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The Contribution of African Women to Economic Growth and Development in Post-Colonial Africa

Historical Perspectives and Policy Implications

Emmanuel Akyeampong
Hippolyte Fofack

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Abstract

This paper draws on history, anthropology, and economics to examine the dynamics and extent of women's contribution to growth and economic development in post-colonial Africa. The paper investigates the paradox of increased female enrollment in education and the persistence of gender discrimination in labor force participation; it also considers the overwhelming importance of the informal economy in female economic activity. The first axis the paper studies is whether reducing educational gender gaps enhances growth in per capita gross domestic product and reduces female fertility rates and infant mortality. The question is, why would some African countries resist this pattern? The second axis examines agriculture and home production. Women's economic activities in the informal economy largely represent the commercialization of domestic skills and dependence on social networks. The shunting of female production to the informal sector in the male-dominated colonial economy is easy to understand, but why has the informal economy persisted where female production is concerned well beyond the colonial period? The paper attempts to explain these trajectories by using country case studies on Senegal, Botswana, and Kenya. Although women's contribution to growth and economic development seems to be positive and significant in predominantly Christian and mineral-rich economies, it is more constrained in pronounced Muslim dominated countries and agrarian economies. At the same time, impressive uniform growth in informal sector production in recent years suggests that occupational job segregation and gender inequality remain strong across the region, despite the apparent loosening of traditional norms and cultural beliefs, most notably illustrated by the reduction in educational gender gaps and increased female labor force participation rates.

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The Contribution of African Women to Economic Growth and Development in Post-Colonial Africa: Historical Perspectives and Policy Implications

Emmanuel Akyeampong (Harvard University)

Hippolyte Fofack (The World Bank) [1]

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I Introduction

The majority of studies that have investigated the costs of gender inequality for growth and economic development in developing countries have primarily attributed gender-based inequality to the persistence of traditional norms and cultural values—the sticky domain of gender-based discrimination [Esteve-Volart (2004), Baah-Boateng (2009), World Bank (2012)].[2] The traditional norms singled out as drivers of gender inequality often comprise of a set of unwritten rules and beliefs which influence and shape expectations and behaviors of economic agents (both male and female) in a given country or community. In practice, these rules and beliefs tend to confine women's responsibility in society and define attributes of '*accepted*' behaviors. Some of these '*accepted*' behaviors include norms around the role of women as caregivers, housewives and mothers, legal restriction on their mobility for protective reasons, lower age of marriage which in the long run may affect women's bargaining power within the household and acceptance of differential wage rates [World Bank (2012)].

In contrast, the same level of attention has not been given to the potential adverse effects of colonial constructs on gender inequality and growth in the realm of economic analysis in Africa, although colonial policies which emphasized export production and encouraged market over non-market production further marginalized women in the region, restricting their contribution to subsistence agriculture and home production.[3] In the process, these policies affected the traditional (social and cultural) norms either directly or indirectly [Boserup (1970), Akyeampong and Fofack (2012)]. In particular, the interaction between socio-cultural norms and colonial constructs further constrain women's participation and contribution to economic development outside the household as illustrated by the continued low female labor force participation rates in the region [World Bank (2012)].

One of the few studies that examine this interaction is the recent work by Akyeampong and Fofack (2012). That study examined the historical processes by which female labor was appropriated in production in pre-colonial Africa through the structures of kinship; dynamics that gained coherence and depth through missionary and colonial education, the codification of customary and Islamic law under colonial rule, and the male bias in colonial economies based on agriculture, commerce and mining. They shed light on the "capture" of female labor, and the processes by which women's economic contribution became subsumed under the category of household production and their labor formally unaccounted for in national accounts. In this regard, the study provides a context in which the informal economy came to frame women's production in the colonial period.

This second installment which covers the post-colonial era has the same objective: deepening the understanding of gender and development dynamics in post-colonial Africa in critical areas which have received less attention, drawing on both historical and anthropological accounts and data

[2] For instance a qualitative survey carried out in 19 countries on gender and economic choice within the context of the World Bank flagship report WDR 2012 consistently singles out social norms as the most binding constraint on women's physical mobility, ahead of public safety [World Bank (2012)].

[3] "Colonial constructs" encompass assumptions and positions of imperial powers that gained force or reality in the colonial setting through policies and institutions. A classic example was the British conviction that all Africans were organized into "tribes", were rural, and could only be governed by customary law. This then became the basis of the colonial policy of Indirect Rule, and informed the British view that Africans who were educated and lived in towns were aberrant or atypical, hence "detribalized" [Hobsbawm and Ranger (1983), Mamdani (1996)]. Or, the colonial assumption that African societies, were patriarchal like European societies, and that women were subordinate with no political role [Chanock (1985), Saidi (2010)]. Constructs were artificial or reifications that gained significant force through operationalization.

analysis. In particular, it provides a comprehensive analysis of the dynamics of the changing nature of social and cultural norms in the region and how these changes are interacting with gender inequality and economic development over time, taking into account a number of key parameters of the colonial economy—the structure of production (agriculture versus natural resources), origins of the colonial institutions (French versus English), typology of decolonization (peaceful versus violent) and religion. In addition the paper addresses the asymmetry in the treatment of constraints to gender equality observed in the literature in recent years by analyzing the dynamic interaction of resilient socio-cultural norms and colonial constructs, as well as their interplay with gender inequality and growth in the post-independence era.

This research does indeed reveal that social and cultural norms are well the 'sticky domain' of gender and development in the region. Despite the increasing commitment of numerous governments to gender inclusion, there are a number of traditional norms which clearly adversely affected gender equality in the colonial period and continue to constrain women's access to economic opportunities, and hence their overall contribution to growth and economic development at the national level. This is particularly the case in rural Africa where the sexual division of labor has confined women's production to the subsistence agricultural sector, consistent with both traditional norms which have sought to reduce women's mobility and colonial constructs which established a distinction between subsistence and export crops, with the latter being the preserve of men [Fofack (2013)]. The strengthening of patriarchy under colonial rule has also limited access of women to arable land, often pushing them onto lands with marginal fertility [Goldstein and Udry (2005)]. In urban areas, women have used the booming informal sector as a sub-optimal alternative to the persistence of barriers to their accession to formal wage employment.

At the same time, the rapid increase of informal economic transactions carried out by women suggest that they are increasingly escaping the household domain—due in part to loosening in some aspects of the traditional norms—and in the process increasing their contribution to growth and economic development. However, even where changes in traditional norms have occurred the process has been very slow, with important variations across countries. For instance changes leading to increased mobility of women and their participation in the market place have been stronger in settler economies and Christian environments than elsewhere. In these two contexts the rate of female labor force participation has increased by more than fivefold since independence. On the other hand, invariance in the structure of African economies, which remain commodity-dependent, especially the non-settler economies, has continued to stifle the participation of women in formal wage employment in the region, suggesting that colonial constructs may be even stickier than traditional norms in the region.

The rest of the paper is organized as follows. Section II reviews the literature on gender inequality and growth in post-colonial Africa. The review emphasizes the importance of raising the stock of female human capital, and the impact of increased female education on growth. We build on insights from the literature review and advance our understanding by drawing on data to illustrate through diagrammatic spider webs the pattern of gender inequality in education and labor force participation in sub-Saharan Africa. The data suggests that while women’s contribution to growth and economic development seems to be positive and significant in predominantly Christian and mineral-rich economies between 1970 and 2010, it has been more constrained in pronounced Muslim dominated countries and agrarian economies. Yet agricultural economies have lower educational gender gap than natural resource-rich countries. Also evident is a persistent educational gender gap between former French and English colonies. Section III draws on history and the social sciences to explain the patterns discerned from the data in section II. We then offer three country case studies – Senegal, Kenya and Botswana – which capture the dynamics observed in the spider webs: French versus

British colonialism, Muslim versus Christian populations, mineral-rich versus agricultural economies, peasant versus former settler colonies, and peaceful versus violent decolonization. Section IV offers our reflections on the changing nature of the informal economy in Sub-Saharan Africa and why it persists as the dominant site of female economic production. Section V provides an analytical framework on gender and economic growth in Sub-Saharan Africa based on panel growth regression, and section VI presents the empirical results. Section VII contains our conclusions and their policy implications.

II Gender Inequality and Growth: Insights from the Literature and Data

This section provides a literature review of the interaction between gender inequality and growth. We go beyond the literature to suggest intriguing patterns in Sub-Saharan Africa based on data analyses. The review particularly focuses on some of the most binding constraints to gender equality and women's contribution to growth and economic development in post-colonial Africa. Although these constraints are numerous, including social norms and residuals from colonial constructs, most studies investigating the dynamics of gender inequality and growth have approached the subject from the human development and labor force participation angle [Dollar and Gatti (1999), Kanbur (2002), Cooray and Potrafke (2011)].

In part, this choice reflects the fact that in mainstream economic theory, labor and education, which are often viewed as important aspects of human development enter the production function with a positive coefficient [Dollar and Gatti (1999)]. Higher education levels are expected to translate into higher human capital endowment, and hence economic growth through increased productivity of labor. At the same time, increasing girls' enrollment rates and reducing educational gender gaps also come with intergenerational benefits with potentially significant implications for long-run growth and health outcomes.

In this regard, it is not surprising that the majority of studies have concluded that increasing female enrollment rates and reducing educational gender gaps are growth-enhancing [Dollar and Gatti (1999), Knowles et al. (2002), Klasen (2002), Baliamoune-Lutz and McGillivray (2009)].[4] In two of the most recent empirical studies focusing on Sub-Saharan Africa, Baliamoune-Lutz and McGillivray (2009) use Arellano-Bond GMM specification to show that gender inequality in literacy has a statistically significant and negative effect on growth; in a related vein using growth accounting, Fofack (2012) shows that raising the stock of female human capital is growth-enhancing and could increase per capita GDP growth by more than half a percentage point during growth spurts.

A cross-section of studies with a larger geographical coverage has produced concordant results. Hill and King (1995) find that in countries whose ratio of female-to-male enrollments in primary or secondary schooling is less than 0.75, GNP is 25 percent lower than in countries that are otherwise similar except for gender gaps in education. Dollar and Gatti (1999) show that persistent gender inequalities in education are not only an inefficient economic choice, but also bad for economic

[4] Among the few studies, which concluded otherwise, one of the most cited is Barro and Sala-i-Martin (1995). The coefficient associated with female education is negative under these two studies, though this result was rejected on the grounds of econometric problems [Knowles et al. (2002)].

growth. Applying least squares estimations on data from developed and developing countries, Klasen (2002) shows that gender inequality in education has a direct negative effect on growth by reducing human capital endowment, and indirect adverse effects through population growth and investment.

Besides its direct effects on economic growth, increasing female enrollment rates and reducing educational gender gaps also entail other indirect benefits, including reduction of under-five mortality rates through improved mother and child health and reduction of fertility rates [Klasen (2002)].[5] For instance, female education often translates into reduction of fertility rates, most notably through the quantity-quality substitution in reproductive outcomes, a behavioral shift that may in turn lower dependency ratios and ultimately raise per capita income. Female education is also thought to increase women's bargaining power at the household level, and could in some cases have stronger effects on fertility than income [Basu (2002)].[6]

For all these potential benefits (both direct and indirect) the literature on gender inequality and growth has emphasized education as the natural path to women's economic empowerment and growth. But if reducing educational gender gaps and increasing female human capital endowment is so critical for growth, then why has the convergence to gender parity in primary and secondary education been so slow in the majority of poverty-stricken Sub-Saharan African countries striving to enter a robust and strong growth regime? Several possible explanations are provided by existing studies, including culture, religion and market failures [Dollar and Gatti (1999), Cooray and Potrafke (2011)].

