Tanzania	-.0286648	.2109476	-0.14	0.892	-.4421145	.3847848
Rwanda	-.4211352	.2034154	-2.07	0.038	-.8198221	-.0224483
Ghana	.6772558	.2379685	2.85	0.004	.2108462	1.143665
Cameroon	-.2443723	.2686087	-0.91	0.363	-.7708357	.2820912
Nigeria	1.310447	.2145467	6.11	0.000	.8899432	1.730951
Namibia	.8895405	.2473765	3.60	0.000	.4046915	1.374389
SouthAfrica	1.75389	.2953211	5.94	0.000	1.175071	2.332709
Mozambique	-.1147721	.2356264	-0.49	0.626	-.5765914	.3470472
Botswana	1.07443	.3097197	3.47	0.001	.4673903	1.681469
_cons	-2.359797	.2719096	-8.68	0.000	-2.89273	-1.826864

A.3.3 Mobile Phone Adoption – Urban

Logistic regression — Number of obs = 9271
Wald chi2(22) = 530.84
Prob > chi2 = 0.0000
Log pseudolikelihood = -46488408 — Pseudo R2 = 0.2907

mobile	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
MaxIndIncomeUSD	.0054766	.0010061	5.44	0.000	.0035047	.0074486
female	-.1865227	.1343988	-1.39	0.165	-.4499395	.0768941
age	.00156	.0050738	0.31	0.758	-.0083844	.0115044
yearsformal	.2126365	.0157328	13.52	0.000	.1818007	.2434722
Student1	-.6709777	.2067384	-3.25	0.001	-1.076178	-.2657778
GrantPension	-.0544628	.3364336	-0.16	0.871	-.7138606	.604935
Employed1	.6051129	.1876692	3.22	0.001	.237288	.9729377
SelfEmployed	.4018114	.1737694	2.31	0.021	.0612297	.7423932
married1	-.2374025	.1499268	-1.58	0.113	-.5312537	.0564487
widowed	-.7352389	.276112	-2.66	0.008	-1.276408	-.1940694
divorced	-.8782645	.356014	-2.47	0.014	-1.576039	-.1804898
Uganda	-.8307934	.2028936	-4.09	0.000	-1.228458	-.4331292
Kenya	-.2935112	.2251713	-1.30	0.192	-.7348387	.1478164
Tanzania	-.4134178	.1543187	-2.68	0.007	-.7158769	-.1109587
Rwanda	-.6298581	.1739092	-3.62	0.000	-.970714	-.2890023
Ghana	.3128492	.2086952	1.50	0.134	-.0961859	.7218843
Cameroon	-.063346	.1540942	-0.41	0.681	-.3653651	.2386732
Nigeria	.1522688	.1831547	0.83	0.406	-.2067078	.5112453
Namibia	-.3408027	.1996116	-1.71	0.088	-.7320342	.0504288
SouthAfrica	.2483267	.2048499	1.21	0.225	-.1531717	.6498252
Mozambique	-.2426572	.1738593	-1.40	0.163	-.5834151	.0981007
Botswana	.0900664	.2320303	0.39	0.698	-.3647047	.5448375
_cons	-1.05141	.2569835	-4.09	0.000	-1.555088	-.5477314

A.4 Internet Use

A.4.1 Internet Use – Entire population

Logistic regression — Number of obs = 15065
Wald chi2(23) = 462.61
Prob > chi2 = 0.0000
Log pseudolikelihood = -84748520 — Pseudo R2 = 0.3102

