

Gender Inequality and Marketisation Hypothesis in sub-Saharan Africa

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Abstract

According to the marketisation hypothesis, the growth of the service sector should reduce gender inequality given that women have a comparative advantage in service jobs and hence would benefit more relative to men as the sector grows. In recent years, the African service sector has grown substantially even surpassing world averages, but gender inequality in the region is still higher relative to other regions of the world. Using a new dataset on gender inequality, and applying dynamic panel data analysis, this paper explores the relationship between service sector shares and gender inequality in 32 sub-Saharan African countries from 1990-2014. Consistent with predictions of the hypothesis, service sector shares significantly reduce gender inequality and these results are robust after the inclusion of control variables such as economic development, institutions and religion. However, contrary to what the hypothesis suggests, female labour force participation in SSA declines in the share of services sector suggesting that for SSA, a different mechanism drives the relationship between service sector shares and gender inequality.

1 Introduction

Recent studies have shown that during the process of economic development, economies experience sectoral shifts (i.e structural transformation) from low skill labour intensive agriculture to high skill capital intensive services which transform the roles of men and women (*see* Akbulut, 2011; Buera & Kaboski, 2012; Freeman & Schettkat, 2005; Rendall, 2011, 2014; Rogerson, 2008). This transition is everywhere associated with the growth of the service sector in which home production of goods and services shifts into the market - a process coined marketisation hypothesis (Freeman & Schettkat, 2005). The hypothesis states that women should disproportionately benefit from the marketisation and remuneration of home production since service

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sector creates jobs particularly suited for women’s skills and preferences (Goldin, 2006) and also because women have a greater comparative advantage in service jobs compared to other sectors (Galor & Weil, 1996) - "brain versus brawn argument". This disproportionate benefit is also reinforced by the similarity between jobs in the service sector and in home production (Akbulut, 2011) and the fact that women have traditionally dominated household production (Olivetti & Petrongolo, 2016).

To this effect, structural transformation which is generally considered a gender neutral shock to the economy yields unexpected gender-biased outcomes through the service sector by increasing female labour supply. On the other hand, increased female labour force participation has been known to improve overall gender outcomes (*see* Goldin, 1990, 2006; Ngai & Petrongolo, 2014; Olivetti & Petrongolo, 2014)). Olivetti and Petrongolo (2014) show that countries with smaller service sector shares have lower female labour force participation and larger gender gaps - suggesting an interplay between marketisation and overall gender inequality. Figure 1 below shows this link between marketisation and gender inequality in SSA. However, this relationship has received very little attention (Ngai & Petrongolo, 2012), especially in sub-Saharan Africa.

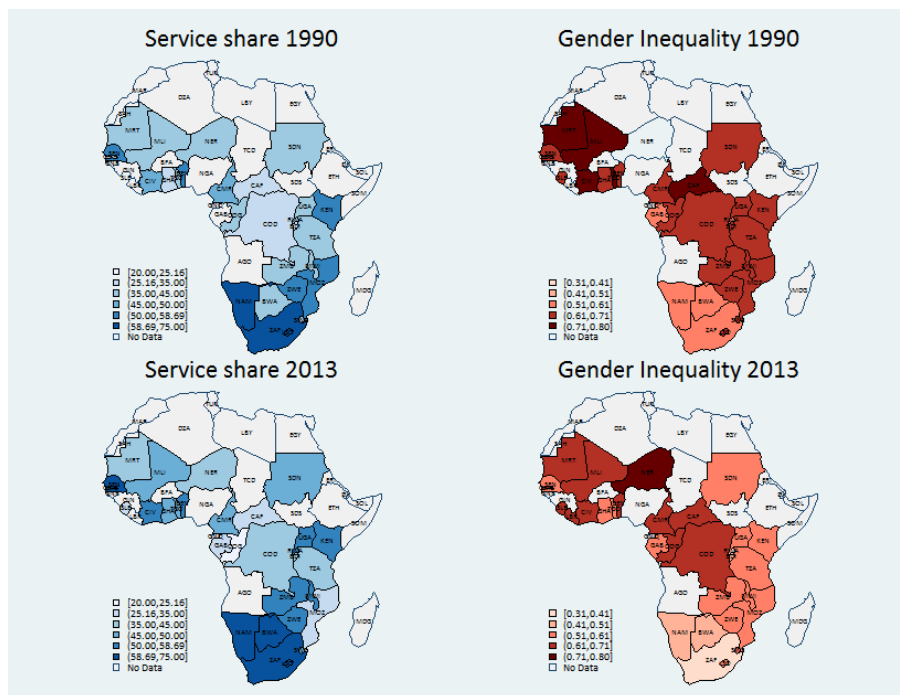


Figure 1: Marketisation and Gender Inequality in SSA

On the other hand, the nature and pace of structural transformation (the source of marketisation) in SSA has not been particularly impressive. Africa has generally been described as having an under performing agricultural sector, an industrial sector experiencing zero to negative growth and a bloated, informal and subsistent service sector (*see* Badiane, 2012, 2015; McMillan & Headey, 2014; Timmer, 2012; Timmer et al., 2015) . As a result, these structural dynamics may bear implications not only on the relevance of the marketisation hypothesis in SSA, but also the extent of its proposed impact on gender inequality. This paper therefore attempts to answer two questions; *What is the impact of marketisation on gender inequality in SSA and how large is this effect?*

Data on a sample of 32 sub-Saharan African countries from 1990-2014 is used to test the hypothesis and answer the questions. Panel data analysis methods including dynamic panel data with fixed effects and fixed effects with instrumental variables are applied. Regardless of the state and speed of structural transformation in the region, the results are consistent with the predictions of the hypothesis. The analysis yields statistically significant negative effects of marketisation on gender inequality.

