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Digitalization and Gender Equality in Political Leadership in Sub-Saharan Africa

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WORKING PAPER

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Digitalization and Gender Equality in Political Leadership in Sub-Saharan Africa

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ABSTRACT: We examine the impact of digitalization on people's perceptions of women as political leaders in 34 Sub-Saharan African countries. We find that being a social media or internet user is linked to a higher likelihood of people supporting gender equality in political leadership. However, the intensive margin of usage does not appear to be significant. Furthermore, women's perceptions of gender equality in political leadership are more sensitive to internet and social media use than men's. The paper recommends policies for improving ICT infrastructure and investing in technological education.

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WORKING PAPERS

Digitalization and Gender Equality in Political Leadership in Sub- Saharan Africa

Prepared by Diego B. P. Gomes and Carine Meyimdjuï¹

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I. Introduction

Increasing gender diversity in political leadership is critical not only for fairness and inclusion, but also for potential economic benefits.¹ First, diverse political leadership can bring a variety of perspectives and experiences to policymaking and decision-making, resulting in more innovative and effective problem-solving solutions. This is especially important when dealing with economic issues because different leaders may have different ideas about how to promote economic growth and development. For example, Perkins et al. (2013) found that in more ethnically diverse nations, having a female national leader is associated with higher GDP growth than having a male leader. Second, diverse political leadership can improve the political system's credibility and legitimacy, which can be important for fostering economic confidence and attracting investment. When a diverse group of leaders is perceived to be representing the population's interests, it can help to build trust and support for the government and its policies. Third, diverse political leadership can contribute to the creation of a more inclusive and equitable society, which in turn can contribute to economic development. More people participating in the political process and having access to leadership roles, regardless of their background, can lead to greater prosperity and opportunity for all members of society. This is especially important for marginalized groups, particularly women, who may face economic barriers and would benefit from having representatives who understand and advocate for their needs.²

Nonetheless, despite the importance of gender diversity in political leadership, gender disparities in political participation are widespread around the world. Perkins et al. (2013), for example, show that from 1950 to 2013, less than 5 percent of national leaders in 188 countries were female. According to the World Economic Forum's (WEF) Global Gender Gap Report, the largest gender gap today is in political participation. The WEF's Global Gender Gap Report monitors progress toward gender equality in four areas: economic participation and opportunity, educational attainment, health and survival, and political empowerment. In the 2022 report, the political empowerment gap was found to be the largest of the four, with a score of just 22 on a scale of 0 to 100 (where 100 represents total parity). The gender gap in political participation is especially pronounced in Africa. According to the WEF data, the average score for Sub-Saharan Africa on the political empowerment index is just 21.3, the lowest of any region in the world, although there is heterogeneity between countries within the region.³ This means that women in this region are even less likely to have positions of political influence than the global average. This highlights the need for increased efforts to promote gender equality in the political sphere and to ensure that women, particularly in Africa, have equal opportunities to participate in decision-making and

¹ For further reading on the subject and empirical evidence, we recommend Hessami and da Fonseca (2020), Anderson (2022), and the references therein.

² According to (Cowper-Coles, 2020), more women in politics seem to be associated with lower levels of corruption. Hence, having more women in political leadership in Africa could be an asset as the region seeks for solutions to lower corruption.

³ According to the World Bank's World Development Indicators (WDI), there is a significant disparity between African countries in terms of the proportion of parliamentary seats held by women as of 2020. Despite efforts in Rwanda (63.8 percent of parliamentary seats), Senegal (43% of parliamentary seats), and South Africa (42% of parliamentary seats), countries such as Nigeria (less than 4% of parliamentary seats) and Benin (less than 8% of parliamentary seats) continue to lag significantly. More recently, the August 2022 elections in Kenya highlighted persistent threats to women, with around a dozen of them being seriously and physically assaulted as they considered running for political office (Akwire and Miriri, 2022).

leadership. Even though women have historically been successful leaders, stereotypes and traditional barriers persist.⁴

Changes in perceptions of women as leaders are one likely mechanism for increasing female political participation. Gender stereotypes and biases can influence how women are perceived and treated in positions of leadership, preventing them from achieving important roles in the political sphere. For instance, women in political leadership positions may be judged more harshly than men by society, and voters may perceive them as less competent or likable. Changing these perceptions and challenging gender stereotypes may help to increase the number of women in positions of leadership in government and parliament. This could include efforts to raise awareness of existing biases as well as initiatives to promote more positive images of women as leaders. For example, this could entail exposing society to real-life examples of successful female leaders and highlighting their accomplishments, or providing training and support to women seeking leadership positions.

Digitalization, through increased internet and social media usage, may be able to help change perceptions of women as political leaders. The internet and social media platforms offer a variety of ways for people to access information locally and worldwide, connect with others, and participate in public discourse. These tools can help women showcase their ideas, experiences, and leadership skills, as well as challenge traditional gender stereotypes and biases. Social media platforms, for example, can be used to amplify the voices of female politicians and leaders, as well as to promote their work and accomplishments. This can help to increase their visibility and credibility, as well as challenge the notion that women are incapable of holding positions of leadership. Furthermore, the internet and social media can provide a platform for women to network and share resources and support.⁵ This is especially important for women who may face barriers to entering or advancing in leadership roles, and it can help to foster a sense of community and solidarity among women in positions of leadership. It can also expose users to the positive work experiences of women in leadership roles not only locally but also globally, helping to raise awareness that when women are in positions of political leadership, they can deliver exceptional results.

To shed light on the interplay between internet and social media usage and perceptions of women as political leaders in Africa, we conduct an empirical analysis using survey microdata from the Round 7 vintage of the Afrobarometer covering 34 Sub-Saharan African countries. We take advantage of specific questions that ask people about their views on female political leadership and their use of the internet and social media. We create indicator variables for gender equality in political leadership and for internet and social media usage, as well as categorical variables that measure their intensity of use. We then estimate regressions with the indicator that measures gender equality in political leadership as the outcome variable and the internet and social media usage

⁴ Women have led as chiefs, monarchs, and politicians for centuries. Nefertiti (-1300s) and Cleopatra (-30s) reigned as pharaohs in Ancient Egypt, and Candace of Meroe (-330) reigned as a queen in Ethiopia. More recent examples include Yaa Asantewaa of Ghana, who led the war against the British colonial authority, Aba, who organized a successful revolution against the British tax regime in Ghana, Queen Zinga of Angola and Congo (1700), who led an army of women against the Portuguese colonialists, and Zauditu, who ruled as Empress of Ethiopia from 1916 to 1930 (Loiseau and Nowacka, 2015; Deloitte, 2019).

⁵ Individuals have been able to spread information about social movements around the world via social media and the internet since the early 2000s. Some of these social movements include #BringBackOurGirls in 2013, which spread the heartbreaking news of girls kidnapped from school by Nigerian rebels, and #HeForShe in 2014, which invited men and others to stand in solidarity for women, garnering the attention of over a billion social media users. Other critical movements include the 2012 #DelhiGangRape, the 2015 #sendeanlat (#tellyourstory in English), and the 2017 #MeToo (first used in 2006). In March 2020, a young female African journalist launched one of the most successful African activism movements with the hashtag #vraiefemmeafricaine ("genuine African woman" in English), which ironically refers to the perception that African women should continue to be bound by traditional laws in order to reflect their "Africanity." The hashtag was used by millions of users from other continents, both male and female.

as the main independent variables. These regressions estimate how much the internet and social media use, and their intensity, are related to the likelihood of people agreeing that women should have the same chance as men to be elected political leaders. The estimates are controlled for a wide range of explanatory factors, including gender, age, education, religion, geographical region, exposure to other media, among others.