internet	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
MaxIndIncomeUSD	.0015469	.0003286	4.71	0.000	.0009028	.002191
female	-.3832955	.1246529	-3.07	0.002	-.6276106	-.1389804
age	-.0303383	.0080638	-3.76	0.000	-.046143	-.0145336
rural	-.3611671	.1373795	-2.63	0.009	-.630426	-.0919082
yearsformal	.2570971	.0353858	7.27	0.000	.1877422	.3264521
Student1	.667205	.2163001	3.08	0.002	.2432646	1.091145
GrantPension	-.5565404	.4056329	-1.37	0.170	-1.351566	.2384854
Employed1	.342729	.2447481	1.40	0.161	-.1369684	.8224264
SelfEmployed	-.218892	.2321662	-0.94	0.346	-.6739294	.2361455
married1	-.1733994	.1630092	-1.06	0.287	-.4928915	.1460927
widowed	.3558854	.3098443	1.15	0.251	-.2513982	.9631691
divorced	-.2426438	.2878305	-0.84	0.399	-.8067811	.3214936
Uganda	-.5363383	.3710538	-1.45	0.148	-1.26359	.1909137
Kenya	.7628247	.2923896	2.61	0.009	.1897517	1.335898
Tanzania	-.6323098	.3250257	-1.95	0.052	-1.269348	.0047289
Rwanda	-.0305301	.2804888	-0.11	0.913	-.580278	.5192178
Ghana	.0920176	.298592	0.31	0.758	-.493212	.6772472
Cameroon	.5409241	.289723	1.87	0.062	-.0269224	1.108771
Nigeria	.5914254	.3131606	1.89	0.059	-.0223581	1.205209
Namibia	.4180289	.2821033	1.48	0.138	-.1348833	.9709412
SouthAfrica	.8202665	.2785718	2.94	0.003	.2742757	1.366257
Mozambique	-.0540166	.2767257	-0.20	0.845	-.5963889	.4883557
Botswana	.397956	.2799674	1.42	0.155	-.15077	.9466821
_cons	-3.692095	.4706445	-7.84	0.000	-4.614542	-2.769649

A.4.2 Internet Use – Rural

Logistic regression — Number of obs = 5794
Wald chi2(22) = 236.19
Prob > chi2 = 0.0000
Log pseudolikelihood = -41700415 — Pseudo R2 = 0.2816

internet	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
MaxIndIncomeUSD	.0022886	.0007475	3.06	0.002	.0008234	.0037537
female	-.4808535	.2108531	-2.28	0.023	-.894118	-.067589
age	-.0303714	.0137113	-2.22	0.027	-.057245	-.0034978
yearsformal	.2095277	.0505652	4.14	0.000	.1104217	.3086336
Student1	.3305523	.3389203	0.98	0.329	-.3337193	.9948239
GrantPension	-.8369148	.7469129	-1.12	0.263	-2.300837	.6270076
Employed1	.0719101	.4309239	0.17	0.867	-.7726852	.9165053
SelfEmployed	-.4242198	.3714609	-1.14	0.253	-1.15227	.3038301
married1	-.1090311	.2620173	-0.42	0.677	-.6225757	.4045135
widowed	.0801138	.4747724	0.17	0.866	-.8504231	1.010651
divorced	-2.156323	1.065714	-2.02	0.043	-4.245083	-.0675626
Uganda	-.2180446	.6744181	-0.32	0.746	-1.53988	1.103791
Kenya	1.175081	.597665	1.97	0.049	.0036792	2.346483
Tanzania	-.7421557	.6819575	-1.09	0.276	-2.078768	.5944565
Rwanda	-.1006956	.5531722	-0.18	0.856	-1.184893	.983502
Ghana	.5784817	.6390519	0.91	0.365	-.674037	1.831
Cameroon	-.2331266	.740642	-0.31	0.753	-1.684758	1.218505
Nigeria	1.030315	.6385146	1.61	0.107	-.2211503	2.281781
Namibia	.2853635	.6308038	0.45	0.651	-.9509893	1.521716
SouthAfrica	.8391146	.6360117	1.32	0.187	-.4074454	2.085675
Mozambique	-.7135655	.6550917	-1.09	0.276	-1.997522	.5703907
Botswana	.678765	.6430081	1.06	0.291	-.5815078	1.939038
_cons	-3.635517	.6699334	-5.43	0.000	-4.948562	-2.322472

A.4.3 Internet Use – Urban

Logistic regression — Number of obs = 9271
Wald chi2(22) = 391.51
Prob > chi2 = 0.0000
Log pseudolikelihood = -41574162 — Pseudo R2 = 0.3073