As the leading proponents of the market failure argument on the supply side, Dollar and Gatti (1999) argue that the negative association between economic growth and gender inequality in education (whereby increases in income lowers gender inequality) suggests that there may be market failures that hinder investment in girls' education, especially in developing countries. On the demand side, a study conducted by the World Bank in 2001 establishes that girls' education is more sensitive to distance to school, school quality and to costs than demand for boys' education.

The costs benefits analysis argument has been drawn upon heavily to explain the persistency of educational gender gaps. In particular, the proponents of that line of thought have argued that in a budget constraint environment lower returns from girls' schooling may justify households' rationing investments in girls' education [Gertler and Alderman (1989)].[7] However, available evidence does not always support the view that lower investment in girls' education is economically efficient [Schultz (1993)]. Moreover, educational gender gaps remain substantial in Sub-Saharan Africa, even after controlling for stage of development and household income.

[5] Although these indirect benefits of female education for growth are important and significant in the long run, this paper emphasizes the direct and short-to-medium term benefits.

[6] At the same time, there is some empirical evidence that the positive effect of female education on the enrollment of children may be greater than that of male [Filmer (1999)].

[7] In the African context characterized by absence of formal social safety nets, returns to schooling exceed the economic sphere of income and wage employment in the formal sector. They also include social returns as parents in traditional societies may still expect more direct benefits from investing in sons.

For illustration, figure 1 below depicts the variations in educational gender gaps and female primary enrollment rates for a cross-section of countries along several dimensions: predominantly Muslim versus Christian nations, violent decolonization versus peaceful decolonization, Anglophone versus Francophone, settler versus non-settler economies, natural resource-rich versus agrarian economies. Estimates are educational gender gaps, primary enrollment rates and gender gaps in labor force participation rates averaged over the reference period (1970-2010). The first row covers a sub-sample of low-income countries (average GDP per capita in constant US$2000 less than or equal to US$866); the second row includes relatively higher income countries, with average GDP per capita above the Sub-Saharan African average. Estimates in the last row include all countries in the sample.

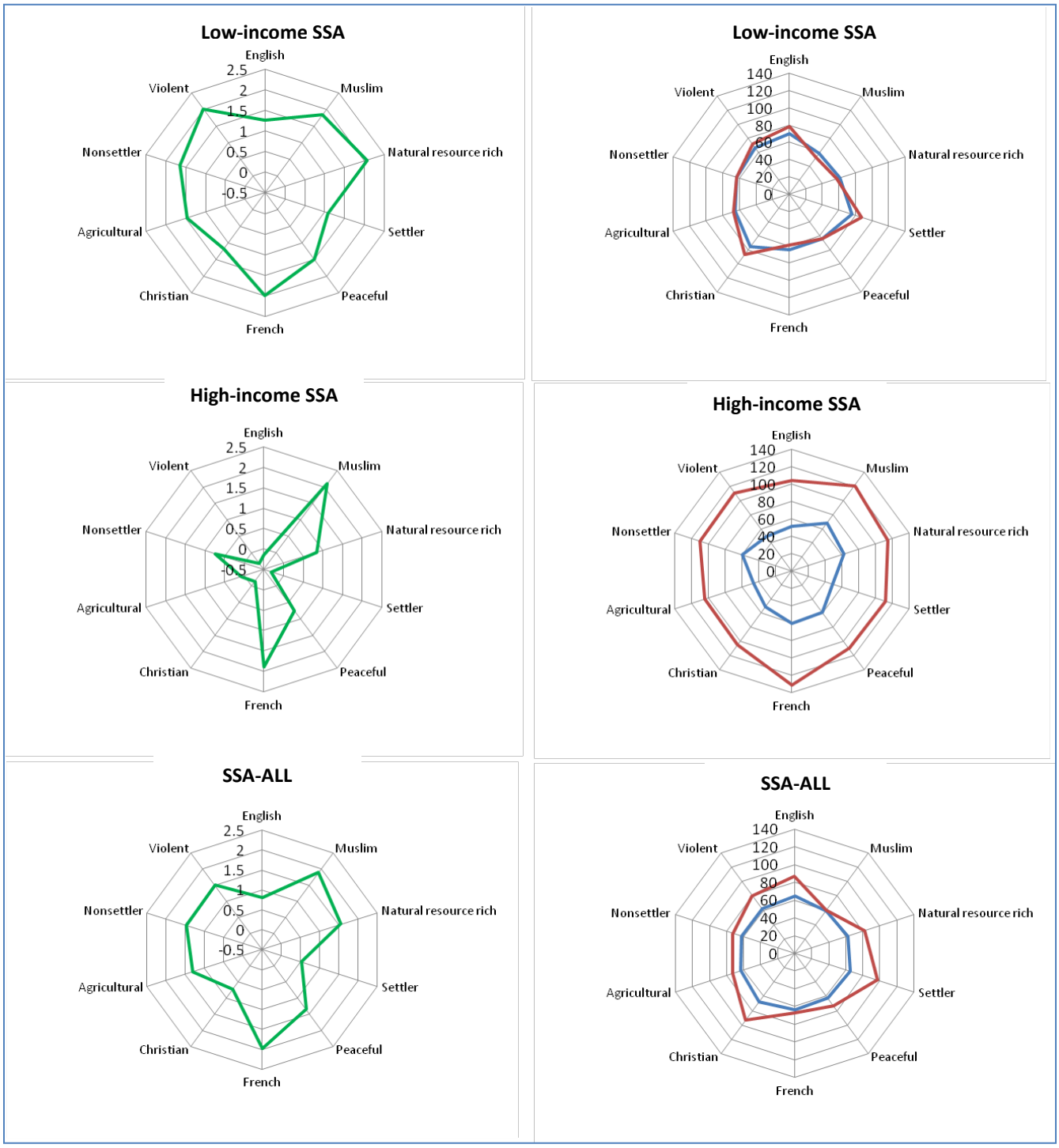
Educational gender gaps are consistent on any of the two dimensional vectors in the left panel of figure 1, irrespective of the stage of development. For instance, a focus on the religious dimension shows that educational gender gaps are consistently higher in predominantly Muslim nations than in Christian nations in the region. Controlling for stage of development also shows that the gap is more pronounced in poorer countries. This is most notably illustrated by the much larger estimates in predominantly Muslim nations, with a relatively high income. Similarly, controlling for the origins of colonial institutions, educational gender gaps are more pronounced in the former French colonies than in the former English colonies, both in the relatively low and high income countries.

Also interesting and worth mentioning is the contrast between natural resource-rich and predominantly agrarian economies. It may appear surprising that predominantly agricultural-based economies have a lower educational gender gap than natural resource-rich countries, though they also enjoy lower per capita income on average. At the same time, educational gender gaps are more pronounced on this vector at the lower end of the income distribution (as shown by the contrast between first and second panel), suggesting that stage of development may also affect prospects for girls' education, in addition to the typology of employment (drivers of aggregate output growth).

The persistence of educational gender gaps along the different dimensions clearly suggests that there may be other critical factors driving gender inequalities in Sub-Saharan Africa besides market failures. Some of these critical factors include social norms, cultural and religious beliefs and the legacy from colonial constructs. Although latent and refractory, the changes in social norms can be very effective with profound transformational effects. For instance, highlighting the potential adverse effects of social norms for gender inequality, Fernandez et al. (2004) establish that sons who are raised by working mothers tend to be more supportive of a working wife, suggesting that changing social norms may actually enhance gender equality more effectively across generations.

In addition to educational gender gaps, studies assessing the dynamics of gender inequalities and growth have also been based on labor force participation rates, with emphasis on differential wage gaps and labor force participation rates, both included in models as possible drivers of economic growth [Hill and King (1995), Klasen (1999), Fofack (2012)]. For instance, using growth regression, Klasen (1999) finds that gender inequality in employment negatively impacts growth in South Asia and Sub-Saharan Africa, with the latter suffering losses of 0.3 percent per year compared to East Asia's overall economic growth rates.

Figure 1: Pattern of gender inequality in education and labor force participation in Sub-Saharan Africa (SSA)



Sources: Sources: Authors' calculations based on World Development Indicators, World Bank (2012)

Spider webs in the right panel of Figure 1 compare gender gaps in labor force participation with gaps in primary enrollments along the different two-dimensional vectors. Irrespective of the stage of development, gender gaps in labor force participation is consistently smaller than gender gaps in primary enrollments, with the latter emerging as more sensitive to the stage of development. However, in a context of an increasingly larger pool of skilled labor, especially among the male population, the lower gender gap in labor force participation and invariance to stage of development may reflect constraints in the demand side, especially in the face of excess supply of labor and high unemployment rates.

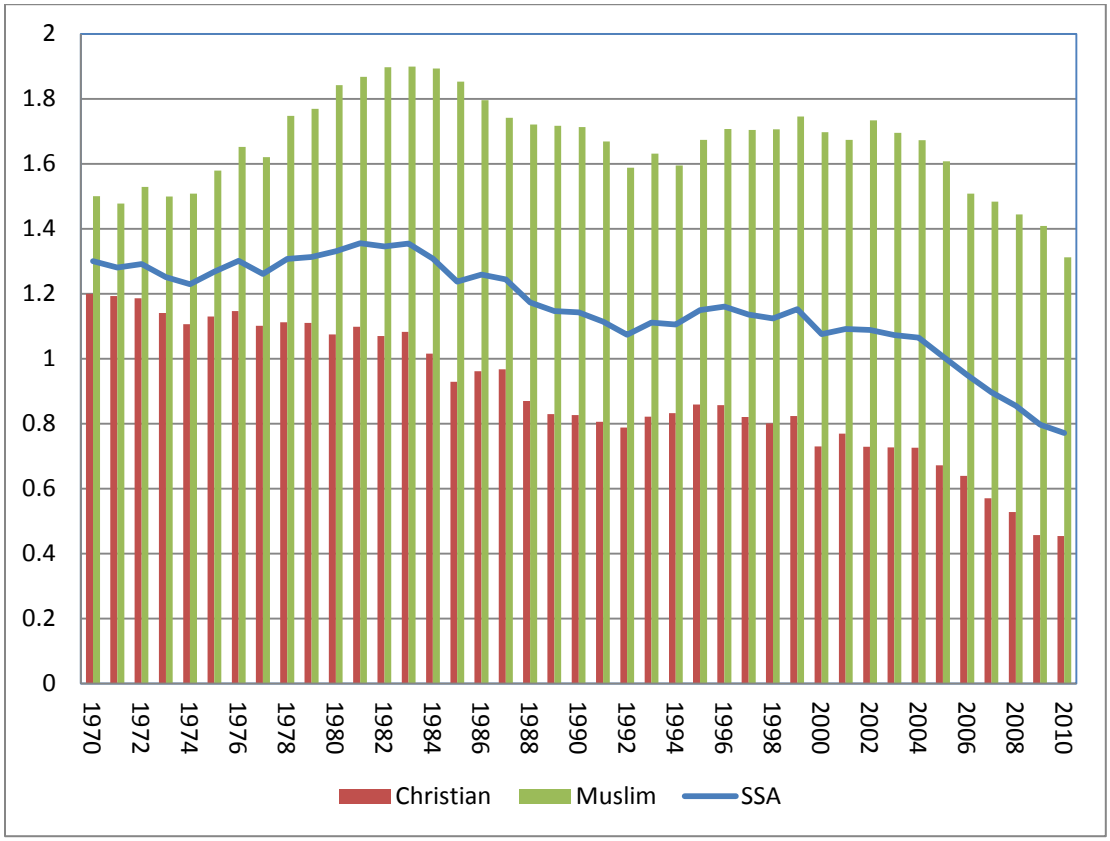
Still, the emphasis on these two variables (labor force participation and educational gender gaps) is dictated by measurement challenges: design of household surveys and unitary model frameworks make it difficult to account for intra-household resource allocation; production functions have labor and capital as key factor inputs. They also relate to the difficulties associated with quantifying some of the social norms and cultural beliefs for inclusion in neo-classical growth models.