Our results show that being a social media or internet user is associated with a higher likelihood of people agreeing that women should have equal chances as men to be elected political leaders. According to our estimates, more people using the internet is associated with a 3.2 percentage point increase in the proportion of people who support that women should have equal opportunities in political leadership as men. For social media usage, the figure is 3.5 percentage points. Our findings also support the notion that women are more likely than men to support gender equality in political leadership. Having a female identity is linked to an increase in the likelihood of supporting women having equal opportunities as men in political leadership positions by slightly more than 12.5 percentage points. The results also support that women's perceptions of gender equality in political leadership is more sensitive to internet and social media use than men's. Finally, we find no compelling evidence to support the idea that the more people who use the internet and social media, the more likely they are to support women having equal opportunities as leaders as men. That is, the intensive margin of usage does not appear to be significant.

Our results are closely related to Shamaileh (2016), who finds evidence that internet access improves women's, but not men's, perceptions of female political leadership ability in the Arab World. We contribute to the discussion by broadening the analysis to a wide range of Sub-Saharan African countries, investigating the impact of not only internet but also social media usage, and considering the effects of the intensity of internet and social media use. Our research also speaks to Bacarreza et al. (2023), who investigate the role and the impact of digitalization on gender employment and job loss in Latin American countries. Their findings suggest that higher levels of digitalization are associated with higher female employment and lower job loss for both men and women. We contribute to the discussion by demonstrating another non-trivial benefit of digitalization that has the potential to help close gender gaps in political participation, which is currently the largest gender gap.

This paper also adds to a growing body of literature on the effects of the internet and social media on women's empowerment (Crittenden et al., 2019). The internet and social media provide a larger platform for women to find and follow role models, increase and create entrepreneurial activities, including marketing and advertisement (Bailur and Masiero, 2017; Delacroix et al. 2019; Camacho and Barrios 2022), and networking (Suseno and Abbott, 2021). More precisely, women could also be able to connect with others who share the same concerns and stories, making it easier for them to stand together and claim their rights. It has also been found that through social media, women have more opportunities to boost their self-esteem and receive informal training for self-development and career advancement (Delacroix et al., 2019). Our contribution to this literature is to shed light on the potential impact of social media and the internet on gender diversity in political leadership.

The rest of the paper goes as follows. Section II summarizes the data and provides an overview of the relationship between internet and social media usage and perceptions of female political leadership in Africa. Section III technically describes the regression analyses. Section IV presents the main findings, and Section V validates the main conclusions through robustness tests. Section VI offers concluding comments.

II. Data and Facts

We use survey microdata from the Afrobarometer's Round 7 completed in 2019.⁶ The Afrobarometer is a non-profit organization that collects and analyzes high-quality survey data on African attitudes, experiences, and aspirations. Its data measures the social, political, and economic atmosphere in more than 30 countries in Africa. The data collection process involves face-to-face interviews with a randomly selected, nationally representative sample of 1,200-2,400 adult citizens in each country. Table 6 in Annex I lists the countries included in the Round 7 sample, as well as the number of individuals surveyed in each country.

We build our main outcome variable based on a question about whether people agree with men only as leaders or women as leaders as well (Question Q16). The question is phrased exactly as follows:

Which of the following statements is closest to your view? Choose Statement 1 or Statement 2.

Statement 1: Men make better political leaders than women, and should be elected rather than women.

Statement 2: Women should have the same chance of being elected to political office as men.

Respondents are asked whether they (1) Agree very strongly with Statement 1, (2) Agree with Statement 1, (3) Agree with Statement 2, (4) Agree very strongly with Statement 2, or (5) Agree with neither. We develop an indicator for agreement with women as leaders that has a value of one if respondents agree or agree very strongly with Statement 2 (options (3) or (4)) and a value of zero otherwise. In our regressions, we use this indicator as the dependent variable.

The first treatment variable of interest is based on a question about how often people use the internet (Question Q91B). Respondents must select one of the following alternatives: (0) Never, (1) Less than once a month, (2) A few times a month, (3) A few times a week, or (4) Every day. We then create an indicator for internet usage that has a value of one if individuals reported some internet access (options (1)-(4)) and a value of zero if they never use it. The second treatment variable under consideration is based on a question about how often people get news from social media such as Facebook or Twitter (Question Q12E). The alternatives are the same as in the previous question. Similarly to the previous indicator, we create one for social media news access.⁷ We investigate the results further for both treatment variables by taking the intensity of usage into account.

We begin by getting a bird's-eye view of how the internet and social media use influence people's perceptions of women having an equal chance as men to be elected political leaders, using the variables described above. **Table 1** documents the fractions of individuals in our sample that agree with gender equality in political leadership. These figures are calculated for the entire sample as well as separately for men and women. We also do it for both the extensive and intensive margins of internet and social media usage. There are five stylized facts that stand out:

⁶ Visit <http://www.afrobarometer.org> for detailed information about the data.

⁷ According to the descriptive statistics presented in Annex I, not all internet users also use social media. For instance, among women, 34.6 percent are internet users, but only 29.7 percent use social media. For men, the figures are 45 percent (internet) and 39 percent (social media). Therefore, assuming that both groups are the same may be misleading, which is why we consider both. Remarkably, the data also shows that across all age and education groups, women are less likely than men to use the internet and social media. This confirms the International Communication Union's (ICU) findings that the digital gender gap persists in low-income countries. Finally, we observe that use of the internet and social media increases with education level and decreases with age.

1. Most people in our sample believe that women should have the same opportunity as men to lead. This is true not only for the entire sample, but also for men and women separately. All figures are greater than 50 percent, regardless of frequency of internet and social media use.
2. Being a social media or internet user increases the likelihood of agreeing that women should have the same chance to lead as men. Around 75 percent of users support gender equality in political leadership, while this fraction drops to 69 percent among those who do not use it.
3. Women are more likely to agree on female leadership than men. For both the internet and social media, and regardless of intensity of use, the proportion of women who are positive about female-male equality in political leadership is always greater than the proportion of men.
4. Women's perceptions of female-male equality in political leadership are more sensitive to the use of the internet and social media than men's. Using the internet increases the proportion of women by approximately 9 percentage points while increasing the proportion of men by only 7 percentage points. In terms of social media, these figures are 10 and 6 percentage points for women and men, respectively.
5. The more frequently people use the internet and social media, the more likely they are to agree that women should have the same chance as men in political leadership. This is true across the board, as well as for men and women separately. When compared to using it less than once a month, using the internet and social media every day adds about 5 to 6 percentage points to the fraction.

We recognize that there are numerous factors that could potentially play an important role in shaping one's perceptions of female-male equality in political leadership (e.g., age, education, religion, geographical region, exposure to other media, among others). Complementary descriptive statistics are provided in Table 7. In the following section, we describe regression exercises that systematically control the estimates for many of these key features, providing more accurate figures to validate the documented facts.

Table 1 Fractions agreeing with gender equality in political leadership

	All	Women	Men
Internet usage			
Never	0.687	0.737	0.628
Some usage	0.754	0.830	0.697
Less than once a month	0.713	0.770	0.666
A few times a month	0.738	0.810	0.688
A few times a week	0.765	0.848	0.702
Every day	0.759	0.833	0.700
Social media news			
Never	0.691	0.741	0.634
Some usage	0.759	0.839	0.698
Less than once a month	0.707	0.768	0.659
A few times a month	0.750	0.838	0.686
A few times a week	0.761	0.844	0.698
Every day	0.767	0.846	0.706

Notes: All figures were calculated using the individual sample weights provided by the survey.

Source: Afrobarometer. Authors' calculations.

