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Cristina Bicchieri and Annalisa Marini

University of Pennsylvania

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The paper studies the relationship between female genital cutting (FGC) dynamics, beliefs and fundamentals across African countries. Results show that social and economic conditions are worse in countries where FGC is practiced. However, if we consider the dynamics of FGC in those countries, there is no clear link between fundamentals and the abandonment of the practice. Instead, we find a significant correlation with social expectations and trust. Our findings support the implementation of bottom-up interventions aimed at changing social expectations.

The world is rife with collective practices that are harmful, maladaptive and often violate fundamental human rights: Child marriage, female genital cutting, honor killing, domestic violence and child labor are just a few examples. Many such practices involve women and girls, and a commonly invoked remedy is to guarantee them better access to education, health and employment (Toubia and Izett, 1998; Harrison, 1997). We focus here on female genital cutting (FGC),[1] an old and still common practice that has been extensively studied. All types of female circumcision are considered a violation of human rights and, since often the practice involves small girls, it is also considered a form of violence against children.[2] Many interventions aimed to reduce or eliminate female circumcision have been undertaken and are well documented (WHO, 2008; Shell-Duncan, 2008; Innocenti Insight, 2010; UNICEF, 2013; Shell-Duncan et al.,

*Corresponding authors: Cristina Bicchieri, University of Pennsylvania, 249 S 36th Street, Philadelphia, PA19104, UnitedStates. E-mail: cb36@sas.upenn.edu; Annalisa Marini, University of Pennsylvania, 249 S 36th Street, Philadelphia, PA19104, United States. E-mail: marinia@sas.upenn.edu

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[1] The term "female genital mutilation/cutting" is used by the World Health Organization to indicate "all procedures involving partial or total removal of the female external genitalia or other injury to the female genital organs for non-medical reasons" (WHO, 2008).

[2] Female circumcision was recognized in 1993 as a human right violation at the World Conference on Human Rights and after that various national laws and international resolutions against FGM/C have been adopted.

2013). Despite these interventions, though FGC has seen a progressive reduction in many countries, it still remains widespread in about 27 African countries, parts of the Middle East, pockets of some communities in Australia, the Far East, and immigrant populations in Europe and the Americas.

It is often argued that the causes of variability in the frequency and dynamics of FGC can be found in the social, political and economic conditions of the countries in which it is practiced (Easton et al., 2003; Williams and Sobiesczyk, 1997). We show that improvements in economic and socio-political conditions, though important, are not necessarily associated with a decrease or disappearance of FGC, especially when this practice is accompanied by shared social expectations.

Social expectations, be they empirical (what other people do) or normative (what other people believe one should do) play a role in supporting FGC. This may happen because FGC is a well established tradition related to gender or group identity, to shared beliefs about beauty, health and cleanliness, or is otherwise supported by norms of purity, honor and fidelity. An analysis of 13 African countries also found that women who have undergone FGC are 40% more likely to get married, suggesting that FGC may be a social norm in some communities (Wagner, 2013). According to a recent study (UNICEF, 2013), FGC in most cases is either itself a social norm, or is supported by other norms and values, i.e., those who practice it have social expectations that sustain it.

This paper provides a comprehensive study of the relationship between economic, political and social conditions and FGC stability or change over the period 1989 – 2011 across the 27 African countries in which FGC is still practiced.[3] In the first part of the paper, we present a preliminary and general analysis comparing the political and socio-economic conditions of African countries where FGC is practiced with those of African countries where it is not practiced, in order to check if there are significant differences between the two sets of countries. The second part of the paper focuses on FGC dynamics in African countries where it is still practiced. We analyze the relation between FGC dynamics across time and the political and socio-economic characteristics of the country. We check whether there are differences across

[3] Other authors have analyzed the effect of social interactions of FGC in Egypt (Naguib, 2012). Of those authors that have analyzed a larger number of African countries, some have looked at micro-level factors such as reputation and identity pressures (Wagner, 2013), others (Bellemare et al., 2015) have used cross-country-year data to explain the persistence of FGC in a limited number of African countries.

countries that experienced a clear decrease in FGC between 1989 and 2011, and those that were stable or experienced only a slight decrease. We also examine the relation between FGC dynamics and social expectations about FGC across countries. In the final section of the paper we select four countries as representative of these different dynamics over time. In order to understand the factors that could explain such differences in FGC dynamics, we analyze the socio-economic conditions and the social expectations surrounding the practice.

A coarse analysis of countries that practice FGC versus countries that do not practice it show that countries that practice FGC have a worse overall performance: they have a lower stage of development, worse political institutions and worse socio-economic conditions. Such results would seem to support the hypothesis that modernization and economic development are accompanied by the abandonment of traditional practices such as FGC. Yet this hypothesis should be checked against a finer analysis of FGC *dynamics* across African countries that still practice it. Among countries where FGC is common, are better socio-political and economic conditions leading to a decrease in FGC over time? Our study shows that there are no univocal relationships between FGC dynamics and fundamentals. Countries with better socio-political-economic conditions may not experience a substantial *decrease* of FGC over time. Instead, trust in institutions, active social participation and positive changes in social expectations[4] are strongly correlated with the weakening of FGC in countries that still practice it. Note that trust in institutions means, among other things, trust in the government and the legal system. Although the majority of African countries have prohibited FGC (Shell-Duncan et al., 2013), legal intervention is likely to be more successful in societies where laws are perceived as legitimate and community-based discussions create an enabling environment supporting the abandonment of FGC (Rahman and Toubia, 2000). Active participation in the community is also important, since being active and promoting social participation facilitates exchange of ideas and discussions about the consequences of FGC and how to change it (UNICEF, 2013). Finally, we found a very strong and significant relationship between FGC rates and social expectations about the practice, which lends credibility to the hypothesis that FGC is still practiced because a) most individuals in the community are expected to practice it, and b) because it is generally believed that most members of the community support the practice and think it should be continued.

[4] We refer here to "positive changes" in expectations as changes in expectations about the frequency (diminished) and approval (lessened) of FGC.

Indeed, social interaction regressions show that the importance of social expectations explain much of the probability that a woman is circumcised. The aggregate data we collected on social expectations do not allow us to conclude that FGC is always a social norm; however, they suggest that the practice is supported by shared values, norms and beliefs that should be studied in depth in target communities.

To the best of our knowledge, this is the first attempt to present a general and comprehensive cross-country evidence on the relation between FGC, socio-economic-political data and social expectations. We should however point out that, due to limited data availability,[5] most of the results of the empirical analysis are qualitative, hence we cannot assess causal relations between economic, social and political indicators and FGC dynamics. The correlations we present are nonetheless strong and significant and could be used to draw some tentative policy hypotheses.

In the next section we describe the framework and data of FGC dynamics. In section 2 we highlight the differences between African countries where FGC is not practiced and countries where it is practiced. Section 3 investigates the differences across African countries that still practice FGC, highlighting the importance of the relation between social expectations and FGC dynamics. Section 4 presents four cases of countries that experienced different dynamics and rates of change. Section 5 presents our conclusions.

1 Framework and Data

1.1 Framework

FGC is a general term that indicates various circumcision procedures that differ in both invasiveness and health risks. The type of practice varies depending on the place and tradition. Several reasons are evoked in support of the practice, ranging from tradition, cultural identity, cleanliness and beauty, preservation of virginity, preservation from promiscuity, better marriage prospects, even religious requirement (UNPF, 2015). Different individuals and groups may give some but not all and not even most of the above listed reasons. In groups that still extensively practice it, FGC is often so deeply rooted that everybody is expected to adopt it: women must undergo FGC to be accepted by their community, and their families must support the practice to avoid the negative consequences that befall both the uncut girl and her family. When talking

[5] The time series for FGC are available from the end of the 1980s, limiting the data to the period 1989-2011.

about social expectations and sanctions we always refer to individuals, groups or sub-groups that adopt FGC. Individual actions and expectations should be contextualized accordingly. It is important to note that in any country there may exist groups that practice FGC and groups that do not (Boyle, 2002; Dorkenoo, 1994). Many African countries are ethnically diverse, and different ethnicities may or may not practice FGC. There is evidence that ethnical fractionalization within a country is negatively correlated with FGC rates (Shell-Duncan 2013, UNICEF, 2013), and marriages across ethnicities may help in this regard.

Whether FGC is diagnosed as a traditional custom or a social norm matters to decisions about how to intervene in order to curb the practice (Bicchieri, 2016).[6] If FGC is a custom based on beliefs about health, gender identity or ethnic markers, social expectations play no role in supporting the practice. If instead FGC is a social norm, social expectations have an influence on actions, and determine whether a practice is or is not followed (Bicchieri, 2006). In a social norm, individual preferences are *conditional* on the expectations about the behavior of a reference network (Bicchieri, 2006).[7] Individuals' empirical expectations are always complemented by normative ones, i.e. individuals believe that members of their reference network think they *ought* to behave in a particular way, and might ostracize them if they do not. For example, if FGC is related to the importance of virginity and fidelity, an uncut girl may be seen as a worse marriage prospect, with serious negative consequences for her and her family. Sanctions are often necessary when deviations from a particular collective behavior create a negative externality, such as with behaviors that signal a group's identity. In this case, FGC may relate to a tradition that strongly identifies a specific group or ethnicity. Note that for a social norm to influence behavior, it is not necessary that the norm is internalized. In fact, individuals may actively dislike the behavior imposed by the norm, but still obey it if their social expectations point in that direction.

The DHS surveys we report measure attitudes, behavior, and the beliefs of women about men's views about continuation of the practice. To fully assess the presence of social norms, surveys should include the target population's incentivized empirical and normative

[6]For the difference between customs and social norms see Bicchieri, 2006 ch. 1 and Bicchieri, 2016 ch. 1. Briefly, a custom is followed independently of social expectations, a social norm is followed because both empirical and normative expectations are present.