A number of studies have attempted to account for qualitative constraints by including dummies in regression models. For instance, Cooray and Potrafke (2011) show that culture and religion matters more for gender equality than political institutions. Norton and Tomal (2009) also show that religion influences gender equality in education. However, the association between religious beliefs or other social norms and growth tells us very little about the stickiness of these social norms and colonial constructs and inherently about their long-term effects for gender inequality and growth in the region.

In effect, a long-term trend of educational gender gaps plotted on the religious vector (assuming the prominence of Islam and Christianity in the majority of countries) in the region shows the persistence of gender gap between predominantly Christian and Muslim nations, despite the overall narrowing gap across the board (see Figure 2). In effect, despite the increasing female enrollment rates in the region, especially in primary enrollments, there is a persistent or widening educational gender gap between former English and French colonies, between predominantly Christian and Muslim nations and between agricultural and natural resource-rich economies. These empirical results suggest that there may be other underlying factors at play, adversely affecting girls' education and labor force participation either directly or indirectly.

Drawing on the historical insights from Akyeampong and Fofack (2012), the next section interrogates these factors and discusses the sources of variations and extent to which they are still inhibiting the contribution of women to growth in post-colonial Africa. It also draws on historical and anthropological records to explain why some of the social norms and religious beliefs have emerged as stickier in predominantly Muslim and French-speaking countries than in predominantly Christian and English-speaking countries, especially given the critical role played by the state in standardizing education in French colonies and enhancing access to formal education [Akyeampong and Fofack (2012)].

Figure 2: Long-term trend educational gender gaps in Sub-Saharan Africa



Sources: Authors' calculations based on World Development Indicators, World Bank (2012).

III Explaining Persistent Gender Gaps: Insights from History and Anthropology

The literature review on gender inequality and growth and the discernible patterns in the spider webs (figure 1) highlight key distinctions in educational gender gaps in Muslim and Christian countries, which intriguingly map onto differences between former French and British colonies as well. A second important observation is the extent to which agricultural-based economies have lower educational gender gap than natural-rich resource countries, even though they have a lower per capita income on average. A third key observation is about how culture and religion might matter more for gender equality than political institutions.

Though Islam values female education, as the case of Nana Asmau, daughter of the 19th century jihadist in northern Nigeria Usman dan Fodio, exemplifies [Mack and Boyd (2000)], many obstacles existed to girl-child education in Muslim societies. Akyeampong and Fofack (2012: 25) note how the length of time required for the acquisition of knowledge and experiences to become an educated Muslim scholar did not accommodate the social status of females, who were expected to be married off by the end of their teenage years. The life of the pre-colonial itinerant cleric and scholar was certainly not amenable to societal expectations of women. Hence traders, clerics and, in the colonial

period, the Muslim assessors attached to colonial courts were all men. Islamic piety also demanded female seclusion. Though this did not necessarily subvert female access to education, it restricted female access to the public realm and to employment, reducing the incentive for fathers to educate daughters.

In the scramble for Africa, France occupied much of Muslim north and West Africa, and by the 1930s and 1940s France had come to see itself as a great Islamic power [Harrison (1988), Prochaska (1990), Robinson (2000)]. Whereas the experience of colonial imposition in Algeria had prepared France for a politicized and radical Islam in West Africa, France soon found paths to accommodation in its relations with Muslims in West Africa [Robinson (2000)]. The French colonial government came to see the Mouride Brotherhood in Senegal, for example, as a force for economic good in its commitment to the groundnut industry and for social order [Cruise O'Brien (1986), Babou (2007)].

It is in this context that patriarchal alliances were struck between colonial officials and Muslim men to the detriment of women in Muslim societies. Diane Barthel (1985) has argued for French West Africa that colonial governments generally neglected girls' education in the interwar period because it proved alienating to Muslim men. She comments on how in the consolidation of colonial authority, "women's education and marital rights were easy sacrifices for larger political gains" [Barthel (1985): 142]. Hence, the instructive pattern that educational gender gaps are more pronounced in former French colonies than in former British colonies, despite the observation in Akyeampong and Fofack (2012) that France sought to free colonial education from missionary control and to give colonial education "greater precision of objective and unity of method" [Hailey (1957): 1135]. The overlap between French colonies and Muslim lands partly explains this pattern.

We also noted that agricultural societies exhibited a lower educational gender gap than natural resource-rich or mineral-rich countries. Female labor has been historically important to agriculture in Africa. Robertson and Klein (1983) pointed out how most slaves in pre-colonial Africa were female, valued for production and reproduction. Akyeampong and Fofack (2012) also noted how in planting cultures females provided the main labor force, using primarily the hoe as an implement of cultivation, and matriliny tended to be a prominent feature of these societies [Boserup (1970), Goody (1976), Meillassoux (1981)]. This integral role of women in production in agricultural-based societies perhaps gave them more of a voice in household decisions on educating daughters.

Robertson (1984) commented in her case study of Ga women fish traders in Accra on how these women, who drew on female networks based on the residential segregation of housing by sex in traditional Ga society, invested in the education of their daughters as a means of adding value to their worth and diversifying the economic opportunities of their daughters and female dependents. Mineral resources, either diamonds or petroleum, have lent themselves to easy control by local male elites as a comprador class, and often depend on specialized technologies and heavy external investment at both the prospecting and extracting phases compared to the hoe in planting agriculture. Thus, even when mineral-rich countries may have a higher per capita income on average, gender relations may not empower women, hence the lower educational gender gap in these countries.

However, the much higher prevalence of gender inequality in natural resource-rich countries in the post-colonial period is not specific to Sub-Saharan Africa. Increasingly, there is a body of work at the theoretical and empirical level suggesting that natural resource endowment may adversely affect female labor force participation in developing countries, both in middle- and low-income countries [Frederiksen (2007), Ross (2008)].[8] For instance, in a study based on global data on natural resource and female labor force participation rates, Ross (2008) finds that when growth is largely driven by oil and mineral extraction, it discourages women from entering the labor force and tends to accentuate gender inequalities in the Middle East and North Africa region.

We noted above the observation by Cooray and Potrafke (2011) that culture and religion may matter more than political institutions where gender equality is concerned. For example, religion may influence the choice of education. Even in the United States, Evangelical Christians may opt for denominational schools, Catholics for parochial schools, and so on. In Accra, not known to be a Muslim city, Muslim parents complement formal school in the state education system with informal private Muslim schooling on weekends. The unwillingness of many Muslim parents to send their wards to "Western" state schools in Ghana inspired the creation of the Islamic Education Unit in the Ghana Education Service in 1987. Islamic proprietors of Quranic schools had proved resistant to the introduction of secular subjects for fear that this would threaten their authority and proprietorship. Headed by a prominent Muslim scholar, the Islamic Education Unit introduced the secular subjects pursued under the national curriculum to the Islamic schools. In spite of notable achievements, the gender bias remains in the statistics of Muslim education into the 1990s and 2000s with girls accounting for a fraction of total school enrollment. The life histories collected for this study emphasized the hurdles, especially parental bias, some of the female subjects had to overcome to obtain an education [Owusu-Ansah, Iddrisu and Sey, (2013)].

Let us now apply our insights to our specific case studies of Senegal, Kenya and Botswana. These three countries present various features that enable us to interrogate the impact on gender of French versus British colonialism, predominantly Muslim versus predominantly Christian populations, mineral-rich (Botswana) versus agriculture-based economies (Senegal and Kenya), peasant versus settler colonies, and peaceful versus violent decolonization (Kenya). Writing in 1986, Claire Robertson had argued that the largely agrarian nature of African economies before 1980 made female education, especially at the primary level, more detrimental to women's productivity, as it detracted from farm labor and yet was inadequate to equip women as skilled labor for other economic sectors. In her opinion, female education as it existed inadvertently reinforced the structures of female subordination.

Africa has witnessed significant urbanization since 1980, while the ranks of women with access to higher education have increased. What has been the qualitative impact of these transformations on our three case studies? Has urbanization reduced the negative effects of girls schooling on rural domestic economies? Has secondary and tertiary education for women translated into jobs in the formal economy? What role does the informal economy still play in women's economic activities,

[8] At the theoretical level, these studies are based on a modified version of Dutch Disease models, which take into account gender-based segregation in the labor force.

especially after 1980, and its relationship to the formal economy? These questions are examined in the country case studies and in the reflections in section 4.

Republic of Senegal

Senegal gained its political independence in 1960 with a group of former French colonies who all received independence from France that year. Its association with France goes back to the 17th century, when the French fortified Saint Louis as a trading post. Saint Louis would become the colonial capital, while Dakar became in 1895 the administrative capital of the newly created Afrique Occidentale Francaise (Federation of French West Africa). Its population comprised four ethnic majorities: Wolof, Pulaar, Serer, and Diola.

Of all the former French colonies, it was in Senegal that the French colonial policy of Assimilation was earnestly pursued, especially in regard to the four communes of Saint Louis, Gorée, Rufisque and Dakar. From 1871, these municipalities sent a delegate to the French legislature. Senegal is regarded as the only African colony in which France made a determined attempt to educate the natives, and many colonial subjects within the federation in West Africa went to Senegal to receive their education. Yet, in 1988, it was estimated that only about 26.9 percent was literate in French, the official language, though this had increased to 49.7 percent in 2006 according to UNESCO figures.[9] On independence in 1960 Senegal's population stood at about three million. This had more than doubled in 1990 to 7.3 million, and in 2011 Senegal's recorded population was 12.7 million [UNDP (2012)].

From a colonial economy based on groundnut exports, desiccation has seriously undermined the Senegalese groundnut economy, and the country now relies heavily on donor assistance, with external aid accounting for about 7.6% of GDP and over 26% of budget. Senegal's key export industries today are fertilizer production, phosphate mining, and commercial fishing. The last has also been undercut by international commercial trawlers, endangering the artisan marine fishing industry. Senegal is the most westernmost country in Africa, encouraging attempts to cross by sea into southern Europe. Rural impoverishment with the decline in farming has also encouraged rural-urban migration, and a 2011 estimate put 43 percent of Senegal's population as urban [World Bank (2011)]. The last couple of decades have witnessed increasing numbers of women moving into urban areas to work as traders or home producers in the informal sector [Echevin and Murtin (2009)]. Informal sector employment accounted for 76 percent of non-agriculture employment in Senegal between 1980 and 1984 [Charmes (2009)]. Women tend to outnumber men as workers in the informal sector, and recent statistics from Senegal indicate that about 44.8% of informal sector workers are female, while only 27% of formal sector workers are male.[10]

Western education in Senegal extends back to the mid-nineteenth century, when the first schools were set up by missionaries under Governor Louis Faidherbe to train sons of African chiefs to become loyal subjects of empire. Female education came onto the colonial agenda only from the

[9] Available at UNESCO website: stats.uis.unesco.org.
[10] Personal Communication, World Bank Senegal Office, June 3, 2013.