III. Regressions

We use the entire Round 7 sample, which includes respondents from the 34 African countries covered by the survey, to estimate the marginal effects of internet and social media usage on people's perceptions of women having the same chance as men to be elected to positions of political leadership in Sub-Saharan Africa. We estimate linear probability models using OLS with standard errors clustered at the regional level.⁸ The regressions are controlled for a rich set of variables that includes age (6 groups), education (4 levels), religion (3 kinds), an employment indicator, urban/rural area, and dummies for geographical regions.⁹ To control for wealth levels, we included a lived poverty index provided by the Afrobarometer that is an average index of 5 poverty items. To control for the influence of other kinds of media, we added three more indicators of news access through radio, television, and newspaper.¹⁰ Finally, we added two new categorical indexes: one that measures satisfaction with democracy and another that assesses individual's perception on how the government handles promoting equal rights/opportunities for women.

To formalize the regressions, we index individuals by i . Let y_i be the indicator for agreement with women having the same chance as men to be elected political leaders, I_i the indicator for internet or social media usage,

⁸ The Afrobarometer data includes information on the region within each country where people live. We therefore take advantage of this more granular level of aggregation when controlling the regressions and estimating the standard errors.

⁹ The age groups are 18-25, 26-35, 36-45, 46-55, 56-65, and over 65. The education levels consist of no formal education, primary, secondary, and post-secondary. Religions include Christian, Muslim, and others.

¹⁰ These three indicators were developed in the same manner as the social media news indicator described in the previous section.

F_i a female dummy variable, and X_i the vector of controls described above. Then, the first regression specification we estimate can be stated as

$$y_i = \alpha + \beta I_i + \gamma F_i + \theta' X_i + \varepsilon_i, \quad (1)$$

where ε_i is the error term. Positive estimates for β imply that being a social media or internet user increases the likelihood of agreeing that women should have the same chances as men of being elected as political leaders (fact 2). Positive estimates for γ imply that women are more likely than men to agree on gender equality in political leadership (fact 3). We further run a second specification that interacts the internet or social media indicator with the female dummy, which can be formalized as

$$y_i = \alpha + \beta I_i + \gamma F_i + \delta(I_i \times F_i) + \theta' X_i + \varepsilon_i. \quad (2)$$

Positive estimates for δ indicate that women's perceptions about gender equality in political leadership are more sensitive to the use of the internet and social media than men's (fact 4). Finally, we estimate a third specification that explores the intensity of internet or social media usage. Let $I_{i,k}$ be the usage indicator associated to the intensity k . Then, the third regression is given by

$$y_i = \alpha + \sum_k \beta_k I_{i,k} + \gamma F_i + \theta' X_i + \varepsilon_i. \quad (3)$$

Higher values for β_k with k 's associated with higher usage intensities indicate that the more frequently people use the internet and social media, the more likely they are to agree that women should have equal chances to be elected as political leaders (fact 5).

IV. Main Results

Table 2 summarizes all the regression results. The column labels correspond to the regression specification numbering from the previous section. To conserve space, we present only the estimates for the independent variables of interest, namely internet or social media usage indicators, the female dummy, the interaction between the usage indicator and the female dummy, and the intensity of usage categories. Annex II shows the results for the control variables. Estimates are weighted using the individual sample weights provided by the survey and standard errors are robust and clustered at the regional level.¹¹

The results of the internet and social media exercises all point in the same direction and confirm three facts documented above. The estimates for the usage indicators are positive and significant, validating the fact that being a social media or internet user increases the likelihood of agreeing that women should have the same chances of being elected as political leaders (fact 2). According to specification (1), using the internet increases the share of people who agree that women should have equal chances of being elected to political leadership positions by 3.2 percentage points, while using social media increases the share by 3.5 percentage points. The female dummy coefficient estimates are positive and significant across all regression specifications,

¹¹ We used Variance Inflation Factors (VIF) tests to assess multicollinearity in our regression models. All of the independent variables of interest had VIFs less than three, indicating that multicollinearity for those variables is not severe enough to warrant corrective measures.

corroborating the fact that women are more likely than men to agree on gender equality in political leadership (fact 3). Overall, having a female identity is linked to an increase of slightly more than 12.5 percentage points in the proportion of people who support women should have the same chances of being elected to political leadership positions. The estimates for the interaction terms are also positive despite being more uncertain in the case of the internet. This finding supports the fact that women's perceptions about gender equality in political leadership are more sensitive to internet and social media use than men's (fact 4).

Table 2 OLS regression results

	Internet			Social Media		
	(1)	(2)	(3)	(1)	(2)	(3)
Usage indicator, I_i	0.032*** (0.007)	0.026*** (0.010)		0.035*** (0.007)	0.024*** (0.009)	
Female dummy, F_i	0.127*** (0.007)	0.121*** (0.008)	0.127*** (0.007)	0.126*** (0.007)	0.118*** (0.008)	0.126*** (0.007)
Interaction, $I_i \times F_i$		0.013 (0.011)			0.023** (0.010)	
Intensity of use, $I_{i,k}$						
Never			<i>base</i>			<i>base</i>
Less than once a month			0.020 (0.016)			0.009 (0.017)
A few times a month			0.027** (0.012)			0.034*** (0.013)
A few times a week			0.039*** (0.009)			0.034*** (0.009)
Every day			0.032*** (0.009)			0.041*** (0.009)
Observations	40,042	40,042	40,042	40,044	40,044	40,044
R-squared	0.100	0.100	0.100	0.100	0.100	0.100

Notes: Estimates are weighted using the individual sample weights provided by the survey. Standard errors in parentheses are robust and clustered at the regional level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: Afrobarometer. Authors' calculations.

All the estimates for usage intensity categories are positive and increasing, in general, with intensity level. However, to determine whether there is an increasing relationship between the intensity of use and the likelihood to support women having equal chances of being elected as political leaders as men, we must first determine whether the usage intensity categories are statistically distinct from one another. We perform Wald tests of simple and composite linear hypotheses about the intensity of use categories to accomplish this (Table 3). Every two subsequent categories are tested to see if they are equal. For instance, the first row displays the results of the

test to see if the coefficients of “Less than once a month” and “A few times a month” are equal. We also test for all equality conditions simultaneously (last row). All tests have significance levels greater than 10 percent, implying that we cannot reject the equality hypotheses at reasonable significance levels. These results do not support the notion that the more people use the internet and social media, the more likely they are to support women having equal chances as men to be elected as political leaders (fact 5). In other words, our findings support that the extensive margin of usage, rather than the intensive, is important.

Table 3 Wald test results for intensity of use (OLS regressions)

Test	Internet		Social Media	
	<i>F</i> -statistic	Significance Level	<i>F</i> -statistic	Significance Level
Less than once a month <i>equals to</i> A few times a month	0.14	0.7092	2.13	0.1448
A few times a month <i>equals to</i> A few times a week	0.91	0.3420	0.00	0.9481
A few times a week <i>equals to</i> Every day	0.99	0.3195	0.69	0.4081
All above simultaneously	0.66	0.5757	1.29	0.2773

Notes: Wald tests results on the equality of all subsequent usage intensity categories.

Source: Afrobarometer. Authors' calculations.

Finally, we summarize the results of the control variables (Table 8 in Annex II). The estimates show that there is an inverted U-shape relationship between supporting gender equality in political leadership and age, with the middle-aged group being highly supportive while teenagers, young adults, and elders are not necessarily supportive. Support for women having equal chances as men of being elected to political leadership positions is greater among those who listen to radio news and are more educated, and lesser among Muslims compared to other religions. Surprisingly, rural dwellers are more supportive of gender equality in political leadership than urban dwellers. This corroborates the findings that women are typically more cautious around vulnerable populations (Cowper-Coles, 2020) and have historically shown this behavior toward rural residents. Also, support for women having equal chances as men of being elected as political leaders is greater among those who perceive the government as making efforts to promote equal rights and opportunities for women.