This paper is related to literature on structural transformation, marketisation and gender inequality. Research on the link between labour force participation and industry structure dates back the work of (Fuchs, 1968; Reid et al., 1934; Stanley, 1993). However, most of these studies did not have a unified theoretical framework in which to analyse marketisation and home production. The seminal work by Galor and Weil (1996) made way for deeper inquiry into the relationship by providing a theoretical framework for analysing female labour force participation and industry structure. In their model, men and women have different endowments of "brain and brawn" which are necessary in the production of goods and services. Men have a comparative advantage in "brawn" which is typically necessary in the production of goods. This can be equated to the agricultural and manufacturing sectors, whilst women have a comparative advantage in "brain" which is more relevant in service production. Olivetti and Petrongolo (2016) propose that even if we take away the "brain versus brawn" argument due to technological advances, women will still have a comparative advantage in services related to the intense use of communication and interpersonal skills which cannot be easily automated.

A number of authors subscribe to this view (*see* Akbulut, 2011; Goldin, 1990, 2006; Ngai & Petrongolo, 2014; Rendall, 2010; Weinberg, 2000). What gives the service sector power to influence gender outcomes is the similarity of service jobs in home production and the market, together with the fact that women have traditionally done these jobs in the household (Olivetti

& Petrongolo, 2016). This kind of shift in female labour triggered by marketisation mirrors male labour shifts that occurred during industrialisation. According to Akbulut (2011), prior to industrialisation, men worked in their farms but with the advent of industry work in which labour was now relatively more productive compared to agricultural work, men "quit" their farm production into industry. This same analogy can be applied today as women "quit" unremunerated home production and shift their labour to the more productive remunerated service economy - with gendered implications.

This work contributes to the existing literature in two ways, first it tests the relevance of the marketisation within developing country context and focusing only on SSA in order to capture the region's unique characteristics. Much of the research discussed above focuses on developed countries. For example, (Heathcote, Storesletten, & Violante, 2010; Ngai & Petrongolo, 2014) examine the role of marketisation in explaining gender inequality in the form of hours worked by women in developed countries, whilst other studies have also used marketisation to explain gender gap variations in employment in the US and the UK (Ngai & Pissarides, 2011; Rogerson, 2007, 2008). Second, the research uses a new and more comprehensive dataset on gender inequality, the historically extended gender inequality index (GII) developed by the UNDP and extended by Gonzales et al. (2015) as an overall measure of gender inequality. The application of these concepts in a developing country context might provide new insights in filling in the gap in the literature on the determinants of gender inequality in Africa.

2 Background

2.1 Gender Inequality in Africa

Gender inequality has been marked as an impediment to growth and development (African Development Bank, 2014; Elborgh-Woytek et al., 2013; King & Mason, 2001). This is because apart from being a social or welfare concern, it is also a human capital efficiency loss concern since it represents an underutilisation of women's potential in the labour market (Cuberes & Teignier, 2014b). Evidence on some of the losses due to gender inequality can be found in Cuberes and Teignier (2014b) who show that due to gender gaps in the labour market, GDP per capita losses are as high as 27% in some regions of the world. Though gender equality has eluded all regions of the world, Africa has had persistently higher levels of gender inequality (using the UNDP's gender inequality index, GII) throughout the sample period as shown below:

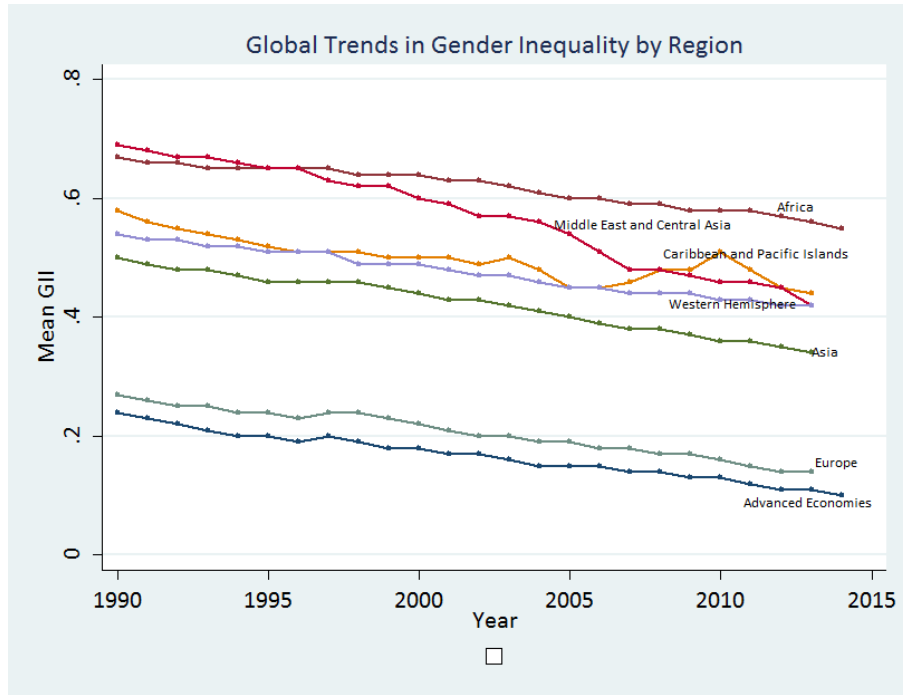


Figure 2: Global Trends in Gender Inequality using GII

2.2 Structural Transformation and Gender Inequality in Africa

2.2.1 Patterns of Structural Transformation in Africa

Structural transformation is defined as the reallocation of economic activity across three broad sectors (agriculture, manufacturing, and services) that accompanies the process of modern economic growth (Herrendorf, Rogerson, & Valentinyi, 2013). This is typically a transition of the economy from low productivity and labour intensive economic activities to higher productivity and skill intensive activities. According to (Timmer, 2012), one of the means of achieving successful and fast structural transformation follows from the Lewis Model where labour productivity is held constant in the industrial and service sectors and this allows them to absorb labour from the agriculture sector at the same rates as each sector itself expands. While the Asian experience closely resembles this, the African experience during most of the first five decades of their independence has been different (Badiane, 2012).