1920s, when the increasing ranks of educated African men raised the question of educated African wives [Schulman (1992)]. Women's education from the onset, then, was tied to the issues of social and biological reproduction. The training of midwives (sage-femmes) at the colonial medical school in Dakar from 1918 was not divorced from this larger agenda. When the colonial government opened the Ecole Normale des Jeune Filles at Rufisque in 1938 to provide an elitist education for African women in French Sub-Saharan Africa, it was with the aim of social reproduction.

Senegal's female:male school enrollment ratio for 1980 was 21:34, very favorable when compared to Guinea Bissau's 37:83 or Togo's 53:99, but unimpressive compared to rates in southern Africa, where female enrollment outpaced male [see Botswana below, Robertson (1986)]. In 2010, 59% of female children and 58% of male children in Senegal were in primary school, and 16% of female youth and 20% of male youth were in high school [UNICEF (2012)]. While Senegalese women have progressed in terms of access to schooling, they remain behind their male counterparts at the secondary school level with sharper disparities in rural areas [Sutherland-Addy (2008): 11]. Michelle Kuenzi (2006) established that most Senegalese still have limited access to formal education and 72% of all women were illiterate. But she highlighted how access to basic numeracy and literacy skills through adult education translates into stronger political participation—voice and agency—in Senegal.

Her study suggests that in terms of self-efficacy and democratic engagement, non-formal educational programs for adults might be more empowering than formal education for youth. The work of historians and sociologists also attest that where highly educated women are concerned, at the elite end of secondary and tertiary education, their visions of development have been rooted in their productive (public and economic) as well as reproductive roles with evidence of entrepreneurship. This is clear from Barthel's work in Dakar in the 1970s with Senegalese women in the teaching and health professions [Barthel (1985)].

In a recent study on pharmacies in Senegal, Patterson (2012: 111) found that women owned 65% of 240 pharmacies in Dakar and 48% of 517 pharmacies throughout Senegal. This remarkable statistics can be traced to the opening of a School of African Medicine for French West Africa in Dakar in 1918 for formal medical training. This school later developed into the School of Medicine and Pharmacy. Though designed with males in mind, the products of this school from the 1940s included talented females from the Ecole Normale des Jeunes Filles, which, as we have seen above, was established in Rufisque in 1938. By the late 1970s, women made up 52% of the students at the School of Medicine and Pharmacy.

For Patterson, the presence of female role models in the health sector is instrumental in explaining the success of female pharmacists. Two women led the Pharmacy Syndicate and the National Order of Pharmacists in Senegal from the 1970s through the 1990s. Mentorship networks of women pharmacists shared skills and credit. The public visibility of female pharmacists has translated into credit worthiness, and lending societies, banks, the state, pharmaceutical companies, and families all find pharmacists to be trustworthy and productive recipients of loans. These insights about the impact of female education, especially in rapidly urbanizing contexts, modify Robertson's model about low

returns to female education and specifically on the limiting effects on production of female education.

The Senegalese example of pharmacists underscored how educated women with the right support, mixed-gender professional networks as well as female mentoring relationships, can break into masculinized professions and transcend feminized professions (nursing, midwifery, teaching, etc). In the Senegalese example, men continue to find pharmacy an attractive and lucrative profession; thus the growing presence of women in the field has not necessarily led to a feminization of the profession.

Kenya

Kenya, a white settler British colony, gained independence in 1963 after a decade of a disastrous colonial and civil war (Mau Mau). Kenya's present population stands at about 42 million with a settlement pattern that presses almost 75% of its population into the southwest corner of the country containing about 10% of Kenya's land area. Nairobi, the capital city, is densely populated, accounting for almost 60% of the urban population in Kenya, in a country where only about 22% of the total population is urban. Situated along the Indian Ocean coast of East Africa, which has experienced centuries of maritime trade with Arabia and Asia, Kenya has influential Arab and Indian minorities, and a small influential European community as a former white settler colony. Of the African ethnic groups, the largest is the Kikuyu, which represents only 22% of the population. Five ethnic groups account for about 70% of the population: Kikuyu, Luo, Luhya, Kamba and Kalenjin. Kenya is a predominantly Christian country with about 70% of the population claiming the Christian faith, and less than 10% Muslim.

Akyeampong and Fofack (2012) highlighted how in British colonies in Africa missionaries played the primary role in African education through the 1920s and 1930s. Missionary education in British colonies could be challenging to colonial objectives, especially in settler colonies. African male education alarmed male settlers who feared economic competition and threats to their political authority, and African female education threatened to undermine the traditional elders on whom indirect rule depended. Such racialized and gendered ambivalences, rooted in methods of indirect rule, constrained British educational policies as colonial authority solidified.

A key shift in British colonies occurred with the production in 1925 of the "Memorandum on Education Policy in Tropical Africa," which advocated stronger state control over educational administration and a curriculum suited to local needs and conditions. The memorandum stressed the setting up of village schools where basic courses would be taught and local languages used at lower levels. Part of the impetus for mass schooling in British colonial Africa was the education of girls and women. Female education would provide educated males with better partners and hopefully reduce the high rates of infant mortality. Here again reproductive and not productive goals were key where women were concerned. But the Advisory Committee from 1925 seemed ambivalent about female education, opining that: "Education is a curse rather than a blessing if it makes women discontented or incompetent" [Advisory Committee (1925): 8)]. British colonial reports on education in 1935 and 1944 both increased colonial spending and school attendance. But this also led to

increased resistance to the industrial training for males and domestic training for females enjoined by the Jeanes school models from the American South. Demands for secondary education increased, a call that nationalist leaders in independent African governments would endeavor to meet.

Historian Claire Robertson (1986) finds problematic the very principle of trying to address gross economic inequalities where women are concerned through education especially for women. She argues that while theoretically female education holds the prospect of economic advancement, in practice the result is economically dysfunctional in the context of largely agrarian African economies. Robertson asserts that the growing numbers of young women in primary schools

> encourages their removal from the labor force both as children and adults and promotes their dependence on men. Rather than leading the way to equality and gender opportunity, then, education for most women in Africa functions as an instrument of oppression to reinforce subordinate roles [Robertson (1986): 92)].

Robertson contends that: "Western education in Africa is instrumental in promoting a gender-specific class formation that leaves women persistently underprivileged in their access to resources" [Ibid]. Robertson endorses Martin Carnoy's (1974) argument that an educational system within a situation of economic dependency cannot provide adequate or meaningful employment for graduates. Indeed, she points out that it is in contexts where African men are most externally dominated that women can secure a relative economic advantage, citing apartheid South Africa as a case in point. She concludes that educational reforms can promote broader development for women and men only if they are situated within global and national economic reforms, which expand opportunities for both urban and rural denizens.

Compared to the relatively large urban populations in Senegal and Botswana, we have seen that only 22% of Kenya's population was urban in 2010. Here the educational needs of rural populations require serious consideration. Kenya had achieved gender parity in primary school enrollments by 1992, and most children in the country attended primary school. A changing economic climate undermined these achievements between the 1990s and the early 2000s, when structural adjustment and the introduction of new tuition and maintenance fees made it difficult for parents to sponsor the education of their' wards [Omwami (2011): 15, Action Aid (2009): 21].

Enrollments grew after 2003, when this cost-sharing plan was abandoned. In 2010 youth literacy was almost universal with 94% of female youth and 92% of male youth literate. Tertiary education in Kenya reflects the challenges common across the continent: only about 3% of all Kenyans access tertiary education with Kenyan females accounting for 1% [Omwami (2011): 24]. Across the continent about a third of university students are female, and it is only in southern Africa where women are not a minority of university students [Sifuna (2006): 87]. Kenyan women, similar to the case in Botswana (below), lag behind young men in science and math, though they excel in languages, a phenomenon researchers root in gender discrimination and girls over-representation in under-resourced schools with poor science teaching facilities [Sifuna (2006): 96].

Most Kenyan women, like their counterparts in Senegal and Botswana, work in the informal sector, which accounts for about 70% of the total number of jobs in the Kenyan economy [Atieno (2006): 1]. Agriculture is the backbone of Kenya's economy, employing about 75% of the labor force and accounting for about 65% of the total export earnings [Van der Walk (2008)]. Kenya is noted for its exports of coffee, tea, cereals, and now flowers to the European market. More than 70% of agricultural workers are women, and the Human Development Report for 2010 gives a female labor force participation rate in Kenya of 75.1% [UNDP (2010): 158]. Here, women are faced with the constraints and exploitation of kinship in production as we detailed in Part I of this paper for the precolonial and colonial periods [Akyeampong and Fofack (2012)]. Women dominate in informal employment in the non-agricultural sector, which offers 83.1% of women work compared to 59.1% of men [Charmes (2009): 41]. Women accounted for 60.3% of total informal employment [Charmes (2009): 48].

Of our three case studies, Kenya has the most diversified economy, and at independence it possessed a more diversified industrial base than most of Sub-Saharan African countries. In manufacturing it has important investments in agro-processing, including livestock products; in textiles and clothing; chemicals; and vehicle assembly plants. It has a vibrant tourist industry centering around game parks and coastal holiday resorts. Kenya is seen as one of the few countries where the private sector has increased its share of the economy since independence [Kurian (1992): 980]. Over half Kenya's manufacturing plants are located in the capital city of Nairobi, also the site of the fastest growing slum population in Africa (Kibera). Nairobi's slum population had grown from 19% in 1965 to 70% by 1990 [Kurian (1992): 969].

Central to both production and reproduction, women have a long working day and the work burden on women's time is unduly heavy. A World Bank study in 2007 noted that women worked on average 13 hours a day in household and outside labor, while men work an average of 8 hours a day. Of our three case studies, this would apply especially to Kenya with its large female agricultural labor force. Thus initiatives in adult education programs would have to take into consideration these circumstances as they seek to enhance women's access to literacy, numeracy and civic engagement skills that have shown promising results in Senegal [Kuenzi (2006)] and Botswana [Alexander et al. (2005)].

Botswana

A former British colony, Botswana attained independence in 1966, and has gone on to become one of Africa's success stories of democratic governance and prudent economic management [Acemoglu et al. (2002)]. It is relatively homogenous, ethnically, and the eight communities in the country all claim descent from the sons of Chief Malope, the progenitor of the Tswana. The Tswana constitute about 79% of the Botswana population with small ethnic minorities from the Kalanga, Basarwa and others [Kurian (1992): 206]. There is a significant white minority (7% of the population) from Britain, Zimbabwe and South Africa. Botswana has one of the highest HIV-AIDS infection rates in the world, but also possesses a comprehensive program for dealing with the disease. Its robust economy, based largely on diamond mining, and a small population (about two million) has made possible a

well-resourced health care program. Its GDP per capita of US$16,300 in 2011 is perhaps the highest in Africa.

The period of decolonization and the early decades of independence (1950-1980) witnessed an impressive expansion in girls schooling across the continent. This was not as marked in southern Africa as it was for the rest of the continent, since southern African countries like Botswana, Lesotho, Swaziland and South Africa had relatively high rates of female school attendance since the advent of missionary education in the nineteenth century. Based on UNESCO figures for the 1950-1980 period, Robertson notes that for the southern African countries, "primary education was mostly at or near parity with that of boys before independence" [Robertson (1986): 96]. In 1980, the school-going rates of young women in Botswana exceeded those of young men: 79% of Botswana girls were in school compared to 66% of young men. In Lesotho the numbers were 85% for girls and 58% for young men. Robertson observes that for southern Africa it was common for boys to herd cattle and then head to the mines to South Africa to work as adults, neither of which requires formal education. In all of Africa in 1980, it was only in Lesotho that women's literacy rates were higher than those of men: Basotho women constituted 65% of the country's literate population. Lesotho's role as a labor reserve for South Africa helps to explain this skewed prominence of female education.