V. Robustness Analysis

We further perform a series of robustness tests to assess if the estimation method or specific countries are influencing our main results. We begin by re-estimating the models with logistic regression rather than OLS (Table 4 and Table 5). The results confirm the findings of the last section: (i) the estimates for the usage indicators are positive and significant; (ii) the female dummy estimates are positive and significant; (iii) the estimates for the interaction terms between usage indicators and female dummy are positive and significant; and (iv) the estimates

for usage intensity categories are positive and increasing, in general, with intensity level, and all Wald tests for the equality of subsequent categories have significance levels greater than 10 percent. Though the interpretation of the point estimates from logistic regressions differs from that of OLS, the logistic regressions' average marginal effects have the same sign as their point estimates.

Table 4 Logistic regression results

	Internet			Social Media		
	(1)	(2)	(3)	(1)	(2)	(3)
Usage indicator, I_i	0.182*** (0.042)	0.100** (0.048)		0.199*** (0.041)	0.094** (0.044)	
Female dummy, F_i	0.699*** (0.038)	0.624*** (0.043)	0.699*** (0.038)	0.695*** (0.038)	0.609*** (0.041)	0.696*** (0.038)
Interaction, $I_i \times F_i$		0.206*** (0.058)			0.277*** (0.058)	
Intensity of use, $I_{i,k}$						
Never			<i>base</i>			<i>base</i>
Less than once a month			0.120 (0.088)			0.050 (0.089)
A few times a month			0.147** (0.066)			0.184** (0.074)
A few times a week			0.229*** (0.054)			0.193*** (0.054)
Every day			0.177*** (0.051)			0.239*** (0.051)
Observations	40,023	40,023	40,023	40,025	40,025	40,025

Notes: Estimates are weighted using the individual sample weights provided by the survey. Standard errors in parentheses are robust and clustered at the regional level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: Afrobarometer. Authors' calculations.

Table 5 Wald test results for intensity of use (Logistic regressions)

Test	Internet		Social Media	
	χ^2 -statistic	Significance Level	χ^2 -statistic	Significance Level
Less than once a month <i>equals to</i> A few times a month	0.07	0.7843	1.88	0.1701
A few times a month <i>equals to</i> A few times a week	1.29	0.2560	0.01	0.9117
A few times a week <i>equals to</i> Every day	1.25	0.2638	0.63	0.4287
All above simultaneously	2.41	0.4925	4.09	0.2518

Notes: Wald tests results on the equality of all subsequent usage intensity categories.

Source: Afrobarometer. Authors' calculations.

The next set of robustness tests involves re-estimating the models while excluding each country individually. The goal is to demonstrate that our main results are not influenced by any particular country. In practice, we estimate 204 additional regressions, as we have two treatments of interest, three regression specifications, and thirty-four countries in our sample. We present the results graphically in Annex III. The charts are grouped according to each independent variable of interest. In each chart, the dots represent the point estimates for the respective independent variable, and the bars represent 95 percent confidence intervals calculated from robust standard errors clustered at the regional level. An estimate associated with a particular country represents the result of the regression excluding that country. Overall, regardless of which country we excluded from the sample, the results confirm the findings of the previous section. These outcomes give us confidence in the reliability of our findings.

VI. Conclusion

Increasing gender diversity in political leadership is critical for promoting equity, inclusion, and economic benefits. Despite the importance of gender diversity in political leadership, gender disparities in political participation exist globally, particularly in Sub-Saharan Africa. Changing perceptions regarding women leadership abilities and challenging gender stereotypes may aid in increasing the number of women in leadership positions in government, parliament, and other spheres of the society. We show that digitalization, as measured by internet access and social media use, is associated with increased perceptions of Sub-Saharan African women having equal chances as men to be elected as political leaders. Because of this significant positive spillover from digitalization, as well as the other well-known benefits, this paper recommends policy measures to improve information and communications technology (ITC) infrastructure, with a focus on the lowest cost of energy. It does not go without encouraging measures to improve people's education, which gives them solid prerequisites to learn and benefit from modern technologies such as the internet and social media.

Annex I. Data Details

Table 6 Sample Description

Country Name	Number of Individuals	Percent Distribution
Benin	1,200	2.62
Botswana	1,198	2.61
Burkina Faso	1,200	2.62
Cabo Verde	1,200	2.62
Cameroon	1,202	2.62
Côte d'Ivoire	1,200	2.62
Eswatini	1,200	2.62
Gabon	1,199	2.62
Gambia	1,200	2.62
Ghana	2,400	5.24
Guinea	1,194	2.61
Kenya	1,599	3.49
Lesotho	1,200	2.62
Liberia	1,200	2.62
Madagascar	1,200	2.62
Malawi	1,200	2.62
Mali	1,200	2.62
Mauritius	1,200	2.62
Morocco	1,200	2.62
Mozambique	2,392	5.22
Namibia	1,200	2.62
Niger	1,200	2.62
Nigeria	1,600	3.49
São Tomé and Príncipe	1,200	2.62
Senegal	1,200	2.62
Sierra Leone	1,200	2.62
South Africa	1,840	4.02
Sudan	1,200	2.62
Tanzania	2,400	5.24
Togo	1,200	2.62
Tunisia	1,199	2.62
Uganda	1,200	2.62
Zambia	1,200	2.62
Zimbabwe	1,200	2.62
Total	45,823	100

Source: Afrobarometer. Authors' calculations.

Table 7 Demographics of internet and social media usage (%)

	Women	Men
Internet	34.6	45.0
<i>By age group</i>		
18-25	46.5	63.4
26-35	39.9	55.6
36-45	28.4	40.2
46-55	21.7	30.8
56-65	15.0	21.5
Over 65	9.1	11.5
<i>By education level</i>		
No formal education	6.8	11.4
Primary	15.4	21.2
Secondary	50.2	57.0
Post-secondary	85.8	84.8
Social media news	29.7	39.0
<i>By age group</i>		
18-25	40.9	57.4
26-35	35.0	49.3
36-45	23.7	34.2
46-55	17.4	23.4
56-65	10.1	15.7
Over 65	7.7	9.0
<i>By education level</i>		
No formal education	5.5	8.5
Primary	12.1	16.8
Secondary	42.8	49.4
Post-secondary	77.7	76.9

Notes: The table shows the percentages of men and women who use the internet and social media. All figures were calculated using the individual sample weights provided by the survey.

Source: Afrobarometer. Authors' calculations.