In Africa, labour productivity in the industrial and service sectors has grown at the same rate as the sectors themselves such that neither sector has the required capacity to effectively "pull" labour from agriculture hence the entire increase in the labour force remains in agriculture (Timmer, 2012). To date, not only is the absolute number of workers in agriculture still rising on this path, so too is the share of agricultural labour in the total labour force. In contrast,

because the industrial sector has experienced zero to negative growth; some of the largest employment losses in Africa have been experienced in formal wholesale and retail trade (with higher productivity), whilst the largest employment gains have been experienced in community, personal and government services which are not as productive (McMillan & Headey, 2014).

Overall, the service sector in Africa has expanded at an extremely rapid pace to a size that is currently not justified by the level of development of African economies, growing by more than twice the world average rate during 2009 -2012 (UNCTAD, 2015) as shown in Figure 3 below:

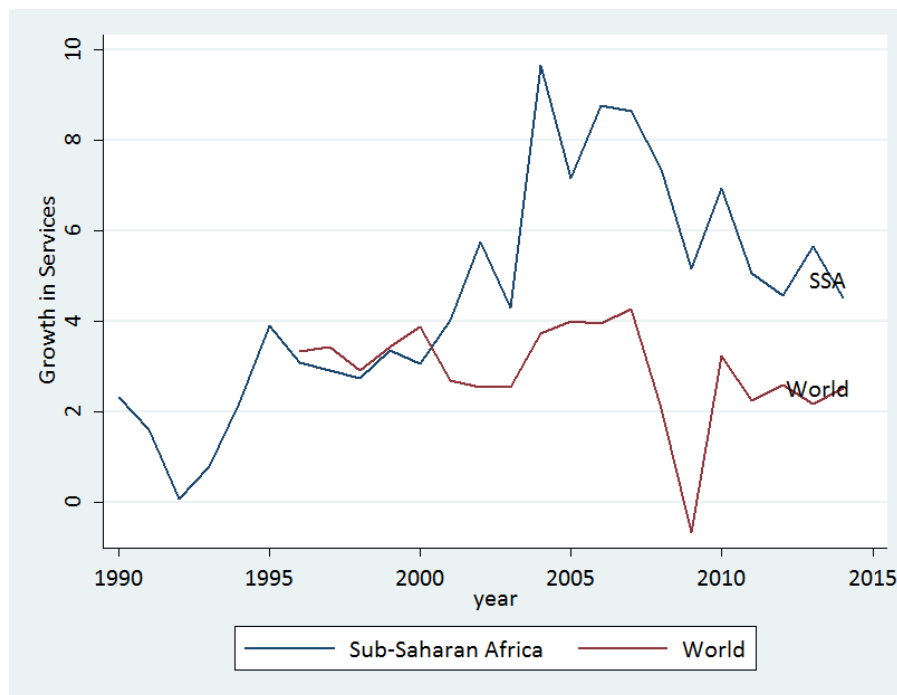


Figure 3: Growth of Service Shares in GDP: SSA and the World

The GDP share of the services sector in Africa is only slightly lower than the average share of Latin American countries, which have an average per capita income that is nearly eight times higher than the African average. Growth was particularly strong in Eastern and Western Africa and in most African countries where the share of services in real output was above 50%, the service sector was mostly domestic-demand driven than exports-led (UNCTAD, 2015). However, this service sector that has emerged in Africa is highly informal, subsistent, non-tradable and less productive (McMillan & Headey, 2014), UNCTAD, 2015).

The agriculture sector, on the other hand, has shrunk faster than is normal under successful transformation (Badiane, 2015). More specifically, the average GDP share of agriculture among African countries is significantly smaller than that of South Asian countries with similar levels

of income. This imbalance in sectoral growth has delayed structural transformation and slowed productivity and income growth across Africa (Badiane, 2015).

2.2.2 Gendered Implications of Structural Transformation Patterns in Africa

Agriculture remains the backbone of most African economies, employing 70% of the population (African Development Bank, 2015). However, among low income countries in SSA, agriculture feminization is prevalent. The region has the highest average female share of agricultural labour force in the world of around 50% . Small-holder agriculture in SSA is often highly segmented by gender: with women typically engaged in the production, processing, and sale of domestic foodstuffs in domestic markets and men typically engaged in the production of cash crops, often for exporting (Gammage, Jorgensen, McGill, & White, 2002). Moreover, women farmers have less access to essential inputs such as land, credit, fertilisers, new technologies and extension services. As a result, their yields tend to be significantly lower than men's. In Ethiopia, for example, female farmers produce 26% less than male farmers, and in Ghana, they produce 17% less (FAO, 2011).

According to Chen (2008) , compared to the Asian experience, manufacturing in Africa has never been quite significant, varied or robust, hence has not created much employment. Most developing countries' manufacturing sectors are heavily dominated by resource - processing sectors that are capital and energy intensive. However, there are country specific cases where manufacturing sector (textiles and garment) has had a significant role in the development process (*for example Kenya, Lesotho, Madagascar, Mauritius and South Africa*. The growth of the garment and textile industries provided much work for women outside of agriculture but this advantage for women is reduced due to the nature and size of manufacturing in the region discussed above. Moreover, due to increased competition from other cheaper imports from other developing countries in the 1990s, female employment in manufacturing declined in a number of SSA countries such as Zimbabwe, Tanzania, Cote d'Ivoire, Nigeria, Kenya, Ghana, and South Africa (UNRISD, 2005).

The service sector has become the dominant form of economic activity in most SSA countries for most women since formal employment outside of agriculture represents a small fraction of total female employment. A large share of the workforce in SSA is engaged in the informal self-employment comprising of the provision of services, including informal retail trade (Chen, 2008). "Street trade" is a pervasive feature in the urban informal economy in Africa (Gammage et al., 2002). Large numbers of women are street vendors and market traders. Cross-border

trade is a significant component of informal trade in the region, for both women and men, particularly in countries where the local economy has been disrupted, case in point Zimbabwe where one fifth of the women in the informal sector are involved in cross-border trade (Gam-mage et al., 2002). Despite all these challenges, the service sector continues to offer women much needed market work.