A 1995 World Bank Report noted the positive impact of female education in reducing fertility rates. Among the fourteen African countries surveyed, Botswana, Kenya and Zimbabwe, with the highest levels of female education, also possessed the most vigorous family planning programs and exhibited the lowest child mortality rates [Ainsworth et al. (1995): ix]. As chief economist of the World Bank, Larry Summers argued that "investment in girls' education may well be the highest return available to the developing world," voicing an increasingly hegemonic conviction concerning the developmental potential of women's education [cited in Kristof and WuDunn (2009)]. Significantly, these contemporary discourses about the instrumentality of women's education echo the past emphases of missionaries, colonial officials, and male African elites on the social reproductive capacity of women and not their productive potential.

The urban growth rate in Botswana has been at 12% since 1970 and in 2010, 61% of Botswana's population was urban [UNICEF (2012)]. The fertility rate is low compared to the rest of Sub-Saharan Africa: just under three per woman compared to nearly five per woman in Senegal and Kenya. The youth literacy rate for women between the ages of 15 and 24 is now 97% and 94% for young men in this group (Ibid). Botswana launched its first National Commission on Education in the mid-1970s, and has now achieved near universal access for nine years basic education [Mogami (1998)]. The attrition rate at the high school level is high and about half of all students in grade 10 do not progress to senior high school. They turn to technical training in the "brigades" (apprenticeships) or end their schooling [Makwinja-Morara (2009)].

For young women, pregnancy is a critical issue, as schools force pregnant women to leave school and reapply later, many of whom never return to school [Meekers and Ahmed (1999), Alexander et al. (2005)]. It is important to note that the attrition rate in female education is at those very stages (closing years of secondary and tertiary education) that equip women for the job market. Those who continue to tertiary education tend to be enrolled in traditionally female fields such as secretarial,

nursing and textile related courses [Mulinge (2002): 8]. Yet women's tertiary enrollments are increasing: the University of Botswana has been at gender parity since 1995, and more than half of all students now are female [Dzimbiri and Pendame (2008): 147]. But there are important disparities in terms of areas of specialization: women make up nearly 60% of teachers college students, but only a quarter of advanced agricultural students [Alexander et al. (2005): 31]. Mulinge (2002) points out instructively that young men outperform young women in math and science fields in school-leaving exams, limiting women's opportunities to enter highly paid fields at the center of Botswana's economic growth. Wendy Duncan (1989) notes how gender discrimination from students and teachers track most young women, aside from those pursuing nursing, into the arts and the humanities.

Similar to Senegal, women in Botswana dominate the informal sector. About two-thirds (67%) of the population of Botswana work in informal employment – subsistence agriculture, home production, domestic service, trade [Alexander et al. (2005): 18)]. The urban sector is the site of much of formal and informal employment in Botswana, and cities account for 55% of formal employment and 64% of informal employment. About half of all informal sector workers are self-employed; 40% of women in the informal sector are self-employed, with or without employees [Alexander et al. (2005)]. The paradox from the Botswana case study is that: "While women in Botswana on average are more educated than their male counterparts, they tend to be employed in less remunerating professions in the formal sector" [Alexander et al. (2005): 18)]. At the same time, women are entering the formal workforce at unprecedented levels as single women and breadwinners for their families, including in historically male occupations such as construction. In the formal sectors women made up 62% of all employees in the education sector, 55% of employees in manufacturing, 35% of parastatal employees and 28% of those in agriculture. Mining is the one sector where women are greatly under-represented, comprising only 6% of employees [Alexander et al. (2005): 17-18)].

Alexander et al. (2005) note interesting overlaps between the formal and informal sectors. Men, who work in the informal sector, often tend to have formal sector jobs as well, while most women are solely dependent on their work in the informal sector. Adult education assists women to strengthen their economic activities in the informal sector, for example access to credit, or to gain skills that could transition them to the formal sector. It is not surprising then, that the study discovered that more adult women taken advantage of literacy classes than men. In Botswana, secondary, tertiary and adult education, all continue to be important.

IV Women and the Informal Economy in Sub-Saharan Africa

The feminization of the labor force and the growth of informal sector activities have emerged as some of the most important stylized facts of economic development in Sub-Saharan Africa in the post-colonial period. The growth of informal sector activities has been particularly strong over the last two decades, irrespective of stage of development (low and middle-income countries), sources of growth (agricultural versus natural resource-rich) and typology of colonization (settler versus non-

settler economies).[11] For instance, available estimates place non-agricultural labor force in the informal sector at 60 percent in Kenya (a middle-income country formerly a settler economy) and at 62 percent in Benin (a low-income country formerly a non-settler economy) [UN (2000)]. In part, the exponential growth of informal sector activities has been the result of sustained rural-to-urban migrations and a systematic implementation of public sector downsizing over the last three decades and limited opportunities for formal employment in the face of sluggish private sector job growth.

Estimates of the size and contribution of informal sector to growth vary widely, according to the nature and type of production and size of enterprises included. However, available statistics suggest that Sub-Saharan Africa is outstanding with informal sector activities (including agricultural informal sector) accounting for 55% of GDP. And the share rises to 60% when Botswana and South Africa are excluded from the sample; likewise, informal sector employment is significant in the region, accounting for more than 75% of non-agricultural labor force, significantly above estimates in other regions of the developing world [Charmes (2000, 2006)].[12] At the same time, the informal sector is employing the majority of economically active women in Sub-Saharan Africa. In the majority of low-income countries virtually all of the female non-agricultural labor force is in the informal sector. For instance, the informal sector now accounts for more than 95 percent of women workers outside agriculture in Benin, Chad and Mali.

Women's predominance in the informal economy in Sub-Saharan Africa dates back to the colonial period. The colonial economy was very male oriented in its urban form – mining, railway work, the lower echelons of the colonial bureaucracy, and so on. Women were absent in these categories, precluded by the physicality of this work and their limited access to education. There is a sense in which colonial towns were even gendered male, and women in towns were seen as out of place, except in historic towns that predated colonial rule. Colonial officials collaborated with chiefs to return female migrants to their home villages across Sub-Saharan Africa. Women who lived in towns were compelled to earn a livelihood through the commercialization of domestic skills: brewing, preparing and selling cooked food, taking in laundry, prostitution, and domestic work where available [Cooper (1983), Cock (1980), White (1990), Crush and Ambler (1992), Akyeampong (1996), Hodgson and McCurdy (2001)].

The original use of the term 'informal sector' is attributed to the economic development model put forward by Arthur Lewis in the seminal book on the *Theory of Economic Growth* published in 1955. Lewis used the term to describe the type of employment that was viewed as falling outside of the modern industrial sector. A couple of decades later, women's economic activity in the informal sector came to the attention of anthropologists and economists in the 1970s and 1980s. The pioneering work from the late 1960s was by Keith Hart, who looked at the low-income, non-wage employment opportunities of northern migrants in Accra (Ghana).

[11] Though the overall scope of informal sector remains relatively smaller in middle-income than in low-income countries, it has been on the rise over the last few years, reflecting private sector sluggish job growth and its inability to absorb the growing labor force.

[12] According to available estimates informal sector employment accounts for about 57% of non-agricultural employment in Latin America and the Caribbean [Charmes (2000)].

Hart's published works in the 1970s and 1980s outlined the nature and dynamics of this informal sector [Hart (1973), and (1988)]. Hart highlighted issues that have informed the debates over the place of the informal sector in developing economies: thus, it may be asked whether the large labor reserve that constitutes the informal sector is just some passive exploited majority or possesses some autonomous capacity to create wealth? Current consensus emphasizes that both realities co-exist, as the informal sector is both subject to capitalist domination and simultaneously exhibits an autonomous capacity. An important update on Hart's work on the economic activities and networks of northern migrants in Accra is Ntewusu Samuel Aniegye's recent doctoral thesis from the University of Leiden, which is a socio-economic history of northern traders and transporters (porters and wheeled transport) in Accra from 1908 to 2008 [Aniegye (2011)].

Hart highlighted the importance of kinship to informal economic organization. In the 1980s the role of personal interactions in economic organization gained analytical coherence through the concept of "social capital". Embracing individuals, households and communities, it incorporated but also transcended kinship. Christiaan Grootaert and Thierry van Bastelaer identify two types of social capital, structural and cognitive:

> Structural social capital facilitates information sharing and collective action and decision-making through established roles and social networks supplemented by rules, procedures, and precedents. As such, it is a relatively objective and externally observable construct. Cognitive social capital refers to shared norms, values, trust, attitudes, and beliefs, and is therefore a more subjective and intangible concept [Grootaert and van Bastelaer (2002): 3].

Both come together well in Mahir Saul's (1981) study of women brewers and the sorghum industry in rural Burkina Faso. Saul ably describes, inter alia, the market for sorghum beer, the networks of brewers and mutual assistance, and the web of beliefs and values – including the veneration of ancestors and social respectability – that drove demand for sorghum beer. Striking was the huge quantities of sorghum (several hundred tons) required in the female brewing industry. The implications for farming and the national economy of Burkina Faso were enormous, yet female brewing was part of the informal sector, neglected in national economic accounting. The economic potential of sorghum beer was recognized by corporate capital in southern and central Africa, and the industry attracted no less than the prominent British multinational corporation, Lonhro, in the early decades of African independence [Rogerson and Tucker (1985)].

We come to an important paradox in the history of the informal sector in Africa. Half a century after African independence, the informal sector remains the domain of much of female economic activity in Africa, despite increasing access of women to education, including higher education, and formal sector jobs. Women who become entrepreneurs in the formal private sector often appear limited to "feminized" industries such as the food and beverage industry, textiles and clothing, and the like.[13] Yet the informal sector has become an important engine of economic growth and capital accumulation, as well as a site of labor employment.

[13] This is clear, for example, from the membership list of the Association of Ghanaian Industries (AGI).

Devarajan and Shetty (2010) estimate that presently the informal sector employs about 80% of the African labor force. At the same time, Sub-Saharan Africa's informal sector is largely a service sector, highly transactional in nature and with very low returns and profitability. And the majority of informal sector workers are women who are contributing to GDP growth either as family workers or self-employed. Heintz and Valodia (2008) find that self-employment of various kinds is the predominant form of informal employment, accounting for four-fifths of informal employment in Kenya, Ghana, Mali and Madagascar. These women are either home-based workers or street vendors, with the latter accounting for a significant proportion of female informal workers. In countries where the mobility of women is not restricted by social norms, available data suggest that informal traders—mainly street vendors—represent a significant proportion (73-99%) of employment in trade. At the same time, women are also actively involved in informal cross-border trade at the regional level. For example, it is estimated that 70% of informal cross-border trade in Southern Africa is by women [UNIFEM (2009)].

The rapid increase of informal economic transactions carried out by women suggest that they are increasingly escaping the household domain—due in part to loosening in some aspects of the traditional norms—and in the process increasing their contribution to growth and economic development. We noted in Part I that kinship is a social and economic organization, the site of female production and the "capture" of their labor. It followed, logically, that female socio-economic mobility would depend on their "escape" from kinship as the domain of female production. The concept of "social capital" captures the maturation and dynamism of the informal sector and its ability to utilize yet transcend kinship. Case studies from developing countries show how social capital "can directly enhance output and lead to higher productivity of other factors such as human and physical capital" [Grootaert and van Bastelaer (2002): 5].