Annex II. Regression Results

Table 8 OLS regression results (continued)

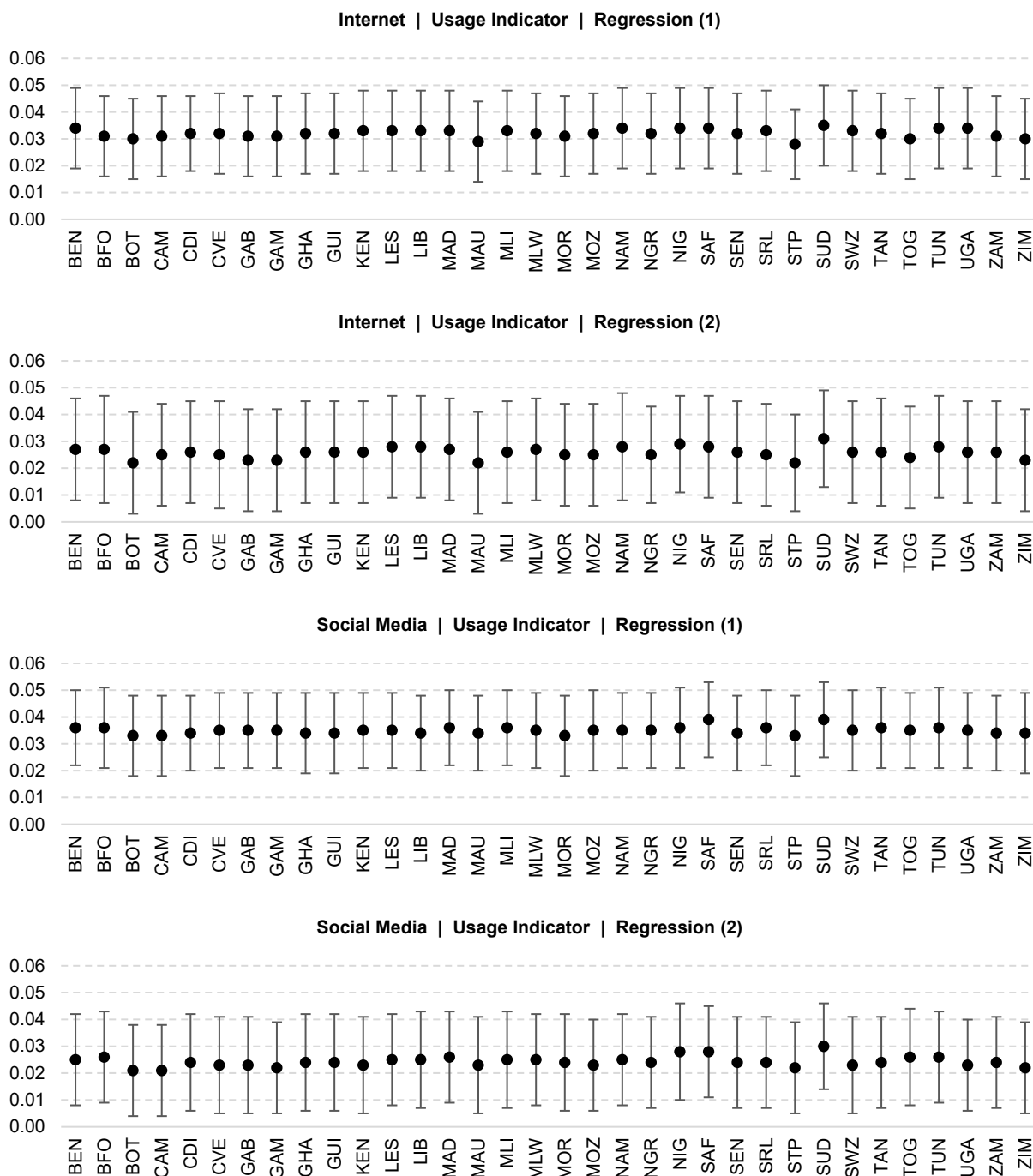
	Internet			Social Media		
	(1)	(2)	(3)	(1)	(2)	(3)
Age group						
18-25	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>
26-35	-0.010 (0.007)	-0.010 (0.007)	-0.009 (0.007)	-0.008 (0.007)	-0.008 (0.007)	-0.008 (0.007)
36-45	0.008 (0.008)	0.008 (0.008)	0.009 (0.008)	0.009 (0.008)	0.009 (0.008)	0.010 (0.008)
46-55	0.024*** (0.009)	0.024*** (0.009)	0.025*** (0.009)	0.027*** (0.009)	0.027*** (0.009)	0.028*** (0.009)
56-65	0.041*** (0.010)	0.041*** (0.010)	0.041*** (0.010)	0.042*** (0.010)	0.041*** (0.010)	0.043*** (0.010)
Over 65	0.024 (0.015)	0.023 (0.015)	0.024 (0.015)	0.025 (0.015)	0.024 (0.015)	0.026* (0.015)
Religion						
Christian	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>
Muslim	-0.027** (0.011)	-0.027** (0.011)	-0.027** (0.011)	-0.029*** (0.011)	-0.029*** (0.011)	-0.029*** (0.011)
Other	-0.005 (0.008)	-0.006 (0.008)	-0.005 (0.008)	-0.005 (0.008)	-0.005 (0.008)	-0.005 (0.008)
Education						
No formal education	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>
Primary	0.040*** (0.009)	0.040*** (0.009)	0.040*** (0.009)	0.042*** (0.009)	0.042*** (0.009)	0.042*** (0.009)
Secondary	0.089*** (0.010)	0.089*** (0.010)	0.089*** (0.010)	0.091*** (0.010)	0.091*** (0.010)	0.091*** (0.010)
Post-secondary	0.131*** (0.012)	0.131*** (0.012)	0.131*** (0.012)	0.133*** (0.011)	0.132*** (0.011)	0.131*** (0.011)
Employed indicator	0.000 (0.007)	0.000 (0.007)	0.000 (0.007)	-0.000 (0.007)	-0.000 (0.007)	-0.000 (0.007)
Lived poverty index	0.001 (0.004)	0.001 (0.004)	0.001 (0.004)	0.001 (0.004)	0.001 (0.004)	0.001 (0.004)
Rural area indicator	0.015** (0.007)	0.015** (0.006)	0.015** (0.007)	0.015** (0.007)	0.014** (0.007)	0.015** (0.007)
Radio news indicator	0.020*** (0.007)	0.020*** (0.007)	0.020*** (0.007)	0.020*** (0.007)	0.019*** (0.007)	0.020*** (0.007)

Television news indicator	0.004 (0.007)	0.004 (0.007)	0.004 (0.007)	0.003 (0.007)	0.003 (0.007)	0.003 (0.007)
Newspaper news indicator	-0.008 (0.006)	-0.008 (0.006)	-0.008 (0.006)	-0.011* (0.006)	-0.011* (0.006)	-0.011* (0.006)
Satisfaction with democracy						
Not a democracy	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>
Not at all satisfied	0.019 (0.022)	0.019 (0.022)	0.019 (0.022)	0.018 (0.022)	0.019 (0.022)	0.018 (0.022)
Not very satisfied	0.025 (0.022)	0.025 (0.022)	0.025 (0.022)	0.024 (0.022)	0.024 (0.022)	0.024 (0.022)
Fairly satisfied	0.011 (0.024)	0.011 (0.024)	0.012 (0.024)	0.011 (0.023)	0.011 (0.023)	0.011 (0.023)
Very satisfied	-0.019 (0.025)	-0.019 (0.025)	-0.019 (0.025)	-0.020 (0.024)	-0.020 (0.024)	-0.020 (0.024)
Handling promoting equal rights/opportunities for women						
Very Badly	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>	<i>base</i>
Fairly Badly	0.003 (0.010)	0.003 (0.010)	0.003 (0.010)	0.003 (0.010)	0.003 (0.010)	0.003 (0.010)
Fairly Well	0.028*** (0.010)	0.028*** (0.010)	0.028*** (0.010)	0.028*** (0.010)	0.028*** (0.010)	0.028*** (0.010)
Very Well	0.013 (0.013)	0.013 (0.013)	0.013 (0.012)	0.012 (0.012)	0.013 (0.012)	0.013 (0.012)
Observations	40,042	40,042	40,042	40,044	40,044	40,044
R-squared	0.100	0.100	0.100	0.100	0.100	0.100

Notes: Estimates are weighted using the individual sample weights provided by the survey. Standard errors in parentheses are robust and clustered at the regional level. The dummy variables for geographical regions are not displayed. *** p<0.01, ** p<0.05, * p<0.1.