3 Empirical Strategy and Data

In order to investigate the relationship between marketisation and gender inequality in SSA, data on a panel of 32 sub-Saharan African countries from 1990-2014 is used. Due of the nature of this data, panel data analysis is used to estimate the impact of marketisation on gender inequality. Determinants of gender inequality are broadly classified into 2 groups; modernisation (i.e economic development) and institutions hence these are controlled for in the baseline model. The lagged dependent variable is also included in the regressions to account for persistence in gender inequality.

Baseline Model: The baseline model specification is:

$$GII_{it} = \alpha_i + \pi_t + \beta_0 GII_{it-1} + \beta_1 Service_{it} + \beta_2 X'_{it} + \epsilon_{it}(1)$$

The dependent variable, GII_{it} is the Gender Inequality Index (GII) score for country i at time t , and α_i and π_t are the country and time fixed effects. Inertia in gender inequality is modelled by the lagged dependent variable $GII_{i,t-1}$ included in the regressors. The main variable of interest is $Service_{it}$. It captures marketisation and is measured as the sectoral share of services in GDP for country i at time t and β_1 is the parameter of interest. X'_{it} is a vector of control variables and ϵ_1 is an i.i.d. error.

Dependent variable: GII: Gender inequality is estimated using the UN historically extended Gender Inequality Index, GII (Gonzales et al., 2015). GII is a composite index capturing the loss of women's achievement due to gender biases. This index covers three aspects of a country's gender inequality, namely reproductive health, empowerment, and labour market participation. The index ranges from 0 – 1, with 1 representing complete inequality and the reverse is true for a 0 score. The use of an index is informed by the fact that gender inequality on its own is a multidimensional concept which manifests in various forms. These dimensions of gender inequality are substitutable and complementary, for example, if in a given country gender inequalities in education are low, while they are high in politics, then the use of a composite

index captures the interaction of these forms of inequality thus providing a broader picture on gender inequality.

Though GII is not necessarily a perfect measure as it is also prone to some weaknesses such as the bias towards elites that in some indicators (such as parliamentary representation) and also missing other important dimensions, such as time use which captures important elements in understanding gender inequality, it does build on previous gender indexes used in the Human Development Reports (HDRs): the gender-related development index (GDI) and the gender empowerment measure (GEM). The GEM focused on political participation (measured by women's shares of parliamentary seats), economic participation (shares of high level and professional positions) and power over economic resources (income gaps). These gender measures had some important limitations, for example, the previous indices combine absolute and relative achievements such that a country with low absolute income scores poorly, even with perfect gender equity. Moreover, nearly all indicators in the GEM arguably reflect a strong urban elite bias and use some indicators more relevant to developed countries. Some of the advantages of GII over these indices is that it measures inequality between genders in three dimensions. GII also removes income, the most controversial component of the GDI and GEM and it does not allow for high achievement in one dimension to compensate for low achievement in another dimension.

Independent variable: Services, value added % of GDP: Marketisation is captured by the service sector share in GDP. Data on service sector contribution to GDP is drawn from the World Bank's World Development Indicators (WDI). Services correspond to ISIC divisions 50-99 and they include value added in wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services. As mentioned before, the hypothesis is; growth in service sector share in GDP reduces gender inequality.

Figure 4 below shows a scatter plot of GII and service share in GDP. It shows significant heterogeneity in the level of gender inequality among the countries within the region. A negative relationship between between gender inequality and service share in GDP is observed and more generally, countries with larger service sector shares in GDP also have lower levels of gender inequality.

Controls: GDP per capita: is the proxy for modernisation (economic development). The relationship between economic development and gender inequality has been found to be complex yielding mixed results (*see* Boserup, 1970; Duflo, 2012; World Bank, 2011). Therefore,