[7] A reference network is the group of people who matter to a person's choices in a specific situation. Different situations and choices may involve different reference networks.

expectations, as well as a measure of the influence such expectations have on behavior.[8] The DHS data however are useful to show, via a social interaction model, that cutting behavior can be predicted by the beliefs and social expectations provided by their surveys, thus lending credibility to a social norm hypothesis.[9]

1.2 The Data

The data span from 1989 to 2011, the time range for which we have available data on FGC. The data are drawn from various data sets. In particular, to obtain time series data for FGC at the country level, we used the UNICEF 2013 report, the UNICEF country-specific 2014 reports and the DHS data sets. The DHS data sets are collected from several countries, including African ones, and contain information on demographics and health status of representative samples of women. The DHS surveys also collect information on FGC practiced on mothers and daughters, the personal normative beliefs of women about the practice, and women's normative expectations about men's normative beliefs FGC.[10] Not all the waves for each country contain information about FGC, so this data set does not allow a full depiction of the situation for each country. Also the time span covered by the DHS is not complete: for a few countries we have data from the late 1980s or early 1990s', but for most of the countries we can only track the evolution of FGC over the last decade. Thus, in order to recover the needed country-level time series observations for FGC dynamics, we use the information provided by the UNICEF country-specific 2014 reports, and interpolate FGC rates over time. The DHS data on FGC are also used in the analysis of beliefs and rates of circumcision for specific countries conducted in the second part of the paper.

When we use survey data, we must acknowledge that, as it is common in surveys, the data collected may be subject to no-response bias (i.e., the answer of those who respond may be different from those of non-responders) and item no-response (i.e., some respondents choose not to answer some questions). While by looking at the survey data we have reason to think that data on FGC rates are reliable, other variables may not be. For instance, a woman may not want (and often does not) disclose information about her intention to circumcise her daughters and this may

[8] Incentivizing social expectations (for example, rewarding successful 'guesses' about what most other group members approve of) is a way to diminish experimenter's effects (Bicchieri and Chavez, 2010).
[9] DHS data are commonly used in the FGC literature (Hayford, 2005; Bellemare et al., 2015)
[10] Personal normative beliefs are individual's beliefs about the value of a practice. Normative expectations are second-order beliefs about the normative beliefs of other people (Bicchieri, 2006)

be due to several factors, such as knowledge that FGC is illegally practiced (Jackson et al., 2003). Also, when analyzing associations between other variables and FGC rates we cannot control for unobserved factors that may affect both: If for instance we want to investigate the relation between women social status and circumcision, we cannot control for factors that may influence both. However, since we do not have alternative indicators and qualitatively better survey data, we use the available data as is commonly done in the literature (Hayford, 2005; Bellemare et al., 2015).

To get a complete picture of the economic, social and political differences across African countries that practice FGC and African countries that do not, as well as to analyze correlations existing between fundamentals and FGC dynamics, we used indicators from various international data sets. From the World Development Indicators (WDI), we selected the following: agriculture value added, industry value added, manufacturing value added and services value added as percentages of GDP, as well as GDP per capita. These indicators are useful to compare stages of development across African countries as well as the relationship, if any, between FGC dynamics and economic development across countries that still practice it. From the WDI we also selected indicators for female education as well as the presence of female teachers in tertiary education. There are several studies that report a negative correlation between women education and FGC rates (Orubuloye et al., 2000; Yount 2002), though they are limited to specific countries.

From the Heritage Foundation (HF), which presents a series of country-specific indicators of the level of various freedoms in each country and provides data from 1995 to 2011, we selected two indicators: the overall score of economic freedom in a country and the indicator of freedom from corruption. The latter is particularly important since we would expect trust in government, and enforcement as well as obedience of the law, to be higher in less corrupt countries.

To check for differences in both civil liberties and political rights, we used the two indicators from the Freedom House (FH) data set. We also used the CIRI data set, which collects country-specific indicators measuring socio-political freedoms. The indicators taken from CIRI are: a measure of physical integrity, empowerment rights index, freedom of association and three indicators for women economic, political and social rights. Finally, from the PolityIV data set we use the indicators *polity2* and *polcomp*, which measure, respectively, a country level of autocracy versus democracy and its degree of political competition. Increasing freedoms and rights, as well as democratization processes, are important elements of modernization theories

that aim to explain decline in FGC as resulting from greater development (Hayes 1975; Boyle et al., 2002; Hayford 2005).[11]

There is a difference between perceived and objective freedoms. Though they should be highly correlated, it is important to measure subjective perceptions of freedom, otherwise conceived as perceptions of autonomy. Tabellini (2010) points out that, in less developed countries, individuals are less autonomous and that this has an effect on productivity. It is reasonable to assume that lower autonomy might also affect decisions to abandon traditional practices, thus we would expect lower autonomy to be correlated with higher rates of FGC. To check whether differences in perceived individual autonomy exist across the countries under study, we collected information from the World Values Survey (WVS) data set. The WVS is made with 6 waves covering the years 1981-1984 (Wave 1), 1989-1993 (Wave 2), 1994-1999 (Wave 3), 1999-2004 (Wave 4), 2005-2009 (Wave 5) and 2010-2014 (Wave 6). Because information on FGC is only available since the late 1980s, we only used Waves 2-6. Only South Africa and Nigeria are present in waves 2 and 3, and for the majority of countries we have information for just the last three waves. Nonetheless, the list of African countries is representative of countries with FGC as well as countries without FGC, and this allows a comparison across countries.[12]

From the WVS, we use the following question to assess individual autonomy: "*Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use a ten point scale in which 1 means 'none at all' and 10 means 'a great deal' to indicate how much freedom of choice and control you have over the ways your life turns out*". For the regression results presented in Section 2.2 (Tables 2 and 3) we derive an indicator taking value 1 if the individual chooses a point on the scale greater than 5, and 0 otherwise.

We also used the Afrobarometer to obtain aggregate social indicators and their evolution across countries that practice FGC. This data set is made up of 5 rounds and covers the period 2000-2011/2013. The data are available for some, but not all the countries of interest, and are

[11] Modernization theory argues that when an economy changes from agricultural to industrial or service based, there is less family control on individual behavior and greater guarantees of individual rights, as well as more emphasis on health. All these changes would create favorable circumstances for the abandonment of female circumcision.

[12] The full list of countries for which data are available is as follows: Algeria, Nigeria, South Africa, Morocco, Zimbabwe, Uganda, Egypt, Tanzania, Ghana, Mali, Rwanda, Burkina Faso, Zambia, Libya and Zimbabwe.

often not available for all the five rounds.[13] The Afrobarometer contains several questions on generalized and personalized trust, trust in institutions, membership in social groups, and views about the treatment of women. We hypothesize that the variables we select may have an impact on FGC rates. For example, trust in institutions would mean that, whenever laws against FGC are passed and people are aware of them, they would be more likely to obey them. Group participation, too, may be important, as active group participants are more likely to exchange ideas and opinions about the practices they engage in, and may be induced to question them (Gillespie and Melching, 2010). Needless to say, progressive ideas about gender equality should correlate with lower FGC rates.

As we already mentioned, many African countries comprise different ethnic groups, and this fact may have positive consequences on declining FGC rates (Shell-Duncan, 2013; UNICEF, 2013). The index of ethnic fractionalization we use is taken from Alesina et al. (2003).

For some of the data sets, especially for the macroeconomic and political data sets, the list of African countries is complete, for other data sets (especially survey data), the list of countries is large but incomplete. However, these country lists are representative of countries with FGC as well as countries without FGC. Moreover, the data are also representative of within-county differences in the practice of FGC, i.e., countries where the practice is widespread as well as countries where the practice is adopted by a minority. The overall data, across and within countries, allows to formulate hypotheses about the drivers of FGC and its dynamics.

The countries we consider in our analysis as well as the variables, their definition and source are listed respectively in Table A1 and Table A2 of the Appendix.

2 Africa: a Comparison of countries with and without FGC

In this section we look at differences in the social, political and economic conditions between African countries that practice FGC and African countries that do not practice it (according to UNICEF classifications in 2013 and 2014 reports). The aim of this section is to check whether there exist *overall* macroeconomic, political and social differences across the two sets of countries. If data from the two sets of countries were significantly different, this would constitute

[13] We have information for the following countries: Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Egypt, Ethiopia, Ghana, Guinea, Kenya, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Tanzania, Togo and Uganda. This is not the complete set of countries where FGC is practiced, but it is a representative sample because it contains countries where the practice is widespread as well as countries where the practice is adopted by a minority.

preliminary evidence in favor of the importance of development and modernization for the abandonment of FGC (Boyle et al., 2002; Hayes, 1975). By comparing these two sets of countries we treat those that practice FGC as belonging to the same set, without drawing finer distinctions between countries with different rates of FGC. The important differences across countries with different prevalence rates of FGC are taken into account in the second part of the paper.

2.1 Macroeconomic and Socio-Political Data

In Table 1 we report the descriptive statistics for relevant indicators taken from several macroeconomic and socio-political data sets for African countries with and without FGC. For each pair of mean values for countries that practice and that do not practice FGC we test differences in means by using the Wilcoxon Mann-Whitney test (Wilcoxon, 1945; Mann-Whitney, 1948), which is similar to the independent samples t-test but more appropriate when non-Gaussian distributions are tested. The data show that, overall, countries where FGC is not practiced are better off than countries where FGC is a common practice. Countries where FGC is practiced have a higher value added as percentage of GDP only for the agricultural sector. This indicates that countries with FGC are more rural and less developed than countries with no FGC. The indicators for schooling and literacy rate show that in countries where FGC is practiced the literacy rate of both young and adult females is lower than in countries with no FGC. The literacy rate of young females is higher than the literacy rate of adult females for both sets of countries, indicating that literacy of females is growing over time regardless of whether FGC is practiced. In addition, for both sets of countries we found a very small percentage of female teachers in tertiary education. Once again, the percentage is lower in the countries where FGC is adopted. One might conclude that economic development favors the abandonment of FGC. Yet this static analysis does not tell whether - in countries where FGC is prevalent - economic development would lead to a decrease of FGC. This is the important dynamic analysis that we provide in section 3.