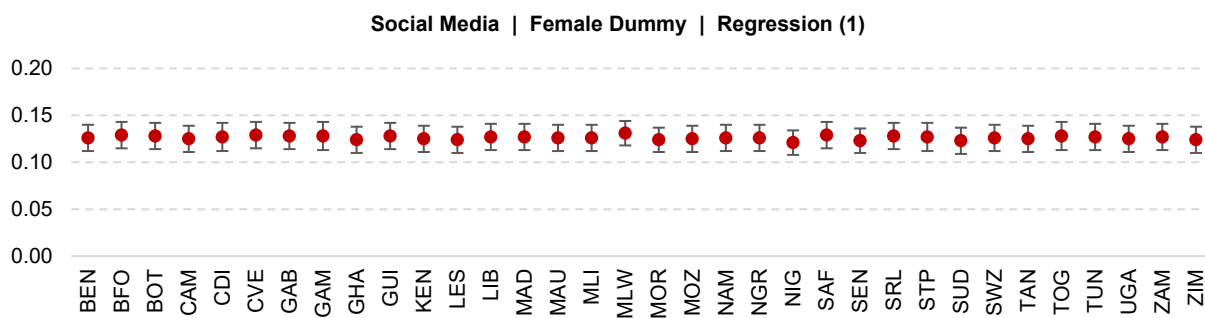
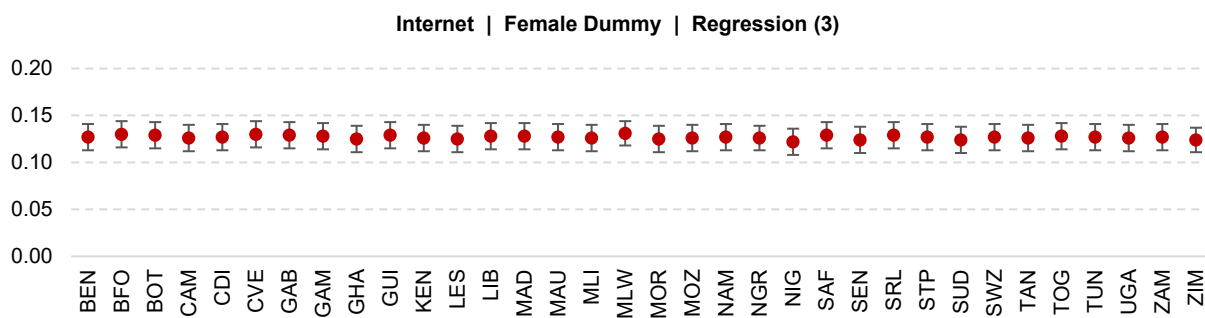
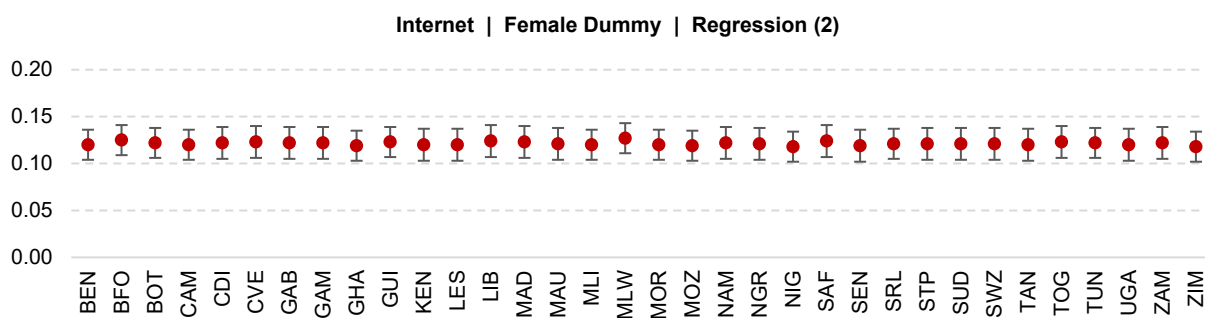
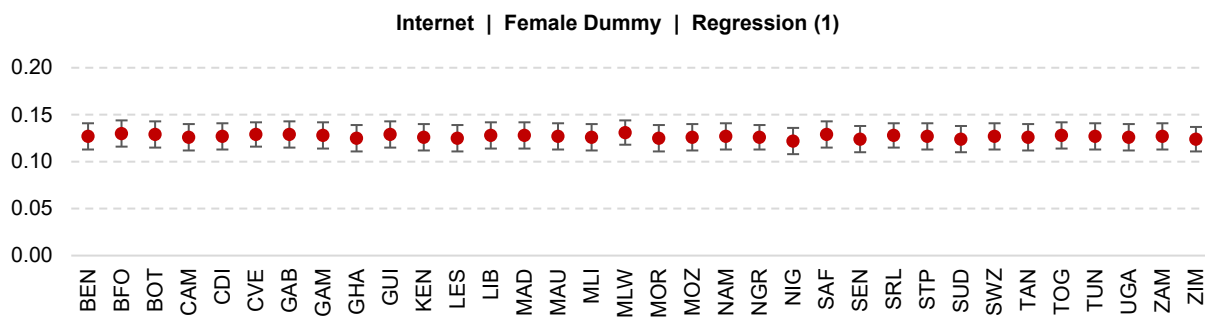
Annex III. Robustness Results

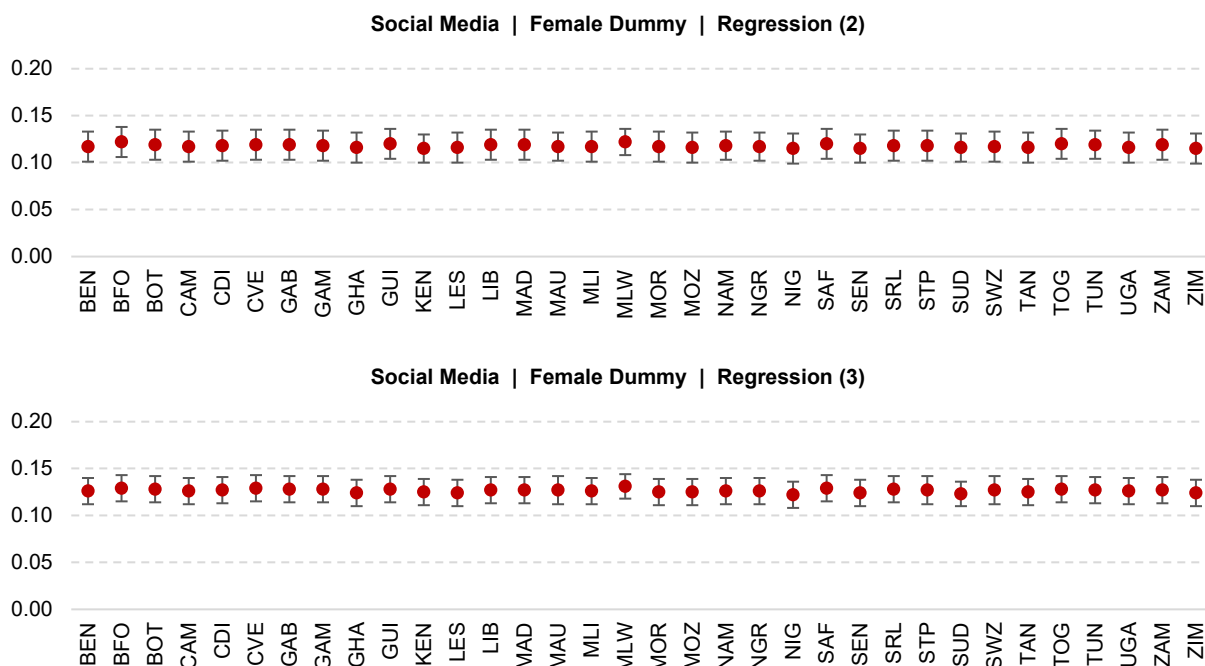
Figure 1 Usage Indicators



Notes: Dots represent point estimates for internet or social media usage indicators. Bars represent 95 percent confidence intervals calculated from robust standard errors clustered at the regional level. The titles indicate the respective regression specifications.