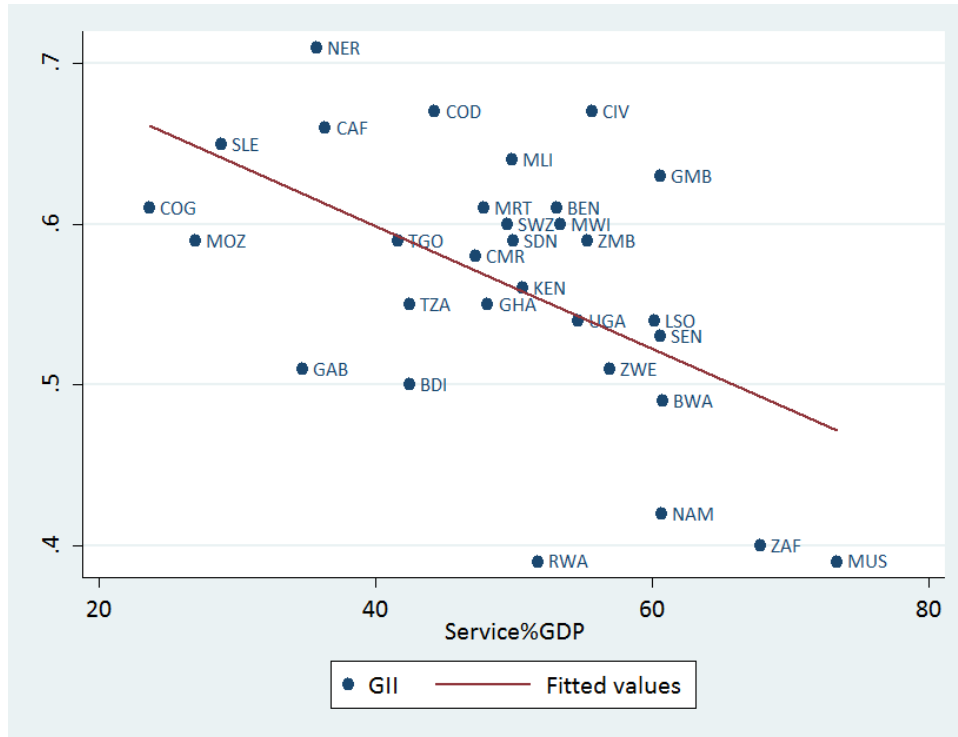


Figure 4: GII and Service Share in GDP in 2013

no a priori relationship is given. The variable *Polity* captures the quality of institutions and is a score that varies between -10 and +10, and increases with the quality of institutions. In a broad sense, more democratic societies are assumed to confer greater freedom of self in general and this should also work to improve the conditions of previously marginalised groups, women included. In this way, improved institutional quality is expected to reduce levels of gender inequality. However, the adoption and spread of new forms of institutions in society is believed to be strongly linked to and reinforcing of inherent forms of institutions in a particular area. SSA is generally patriarchal, placing the man as the household head. Therefore, the relationship could go either way (see Cooray & Potrafke, 2011; Inglehart & Norris, 2003; Inglehart, Norris, & Welzel, 2002).

From the empirical strategy applied, the growth of the service sector can significantly reduce gender inequality as more women are inclined to work in the services sector because of the strong similarity of the work done at home and in the service market. On the other hand, with more women working, this might trigger an even greater demand for market produced services such as child care and cooked meals among others – giving rise to the endogeneity problem. To correct for this problem, the relationship is also estimated using a historical variable, *State history index* as well as the lagged service share as instruments that would give a more exogenous

variation for service sector shares in Africa.

The state history index developed by Bockstette, Chanda, and Putterman (2002) summarises whether present day countries had states from 1 - 1950CE. It ranges from 0 - 50, with 50 representing presence of a government that was locally based and had control of more than 50% of the present day country territory. Lower values indicate some or no government at all in the case of 0. The dataset is divided into 50-year periods and hence captures 39 different time points. In order to use this data, each of the 39 time points is hypothesised as representing a long lag of a particular year within the current sample. With a sample period of 24 years, 24 time points from the state history dataset were used and hence this long lag dates from 651 - 1950CE. The data is also standardised so that it ranges between 0 - 1 and state history increases with the score. The index proposes that present day countries that have been the site of states, kingdoms or empires over long spans of history have achieved more rapid economic development in recent decades which we can observe as a greater transition from agriculture and manufacturing. The use of the index in this paper is based on the fact that one of the features of economic development is a growing service sector and thus more generally, countries with longer state histories, are more developed and thus also have larger service shares today.

3.1 Descriptive Statistics

Tables 1 and 2 below provides for the description of the data as well as correlations respectively.

Table 1: Descriptive statistics

Variable	Mean	Std. Dev.	Min.	Max.	N	Source
GII	0.616	0.084	0.36	0.830	751	Gonzales et al. (2015)
Service share	45.936	10.805	12.872	73.319	758	WDI
GDP/capita	1981.028	2736.346	115.436	11906.569	825	WDI
Polity	0.506	0.28	0	0.952	677	Center for Systemic Peace

Table 2: Cross-correlation table

	GII	Service	GDP/c	Polity
GII	1			
Service	-0.505***	1		
GDP/capita	-0.576***	0.335***	1	
Polity	-0.349***	0.415***	0.168***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

For an index ranging between 0 and 1, overall gender inequality (as measured by the GII)

for the region is high with an average of 0.62 and it is as high as 0.83 in Niger and as low as 0.36 in Mauritius. Service sector share in GDP for the region on average is below 50%, which shows that there is room for the sector to grow as a result of continued structural transformation in the region. There is considerable variation in the service sector share in GDP across countries within the region - as low as 12.9% in Sierra Leone and as high as 73% in Mauritius. Income per capita also shows a lot of heterogeneity in the region with a huge gap between Liberia and Gabon for example, with GDP per capita levels of US115.40 and US11907 respectively. After normalising the polityIV score to between 0 and 1, the lowest score, 0 is recorded Swaziland whilst the highest institutional quality is recorded in Zambia at 0.95.

From Table 2 above, the sign of the correlation coefficient between service share in GDP and gender inequality is negative and significant as expected. The correlation results also establish negative and significant relationships between income per capita and gender inequality, polity and gender inequality as expected.

4 Results

4.1 The Impact of Marketisation on Gender Inequality

Table 3 below reports the estimates of equation 1. Reported in columns 1 to 4 are the OLS estimates. Included in column 1 are the initial levels of service shares, economic development and quality of institutions. These variables capture elements of convergence. Other things equal, countries with smaller service shares, are poorer and have low institutional quality should reduce gender inequality faster than countries with higher initial service shares, are richer and have better quality institutions, and effectively catch up. From column 1, a lower initial service share actually increases gender inequality, thereby refuting the notion of convergence whilst initial economic development and institutional quality do exhibit statistically significant convergence. After controlling for initial levels, marketisation significantly reduces gender inequality. A 10% increase in the share of services in GDP will reduce gender inequality by between 15- 18%. However, given that this association might be driven by unobserved country-specific characteristics, in columns 5 - 8 are fixed effects estimates to control for any unobserved heterogeneity. Each of the columns includes a common time varying shock. The negative relationship between marketisation and gender inequality is still robust but the impact is reduced, suggesting that country and time fixed effects have a significant impact on gender inequality. Using fixed effects estimation, a 10% increase in the share of services in GDP will reduce gender inequality

by between 2 - 5%. Column 8 includes the lagged dependent and the relationship between marketisation and gender inequality is still negative and statistically significant.