With regards to the indicators taken from the Heritage Foundation, Freedom House and the CIRI data sets, the countries with or without FGC do not significantly differ in terms of overall freedom. However, countries with no FGC have significantly higher rates of freedom from corruption. Protection of both civil liberties and political rights is higher in countries without FGC (for these indicators lower values indicate higher freedoms) and the averages are

significantly different for the two sets of countries (see Appendix A.2 for a description of the variables used in Table 1).

Table 1 here

The social indicators collected from the CIRI data set indicate that physical integrity, empowerment rights, freedom of association and women's political, economic and social rights are higher in countries where FGC is not practiced. The result for freedom of association is consistent with the findings of the UNICEF report on FGC (UNICEF, 2013), according to which FGC is a persistent practice wherever individuals do not talk about it and therefore do not share their opinions, nor do they have avenues for meeting and sharing their views.

Finally, the descriptive statistics for the two indicators collected from the Polity IV data set, a measure of the degree of democracy versus autocracy and a measure of political competition across the two sets of countries, show that, overall, both countries with and without FGC enjoy a low degree of political competition and low levels of democracy. Yet, once again, on average the political framework is slightly better for countries where FGC is not practiced than for those where FGC is practiced.

2.2 Autonomy

The differences in macroeconomic, social and political indicators between the two sets of countries are likely to be correlated with individual autonomy. As we already mentioned, previous studies show that in less developed countries (e.g. countries with lower GDP per capita and lower growth rates) individuals are less autonomous (Tabellini, 2010). It has been pointed out that lower degrees of motivation, more passive attitudes and less perceived self-efficacy (all variables related to lower autonomy) may lower individual productivity as well as macroeconomic performance (Tabellini, 2010; Bavetta and Navarra, 2012). Moreover, higher levels of autonomy have been shown to correlate with greater economic development and better governance (Tabellini, 2008, 2010). As we already noted, greater economic, social and political development characterize countries that do not practice FGC.

Our hypothesis is that, wherever autonomy is high, FGC should be low, in that women who can freely decide about their lives might be less inclined to follow traditions and feel entitled to make choices about their own and their daughters' bodies (Althaus,1997; Yount, 2002). We also want to test whether FGC is negatively correlated with openness to diversity, and positively

correlated with attachment to one's local community. Openness to diversity means, among other things, the capacity to acknowledge the existence and value of different behaviors and traditions. We would expect greater autonomy to be accompanied by greater openness to diversity, and thus both should be associated to lower levels of FGC. Attachment to local community would instead be related to higher FGC levels since it might mean that whatever is traditionally done in one's community is highly valued. In Table 2 we check for the presence of all these correlations.

In particular, we check whether individuals living in countries with and without FGC experience different levels of autonomy,[14] whether individual autonomy is correlated with generalized trust (*trust*), whether FGC is more likely to be practiced when attachment to a local community (*localCommunity*) is high and openness to experience or diversity in terms of nationality or religion (*worldCitizen*, *trustOtherNation*, *trustOtherReligion*) is low. To examine if there are significant correlations between autonomy and indicators for trust and openness, we use the WVS data and compare individual autonomy and trust indicators between the African countries that practice and those that do not practice FGC.

Table 2 here

Table 2 reports the correlation coefficients between individual autonomy (*autonomy*), the rate of FGC (*FGC_rate*) in the country (equal to 0 for countries that do not practice it, and to the actual rate for those that practice it) and other variables capturing trust and openness to diversity for each country. The results show that the rate of FGC is negatively and significantly correlated with individual autonomy. FGC rates (*FGC_rate*) are instead positively and significantly correlated with the indicators for generalized and personalized trust (*trust* and *trustKnown*, respectively) and with attachment to the local community (*localCommunity*). They are negatively correlated with openness (i.e., whether one feels to be a citizen of the world and whether one trusts individuals from different nations, respectively *worldCitizen* and *trustOtherNation*).

As we hypothesized, individual autonomy is negatively correlated with FGC rates: autonomy is higher in more developed countries, and we know that FGC is generally much lower or absent in such countries. Autonomy is usually positively correlated with generalized trust, a correlation

[14] To assess perceived autonomy, we use the variable from the WVS described in the data section 1.2.

typical of developed countries (Tabellini, 2010). Yet we see that countries that practice FGC have low levels of autonomy and high levels of trust, both generalized and personalized. This negative correlation between autonomy and trust may be due to structural characteristics of the country (e.g., more communitarian societies may display high trust and low autonomy; see Markus & Kitayama, 1991). In countries that practice FGC, we see that individuals do not feel they are 'citizens of the world', and they do not trust people coming from different countries. How does this square with the high rate of generalized trust? The positive correlation between the rate of FGC and generalized trust may be explained by the fact that whenever a society follows traditional practices, the belief that most other society members also follow the tradition makes them trustworthy (unfortunately, there are no surveys measuring such beliefs). Also consider that many areas where FGC is practiced are rural, and people rarely move away from their villages. In this case generalized trust may refer to the disposition to trust those one already knows. The fact that personalized and generalized trust may be confused in these settings demonstrates the need for a refinement of trust indicators (Yamagishi, 2011a,b). On the contrary, individuals living in countries with no FGC tend to see themselves as citizens of the world and are more open to individuals of other nationalities than people living in a country practicing FGC. Those countries, however, are usually characterized by greater urbanization and therefore a greater chance of meeting strangers. Interestingly, trust in individuals who practice other religions (*trustOtherReligion*) is positively correlated with FGC; this may be explained by the presence of ethnic and religious fractionalization within such countries.

We next look at differences in the components of individual autonomy between African countries that do and do not practice FGC. We want to assess whether living in a country where FGC is practiced reduces individual autonomy, and to what extent. We hypothesize, as suggested above, that in a country where FGC is practiced there is less individual autonomy due to the positive association between economic development (overall higher in countries that do not practice FGC) and individual autonomy. Also, given the differences existing across countries that practice and do not practice FGC, we expect to find differences in the way regressors influence individual autonomy. Finally, we also investigate whether the determinants of women autonomy in FGC countries differ from the determinants of autonomy for both men in FGC countries and women in countries that do not practice FGC. We have reason to think that there are important differences in what determines autonomy because, in countries that practice FGC,

women usually perform a more traditional role in the family, and their autonomy might be linked to their family role. On the other hand, as suggested by the previous literature (Althaus,1997; Yount, 2002), women autonomy in a country that does not practice FGC should be more dependent upon the level of education and having a job.

We now look at the above suggested differences by means of logit models (Table 3). We are aware of possible statistical problems (Allison, 1999) in comparing logit coefficients across groups so, as suggested by recent work (Triventi, 2013), we use Average Partial Effects to make such comparison. All the regressions include both country dummies and time dummies for waves 2 to 5 (period 1989-2009), leaving the last wave as a reference (years 2010-2014). Thus, we estimate the following equation:

$$autonomy = \beta_0 + \beta_1 X_i + \beta_2 FGC_{ic} + \eta_i + \xi_t + \varepsilon_i \quad (1)$$

Where X_i represents individual characteristics (i.e. age, age squared, female gender, dummy variables for either compulsory or tertiary level of education as maximum level of education obtained, dummies for marital status (i.e. single or married) a dummy indicating whether the individual has children, dummies for working status (i.e. full-time, part-time worker or self-employed) and the size of the city the individual is living in). *FGC* represents a dummy taking value 1 if the individual is living in a country that practices FGC and it is both individual (*i*) and country (*c*) specific; η_i indicates country dummies and ξ_t represents time dummies. *autonomy* is the dependent variable and ε_i represents the error term, $\beta_0, \beta_1, \beta_2$ are parameters.

Model 1 (column 1 in Table 3) analyzes the probability of being an autonomous individual on the whole sample of African countries with and without FGC. In order to avoid simultaneity, the dummy for the practice of FGC (*FGC*) is constructed using the period preceding the reference wave of the survey. It could be argued that using both the *FGC* dummy variable and the country dummies as regressors could be problematic. However, we estimated the model with and without the FGC dummy and we also estimated a model that only accounts for the *FGC* dummy and excludes the country-dummies from the set of regressors. The results are statistically invariant, therefore we conclude that both the sign and the significance of the effect of the dummy for FGC countries is correctly estimated.

The results in Model 1 show that individuals living in countries where FGC is practiced are less likely to be autonomous than individuals living in countries where FGC is not practiced. In general, individuals with at least some degree of tertiary education are more likely to be autonomous than individuals with intermediate education (reference group), while individuals with at most a compulsory level of education are significantly less likely to be autonomous than individuals with secondary education. Married individuals are more likely to experience a higher level of control over their own life than individuals that are neither married nor single (i.e. widowed, divorced). Individuals with a job (either employed full-time, part-time or self-employed) are overall more likely to be autonomous than individuals belonging to the reference category (students, retired, homemakers, unemployed, other). Individuals living in big cities are more likely to be autonomous than those living in small cities. Thus Model (1) says that individuals living in countries that practice FGC are less autonomous than individuals that live in countries where FGC is absent, after controlling for other variables, such as education, having a job, etc.

Models (2) and (3) report the regression results on, respectively, the sample of individuals living in a FGC country and individuals living in a country without FGC. Comparing columns 2 and 3, we observe that in both sets of countries individuals with higher (lower) education are significantly more (less) autonomous than individuals with intermediate levels of education (the reference group). Also, in both sets of countries, full-time or self-employed workers are more autonomous than individuals in the reference group (unemployed, students, retired, etc.).

There are, however, a few important differences between the two groups of countries. In countries *without* FGC, women are less likely than men to be autonomous, but this is not the case in countries *with* FGC, where there is no significant gender difference in autonomy. This may reflect the important role that women play in the family in more traditional societies. Where FGC is present, married individuals (of both sexes) or singles by choice are more autonomous than individuals that are widowed or divorced, and this is probably indicative of the importance of marital status in these countries.