Sub-Saharan Africa, perhaps with the sole exception of South Africa, seems to have circumvented the three stages of economic growth, agriculture – industry – service, and in the process failed to take advantage of the virtuous forward and backward linkages associated with the dynamic transition from primary to secondary and tertiary sectors. Such a transition process is often associated with the creation of low skills labor-intensive jobs in the industrial and formal service sector. Instructively, South Africa, which is the most advanced economy of the region in terms of complexity and depth of its industrial and manufacturing base, also has the smallest share of informal sector in the region and the largest share of workers in the industrial sector. Depending on the definition, informal sector workers varies between one-fifth and one-third total employment in South Africa, with over 50% working in two sectors: agriculture and retail trade [Davies and Thurlow (2009)].

Informal sector workers also have the highest incidence of poverty in South Africa, reflecting the large wage gap with formal sector workers. According to the 2004 Labor Force Survey, formal sector workers have an average wage of more than 26,000 Rand per worker against 8,000 Rand for informal sector workers [Davies and Thurlow (2009)]. This wage gap is consistent with estimates across Sub-Saharan Africa and reflects the fact that average income has been consistently lower in the informal

sector than in the formal sector [Charmes (2006)]. [14] According to the 2012 African Economic Outlook published by the AfDB, the poorest countries in the region have a large informal sector that employs up to 90% of the working age population; conversely, the more affluent middle-income countries tend to have bigger formal sectors, employing a large share of the working age population. And to the extent that the overwhelming majority of informal sector workers are women, the rise of the informal sector over the last few decades as a temporary substitute to the shortage of jobs in the formal sector may be contributing to persistent gender inequality in both income and poverty terms in the region.

Sub-Saharan Africa appears to have gone straight from agriculture to service, industry being weak or non-existent in most countries. Telecommunications, notably the cellular phone industry, has revolutionized the informal sector and highlighted the synergies that connect the formal and informal sectors. Economists have noted that the socio-economic mobility of women has been particularly tied to urbanization and the service industry. It is this niche that the informal sector in Sub-Saharan Africa has come to occupy for women, representing simultaneously a constraint and an opportunity. Reflecting this duality, African governments face a serious dilemma presented by the large and growing informal sector that suffers from low wages and is a source of persistent gender inequality, yet at the same time acts as a temporary substitute for the inexistent social protection and formal safety net systems such as unemployment benefits in a context of structurally high unemployment rates and increased vulnerability heightened by massive rural-to-urban migration.

V Analytical Framework

The first generation of empirical models on growth dynamics primarily drew on capital and labor as the main drivers of aggregate output. The empirical specification of that first generation of growth models reflects the emphasis on capital and labor in standard economic theory.[15] The second generation of these models was later expanded to include other economic and non-economic control variables such as technology, trade, and institutions [Solow (1957)]. In part, this adjustment is due to the increasing recognition that there are a host of other variables, which affect growth in an open economy besides the traditional factor inputs.

In this line, empirical studies on gender and growth have integrated some measures of gender inequality among explanatory variables. This adjustment reflects the fact that gender inequalities, either measured by educational gender gaps or gender bias in labor force participation, are likely to affect growth, both directly and indirectly. Assuming that women's contribution is adversely affected by occupational job segregation and gender gaps in human capital, this paper takes the converse view that a reduction of gender inequality may enhance the contribution of women to growth.

[14] Informal income worldwide tends to decline as one moves across the following types of employment: employer—self-employed—casual wage worker—sub-contract worker

[15] See for instance standard Cobb-Douglas production functions.

However, in a context of sticky norms and resilient colonial constructs the reduction of gender inequalities may also depend on other parameters such as religion, social norms and production structure. For instance, in economies where production is primarily driven by resource extraction, employment opportunities outside the agricultural sector may be very limited for women, especially wherever resource extraction has not been accompanied by value addition and strengthened forward and backward linkages for a better integration along value chains [Ross (2008), Fofack (2013)]. In order to account for the multiplicity of growth drivers, the baseline cross-section model has the following form:

$$Y_{i,t} = f(Y_{i,t-1,}\mathbf{G}_{i,t}, \mathbf{E}_{i,t}, \mathbf{D}_{i,t}) \quad (1)$$

The analytical framework is a panel growth regression, which accounts for individual country fixed effects and time effects. The initial functional relationship represented by equation (1) can therefore take the following specification:

$$Y_{i,t} = \alpha Y_{i,t-1} + \mathbf{G}_{i,t}\boldsymbol{B} + \mathbf{E}_{i,t}\boldsymbol{\Delta} + \mathbf{D}_{i,t}\boldsymbol{\theta} + \eta_i + T_t + \varepsilon_{i,t} \quad (2)$$

The response variable $Y_{i,t}$ is the level of income per capita in country i at time t. A lagged dependent variable in the right-hand side (RHS) vectors accounts for the possible effects of stage of development on growth.[16] Although the model has a lagged dependent variable, we also include country fixed effects to account for country differences, which are not driven by income. For instance, fixed effects account for the fact that female labor force participation rates and educational gender gaps may vary from country to country. Indeed a data analysis in Section II shows cross-country variance in measures of gender inequality when income is controlled for.

The vector $\mathbf{G}_{i,t}$ comprises a set of measures of gender inequality. Consistent with practice in the literature the paper emphasizes educational gender gaps and gender gap in labor force participation [Dollar and Gatti (1999), Baliamoune-Lutz and McGillvray (2009)]. Similarly, $\mathbf{E}_{i,t}$ is a vector of other relevant economic control variables affecting growth; η_i is the country fixed effect and T_t is year fixed effect; $\mathbf{D}_{i,t}$is a vector of dummy variables controlling for differences across religion and colonial constructs.

The vector of dummy includes religion, language, production structure and typology of decolonization (peaceful versus violent decolonization).[17] Following Inglehart and Baker (2000), the religion dummy takes on the value of one when a particular religion is dominant and zero otherwise. We focus on three main religions in the region (Christianity, Indigenous, and Islam) and use

[16] In light of the U-shaped relationship between gender equality and growth, whereby economic growth may lead to a reduction of gender inequality via the employment channel, dual causality cannot be ruled out [Goldin (1994)].
[17] The variable structure is included to capture the residual effects of colonialism on production. The colonial economy shaped the structure of production and political institutions. However, due to space limitation empirical results do not include production structure and typology of decolonization.

Christianity as the reference category. In addition to reducing the risk of multicollinearity, the selection of Christianity as reference category reflects the latent effect of colonialism in the region.[18]

Language is also included in the dummy vector. Language is an important colonial heritage, which for many decades conditioned the access of African countries to global knowledge. As the necessary path to structured learning, languages introduced by colonial administrations played a critical role in the education process, and may have affected educational gender gaps. Likewise, English is used as the reference category; hence, language takes the value of zero for English and 1 otherwise for French speaking countries; and zero for English and 1 otherwise for other languages such as Portuguese, Spanish or African languages. The linguistic characterization essentially captures the differences between English and French colonial systems, given the geographical coverage and depth of these two languages.

Economic control variables include the lagged dependent variable to account for possible effects of stage of development on growth, total investment, government expenditure (as a share of GDP), trade openness, and inflation to account for adverse effects of macroeconomic instability, which through the growth channel may accentuate gender inequalities. While government expenditures are expected to reduce gender inequality if allocated within a gender-responsive budgeting framework, the effects of trade openness on gender inequality are rather ambiguous.

On one hand, trade-openness could decrease gender inequality by expanding employment opportunities for unskilled female labor in labor-intensive export industries such as garments [Baliamoune-Lutz and McGillvray (2009)]; on the other hand, openness to trade may widen gender inequalities if it results in increased demand for skilled labor. The lower representation of women in the pool of skilled workers as a result of educational gender gaps could widen the wage gap between women and men. A number of studies have actually reported that trade liberalization did not always lead to a reduction of gender inequality, but instead accentuated it [Seguino (2000)].

RHS variables are all treated as endogenous during estimation. In addition, interaction terms are included to account for possible effects of religion on educational gender gaps and gaps in labor force participation rates. Educational gender gaps are sequentially measured in terms of years of schooling, primary and secondary completion rates. This sequential approach makes it possible to assess the extent to which the dynamics of gender inequality may be affected by progress on the education ladder.

The econometric model specified above is estimated using different regression techniques for robustness check, including a panel regression method that accounts for country-specific fixed effects with the fixed effects ordinary least squares estimation method, endogeneity of regressors using the generalized method of moments (GMM), and controlling for potential outliers using the iteratively reweighted least squares procedure (IRLS). The results generated from these different regression techniques are discussed in the next section.

[18] Despite incursion from the East, including within the context of Indian Ocean slave trade, the majority of countries in the region are predominantly Christian [Cooray and Potrafke (2011)].

VI Data and Empirical Results

The study uses a sample of 40 Sub-Saharan African countries for which data on gender inequality—educational gender gaps and gender gaps in labor force participation rates — are available. While the time series reporting school attendance (number of years) and enrollment rates spans four decades (1970—2010), the labor force participation rate data have a shorter time span (1980-2010) since annual reporting on labor force participation in Sub-Saharan Africa began much later. The dataset is obtained from two different sources: the World Bank Development Indicators (WDI) and African Development Indicators (ADI).

The gender inequality variables are defined by taking the natural log of the ratio between men's and women's years of schooling, enrollment in primary or secondary school and labor force participation rates. The log ratio is expected to reduce the risk of multicollinearity because countries with low levels of male enrollment also have low levels of female enrollment rates (conversely countries with high levels of male enrollment rates tend to also have high levels of female enrollment rates). In practice, the logarithmic application is expected to reduce the degree of correlation between educational gender inequality (inequality in labor force participation) and the stock of education (stock of active labor force) in the country [Esteve-Volart (2004)].

For each variable, the original panel of annual data is collapsed into five-year non-overlapping pooled cross-sections. This conversion produces a maximum of 8 data points per country. This adjustment has the advantage of smoothing out large annual fluctuations that may potentially bias the empirical results. Large fluctuations departing from trend are possible and could be due to temporary shocks. For instance, the policy promoting universal primary education adopted under the MDG framework and Education for All (EFA) resulted in a dramatic increase in enrollment rates in several countries in the region, especially when it was coupled with free access and elimination of education fees [Lewin (2009).[19]

In this section, we draw on the panel regression models presented in section V to infer on the interaction between gender inequality and growth in post-colonial Africa. Table 1 reports the results for the implications of educational gender gaps on growth when gender gaps in access to formal labor market—measured by labor force participation rates—are not taken into account in the empirical specifications. Table 2 reports the results based on an empirical model that includes both educational gender gaps and gender inequality in labor force participation rates.

The results highlight the predictive power of the underlying panel regression models. That predictive power is most notably illustrated by the size of adjusted R-squared estimates in the fixed effects and Iteratively Reweighted Least Squares models. For empirical specifications in columns 1-8 (Table 1), the adjusted R-squared is relatively high. It shows that over 98 percent of the proportional change in GDP per capita is explained by the underlying models. Adjusted R-squared estimates are consistent

[19] Similarly, empirical results suggest that conditional cash transfer programs have contributed to an unusual increase in enrollment rates and a reduction of dropout rates in several countries where such programs have been piloted [Bourguignon et al. (2003), Baird et al. (2011)].

under the alternative empirical specification, which has both educational gender gaps and gender gaps in labor force participation rates in the RHS variables (Table 2). Furthermore, the J-test and Z-test rejects the alternative of over-identification and serial correlation problems in both cases.