Table 3:

Marketisation and Gender Inequality SSA- OLS and Fixed Effects Results

Dependent:GII	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	OLS	OLS	OLS	FE	FE	FE	FE
Initial Service share	0.006 (0.068)	0.078 (0.067)	0.077 (0.071)	0.076 (0.074)				
Initial GDP/capita	-0.049** (0.021)	-0.048** (0.019)	0.046 (0.055)	0.046 (0.055)				
Initial Polity	-0.011*** (0.003)	-0.009*** (0.003)	-0.008** (0.003)	-0.008** (0.004)				
Service share		-0.178*** (0.059)	-0.154** (0.057)	-0.153** (0.063)	-0.052* (0.028)	-0.042 (0.027)	-0.048* (0.028)	-0.015* (0.008)
GDP/capita			-0.099* (0.056)	-0.100* (0.055)		-0.065* (0.035)	-0.064* (0.034)	-0.014 (0.009)
Polity				-0.000 (0.003)			0.001 (0.001)	-0.000 (0.000)
GII_{t-1}								0.810*** (0.045)
Observations	558	558	558	558	558	558	558	518
R-squared	0.427	0.492	0.520	0.520	0.709	0.727	0.729	0.930
Country FE	NO	NO	NO	NO	YES	YES	YES	YES
Year FE	NO	NO	NO	NO	NO	NO	NO	YES
F	7.506***	9.357***	8.052***	6.980***	11.06***	21.81***	27.98***	729.1***
Number of i	31	31	31	31	31	31	31	31

Standard errors in parentheses:*** p<0.01, ** p<0.05, * p<0.1

Tables 4 below shows the estimations that address the endogeneity problem using fixed effects instrumental variables method. We use the lagged service share and state state history index respectively as instruments. The identifying instruments in the first stage regression are statistically significant. The F test for joint significance is also statistically significant – thus the model does not suffer from weak instruments. Both the lagged service share and state history index are positively and statistically related to the share of services in GDP as expected

Table 4:

Marketisation and Gender Inequality SSA- Fixed Effects with Instruments Results

Dependent:GII	(1) FE-IV	(2) FE-IV	(3) FE-IV		(4) FE-IV	(5) FE-IV	(6) FE-IV
Service share	-0.055*** (0.013)	-0.045*** (0.013)	-0.104*** (0.017)		-0.098* (0.059)	-0.101* (0.057)	-0.127** (0.056)
GDP/capita		-0.059*** (0.010)	-0.034*** (0.012)			-0.066*** (0.014)	-0.029 (0.020)
Polity			0.001* (0.001)				0.002* (0.001)
Observations	656	656	537		634	634	528
Number of i	31	31	31		29	29	29
Country FE	YES	YES	YES		YES	YES	YES
F	76.54***	79.17***	67.59***		67.37***	69.85***	63.39***
R-squared	0.199	0.459	0.451		0.247	0.499	0.429
First Stage Regressions							
(Lagged Service Share)	0.718*** (0.028)	0.718*** (0.026)	0.617*** (0.032)	(State History Index)	0.130*** (0.03)	0.131*** (0.029)	0.136*** (0.029)
F test for weak instruments	252.0***	188.0***	180.1***		225.1***	170.0***	163.3***

Standard errors in parentheses:*** p<0.01, ** p<0.05, * p<0.1

From table 4 above, the results are still robust - marketisation significantly reduces gender inequality. The coefficient of the share of services in GDP are significantly larger using the instruments compared to the fixed effects estimates. This might be due to the external variation from the instruments which reduces the endogeneity bias.

With regards to other regressors, the impact of GDP per capita on gender inequality is negative and mostly significant suggesting that as economies develop, gender inequality levels decline. This result is consistent with the findings of (Dinkelman, 2011; Doepke & Tertilt, 2009; Duflo, 2012; Fernández, 2014; Greenwood, Seshadri, & Yorukoglu, 2005; Miller, 2010; World Bank, 2006). The impact of institutional quality on gender inequality reveals the complexity associated with the adoption of new forms of institutions in any society (*see* Beer, 2009; Cooray & Potrafke, 2011) discussed earlier.

5 Is Female Labour Force Participation the Channel?

The marketisation hypothesis proposes that the link between gender inequality and marketisation is explained by increased female labour force participation. This link needs to be tested. However, the measure for gender inequality used (GII) is an index consisting of 5 different variables namely; maternal mortality ratio, adolescent fertility rate, proportion of parliamentary

seats occupied by females, proportion of females aged 25 years and older with at least some secondary education and labour force participation rate of female population aged 15 years and older. It is therefore disaggregated in order to determine if female labour force participation plays the central role in explaining marketisation and gender inequality in SSA. First explored in table 5 below are the fixed effects estimation results on all 5 components of GII , whilst table 6 further explores the relationship between female labour force participation and marketisation.

Table 5:

Impact Marketisation on GII Components - Fixed Effects Estimation Results: SSA

	(1)	(2)	(3)	(4)	(5)
	Maternal Mortality	Politics	Labour(Female)	Adolescent Fertility	SecEducation (Female)
Service share	-0.076 (0.067)	0.535 (0.342)	-0.011 (0.020)	-0.099* (0.057)	0.086 (0.180)
Observations	558	408	558	558	327
R-squared	0.425	0.436	0.378	0.686	0.684
Number of i	31	31	31	31	29
Controls	All	All	All	All	All
Country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
F	22.00***	7.831***	4.912***	12.11***	52.50***

Robust standard errors in parentheses:*** p<0.01, ** p<0.05, * p<0.1

From table 5 above, service shares are regressed on each of the components of GII, column 1 being maternal mortality ratio, column 2 number of parliament seats held by women, column 3 is female labour percentage of total labour force, column 4 is adolescent fertility rate and column 5 is female secondary school enrolment % of female population .

In line with the other GII components, marketisation significantly reduces adolescent fertility rate. It also reduces maternal mortality, increases the number of parliamentary seats held by women and female secondary school enrolment but these effects are insignificant. Despite the insignificance, the signs of the coefficients are consistent with the predictions of the marketisation hypothesis that female outcomes should significantly improve in the share of services in GDP. Increases in medical services should effectively result in better and improved access for women and hence provide them with information and medical attention particularly in line with contraception use and availability as well as pre and post natal care. Put together, these will impact on fertility rates and maternal and even child mortality.