Comparing women and men living in FGC countries (columns (4) and (5), respectively), we see that working full time increases the autonomy of both men and women. As one would expect, men with higher levels of education (*education High*) are more autonomous than men with intermediate education levels (the reference group). This is not the case for women: this

points to the low importance of higher education for women in these countries, possibly related to the difficulty for women to find skilled jobs (Obbe, 1980). As expected, both men and women with only (at most) compulsory education (*education Low*) are significantly less autonomous than individuals with intermediate levels of education (the reference group).

In FGC practicing countries, women who are married and have children are more autonomous than women that, respectively, are widowed/divorced or have no children, but marital and parental status do not influence men's autonomy, highlighting the importance of the traditional homemaking role for women. Overall, the results indicate that individual autonomy of women in countries that practice FGC is mainly influenced by their marital and parental condition, while higher levels of education and self-employment have a positive and significant impact on men's autonomy. This is consistent with the fact that in more traditional societies being unmarried or, if married, sterile have negative consequences for women.

Table 3 here

Finally, model (6) reports the results for the sample of women living in African countries where FGC is not practiced. Comparing these results with those of women living in countries that practice FGC (column 4), we see that in non-FGC countries higher levels of women education correspond to higher autonomy. Note that, since the percentage of women with higher education in no-FGC countries does not largely differ from that of women in countries with FGC, we may conclude that the non-significance of the higher education variable (*education High*) for women in FGC countries is not driven by the small percentage of women with higher education. Also, in countries without FGC, marital and parental status are not relevant to women's autonomy, unlike what happens in FGC-practicing countries. We may conclude that the difference between more traditional countries where FGC is practiced and those that do not practice it is reflected in women's role in the family and society.

In sum, the data show that overall the macroeconomic, social and political conditions of countries without FGC are better than those of countries where FGC is practiced, and this seems to support the importance of modernization for the elimination of FGC (Boyle et al., 2002). Countries without FGC also show a greater level of individual autonomy and a wider set of roles women can take in society, which supports the feminist theory (Althaus,1997; Yount, 2002),

according to which women circumcision is related to the low social condition of women. When women become more independent, FGC loses its importance as a marker of womanhood and women can decide what to do with their bodies and the bodies of their daughters. Though our data show that more developed countries are less likely to practice FGC, we cannot infer that greater development will be accompanied by a *reduction* of FGC within a country. In the next two sections we show that, within countries that practice FGC, those with better economic/social/political conditions do not necessarily have the lowest rate of FGC, nor greater success in curbing this practice over time.

3 FGC Dynamics

We now focus on African countries where FGC is practiced. Note, again, that we take the data on female circumcision from UNICEF 2013 and 2014. These data do not make finer distinctions among countries with high or low FGC prevalence. We want to analyze the dynamics of change in all those countries that practice FGC, separating countries in which FGC is practiced by more than 50% of the population from countries where FGC prevalence is less that 50%. We look at stability and decrease of FGC over time in all these countries, and seek to establish whether there exist significant correlations between fundamentals (i.e. socio-economic-political indicators) and FGC dynamics.

We first look at the relationship between the rate of FGC and fundamentals, although we cannot investigate causal relations between such indicators and the practice. As we mention in the Introduction, we have chosen to analyze the relation between a broad set of variables and the variable of interest (FGC), to understand which of those are relevant. We have panel data available for the countries of interest, but the absence of many data and complete time-series observations for both FGC and some of the indicators make an econometric analysis unsuitable.

This part of the analysis is aimed at assessing whether FGC is significantly correlated with socio-economic-political indicators and the extent to which such correlations qualitatively differ across countries characterized by different FGC dynamics over time.

In Table 4, we group the 27 countries that practice FGC into countries that experienced a *decrease* in the rate of FGC between 1989 and 2011 (column 1), and countries where FGC is relatively *stable* (column 2). In column 3, we look at FGC rates and socio-economic-political indicators in countries in which FGC is practiced by more than 50% of the population over the

time span considered. This part of the analysis can cast some light on the presence of significant and consistent relations between macroeconomic, social and political indicators and FGC dynamics over time.

We next present the correlations between FGC changes and further social indicators (Table 5) in order to investigate whether FGC changes are correlated with indicators for trust, active and passive participation in society, confidence in institutions and beliefs about the presence of widespread discrimination towards women across countries. We also test for the existence of a negative correlation between ethnic fractionalization and FGC dynamics (Table 6). Indeed, as pointed out by the previous literature (UNICEF, 2013), FGC rates are likely to be lower in the presence of ethnic fractionalization, since different ethnicities have different customs and traditions. While some ethnic groups consider FGC very important, others do not, and the possibility of interethnic marriages may facilitate the overall reduction of the practice. Finally, we conclude section 3 by presenting correlations between FGC rates and beliefs about FGC using DHS data.

3.1 Fundamentals and FGC Dynamics

Table 4 shows the correlation coefficients between the rate of FGC and social, political and macroeconomic indicators in countries where FGC has shown a clear decreasing trend (column 1), and countries where such clear decreasing trend cannot be detected (column 2); we also show the correlations for the countries with a prevalence rate equal or higher than 50% over the time span considered (column 3), irrespective of the FGC trend.[15] This last column highlights the relation between FGC dynamics and fundamentals in countries where FGC rates are still quite high.[16]

Table 4 here

The data in table 4 do not allow making generalizations about socio-political-economic indicators and the dynamics of FGC. Though the data partly support the modernization theory,

[15] The available data do not allow a clear-cut distinction, within countries with FGC rates above 50%, between decreasing and stable trends.

[16] Note that indicators for political rights and civil liberties (*Political Rights, Civil Liberties*) are coded from 1 to 7, where 1 represents highest political rights and civil liberties and 7 the lowest. So a positive correlation indicates a negative relationship (see the Appendix).

they are by no means conclusive. For example, we see that the higher the service sector value added as percentage of GDP, the higher is FGC in all the three groups of countries, and the correlation coefficient is large for countries with FGC rates over 50%. Whenever industrialization is increasing, FGC is decreasing in both countries with decreasing and relatively stable trends of FGC; however, this correlation is positive when we look at countries with a FGC rate over 50%. A large agricultural sector instead negatively correlates with FGC in both countries where FGC is decreasing and in countries with FGC rates over 50%, while this relationship does not hold for countries where FGC is not clearly decreasing over time. This latter result indicates that generally FGC decreases when a country becomes less rural; however, column (2) indicates that the result cannot be generalized. Whenever GDP per capita increases, there is a tendency to lower FGC rates in countries with a clear decreasing trend of FGC, but this does not happen in countries with relatively stable FGC rates and countries with rates of FGC over 50%. This indicates that the economic development of a country is not always associated to a decrease in FGC. Finally, especially for countries with relatively stable rates of FGC, when women's literacy and their contribution to education as teachers in tertiary education increase, rates of FGC decrease; instead, the opposite relation holds between female education and FGC dynamics in countries with rates of FGC over 50%. Thus, although the evidence emerging from the correlations between indicators of economic development and FGC may partly support the modernization theory, the evidence is not compelling.

The association between FGC and social rights (see Appendix for definitions) is not univocal either. The same can be said for women's social, economic and political rights. There is, however, a positive association between political rights and civil liberties for the three sets of countries,[17] indicating that the more these rights are guaranteed, the lower are FGC rates. Note, however, that this association does not reach significance for countries with FGC rates over 50%. We also see that living in a democratic country or in a country that guarantees political competition is negatively associated with the practice of FGC everywhere, even though not all of these relationships are significant for countries with rates of FGC over 50%. This also holds true for economic freedom, which is negatively correlated with FGC, but this relationship is not significant when we consider countries with FGC rates over 50%.

[17] See footnote 16.

Finally, when we consider indicators for generalized and personalized trust, generalized trust is negatively correlated with FGC rates in countries where FGC has clearly decreased over time, indicating that FGC is lower in the presence of higher generalized trust. This relation is not significant for countries with FGC rates over 50%. In countries where FGC has not shown a clear decrease, the relation between FGC and generalized trust is instead positive and significant. This may indicate that in countries with no clear tendency to decrease FGC, the more individuals trust their society, the less they put into question its traditions, although further investigations are needed. Personalized trust (*trustKnown*) is always positively associated to FGC rates, although the association only reaches significance in countries with 50% or higher FGC rates. These data suggest that the more individuals trust people they know and their network of close relationships, the more existing traditions such as FGC can be supported.

In conclusion, Table 4 shows that while a reduction of FGC is not clearly associated to higher economic development or to a higher protection of social rights everywhere, a higher protection of political rights and civil liberties, as well as higher economic freedom, political competition and democracy are associated to a reduction of FGC, even though many of these relationships are not significant for countries with high prevalence rates (50% or more). It is important to notice that FGC rates are negatively correlated with women political rights in countries that experience relative stability of FGC as well as in countries where FGC rates are over 50%. This suggests that guaranteeing women political rights has a significant and positive effect on the elimination of practices that negatively affect women lives.

The above results indicate that, with the exception of a few important variables that have a strong and univocal relation with decreasing FGC, the FGC dynamics is not always related to the socio-economic development of a country.

3.2 Are trust and social engagement relevant?

In Table 5 we report the overall correlation coefficients between the dynamics of FGC and (generalized and personalized) trust indicators, trust in institutions (government, police, etc.), social participation in one's community and beliefs about how women are treated in society at large. Unfortunately lack of data prevents us to partition the table into the three groups of Table 4. However, we can draw interesting conclusions about the dynamics of FGC and their relation to trust and social engagement.