The predictive power of underlying models reflects the magnitude of regression coefficients and their degree of significance. For instance, the lagged value of GDP per capita has a positive sign and is significant at the 1 percent level across all specifications, under the country-fixed effects models and when outliers (IRLS) and endogeneity (GMM) are taken into account. This result points to over time persistence of stage of development. In particular, countries' initial conditions (stage of development) seem to play a significant role in development outcomes measured in terms of per capita income in the medium and long term.

Other economic control variables, especially investment, trade openness, government expenditures (as a share of GDP) and inflation which are included to partly control for heterogeneities across countries are also significant. Consistent with economic theory, inflation has a negative sign and is significant across all modeling specifications. This result further supports the view that macroeconomic instability is bad for growth. However, government expenditure (as a percentage of GDP) has a negative sign, though we expect a positive influence of government expenditure on growth, both directly and indirectly through human capital development and infrastructure channels.

The estimated coefficient associated with trade openness is also consistent with previous empirical results. The positive sign supports the hypothesis that trade is growth-enhancing. However, trade openness is not uniformly significant across all specifications. In particular, it loses significance in specifications that accounts for endogeneity (GMM). This result may well reflect the ambiguous nature of the relationship between trade openness and growth in developing countries [Mukhopadhyay (1999), Rodriguez and Rodrik (2001)]. For instance, Mukhopadhyay (1999) finds that trade liberalization led to growth decline in numerous countries across Sub-Saharan Africa in the 1980s and 1990s. In a related vein, Baliamoune (2002) shows that the deepening of trade also led to income divergence rather than convergence within the region, with income in poorer countries growing at a slower rate relative to higher-income countries.[20]

Turning to the link between gender inequality and growth, the coefficients associated with the two educational gender gaps considered (gender gaps in the years of schooling, and gender gaps in secondary enrollment rates) have the right negative signs in the first set of panel regressions (Table 1). Under the country-specific fixed effects model they are statistically significant at the 5 percent level (column 3) and at 10 percent level (columns 1, 2 and 4). Similarly, the results are consistent in the specifications that account for endogeneity (GMM) and outliers (IRLS). In particular, under the IRLS specification, gender gaps in secondary enrollment rates is significant at the 5 and 10 percent levels (columns 5 and 8); and gender gaps in the years of schooling is significant at 5 and 10 percent level, respectively (columns 6 and 7).

[20] At the same time, this result may also reflect the fact that countries in the region may be operating at different steady state levels of output.

The negative sign of the regression coefficients under the three alternative specifications is consistent with economic theory and earlier empirical results from the literature [Dollar and Gatti (1999), Baliamoune-Lutz and McGillvray (2007)]. These results suggest that gender inequality is bad for growth, and conversely they imply that the reduction of gender inequality in human capital development has been growth enhancing in post-colonial Africa. Although the correlation does not imply causation, this result may indirectly support the hypothesis of increased contribution of women to growth in the region in recent years, partly as a result of increasing convergence to gender parity in education. And to the extent that the convergence to gender parity in education is affected by social norms and colonial constructs, the reduction of gender inequality over time could be a sign of loosening social norms and colonial constructs in the region.

A close look at the potential effects of parameters underpinning social norms such as religion and language, which is a proxy for colonial constructs, shows some very interesting results. Note that to avoid multicollinearity between the religious dummies, one of the religious dummies functions as the reference category (here Christianity).[21] Likewise, language is used as a proxy for colonial constructs and one of the languages is used as the reference category in the paper (English). The estimated effects of other religious and language dummies are treated as deviations from the reference category.

Although religions of all form have historically been refractory to female education at some point in history, recent empirical evidence suggests that the proportion of Muslim adherents in a country has acted as a more constraining factor to female educational attainment than in countries, which are predominantly Christian [Norton and Tomal (2009)].[22] We therefore expect a negative influence of the religion dummy on growth compared to the reference category. The estimated coefficient associated with the Islam dummy in the country fixed effect model suggests that growth has been lower by about 2 percentage points in countries with predominantly Muslim religion compared to countries with predominantly Christian religion (the reference category), ceteris paribus.

Compared to the alternative scenario of a predominantly Christian country, the potential adverse effect of Muslim religion on growth is even stronger under the IRLS and GMM specifications. When outliers are taken into account under the former, growth is hypothetically lower by about 4 percentage points compared to countries with a predominantly Christian religion; and when the potential effects of endogeneity are taken into account under the latter, it is lower by about 5 percentage points. In contrast, results suggest that growth has been higher in countries with predominantly indigenous religion (other religions) compared to countries with predominantly Christian religion. The effect of religion on growth may act indirectly via the educational gender

[21] Although European missionaries actively sought to introduce Christianity in all their African colonies, Islam and Indigenous African religions persisted in several countries. In many countries, the coexistence of several religious confessions and denominations has been and remained in effect.

[22] Though, it has been shown that the promotion of female education has not been uniform across different strands of Christianity. Historical records and empirical research have established that Protestantism led to greater gender equality in education than Catholicism [Lagerlof (2003), Becker and Woessmann (2008)].

inequality gap channel, though an interaction term pairing religion and education is found to be statistically insignificant.

Likewise, the data analysis in Section II suggests that gender gaps in educational enrollment and labor force participation were lower in former English colonies than in former French colonies. Using language as a proxy for colonial heritage and English as the reference category, we estimate the potential losses or gains in terms of growth associated with the colonial origins (French vis-à-vis English). The colonial dummy, which classifies countries on the basis of the national language inherited from the colonial administration, is significant at conventional levels in all three specifications.

In particular, the French dummy is statistically significant at the 5 percent level in OLS country-fixed effect specification and at the 10 percent level in the IRLS and GMM specifications. Under the three specifications, the estimated coefficient associated with the French dummy variable is negative, suggesting that growth has been lower in French-speaking countries compared to English-speaking countries (the reference category). In particular, in the country-fixed effect specification, growth is lower by about 6 percentage points in French-speaking countries, compared to English-speaking countries, ceteris paribus.

However, the results presented in Table 1 could be affected by omitted variable bias. Hence, in addition to all RHS variables considered in the base model in Table 1, the results in Table 2 also include a variable on gender inequality in labor force participation rates. As expected gender inequality in labor force participation has adversely affected economic growth in the region over the last few decades. The variable summarizing gender inequality in labor force participation consistently has a negative sign and is significant across all modeling specifications—OLS fixed effect, IRLS and GMM. In particular, in the IRLS specification (column 5), a 1 percentage point increase in gender inequality in the labor force participation rate is expected to reduce growth rate by about 6 percentage points.

The estimated results associated with other variables are consistent as well. In particular, the Muslim dummy has a negative sign and is significant across all three specifications. In the country fixed effect specification, growth is expected to be about 8 percentage points lower in countries with a predominantly Muslim religion compared to countries with a predominantly Christian religion (the reference category). Likewise, the dummy variable for French language is also statistically significant across all specifications. In addition, the French dummy has a negative sign, again, suggesting that on average growth has been lower in French-speaking countries compared to English-speaking countries.

The negative sign associated with all educational gender gap variables and gender differential in labor force participation suggests that gender inequality has adversely affected growth prospects in the region. In particular, the regression results show that GDP per capita decreases by about 4 percentage points when educational gender gaps and gender gaps in labor force participation rates increases by about 1 percent under the country fixed effect specification (Table 2). Conversely, and to the extent that the convergence to gender parity in education and increasing female labor force

participation have been the norm, these results also suggest that the contribution of women to economic growth has been positive in the region over the last few decades.

VII. Concluding Remarks

In addition to complementing the first part of the research focusing on the contribution of women to economic growth and development in pre-colonial and colonial Africa, this paper draws on historical and anthropological scholarship and empirical analysis from panel growth regressions to investigate the dynamics of gender inequality and growth in Sub-Saharan Africa in the post-colonial period. The key feature and contribution of the paper is that it combines quantitative and qualitative methods to deepen understanding of gender and growth dynamics in the region, taking into account a number of typologies, most notably the patterns of decolonization, drivers of growth and other relevant colonial constructs likely to adversely affect the prospects for women's economic empowerment and contribution to growth. These typologies informed the selection of the few country case studies discussed in the paper.

Drawing on historical and anthropological records, we have noted in agricultural and home production that kinship networks are most deployed. While this promotes the capture of female labor in the rural, agrarian setting, as we have seen with the example of Kenya, kinship and community networks are at the same time essential to informal economy activity. Examining where and when kinship becomes a negative or positive force for production and female empowerment and accumulation is important to policy considerations of which interventions would be most beneficial to women. That the urban setting loosens the hold of kinship is clear, and the vibrancy of the informal market, the hub of female economic activity, in urban centers, should not be surprising. The non-agricultural pursuits of urban women liberate them from the control of their labor associated with farm work.

Similarly, an expanding service sector is another important factor in the economic empowerment of women in the post-colonial period in the region. The impressive statistics of formal employment across the region in general and among Botswana women in particular is partly explained by the high levels of female education, its highly urbanized population, its small agricultural sector (2.1% of GDP), and a large service industry accounting for more than 52% of GDP. Historically, the growth of the service sector has been the avenue by which increasing ranks of women have been incorporated into the workforce, the example of female employment in Europe and America during the world wars being cases in point.

Furthermore, analysis from historical records and empirical results show that the post-colonial period is increasingly characterized by the closing gender gaps in education and labor force participation in the region. Through these two channels—skill acquisition and labor force participation— women are raising their relative contribution to economic growth on account of increased allocative efficiency and productivity enhancement. In particular, empirical results suggest that a 1 percentage point

reduction in gender gap in labor force participation rate is likely to raise GDP per capita growth by about 0.2 percentage point in the region, ceteris paribus.

However, the robustness of these results and particularly the strength of the correlation between reduction of gender inequality and growth continue to be affected by other variables such as religion and typology of decolonization and determinants of growth. This has resulted in important variations across countries, reflecting the fact that the loosening of social norms and colonial constructs has not been uniform across countries in the post-colonial period. Despite the generalized trend of loosening effects of prevalent social norms and colonial constructs the contribution of women to growth is significantly lower in predominantly Muslim countries in the region.

Still these developments are in contrast with the colonial period where women's contribution to economic growth was confined to home production and subsistence agriculture, and access to schooling was either the preserve of men or tailored to enhance women's reproductive functions. The reduction of gender inequality on both scores—educational enrollment and labor force participation—is also a reflection of loosening colonial constructs and social norms. However, the increasing contribution of women to economic growth through wage employment outside the household has not necessarily led to increased-task sharing at the household level. Women are still carrying the lion's share and burden of home production, resulting in rather long effective working days for them.

At the same time, the reduction of gender inequality as a result of loosening social norms and colonial constructs in the post-colonial period has not necessarily resulted in the closure of gender gaps in the formal labor market, though gender parity has been achieved in a few professions, most notably the healthcare delivery sector as illustrated by the Senegalese example of pharmacists. Outside the very few and specialized professions, the increasing participation of women in the production process in the market environment has been largely visible in the informal sector. The overwhelming majority of informal sector workers in non-agricultural employment are women. While this is good and reflects increased mobility of women in the post-colonial period, it is also source of persistent gender inequality. The gender gap in terms of income and poverty between formal and informal employment remains large and reflects the fact that informal employment is still considered as a disguised form of unemployment, and a transient path to the formal sector for most economic agents.