internet	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
MaxIndIncomeUSD	.0011517	.0003005	3.83	0.000	.0005627	.0017408
female	-.3128427	.1451633	-2.16	0.031	-.5973575	-.0283278
age	-.0299143	.0091217	-3.28	0.001	-.0477925	-.0120361
yearsformal	.330779	.027472	12.04	0.000	.2769348	.3846232
Student1	1.028807	.2407326	4.27	0.000	.5569794	1.500634
GrantPension	-.3756303	.4478265	-0.84	0.402	-1.253354	.5020936
Employed1	.5425715	.2209342	2.46	0.014	.1095484	.9755946
SelfEmployed	.0505103	.2248664	0.22	0.822	-.3902197	.4912404
married1	-.3556676	.1582426	-2.25	0.025	-.6658174	-.0455178
widowed	.5048	.4223006	1.20	0.232	-.3228938	1.332494
divorced	.0940849	.3302403	0.28	0.776	-.5531742	.7413441
Uganda	-.491567	.2437151	-2.02	0.044	-.9692399	-.0138942
Kenya	.4429653	.2432341	1.82	0.069	-.0337648	.9196954
Tanzania	-.4509507	.2613815	-1.73	0.084	-.9632491	.0613477
Rwanda	.4367039	.2781642	1.57	0.116	-.1084878	.9818957
Ghana	-.0927179	.2178503	-0.43	0.670	-.5196967	.3342608
Cameroon	.6713244	.2149331	3.12	0.002	.2500634	1.092585
Nigeria	.3648944	.2206506	1.65	0.098	-.0675729	.7973616
Namibia	.7385929	.2122087	3.48	0.001	.3226715	1.154514
SouthAfrica	.9946128	.1956714	5.08	0.000	.6111039	1.378122
Mozambique	.421098	.2080948	2.02	0.043	.0132396	.8289563
Botswana	.401454	.206821	1.94	0.052	-.0039077	.8068158
_cons	-4.694771	.4442041	-10.57	0.000	-5.565395	-3.824147

Appendix B: Focus group discussions

Cameroon

Nine focus groups were held in Cameroon: in a formal urban area, an informal urban area and a rural area. Three groups were held in each area: one mixed gender group and two separate groups by gender. The groups in the formal urban area were conducted in Etoa Meki, Bastos and Warda, the informal in Mendong, Nsam Effoulan and Mimboman, and the rural in Mfou, Awae and Nkol Afamba. The lower income group category of participants were identified in the informal and rural areas, while the middle to high income participants were selected in the formal urban areas.

Ghana

The nine focus groups in Ghana where held in Accra (formal urban), Kwabenya (informal urban) and Nsawam Adoagyre (rural). Participants in the formal urban area group were from a middle-income level, while those in the informal urban and rural areas were from the lower-income category. Three discussion groups were held in each area, with a mixed group and two single gender groups.

Kenya

Nine focus groups were held in Kenya in selected areas: a formal urban area, an informal urban area and a rural area. Three groups were held in each area: one mixed gender group and two separate groups by gender. The groups in the formal urban area were conducted in Makadara, the informal urban in Kibera and the rural in Ruai. The lower-income group categories were identified in the informal urban and rural areas.

Nigeria

Nine focus groups were held in Nigeria in three designated areas, namely formal urban, informal urban and rural, with separate and mixed gender groups as well as among different income groups. Areas were randomly selected, with Yaba identified as the formal urban area, Alimosho as the informal urban area and Ijede as the rural area. Three focus group discussions were held in each area.

South Africa

Twelve focus groups were held in South Africa in selected regions, with separate and mixed gender groups as well as among different income groups. Areas were randomly selected, with Bonteheuwel/Langa and Soweto identified as lower income bracket groups in the Western Cape and Gauteng respectively. A mixed gender group from a higher-income was conducted in both regions, while a more rural area was identified close to Thembalethu (in the Western Cape).

Uganda

Nine focus groups were held in Uganda: in Kampala for the formal urban category, Kawempe for the informal urban and Kisoga, Mukono, for the rural category. Three focus groups were held in each area, one with a mix of the genders, one with only females and the other with only males. In the formal urban area, individuals were recruited from the middle- to high-income category, while the rural and informal urban areas accommodated the low-income earners.

Appendix C: Country sample size unweighted

Country	Urban		Rural		Total
Botswana	624	67.9%	295	32.1%	919
Cameroon	839	70.0%	360	30.0%	1199
Ethiopia	960	59.7%	648	40.3%	1608
Ghana	723	60.1%	480	39.9%	1203
Kenya	868	70.1%	371	29.9%	1239
Mozambique	718	59.9%	481	40.1%	1199
Namibia	658	68.0%	309	32.0%	967
Nigeria	914	58.9%	638	41.1%	1552
Rwanda	431	35.9%	769	64.1%	1200
South Africa	1086	68.3%	503	31.7%	1589
Tanzania	745	62.0%	456	38.0%	1201
Uganda	712	59.3%	488	40.7%	1200


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