Table 5 here

Our hypothesis is that a decline in FGC should be accompanied by a high level of institutional trust, especially since in many of the countries we study there are laws banning the practice. We also hypothesize that a decline in FGC should be accompanied by greater active participation in one's community, especially since many interventions to curb the practice take place at community level, and being actively involved in community life may help to talk about the practice, its value and disadvantages. Finally, a decrease in FGC should correlate with the perception of a better treatment of women in society.[18] This latter consideration is consistent with Table 4 results, showing that when women political rights are protected, FGC rates are lower.

The first rows of Table 5 tell us that rates of FGC are higher when both generalized and personalized trust are higher. As we already discussed, there is often a confusion, especially in rural environments where mobility is limited, between the two types of trust. Moreover, in communitarian societies such as African ones, we would expect the two types of trust to coincide. Rates of FGC are instead lower when trust in government institutions (president, parliament, police, courts, electoral commission, local government and ruling party) is higher. In particular, the relationship is significant with trust in the court of law, trust in the national electoral commission and trust in the ruling party. This is not surprising, as in most countries laws banning FGC have been introduced, and the higher the trust in government, the more likely it is that laws are obeyed (Tabellini, 2008).

It is also noticeable that FGC rates decrease with an increase in social involvement and activism (Beugelsdijk and van Schaik, 2005). As we noted, many interventions to curb FGC take place at the community level. It is thus reasonable to assume that the higher the participation in community activities and collective deliberations, the more likely it is that traditional practices will be discussed and, if negatively evaluated, will be abandoned.

Finally, the stronger the belief that the government is empowering women, the lower the rate of FGC. FGC rates instead are higher when women are perceived to be unequally treated by a leader, an employer or institutions. Hence FGC is higher in countries where the perception that women receive an unequal treatment is widespread. Since aggregate perceptions are likely to

[18] We talk of 'perception' since indicators such as "women treated unequally by the employer, a leader, the Courts or the police", as well as an indicator of "women empowerment by the government" are based on surveys and surveys measure subjective perceptions, not objective data.

reflect the objective conditions of women in a country, these data are supported by our previous findings about women condition in countries where FGC is prevalent (Section 1).

In sum, there are strong and meaningful correlations between decrease in the rate of FGC in a country and the level of trust in institutions, social participation in one's community and beliefs about how women are treated in society at large.

3.3 Ethnic Fractionalization and FGC

Many African countries are characterized by ethnic fractionalization (Alesina et al., 2003). We might expect the relation between FGC and fractionalization to be negative, as different ethnic groups usually have different traditions, and FGC might be one of them. Thus we would expect FGC to be overall lower in more ethnically heterogeneous countries.

Table 6 here

Table 6 confirms that ethnic fractionalization and FGC rates are negatively correlated, i.e., greater ethnic fractionalization corresponds to lower FGC rates. Another reason why fractionalization may decrease FGC rates is that, in cases where FGC is not a group identity marker (Shell–Duncan et al., 2011), within-country inter-ethnic coexistence may lower FGC rates. In Senegal, for example, there can be major variations in FGC prevalence among ethnic groups depending on the prevalent ethnicity of the region within which they live (UNPF, 2015).

3.4 Social Expectations Matter

The theory that explains FGC as a social norm proper, or as supported by a web of other norms and values (such as purity, beauty, fidelity, etc.) relies on the assumption that social expectations within a reference group matter to the stability or change of the particular collective behavior studied. Though the surveys we use were not geared toward a specific measurement of social norms, they provide evidence about the role that social expectations may play in the dynamics of FGC. The data we use are taken from the DHS, where the women interviewed were asked whether they have been circumcised, their own beliefs (attitudes) about this practice, whether they believe men want it to continue, and whether FGC is dictated by their religion. The data allow us to say that social expectations – if they are positively correlated to changes in the practice – are likely to be important drivers of change.

Table 7 presents the correlations existing between FGC rates and aggregate beliefs about FGC across practicing countries.

Table 7 here

For each country, we computed yearly averages (for each wave) of each variable to track the evolution of beliefs and FGC dynamics over time. Since the data include countries where FGC is widespread as well as countries where a minority practices FGC, they are a representative sample of the countries practicing FGC.[19] The table clearly shows that correlation coefficients between the rate of circumcision (*circumcision*) and the women's beliefs (i.e., whether FGC should continue, if men/husbands want it to continue and whether it is required by religion) are large, positive and significant. This result is important because it shows that the actual prevalence of FGC is highly correlated with positive beliefs and expectations about the practice. Permanence of FGC seems to be strictly related to the existence of beliefs supporting its continuation.

The correlation *among* the three beliefs is large, positive and strong, indicating that women who think that FGC should continue are also likely to think that men in general want FGC to continue and/or that FGC is required by religion. In sum, the whole table indicates that personal beliefs (attitudes), social expectations and the actual practice of FGC are very highly correlated, indicating that FGC may be strongly linked to the social and religious context (Hayford and Trinitapoli, 2011). These factors seem to play a much larger role than the social, political and economic variables we have analyzed thus far.

Note that these are country-level averages. Thus these results do not imply that – within a country or even a community – there is homogeneity of individual beliefs and expectations. Our results support the hypothesis that countries with higher FGC rates should have more favorable beliefs (attitudes) and consistent social expectations regarding the practice, and where FGC is declining social expectations and attitudes should support the decline. Using the DHS data, in

[19] In Table 8 the DHS survey data are used for the following countries and years: Benin(2001, 2006), Burkina Faso (1998,2003, 2010), Cameron (2004), Central African Republic (1994), Chad (2002), Cote d'Ivoire (1994, 1998, 2011), Egypt (1995, 2000, 2003, 2005, 2008), Ethiopia (2000, 2005), Ghana (2003), Guinea (1999, 2005), Kenya (1998, 2003, 2008), Mali (1995, 2001, 2006), Niger (1998, 2006), Nigeria (2003, 2008), Senegal (2005, 2011), Sierra Leone (2008), Sudan (1989), Tanzania (1996, 2005, 2010), Uganda (2006, 2011).

the next section we estimate a social interactions model to investigate the impact of both social expectations and the practice's frequency on the probability to undergo circumcision.

4 FGC in four countries: Egypt, Ethiopia, Nigeria and Senegal

We have chosen four countries that vary in FGC dynamics and economic development to analyze the relationship existing between FGC dynamics and economic-socio-political conditions, as well as the impact of social expectations on FGC dynamics. Our goal is to provide examples that may further support the general analysis conducted thus far.

4.1 FGC and Fundamentals

Figure 1 summarizes the socio-economic-political conditions of the four countries chosen (Egypt, Ethiopia, Nigeria and Senegal). Egypt has an extremely high FGC rate, Ethiopia has a decreasing rate, Nigeria has a relatively stable rate and Senegal, though having a low starting rate, has achieved a significant reduction in areas where the rate was high. We selected indexes that capture economic, social and political freedoms enjoyed by the countries.

Figure 1 here

Egypt is the country with the highest GDP per capita of the four countries considered,[20] showing that FGC rates do not depend on economic development. As to socio-political indicators, Senegal, followed by Egypt, is the country with the highest average level of overall freedom and freedom from corruption, although the graph shows that the trends for the two indicators of freedoms are similar across the four countries, and freedom from corruption is declining everywhere. Senegal has the highest average levels of political competition and empowerment rights but, again, no path can be detected between the dynamics of these indicators and FGC dynamics across the four countries. Ethiopia has relatively low GDP per capita, high though unstable values for the empowerment rights index, and freedom scores are similar to those in Egypt. Nigeria has experienced an increase of political competition over the period, but has an unstable empowerment rights index and high corruption. In conclusion, there

[20] We report the logarithm of the GDP per capita rather than the GDP per capita for the sake of graphical clarity. We also want to recall that high civil liberties indicators are associated with **lower** protection of such rights.

is no clear, univocal relationship between FGC dynamics and socioeconomic or political fundamentals.

In all four countries, there have been legal and policy interventions to eliminate FGC. Though this is not the place for a detailed analysis of different types of interventions, the available data suggest that social interactions and individual expectations about the behavior and beliefs of members of one's reference group are important in deciding whether to continue or abandon FGC (Diop and Askew 2009; Gillespie and Melching, 2010; Naguib 2012).

4.2 Social Interaction Model

Given the previous findings about the importance of the relation between social expectations and FGC rates across countries (Table 7), we estimate a social interaction model, using DHS data, on the whole sample of interviewed women in the four countries we chose. The model tests the probability of being circumcised as a function of social expectations, and shows the importance of both the perceived frequency of a behavior (empirical expectations) and the expectation about others' approval of the practice (normative expectations). We conclude that both kinds of expectations play a crucial role in supporting the continuation of FGC.

Since we want to investigate what are the determinants of women behavior, our dependent variable is a dummy variable taking value 1 if the woman has been circumcised and 0 otherwise: This distinguishes our regression from previous studies (Bellemare et al., 2015), which use as dependent variable the woman' belief that FGC should continue.

We estimate the following social interaction model (Brock and Durlauf, 2001):

$$\omega_i = c + \gamma_1 X_i + \gamma_2 Y_{ig} + J m_i^e + \varepsilon_i \qquad (2)$$

where ω_i is behavior of individual *i*, that is, whether the woman has been circumcised. This is a function of a constant (*c*), individual characteristics X_i (represented here by age, age squared, a dummy that takes into account whether the woman is living in a rural or urban area, an indicator for education level and a dummy variable taking value 1 if the women is of Islamic religion). Y_{ig} indicates contextual-specific variables, represented here by country dummies. m_i^e is the social interaction term, and represents the region-specific rate of circumcision and women's empirical expectations about it (assumed to be correct for each *i*), as well as normative expectations, i.e.

the region-specific women's second-order belief about whether others believe that FGC should continue (assumed to be correct for each *i*). Finally, ε_i is the error term.

Unfortunately, since data are incomplete, we can control only for a few variables. We assume exchangeability of the error terms. Furthermore, as it is conventional in the social interaction literature, in order to close the model we assume that individual expectations about average behavior, and whether circumcision should continue or not, are obtained on the whole sample excluding the interviewed woman. Given the large sample size, the sample average does not significantly differ from the averages obtained on the whole sample. This, together with assuming individuals' self-consistency, allows to align individual expectations to the objective probability generated by the model.[21] Both the average circumcision rates and normative expectations are yearly regional averages, for each country and wave. Regressions contain country dummies.