The increase in years of schooling builds on the stock of human capital women possess

and hence might improve women’s bargaining power giving them "voice" to engage in public and civic roles as observed through increased parliamentary representation. An explanation for the insignificant outcome on female secondary school enrolment could be found in the nature of services in SSA which are generally subsistent and thus do not require high skills sets. Effectively, women do not necessarily need higher levels of education in order to engage in the type of service work available now and are therefore slacking in enrolling for higher education.

Female labour force participation is the variable of interest, hence we explore the effect of service share in GDP on female labour in table 6 below.

Table 6:

Marketisation and Gender Inequality SSA: Is Female Labour force Participation the Channel?

Dependent:Female Labour	(1) FE	(2) FE	(3) FE
Service share	-0.027*** (0.010)	-0.019** (0.010)	-0.011 (0.010)
GDP/capita		-0.053*** (0.010)	-0.054*** (0.010)
Polity			-0.001** (0.001)
Observations	558	558	558
R-squared	0.337	0.370	0.378
Number of i	31	31	31
Country FE	YES	YES	YES
Year FE	YES	YES	YES
F	12.27	13.49	13.30

Standard errors in parentheses:*** p<0.01, ** p<0.05, * p<0.1

The result is contrary to the argument made earlier that service shares disproportionately benefit women relative to men through increased female labour force participation due to the comparative advantage they have in work done in the service sector. A possible explanation for this result is that the SSA context is unique in that the job creation in most sectors is generally low, hence generally high unemployment rates in most countries. Effectively, men in SSA are also competing for the same service sector jobs as women. Because of this increased competition – which probably does not factor in any elements of comparative advantage (the necessary condition that makes structural transformation produce gender-biased outcomes), the ability of marketisation to significantly increase female labour force is reduced, and in some cases actually eroded.

6 Robustness Tests

6.1 Religious Influences, Other Variables and Nonlinearities

Religion in the form of Christianity and Islam is a fairly new institution in Africa compared to most regions of the World. It therefore seems reasonable to test the effect of marketisation on gender inequality in the presence of this form of social institution. For this purpose, the ratio of the total population who are Catholic, Protestant and Muslim is used. This data is obtained from the Association of Religion Data Archives. Table 6 below shows a summary of the estimations.

Table 7:

Marketisation and Gender Inequality - Fixed Effects Robustness Check Results

Dependent:GII	(1) FE	(2) FE	(3) FE	(4) FE	(5) FE	(6) FE	(7) FE	(8) FE
Service share	-0.049* (0.026)	-0.036 (0.033)	-0.044* (0.025)	-0.046* (0.027)	-0.043 (0.027)	0.053 (0.049)	-0.049* (0.028)	0.468* (0.234)
Religion	19.399*** (1.948)							
Muslim		0.669* (0.359)						
Catholic			-0.885*** (0.083)					
Protestant				-0.436*** (0.043)				
Urbanisation					-0.096*** (0.035)			
Urbanisation*Service share						-0.096*** (0.035)		
Trade openness							-0.007 (0.016)	
Service share-squared								-0.073** (0.033)
Observations	558	558	558	558	558	558	558	558
R-squared	0.696	0.391	0.694	0.719	0.748	0.748	0.729	0.737
Controls	All	All	All	All	All	All	All	All
Number of i	31	31	31	31	31	31	31	31
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	NO	NO	NO	NO	YES	YES	YES	YES
F	32.51***	14.29***	33.94***	32.98***	63.35***	63.35***	29.83***	45.25***

Standard errors in parentheses:*** p<0.01, ** p<0.05, * p<0.1

Columns 1 to 4 show that the coefficients of marketisation remain mostly negative and sta-

tistically significant even after controlling for religious influences. Generally, religion increases gender inequality. Of the different forms of religion analysed, Islam has a positive and statistically significant impact on gender inequality, whilst both Catholicism and Protestantism significantly reduce gender inequality. These findings are generally consistent with the literature on religion (as a form of institution) and its impact on gender inequality and attitudes (*see* Cooray & Potrafke, 2011; Inglehart & Norris, 2003, 2004; Klingorová & Havlíček, 2015; Phillips, 2009; Seguino & Lovinsky, 2009).

Columns 5 and 6 in table 6 control for some of the other determinants of gender inequality discussed in the literature namely, the level of urbanisation and degree of trade openness. The impact of marketisation on gender inequality remains negative in both cases, and statistically significant with the inclusion of trade openness. The impact of urbanisation and trade openness on gender inequality in SSA is consistent with some of the findings of (*see* Chant, 2013; Tacoli, 2012; Tacoli & Satterthwaite, 2013) on gender inequality and urbanisation, and (*see* Aguayo-Tellez, Airola, Juhn, & Villegas-Sanchez, 2014; Juhn, Ujhelyi, & Villegas-Sanchez, 2013; Korinek, 2005) on trade openness and gender inequality.

Column 7 in table 6 above shows evidence of a simple nonlinear relationship between marketisation and gender inequality, a relationship captured by the service share in GDP squared. The coefficient of marketisation is positive though insignificant, whilst the squared term is negative and also insignificant, validating a nonlinear relationship between marketisation and gender inequality albeit a weak one. When the service sector has a relatively smaller share in GDP, women will fair much worse in general. However, as the share of services in GDP increases, women start doing relatively better as the service market opens more opportunities for them and hence improve gender outcomes and reduce gender inequality.

7 Conclusion

The paper tests the proposition of the marketisation hypothesis that service sector growth reduces gender inequality given that women have a comparative advantage in service jobs, and hence should disproportionately benefit when the sector grows. The empirical findings from this analysis provides evidence of this relationship in SSA countries. However, contrary to what the hypothesis suggests, female labour force participation in SSA declines in the share of services. These findings may be a result of a number of related factors, including the nature of structural transformation in the region, composition of services, informality and subsistence within the

service sector or a services quantity- quality trade off. The task of disentangling this relationship is however left open for future research.