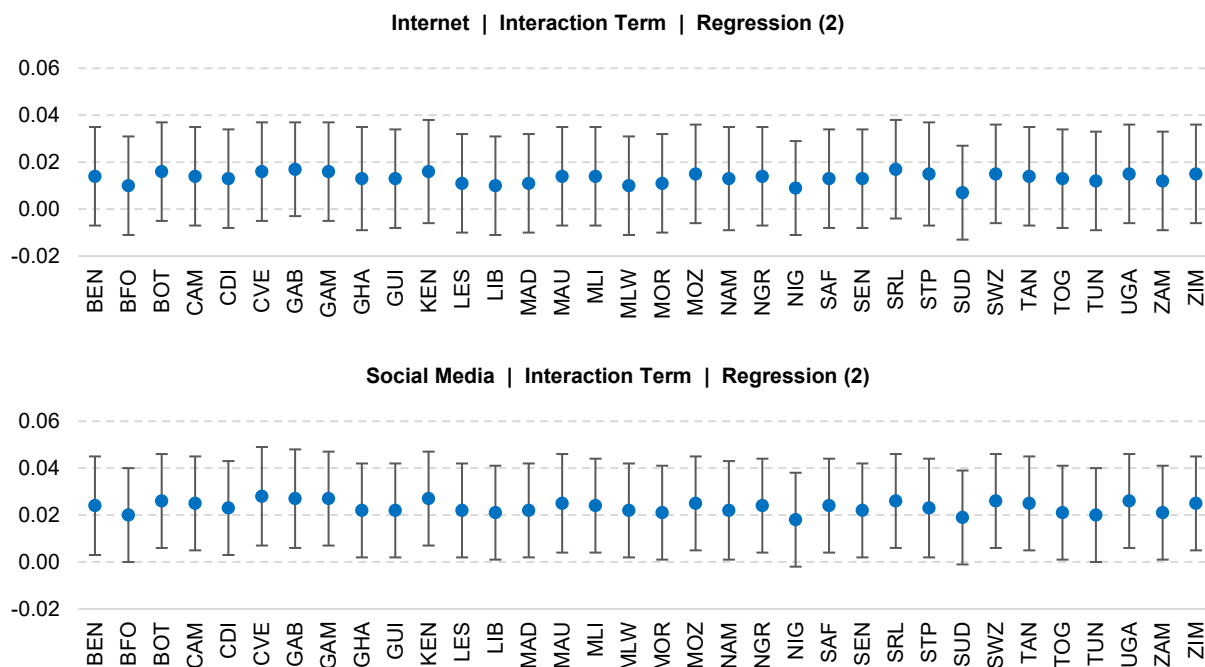
Figure 2 Female Dummies





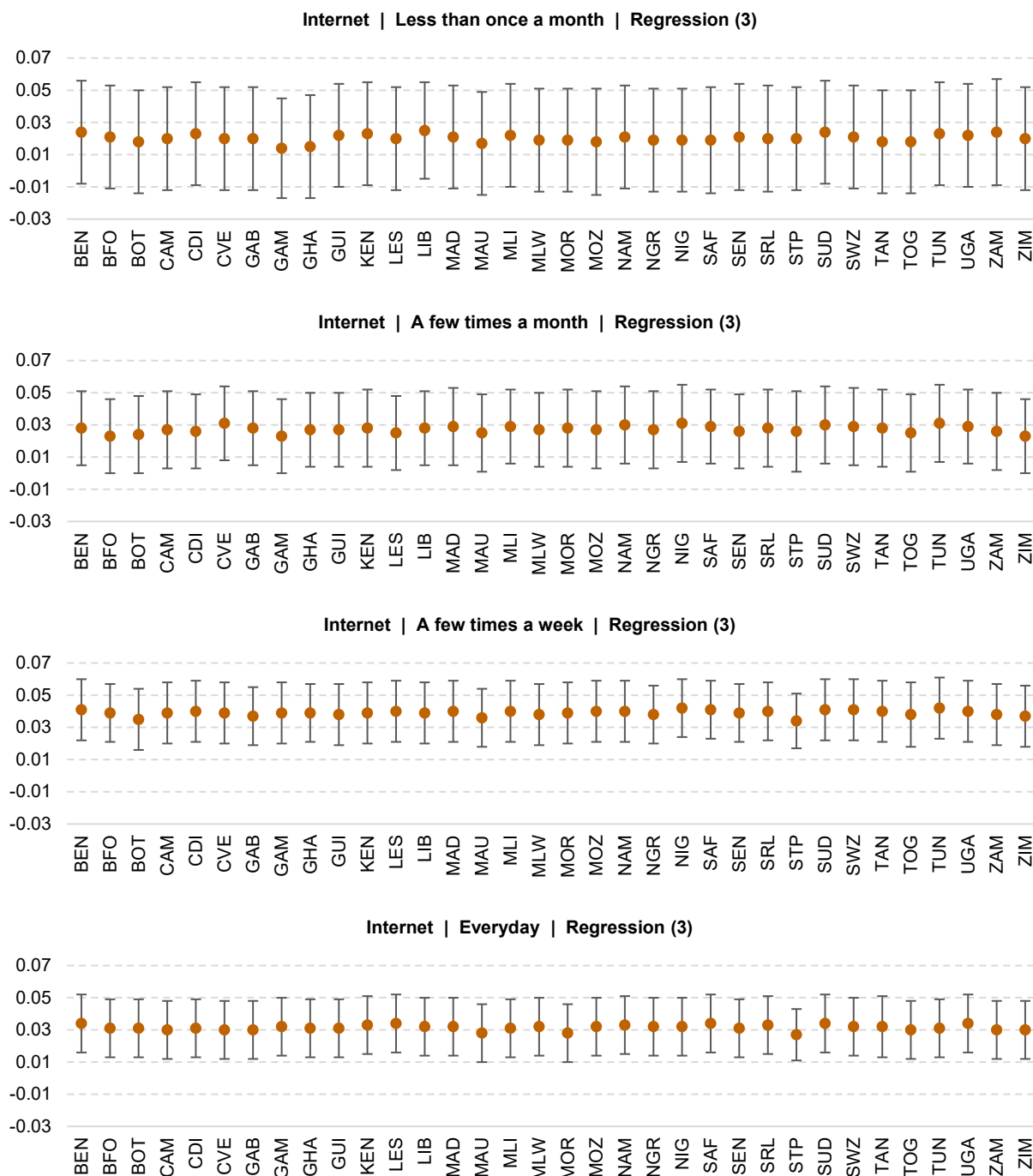
Notes: Dots represent point estimates for female dummies. Bars represent 95 percent confidence intervals calculated from robust standard errors clustered at the regional level. The titles indicate the respective regression specifications.