The estimation results are presented in Table 8.

Table 8 here

The chosen variables capture the essential features that may influence the likelihood of being circumcised. The estimated model shows that both the regional average rate of circumcision and the regional average collective normative expectations about whether circumcision should continue have a positive and significant impact on the probability of being circumcised. This result supports the findings in Table 7, is valid for all the countries in our sample, and is consistent with our regional analyses. The model also shows that, *overall*, other variables have an impact on circumcision. Older females are slightly more likely to be circumcised. Living in an urban area as well as having higher education decrease the probability to be circumcised. Furthermore, Muslim women are more likely to be circumcised.

Since women education may occur after or before circumcision (depending on local customs), we did run a regression including education of the head of household rather than a woman education. The merging between the women and the household data sets reduced the available

[21] With regard to endogeneity problems (reflection and self-selection), our non-linear model overcomes the reflection problem (Manski 1993; Blume et al. 2011). The self-selection problem is usually a relevant one. However, in our case we have seen that individual mobility does not significantly decrease FGC even in immigrant communities. More generally, we can say that solving the self-selection problem would not significantly change our results.

observations, and the reduced number of regions makes it impossible to estimate a model that includes both *FGC_continue* and *circumcision,* and for this reason we omitted the result. However, the education of the head of household had a negative impact on the probability for a women being circumcised, and this confirms the importance of education to curb this practice. Also, there exist cross-country differences on the influence of such variables on FGC, and we show it running separate regressions for each country.

We estimate separate models for each of the four countries, to check for differences across them (results are omitted for space, but are available upon request). Regressions show that the impact of age, education and social expectations is similar across countries. Instead, the impact of living in an urban area is only positive and significant in Egypt, Ethiopia and Nigeria, indicating that women living in cities are slightly more likely to be circumcised; the opposite is true for women in Senegal. Finally, being a Muslim also shows cross-country variability, negatively affecting the probability to be circumcised in Nigeria and positively in the other three countries. We may conclude that while the impact of some variables is region and country-specific, the impact of social expectations is pervasive, positive and significant everywhere. This highlights the importance of acting on social expectations to reduce FGC in countries that still practice it.

5 Discussion and Conclusions

Female circumcision is a harmful practice that violates the rights of women and children and it is mostly illegally performed around the world. In some communities it may be supported by health beliefs or norms of purity and fidelity, in others it may be a necessary prerequisite for marriageability; it may represent a traditional custom that signals group identity, or it may mark the initiation into womanhood. More research is needed at the local level to assess the drivers of FGC. Also, the existing literature shows that law enforcement and interventions are neither homogeneous nor equally efficacious across countries. The scarce availability of good data for all the countries where FGC is practiced limits the tools of the researcher who wants to investigate the causes of different dynamics of FGC across countries that still practice it. Providing a complete picture of the relationship between fundamentals and the dynamics of FGC across time is very important in order to understand what should be done to end such practice.

However, whatever the drivers might be, social expectations seem to play a crucial role in supporting the continuation of FGC. This tells us that there are behavioral interdependencies. Whether or not such interdependencies signal the presence of a social norm, and what the nature of such norm might be (marriageability, honor, purity, group identity, etc.) are beyond the scope of this study.

Our goal has been to present a general analysis of the relation between FGC dynamics and the economic, social and political conditions across African countries. The data show that, overall, economic/political/social conditions of countries that do not practice FGC are much better than those of countries that do, and that individuals living in countries practicing FGC experience a lower degree of autonomy than individuals living in countries where FGC is absent.

When we look closely at the differences across countries that do practice FGC, we find that there exists a weak, non-univocal relationship between economic/social/political development and the prevalence of FGC. We also find that prevalence decreases with increasing trust in institutions and active social participation. The prevalence of FGC increases with the degree of women discrimination, and it is also higher the stronger the social expectations supporting it. Finally, though many countries that practice FGC are prevalently Islamic, we found that there is no strong link between Islam and female circumcision. Our conclusion is that practices as traditional as FGC are not very sensitive to changes in fundamentals.

The importance of social interactions and social expectations suggest that approaches aimed at changing beliefs, attitudes and/or values directly or indirectly involving FGC can be very effective in reducing the practice. The attempts made by AMREF in Kenya (AMREF, 2014a,b), which proposes alternative rites of passage (ARP) to end FGC and improve the health and education of girls, are a good example of such approaches. Mass media (radio and Tv soap operas) could also be helpful in changing individual beliefs and attitudes (Bicchieri and McNally, 2015; Della Vigna and La Ferrara, 2016; La Ferrara, 2015; La Ferrara et al., 2012). If there are interdependencies, these interventions will inevitably also change social expectations, reinforcing the effects of social interactions.

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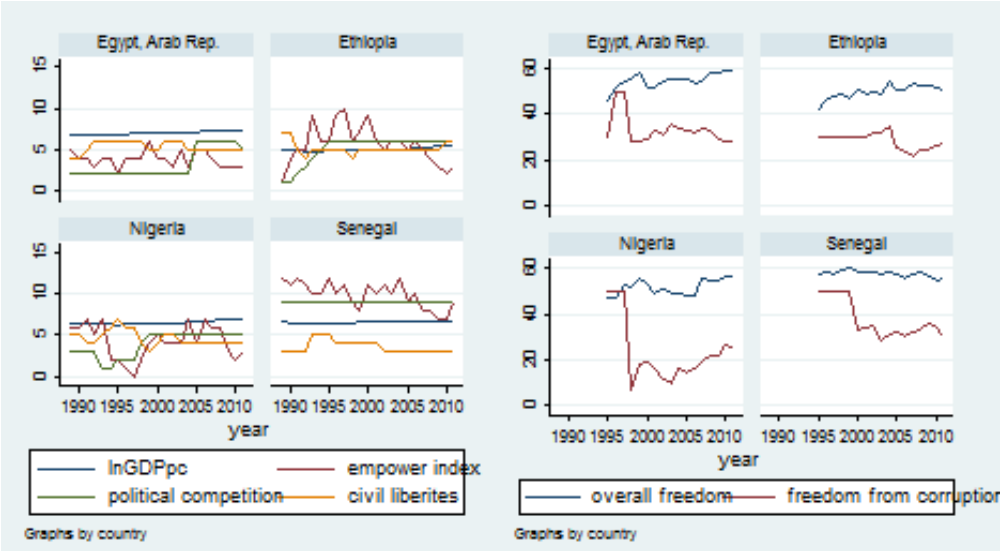
Figures and Tables

Figure 1: FGC Dynamics and Fundamentals



Source: WDI, CIRI, PolityIV, Freedom House. Years 1989-2011.

Table 1: Fundamentals for African Countries by FGC

	FGC					NO FGC				
	World Development Indicators					World Development Indicators				
Variable	**Observations**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**	**Observations**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
Service Value Added***	575	43.97	12.64	4.14	82.26	568	48.99	14.41	3.64	87.76
Industry Value Added***	575	22.01	10.19	1.88	54.97	561	33.17	16.79	5.38	80.59
Manufacture Value Added***	556	8.75	4.61	0.24	22.30	536	13.24	8.26	1.72	45.67
Agriculture Value Added***	577	34.80	14.64	3.06	93.98	561	17.76	13.69	1.16	57.22
GDP per capita***	598	502.69	274.29	50.04	1551.25	587	2592.88	2961.06	143.04	15098.62
Literacy Young Females***	460	50.17	21.33	6.90	96.06	539	82.16	16.65	30.50	99.83
Literacy Adult Females***	471	33.45	17.22	2.29	81.04	535	65.97	17.30	18.93	96.72
Tertiary Female Teachers***	386	12.31	6.77	1.23	43.93	379	24.82	13.10	4.96	55.23
	Heritage Foundation Freedom Indexes									
Overall Freedom	412	52.91	6.52	26.00	70.19	405	52.55	10.74	21.40	76.30
Freedom Corruption***	417	24.37	10.56	7.00	70.00	405	31.19	14.73	10.00	70.00
	Freedom House					**Freedom House**				
Political Rights***	617	5.06	1.59	1.00	7.00	598	4.43	2.04	1.00	7.00
Civil Liberties***	617	4.73	1.30	2.00	7.00	598	4.24	1.55	1.00	7.00
	CIRI					**CIRI**				
Physical Integrity***	598	3.87	1.96	0.00	8.00	563	4.39	2.19	0.00	8.00
Empowerment Rights***	598	6.58	2.99	0.00	14.00	563	7.47	3.61	0.00	14.00
Freedom Association***	598	0.77	0.72	0.00	2.00	563	1.00	0.82	0.00	2.00
Women Economic Rights***	598	0.88	0.50	0.00	2.00	563	1.09	0.52	0.00	3.00
Women Political Rights***	598	1.72	0.53	0.00	3.00	563	1.92	0.52	0.00	3.00
Women Social Rights***	596	0.68	0.53	0.00	2.00	563	0.80	0.67	0.00	3.00
	Polity IV					**Polity IV**				
Polity2***	617	-0.92	4.84	-9.00	8.00	552	0.54	6.26	-10.00	10.00
Political Competition***	596	5.02	2.73	1.00	10.00	552	5.56	3.16	1.00	10.00

Note : *** indicates ignificance at the 1% according to the Wilcoxon-Mann-Withney test.
Source : World Development Indicators, Heritage Foundation, Freedom House, CIRI, PolityIV. Years 1989-2011.