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A Appendices

A.1 Comparison with OECD Countries

Having observed that much of the research done on this topic covers developed countries particularly those in Europe as well as the US, we explore the same relationship within that context in order to assess its overall relevance. This also allows us to test if the marketisation is sensitive to sample selection in terms of sign and size. Moreover, we also focus on this region because these countries are characterised as developed and one widely accepted feature of a developed economy is a large service economy. Also noticeable is that gender inequality levels in these countries are much lower than most regions of the world, suggesting a possible link between marketisation and gender inequality. But just how strong is this link within developed country-context? To answer this question we run a fixed effects regression on 21 OECD countries over the same period of time. Shown below are the descriptive statistics on the sample as well as the regression results.

Table 8: Descriptive statistics: OECD

Variable	Mean	Std. Dev.	Min.	Max.	N
OECD Sample					
GII	0.153	0.066	0.02	0.33	528
Service Share	70.343	5.559	53.943	87.989	484
GDP/capita	43981.016	17366.631	16688.258	110001.055	550
Polity	0.949	0.014	0.857	0.952	440
SSA Sample					
GII	0.616	0.084	0.36	0.830	751
Service share	45.936	10.805	12.872	73.319	758
GDP/capita	1981.028	2736.346	115.436	11906.569	825
Polity	0.506	0.28	0	0.952	677

Table 9:

Marketisation and Gender Inequality - OECD vs. SSA Fixed Effects Results

	(1)	(2)	(3)	SSA	SSA	SSA
Dependent:GII	OECD	OECD	OECD			
Service share	-3.727*** (0.918)	-2.115*** (0.710)	-2.042*** (0.702)	-0.052* (0.028)	-0.042 (0.027)	-0.048* (0.028)
GDP/capita		-1.124*** (0.275)	-1.116*** (0.272)		-0.065* (0.035)	-0.064* (0.034)
Polity			2.629*** (0.381)			0.001 (0.001)
Observations	448	448	448	558	558	558
R-squared	0.363	0.555	0.564	0.709	0.727	0.729
Number of i	21	21	21	31	31	31
Country FE	YES	YES	YES	YES	YES	YES
Year FE	NO	NO	NO	NO	NO	NO
F	16.48	26.26	.	11.06	21.81	27.98

Standard errors in parentheses:*** p<0.01, ** p<0.05, * p<0.1

From Table 9 above, the negative impact of marketisation on gender inequality is robust in both samples. However, also apparent is that the effect is much more pronounced in OECD than in SSA. For example, a 10% increase in service GDP can be expected to reduce gender inequality by 20% in a typical OECD country, compared to a 4% reduction in a typical SSA country. This can be a result of the fact that compared to SSA the mean share of services in GDP for OECD countries shown in table 8 above is much larger at 70% compared to that of SSA at 46%. Moreover, a comparison of the lowest service share in GDP in the two samples shows a huge disparity. In the OECD sample, the lowest level is 53.9% in Norway, whilst in the SSA sample, it is 12.8% in Sierra Leone. On the other and, the highest service share in GDP in the OECD is 87.9% in Luxembourg, compared to 73.3% in Mauritius. Moreover, though not explored in this paper, this difference might be reflective of the difference in the nature of services in terms of complexity and value addition in the two regions.

In order to explain the differential impact of marketisation on gender inequality in the 2 samples, the GII for OECD countries also disaggregated to test the channels through which marketisation reduces gender inequality in the region. Reported in Table 9 below are the estimation results.

Table 10:

Impact Marketisation on GII Components Fixed Effects Estimation Results: OECD

	(1)	(2)	(3)	(4)	(5)
	Maternal Mortality	Politics	Labour(Female)	Adolescent Fertility	SecEducation (Female)
Service share	0.037 (0.545)	1.471* (0.719)	0.239** (0.093)	1.280** (0.507)	0.435 (0.269)
Observations	467	372	467	467	448
R-squared	0.668	0.640	0.700	0.718	0.263
Number of i	21	21	21	21	21
Controls	All	All	All	All	All
Country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
F

Robust standard errors in parentheses:*** p<0.01, ** p<0.05, * p<0.1

From table 10 above, marketisation significantly increases women's participation in parliament, adolescent fertility and the female labour in the OECD. The labour outcome is much more important in this analysis since it is central to the marketisation hypothesis. We also narrow down to explore the actual link between marketisation and female labour force participation within the OECD region. Below are the comparative results with the SSA sample.

Table 11:

Marketisation and Female Labour force Participation - OECD vs. SSA

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent:FLFP	OECD	OECD	OECD	SSA	SSA	SSA
Service share	0.229*** (0.033)	0.241*** (0.034)	0.239*** (0.034)	-0.027*** (0.010)	-0.019** (0.010)	-0.011 (0.010)
GDP/capita		0.037* (0.021)	0.036* (0.021)		-0.053*** (0.010)	-0.054*** (0.010)
Polity			-0.124 (0.099)			-0.001** (0.001)
Observations	467	467	467	558	558	558
R-squared	0.697	0.699	0.700	0.337	0.370	0.378
Number of i	21	21	21	31	31	31
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
F	38.65***	37.47***	36.19***	12.27***	13.49***	13.30***

Standard errors in parentheses:*** p<0.01, ** p<0.05, * p<0.1

Shown in table 11 above, as proposed by the hypothesis marketisation actually increases female labour force participation within OECD countries, whilst in the SSA sample, marketisation reduces female labour force participation. This could be the gap which makes gender outcomes different in the two regions. As previously suggested, increasing female labour force

participation triggers positive feedback effects in other dimensions of women's lives. As such, female labour force can be viewed as a necessary condition for marketisation to significantly reduce gender inequality. Such differences are left open for further research.