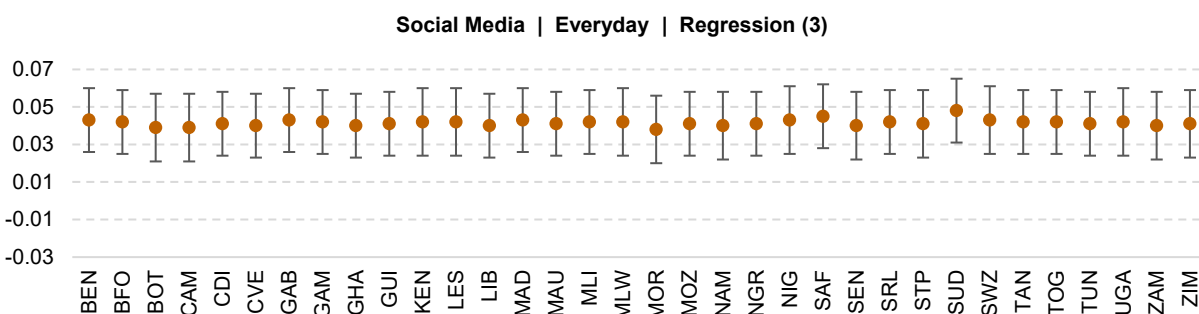
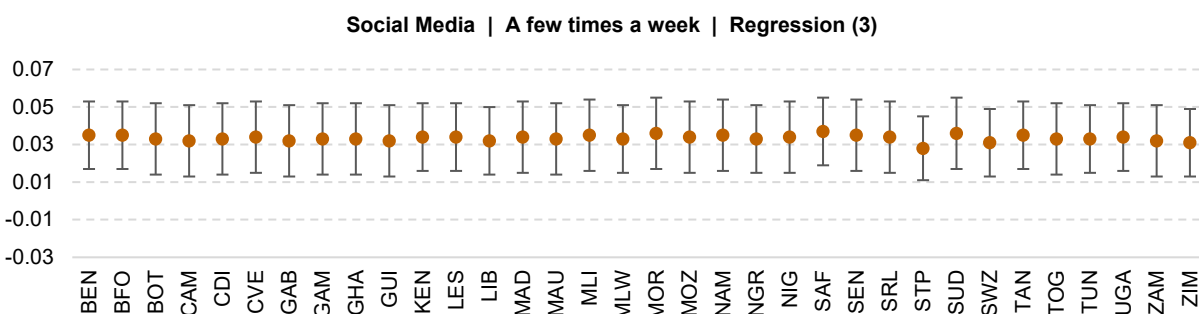
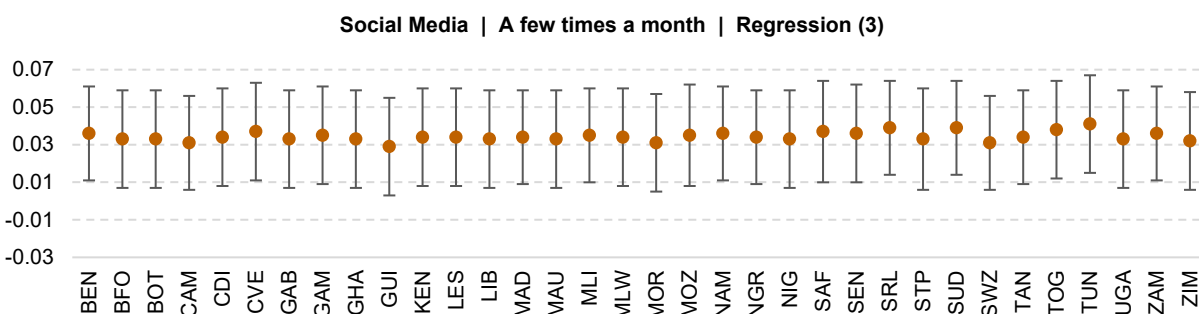
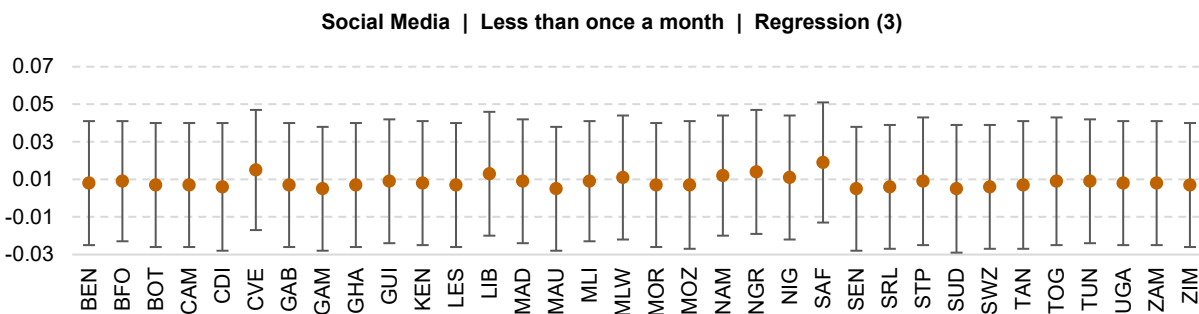
Figure 3 Interaction Terms



Notes: Dots represent point estimates for interaction terms between usage indicator and female dummy. Bars represent 95 percent confidence intervals calculated from robust standard errors clustered at the regional level. The titles indicate the respective regression specifications.

Figure 4 Intensity of Use





Notes: Dots represent point estimates for intensity of use indicators. Bars represent 95 percent confidence intervals calculated from robust standard errors clustered at the regional level. The titles indicate the respective regression specifications.

References

- Akwiri, J., & Miriri, D. (2022). Kenyans ponder a first female vice president as results awaited. Reuters, August 9, 2022. Link: <https://www.reuters.com/world/africa/kenyans-ponder-first-female-vice-president-results-awaited-2022-08-09/>
- Anderson, S. (2022). Unbundling female empowerment. *Canadian Journal of Economics*, 55(4), 1671-1701.
- Bacarreza, G. J. C., Ghazanchyan, M., Ibarra, S. J. G., Yang, Y. (2023). Differential Effects of Digitalization on Gender Employment Gaps and the COVID Crisis: Evidence from Latin America. *International Monetary Fund*, forthcoming.
- Bailur, S., & Masiero, S. (2017). Women's income generation through mobile Internet: A study of focus group data from Ghana, Kenya, and Uganda. *Gender, Technology and Development*, 21(1-2), 77-98.
- Camacho, S., & Barrios, A. (2022). Social commerce affordances for female entrepreneurship: The case of Facebook. *Electronic Markets*, 32(3), 1145-1167.
- Cowper-Coles, Minna. (2020) "Women political leaders: The impact of gender on democracy." *The Global Institute for Women's Leadership: Kings College London* .
- Crittenden, V. L., Crittenden, W. F., & Ajjan, H. (2019). Empowering women micro-entrepreneurs in emerging economies: The role of information communications technology. *Journal of Business Research*, 98, 191-203.
- Delacroix, E., Parguel, B., & Benoit-Moreau, F. (2019). Digital subsistence entrepreneurs on Facebook. *Technological Forecasting and Social Change*, 146, 887-899.
- Deloitte. (2019). Women in the boardroom: A global perspective. Sixth edition.
- Hessami, Z., & da Fonseca, M. L. (2020). Female political representation and substantive effects on policies: A literature review. *European Journal of Political Economy*, 63, 101896.
- Loiseau, E., Nowacka, K. (2015). Can social media effectively include women's voices in decision-making processes? *OECD Development Centre*
- Perkins, S. E., Phillips, K. W., & Pearce, N. A. (2013). Ethnic diversity, gender, and national leaders. *Journal of International Affairs*, 85-104.
- Shamaileh, A. (2016). Am I equal? Internet access and perceptions of female political leadership ability in the Arab World. *Journal of Information Technology & Politics*, 13(3), 257-271.
- Suseno, Y., & Abbott, L. (2021). Women entrepreneurs' digital social innovation: Linking gender, entrepreneurship, social innovation and information systems. *Information Systems Journal*, 31(5), 717-744.



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