Table 2: Autonomy, FGC and Social Capital Correlations

Variable	Autonomy	FGM_rate	trust	trustKnown	localComm	worldCitizen	trustOtherNations	trustOtherReligions
autonomy	1.00***							
FGC_rate	-0.14***	1.00***						
trust	-0.02***	0.10***	1.00***					
trustKnown	0.00	0.15***	0.11***	1.00***				
localCommunity	0.03***	0.02***	0.01	0.04***	1.00***			
worldCitizen	0.07***	-0.13***	0.01**	-0.08***	0.21***	1.00***		
trustOtherNation	0.07***	-0.03***	0.08***	0.14***	0.04***	0.13***	1.00***	
trustOtherReligion	0.07***	0.02***	0.06***	0.14***	0.04***	0.12***	0.60***	1.00***

Note : Correlation coefficients are reported. *p<0.10, **p<0.05, ***p<0.01.

Table 3: Autonomy across African countries

Dependent Variable: autonomy	Whole Sample	FGC Countries	NO FGC Countries	FGC Women	FGC Men	NO FGC Women
	(1)	(2)	(3)	(4)	(5)	(6)
age	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
age^2	0.00*	0.00	0.00*	0.00	0.00	0.00
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
female	-0.01	0.01	-0.02***			
	(0.007)	(0.011)	(0.008)			
education High	0.04***	0.05***	0.04***	0.02	0.06***	0.05***
	(0.009)	(0.013)	(0.012)	(0.014)	(0.017)	(0.015)
education Low	-0.07***	-0.05***	-0.08***	-0.06***	-0.04***	-0.09***
	(0.009)	(0.014)	(0.012)	(0.019)	(0.014)	(0.012)
single	0.01	0.07***	-0.01	0.12***	0.01	-0.01
	(0.017)	(0.023)	(0.021)	(0.028)	(0.038)	(0.025)
married	0.02*	0.05**	0.01	0.08***	0.01	0.00
	(0.013)	(0.020)	(0.016)	(0.025)	(0.029)	(0.021)
child	0.01	0.02	0.01	0.05***	-0.01	0.00
	(0.010)	(0.014)	(0.014)	(0.025)	(0.020)	(0.015)
full-time	0.04***	0.04***	0.04***	0.06***	0.04***	0.04***
	(0.008)	(0.011)	(0.010)	(0.019)	(0.014)	(0.014)
part-time	0.02*	0.02	0.03*	0.03	0.02	0.02
	(0.013)	(0.024)	(0.015)	(0.026)	(0.034)	(0.018)
self-employed	0.03***	0.03**	0.03*	0.04	0.04**	-0.00
	(0.010)	(0.015)	(0.014)	(0.024)	(0.017)	(0.022)
CitySize	0.02**	-0.00	0.05***	0.00	-0.02	0.05**
	(0.011)	(0.013)	(0.017)	(0.015)	(0.018)	(0.022)
FGC	-0.21***					
	(0.040)					
country dummies	Yes	Yes	Yes	Yes	Yes	Yes
time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Log pseudo-Likelihood	-17,828.09	-8,464.65	-9,325.68	-4,012.93	-4,417.74	-4,721.86
Observations	31,047	14,653	16,394	6,861	7,792	8,139

Note : Estimation Method: Logit. Standard errors are robust to the heteroskedasticity and clustered by region. *p<0.10, **p<0.05, ***p<0.01.

Source : UNICEF reports (2014) and World Values Survey. Years 1989-2014.

Table 4: FGC and Fundamentals by FGC dynamics

	Decreasing FGC	Not Decreasing FGC	FGC≥50%
	(1)	(2)	(3)
Variables	FGC_rate	FGC_rate	FGC_rate
FGC_rate	1.00***	1.00***	1.00***
Service Value Added	0.27***	0.1412*	0.3536***
Industry Value Added	-0.07	-0.0736	0.1992**
Manufacture Value Added	-0.03	-0.1448**	0.2551***
Agriculture Value Added	-0.19**	0.0159	-0.3390***
GDP per capita	-0.21***	0.0453	0.3834***
Literacy Young Female	0.06	-0.4589***	0.4482***
Literacy Adult Female	0.03	-0.5487***	0.2520***
Tertiary Female Teachers	-0.10	-0.3792***	0.4294***
Physical Integrity	-0.35***	0.1362**	-0.1141
Empowerment Rights	-0.29***	0.0283	-0.2664***
Freedom Association	0.02	-0.0201	-0.2544***
Women Economic Rights	0.13*	0.1663***	-0.0791
Women Political Rights	0.10	-0.2253***	-0.2460***
Women Social Rights	0.42***	-0.0261	0.0201
Political Rights	0.46***	0.2024***	0.0885
Civil Liberties	0.49***	0.2433***	0.1173
Polity2	-0.47***	-0.1659***	-0.0722
Political Competition	-0.42***	-0.2124***	-0.1274*
Overall Freedom	-0.39***	-0.2033***	-0.1001
Freedom Corruption	0.32**	-0.0361	0.0628
trust (generalized)	-0.72***	0.4610***	-0.0417
trustKnown (personalized)	0.28	0.1581	0.6346**

Note : Correlation coefficients are reported. *p<0.10, **p<0.05, ***p<0.01.
Source : UNICEF reports (2014), World Development Indicators, CIRI, PolityIV, Heritage Foundation, Freedom House and Afrobarometer.Years 1989-2011.

Table 5: FGC dynamics, Trust and Women Conditions

Variables Labels	FGC_rate
FGC_rate	1.00***
trust	0.21*
trustKnown	0.10
trustPresident	-0.14
trustParliament	-0.17
trustPolice	-0.15
trustCourt	-0.42***
trustElectoralCommission	-0.21**
trustLocalGovernment	-0.15
trustRulingParty	-0.23**
MemberReligiousGroup	-0.50***
MemberCommunityDevelopment	0.36***
AttendCommunityMeeting	-0.46***
AttendDemo	-0.26***
RaiseIssue	-0.49***
ContactOfficial	-0.32***
ContactInfluential	-0.35***
EmpowerWomen	-0.52***
WomenTreatedUnequal(Leader)	0.90***
WomenTreatedUnequal(CourtPolice)	0.92***
WomenTreatedUnequal(Employer)	0.66***

Note: correlation coefficients are reported. *p<0.10, **p<0.05, ***p<0.01.

Source: UNICEF reports (2014) and Afrobarometer. Years 2000-2011.

Table 6: FGC and Ethnic Fractionalization: Correlations

Country Variables	FGC_rate	EthnicFract
FGC_rate	1.00***	
EthnicFract	-0.28	1.00***

Note : Correlation coefficients are reported. *p<0.10, **p<0.05,
Source : UNICEF reports (2014), Alesina et al., 2003 and Afrobarometer. Years 1989-2011.

Table 7: FGC and Beliefs: Correlations

Variable	circumcision	FGC_continue	believe_Men_continue	FGM_required_Religion	trust	trustKnown
circumcision	1.00***					
FGC_continue	0.86***	1.00***				
believe_Men_continue	0.91***	0.98***	1.00***			
FGC_required_Religion	0.90***	0.94***	0.93***	1.00***		
trust	0.13	-0.04	-0.30	-0.17	1.00***	
trustKnown	0.02	0.12	0.78*	0.38	-0.20	1.00***

Note : Correlation coefficients are reported. *p<0.10, **p<0.05, ***p<0.01.
Source : Demographic Health Surveys with information on FGM/C for available countries and Afrobarometer.Years 1989-2011.

Table 8: Social Interaction Model

	4 countries	
Dependent Variable: circumcised		
	(1)	**(2)**
age	0.01***	(0.001)
age2	-0.00***	(0.000)
urban	-0.01***	(0.002)
education	-0.02***	(0.001)
FGC_continue	0.03***	(0.007)
circumcision	0.61***	(0.004)
Islam	0.07***	(0.003)
Country Dummies	Yes	
Log pseudolikelihood	-47,811.91	
Observations	140,528	

Note : Estimation method: Logit. Column (1) reports the average partial effects at the mean. Standard errors, in parenthesis, reported in column (2), are robust to the heteroskedasticity.

Note : Demographic Health Surveys for Egypt, Ethiopia, Nigeria and Senegal.

Appendix

Table A.1 reports the countries object of the analysis, whether FGC is practiced in each country and, for countries that practice it, its dynamics.

Table A.1: List of Countries

Country	FGC	FGC Dynamics	Country	FGC
Benin	y	Decreasing	Algeria	n
Burkina Faso	y	Not Decreasing	Angola	n
Cameroon	y	Not Decreasing	Botswana	n
Central African Republic	y	Decreasing	Burundi	n
Chad	y	Not Decreasing	Cape Verde	n
Cote d'Ivoire	y	Decreasing	Comoros	n
Djibouti	y	Not Decreasing	Congo, Dem. Rep.	n
Egypt	y	Not Decreasing	Congo, Rep. of	n
Eritrea	y	Decreasing	Equatorial Guinea	n
Ethiopia	y	Decreasing	Gabon	n
Gambia	y	Not Decreasing	Lesotho	n
Ghana	y	Not Decreasing	Libya	n
Guinea	y	Not Decreasing	Madagascar	n
Guinea-Bissau	y	Not Decreasing	Malawi	n
Kenya	y	Decreasing	Mauritius	n
Liberia	y	Not Decreasing	Morocco	n
Mali	y	Not Decreasing	Mozambique	n
Mauritania	y	Not Decreasing	Namibia	n
Niger	y	Decreasing	Rwanda	n
Nigeria	y	Not Decreasing	Sao Tome and Principe	n
Senegal	y	Not Decreasing	Seychelles	n
Sierra Leone	y	Not Decreasing	South Africa	n
Somalia	y	Not Decreasing	Swaziland	n
Sudan	y	Not Decreasing	Tunisia	n
Tanzania	y	Decreasing	Zambia	n
Togo	y	Decreasing	Zimbabwe	n
Uganda	y	Not Decreasing		

Note : y indicates that the country practices FGC, n that it does not practice it.

Table A.2 lists the variables used in the paper, their definition, the source and the variables from which they have been obtained.