Moreover, in the absence of manufacturing industries for value addition, non-agricultural informal sector activities are largely concentrated in the service sectors, with petty traders accounting for most informal sector workers in urban areas. The growing competition from formal traders in the product markets is keeping the markups and overall profit margins at relatively low levels in the informal economy for the majority of women. At the same time, informal sector workers are increasingly facing a stiff competition from formal sector workers who are turning to informal sector production in large number to raise their income. Still and remarkably, a number of studies find that employers are also turning to the informal sector to lower costs and cope with increased competition.

The growing synergy and linkage between formal and informal sectors both at the level of product and labor markets and the potentially changing dynamics of that relation in the face of a combined high unemployment rate and structurally lower wages in the informal sector raises the question of viability of the informal sector as a sustainable alternative to women's economic empowerment in a context of structurally high unemployment rates at the national level and higher poverty incidence for those engaged in that sector. Still, there are a number of equally important questions, including the extent to which the structure and size of the formal sector is influencing employment opportunities for women in the informal sector in the region; and the constraints toward equalization of employment opportunities in the formal economy in the context of rising female enrollment rates and reduction of skills gap between women and men. Future research will explore some of these questions.

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Table 1: Regression Results Gender Inequality and Economic Growth (with emphasis on educational gender gaps)

Dependent variable: Log of real GDP per capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS (Fixed effect)				Iteratively weighted				GMM			
(Log of real GDP per capita)$_{-1}$	0.987	0.974	0.979	0.987	0.987	0.990	0.996	0.986	0.870	0.943	0.923	1.050
	(211.946)***	(82.778)***	(84.372)***	(205.785)***	(244.676)***	(174.752)***	(167.642)***	(241.597)***	(4.595)***	(9.176)***	(19.781)***	(3.798)***
SCHOOLING_log(M/F)		-0.072	-0.043			-0.050	-0.015			-0.056	-0.034	
		(-1.716)*	(-1.936)**			(-1.911)**	(-1.672)*			(-1.692)*	(-1.633)*	
SECONDARY_log(M/F)	-0.034			-0.015	-0.034			-0.021	-0.145			-0.034
	(-1.885)*			(-1.7)*	(-2.068)**			(-1.827)*	(-1.923)*			(-1.604)*
Investment (share in GDP)	0.010	0.009	0.009	0.010	0.009	0.009	0.009	0.009	0.013	0.007	0.003	0.023
	(8.907)***	(7.725)***	(7.38)***	(8.641)***	(7.863)***	(7.932)***	(7.586)***	(8.169)***	(2.245)**	(1.755)*	(1.729)*	(1.771)*
Government final consumption (share in GDP)	-0.006	-0.006	-0.007	-0.006	-0.005	-0.006	-0.007	-0.005	-0.011	-0.006	-0.005	-0.021
	(-4.412)***	(-4.272)***	(-4.858)***	(-4.445)***	(-4.158)***	(-4.22)***	(-4.61)***	(-4.31)***	(-1.735)*	(-1.971)*	(-1.971)*	(-1.82)*
Inflation rate	0.000	-0.001	-0.001	0.000	0.000	-0.001	-0.001	0.000	0.000	0.000	-0.002	0.000
	(-2.679)***	(-3.945)***	(-4.258)***	(-2.648)***	(-10.715)***	(-3.866)***	(-4.107)***	(-10.37)***	(-0.523)	(-1.659)*	(-1.991)*	(-1.839)*
Trade openness	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.002	0.002	0.002	0.001
	(1.57)	(1.617)*	(1.383)	(1.612)*	(2.581)**	(1.686)*	(1.389)	(1.748)*	(0.545)	(0.633)	(1.322)	(0.178)
FRENCH*SECONDARY_log(M/F)				-0.024				-0.014				-1.586
				(-1.641)*				(-1.622)*				(-1.311)
OTHER LANGUAGES*SECONDARY_log(M/F)				-0.012				-0.020				-1.542
				(-0.236)				(-0.631)				(-0.944)
MUSLIM		-0.020				-0.039				-0.056		
		(-1.776)*				(-1.653)*				(-1.689)*		
OTHER RELIGIONS		0.017				0.035				0.672		
		(0.712)				(1.447)				(0.414)		
FRENCH			-0.059				-0.041				-0.110	
			(-2.511)**				(-1.693)*				(-1.686)*	
OTHER LANGUAGES			0.027				0.031				0.127	
			(0.807)				(0.889)				(0.259)	
No of observations	249	211	211	249	249	211	211	249	144	189	189	144
Adjusted R2	0.9824	0.9850	0.986	0.982	0.9834	0.983	0.983	0.983				
Arellano-Bond serial correlation test AR(1)									1.070	0.782	0.972	1.260
J-Statistics									0.285	1.694	0.104	0.402

Note: The methodology is OLS panel regression including country fixed effects and time effects, iterated reweighted least squares, and GMM. In each methodology, time and fixed effects are included. The data is based on a sample of SSA countries for the period 1970-2010 (5 year averages are used). The t-statistics are given in paranthesis. *** stands for significance at the 1% level; ** stands for significance at the 5% level; * stands for significance at the 10% level. Real GDP per capita is in constant 2000 $US; (Log of real GDP per capita)$_{-1}$ is the lagged value of log of real GDP per capita; SCHOOLING_log(M/F) is the log of the ratio of the total number of years of schooling for males to females; SECONDARY_log(M/F) is the log of the ratio of secondary enrollment for males to females; Trade openness is the sum of exports and imports over GDP; MUSLIM is the dummy variable which equals to 1 for predominantly Muslim countries and zero otherwise; FRENCH is the dummy variable which assigns the value of 1 to predominantly French-speaking countries and zero otherwise. OTHER RELIGIONS is the dummy variable which equals to 1 for predominantly non-Muslim or non-Christian countries and zero otherwise. OTHER LANGUAGES is the dummy variable which equals to 1 for predominantly non-French or non-English-speaking countries and zero otherwise. J-test is for overidentification problem where the null mypothesis H0: there is no overidentification problem. We fail to reject in each case. For serial correlation z-tests are repoerted; the null hypothesis H0 is "there is no serial correlation". We fail to reject H0 in each test.

Table 2: Regression Results Gender Inequality and Economic Growth (with emphasis on gender gaps in education and labor force participation rates)

Dependent variable: Log of real GDP per capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS (Fixed effect)				Iteratively weighted				GMM			
(Log of real GDP per capita)$_{-1}$	0.989	0.988	0.995	0.989	0.978	0.980	0.985	0.914	0.929	0.970	1.001	1.053
	(187.383)***	(156.676)***	(156.404)***	(177.017)***	(195.65)***	(67.439)***	(70.211)***	(20.151)***	(7.047)***	(77.044)***	(26.909)***	(2.791)***
SCHOOLING_log(M/F)		-0.041	-0.022			-0.038	-0.035			-0.017	-0.029	
		(-1.714)*	(-1.734)*			(-1.813)*	(-1.671)*			(-1.879)*	(-2.085)**	
SECONDARY_log(M/F)	-0.046			-0.05	-0.065			-0.07	-0.107			-0.025
	(-1.945)*			(-1.729)*	(-2.946)***			(-1.699)*	(-1.899)*			(-1.656)*
LABOR_log(M/F)	-0.044	-0.057	-0.056	-0.034	-0.062	-0.031	-0.027	-0.029	-0.022	-0.028	-0.021	-0.025
	(-1.618)*	(-1.743)*	(-1.687)*	(-1.816)*	(-1.653)*	(-1.667)*	(-1.618)*	(-1.854)*	(-1.678)*	(-1.653)*	(-1.65)*	(-1.655)*
Investment (share in GDP)	0.009	0.008	0.008	0.009	0.009	0.008	0.008	0.005	0.014	0.026	0.01	0.02
	(7.247)***	(6.053)***	(5.684)***	(6.871)***	(6.869)***	(5.994)***	(5.722)***	(3.732)***	(3.755)***	(1.848)*	(1.842)*	(1.908)**
Government final consumption (share in GDP)	-0.006	-0.006	-0.006	-0.006	-0.007	-0.006	-0.007	-0.007	-0.010	-0.005	-0.007	-0.002
	(-4.22)***	(-3.72)***	(-4.12)***	(-4.286)***	(-5.763)***	(-3.407)***	(-4.152)***	(-3.597)***	(-2.233)**	(-1.614)*	(-1.703)*	(-1.633)*
Inflation rate	0.000	-0.001	-0.001	0.000	0.000	-0.001	-0.001	0.000	0.000	-0.001	-0.001	0.000
	(-2.476)**	(-3.704)***	(-4.108)***	(-2.427)**	(-2.563)**	(-3.704)***	(-4.07)***	(-1.822)*	(-2.297)**	(-2.159)**	(-1.848)*	(-1.612)*
Trade openness	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.003	0.001	0.020	0.001	0.001
	(1.744)*	(2.376)**	(2.142)**	(1.779)*	(1.612)*	(1.877)*	(1.708)*	(4.363)***	(0.341)	(0.993)	(0.342)	(0.301)
FRENCH*SECONDARY_log(M/F)				-0.038				-0.136				-0.449
				(-0.757)				(-1.207)				(-0.433)
OTHER LANGUAGES*SECONDARY_log(M/F)				-0.011				-0.079				-0.401
				(-0.168)				(-0.659)				(-0.416)
MUSLIM		-0.087				-0.063				-0.064		
		(-1.678)*				(-1.734)*				(-1.69)*		
OTHER RELIGIONS		0.031				0.013				0.649		
		(1.098)				(0.445)				(0.239)		
FRENCH			-0.055				-0.077				-0.088	
			(-2.036)**				(-2.898)***				(-1.671)*	
OTHER LANGUAGES			0.033				0.016				0.486	
			(0.88)				(0.439)				(1.363)	
No of observations	195	166	166	195	195	166	166	195	142	109	109	142
Adjusted R2	0.981	0.982	0.982	0.982	0.991	0.983	0.984	0.990				
Arellano-Bond serial correlation test AR(1)									1.120	0.978	1.032	1.023
J-Statistics									3.285	2.584	2.963	0.464

Note: The methodology is OLS panel regression including country fixed effects and time effects, iterated reweighted least squares, and GMM. In each methodology, time and fixed effects are included. The data is based on a sample of SSA countries for the period 1970-2010 (5 year averages are used). The t-statistics are given in paranthesis. *** stands for significance at the 1% level; ** stands for significance at the 5% level; * stands for significance at the 10% level. Real GDP per capita is in constant 2000 $US; (Log of real GDP per capita)$_{-1}$ is the lagged value of log of real GDP per capita; SCHOOLING_log(M/F) is the log of the ratio of the total number of years of schooling for males to females; SECONDARY_log(M/F) is the log of the ratio of secondary enrollment for males to females; Trade openness is the sum of exports and imports over GDP; MUSLIM is the dummy variable which equals to 1 for predominantly Muslim countries and zero otherwise; FRENCH is the dummy variable which assigns the value of 1 to predominantly French-speaking countries and zero otherwise. LABOR_log(M/F) is the log of the ratio of male labor force participation to female labor force participation. OTHER RELIGIONS is the dummy variable which equals to 1 for predominantly non-Muslim or non-Christian countries and zero otherwise. OTHER LANGUAGES is the dummy variable which equals to 1 for predominantly non-French or non-English speaking countries and zero otherwise. J-test is for overidentification problem where the null hypothesis H0: there is no overidentification problem. We fail to reject in each case. For serial correlation z-tests are repoerted; the null hypothesis H0 is "there is no serial correlation". We fail to reject H0 in each test.