Table A.2: List of Variables, Definition and Sources

Variable	Definition	Source
circumcised	dummy variable taking value 1 if the woman is circumcised, 0 otherwise	Demographic Health Survey (DHS), variables (v.): s801, s802, s901, s902, s821, g102, fg103, v902, s1001, s1002, s1003, s229, s521, s551, s552, g102, s631f
circumcision	regional percentage of women that have been circumcised	DHS, v.: see circumcised
FGC_continue	regional percentage of women that think that FGC should continue	DHS, v.: fg123, g119, s830, s916, s631g, s566, s560, s1012, s1023, s816
FGC_required_Religion	regional percentage of women who think that FGC is required by religion	DHS, v.: fg122, g118, s1022
believe_Men_continue	regional percentage of women thinking that men/their husband believe that FGC should continue	DHS, v.: fg124, s924, s1024, s817
FGC_rate	variable taking value 0 for countries with no FGC, and the yearly average rate of FGC for countries practicing FGC	DHS, v.: see circumcised; UNICEF Reports (2014)
age	age of respondent (r hereafter)	DHS, v.: v012
age^2	age of r squared	DHS, v.: see age
urban	dummy variable taking value 1 if the r lives in a city, 0 otherwise	DHS, v.:v025
education	education taking values 0-3. 0 if the r has no education, 3 if the r has a higher education level	DHS, v.: v106
Islam	dummy variable taking value 1 if the r is Muslim, 0 otherwise	DHS, v.: v130
Service Value Added	service value added as percentage of GDP	World Development Indicators (WDI)
Industry Value Added	industry value added as percentage of GDP	WDI
Manufacture Value Added	manufacture value added as percentage of GDP	WDI
Agriculture Value Added	agriculture value added as percentage of GDP	WDI
GDP per capita	GDP per capita at constant prices in US$. Base year: 2005	WDI

Variable	Definition	Source
Literacy Young Females	literacy rate of young females (percentage of females aged 15-24)	WDI
Literacy Adult Females	literacy rate of adult females (percentage of females aged 15 and above)	WDI
Tertiary Female Teachers	percentage of females as teachers in tertiary education	WDI
Overall Freedom	index of overall freedom as average of the ten indexes for economic freedom scaled 0-100 (100=maximum)	Heritage Foundation (HF)
Freedom Corruption	index scaled 0-100 (100=maximum). The score is derived from transparency International's Corruption Perception Index (CPI), which measures the level of corruption	HF
Political Rights	indicator ranging from 1 to 7, 1 represents the most free in political rights, 7 the least free	Freedom House
Civil Liberties	indicator ranging from 1 to 7, 1 represents the most free in civil liberties, 7 the least free	Freedom House
Polity2	index ranging from -10 to 10. -10 indicates that the country is strongly autocratic, 10 that the country is strongly democratic	PolityIV
Political Competition	index ranging from 1 to 10 (10=highest). It measures political competition	PolityIV
Physical Integrity	index constructed from Torture, Extrajudicial killing, Political Imprisonment and Disappearance indicators. It ranges from 0 to 8. 8 means full government respect for these rights.	CIRI
Empowerment Rights	index constructed from the Foreign Movement, Domestic Movement, Freedom of Speech, Freedom of Assembly and Association, Workers' Rights, Electoral Self-Determination and Freedom of Religion indicators. It ranges from 0 to 14. 14 means a full government respect for these rights.	CIRI
Freedom Association	it ranges from 0 to 2. 2 means that the rights of citizens to assemble freely and to associate with other persons in political parties, trade unions, cultural organizations or other special interest groups were unrestricted and freely enjoyed by pratically all citizens in a given year.	CIRI
Women Economic Rights	it ranges from 0 to 3. 3 means that all or nearly all of women's economic rights were guaranteed by law and the government fully and vigorously enforces these laws in a given year.	CIRI
Women Political Rights	it ranges from 0 to 3. 3 means that women's political rights were guaranteed in both law and practice in a given year.	CIRI
Women Social Rights	it ranges from 0 to 3. 3 means that all or near all of women's social rights were guaranteed in both law and practice in a given year.	CIRI

Variable	Definition	Source
trust	dummy variable taking value 1 if r thinks that most of people can be trusted, 0 otherwise. For the Afrobarometer it is a country average based on the dummy variable.	World Values Survey (WVS), v.: a165; Afrobarometer (Afrob.), v.: sctrust, q83, q87
trustKnown	country average based on a dummy variable taking value 1 if r thinks that most of people (s)he knows can be trusted, 0 otherwise	Afrob., v.: q84b, WVS, v.: G007_33_B
trustPresident	country average based on a dummy variable taking value 1 if r thinks the Parliament can be trusted, 0 otherwise	Afrob., v.: trspre, q43a, q55a, q49a, q59a
trustParliament	country average based on a dummy variable taking value 1 if the r thinks that the parliament can be trusted, 0 otherwise	Afrob., v.: q43b, q55b, q49b, q59b
trustPolice	country average based on a dummy variable taking value 1 if r thinks the police service can be trusted, 0 otherwise	Afrob., v.: trspol, q43b, q55h, q49g, q59h
trustCourt	country average based on a dummy variable taking value 1 if r thinks that the Court of Law can be trusted, 0 otherwise	Afrob., v.: trscts, q43j, q55i, q49h, q59j
trustElectoralCommission	country average based on a dummy variable taking value 1 if r thinks that the Electoral Commission can be trusted, 0 otherwise	Afrob., v.:trsnec, q43c, q55c, q49c, q59c
trustLocalGovernment	country average based on a dummy variable taking value 1 if r thinks that Local Government can be trusted, 0 otherwise	Afrob., v.: q43e, q55d, q49d, q59e
trustRulingParty	country average based on a dummy variable taking value 1 if r thinks that Ruling Party can be trusted, 0 otherwise	Afrob., v.: q43f, q55e, q49e, q59f
MemberReligiousGroup	country average based on a dummy variable taking value 1 if r is a member of a religious group, 0 otherwise	Afrob., v.: memrel, q24a, q28a, q22a, q25a
MemberCommunityDevelopment	country average based on a dummy variable taking value 1 if r is a member of a local self-help association, 0 otherwise	Afrob., v: memdev, q24d, q28d, q22b, q25b
AttendCommunityMeeting	country average based on a dummy variable taking value 1 if r attends meetings of a group that does things for the community, 0 otherwise	Afrob., v.: parcom, q25b, q31a, q23a, q26a

Variable	Definition	Source
AttendDemo	country average based on a dummy variable taking value 1 if r has attended a demonstration or protest march, 0 otherwise	Afrob., v.: pardem, q25d, q31c, q23c, q26d
RaiseIssue	dummy variable taking value 1 if r has participated with others to address an important problem affecting the community or nation (other than elections), 0 otherwise	Afrob., v.: pariss, q25c, q31b, q23b, q26b
ContactOfficial	country average based on a dummy variable taking value 1 if r, in the past, has contacted a government or a political party official about some important problem or to give them his/her views	Afrob., v.: parctg, q29b, q29c, q32b, q32c, q25b, q25c, q30b, q30c
ContactInfluential	country average based on a dummy variable taking value 1 if r, in the past, has contacted an influencial person, such as church or community leader about some important problem or to give them his/her view	Afrob., v.: parcti, q29b, q29g, q32g, q27c,
WomenTreatedUnequal(Employer)	country average based on a dummy variable taking value 1 if r thinks that women are deserved an unequal treatment by the empoyer, 0 otherwise	Afrob., v.: q56e
WomenTreatedUnequal(CourtPolice)	country average based on a dummy variable taking value 1 if r thinks that women are deserved an unequal treatment by the court or the police, 0	Afrob., v.: q56d
WomenTreatedUnequal(leader)	country average based on a dummy variable taking value 1 if r thinks that women are deserved an unequal treatment by a leader, 0 otherwise	Afrob., v.: q56c
EmpowerWomen	dummy variable taking value 1 if r thinks that the present government is handling well with empowering of women, 0 otherwise	Afrob., v.: q67, q57p, q65p
EthnicFract	index of ethnic fractionalization	Alesina et al., 2003
autonomy	dummy variable taking value 1 if r's control on her/his own life is 6 or more on a sclae of 10, 0	WVS, v.: a173
localCommunity	dummy variable taking value 1 if the r declares (s)he feels to be citizen of a local community, 0 otherwise	WVS, v.: G020
age	age of r	WVS, v.: X003
age^2	age of r squared	WVS, v.: see age
worldCitizen	dummy variable taking value 1 if the r declares (s)he feels to be citizen of the world, 0 otherwise	WVS, v.: G019
trustOtherNation	dummy variable taking value 1 if the r declares (s)he trust individuals from other nations, 0 otherwise	WVS, v.: G007_36_B
trustOtherReligion	dummy variable taking value 1 if the r declares (s)he trust individuals from other religions, 0 otherwise	WVS, v.: G007_35_B
education High	dummy variable taking value 1 if r has tertiary level education, 0 otherwise	WVS, v.: X025

Variable	Definition	Source
female	dummy variable taking value 1 if r is female, 0 otherwise	WVS, v.: X001
single	dummy variable taking value 1 if r is single or never married, 0 otherwise	WVS, v.: X007
married	dummy variable taking value 1 if r is married or living together, 0 otherwise	WVS, v.: X007
child	dummy variable taking value 1 if r has children, 0 otherwise	WVS, v.: X011
CitySize	dummy variable taking value 1 if r is living in a city with more than 100,000 inhabitants, 0 otherwise	WVS, v.: X049
full-time	dummy variable taking value 1 if r is working full-time, 0 otherwise	WVS, v.: X028
part-time	dummy variable taking value 1 if r is working part-time, 0 otherwise	WVS, v.: X028
self-employed	dummy variable taking value 1 if r is self-employed, 0 otherwise	WVS, v.: X028
FGC	dummy variable taking value 1 if the country r is living in practice FGC, 0 otherwise	UNICEF reports, 2013 and 2014