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# Gender Equality, Women's Education and Pro-Poor Development Lessons from Nigeria

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**Preface**

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# Gender Equality, Women's Education and Pro-Poor Development Lessons from Nigeria

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**Abstract**

Economic development which is worth sustaining is one that not only guarantees economic growth but also reduces poverty. This has been elusive in many countries. Several past studies point at gender equality as a possible solution. Studies have also shown that balancing the gender equation through economic empowerment of women not only benefits the women themselves but that it also benefits men, children and society. Using data from the World Bank for 1970-2012, this study demonstrates the influences of women's labour participation rates (LAPAR) and education (WEDU) on both per capita growth and poverty levels separately using the 'Bound Testing technique'. The study proves that if women are not restricted or hindered from income generating activities, there are significant improvements in both output per capita and poverty reduction. Specifically, the long-run model reveals that a percentage increase in women's labour participation rates will increase output per capita by over 214 per cent and decrease poverty levels by at least 5 per cent. Ironically, women's education just till the secondary level does not conform to à-priori expectations for both metrics. This buttresses an earlier study showing that for most poor countries the impact of education on economic development becomes significant only at the tertiary level (perhaps below the tertiary level women in poor nations are not capable of challenging the usual socio-cultural factors that limit their involvement in formal paid employment). We conclude that undermining women in developing countries in most part may have led to the wide divergences between the development in the global North and South. The study recommends that women should be fully empowered and unrestricted in workplaces for increasing output per capita and reducing poverty. In addition, women's education should be encouraged up to the tertiary level to enhance their chances of catching-up with developed nations in an inclusive manner.

Keywords: Gender equality, growth, development, auto-regressive distributed lag model.

JEL Classification Codes: O1; C12; 040; C23.

## 1. Introduction

Inequality emanates from several channels. Most of these affect incomes. Income inequalities exist because money is denied to those who would have spent it on meeting their essential needs and is instead transferred to people who have far more money than they can possibly spend. This erodes aggregate effective demand and cripples economic activities. Inequality emanating from a gender imbalance presents the highest level of inequality – defined as income gap between the poorest woman and the richest man. This study investigates how this influences economic development (increase in real output per capita and reduction in poverty). The research is based on a debate on the question: 'Are women and the family relevant for economic development?' An opposing school of thought believes that the earth is limited in its endowments and, therefore the lesser we are, the higher each person's share of the limited resources (the fewer the merrier). The more we are, it says, the poorer we will all be. This group does not favour family expansion. It sees a family as a problem for economic development; and large populations as a factor that perpetuates poverty and threatens government stability. This group concludes by sighting poverty and instability in developing countries with relatively high populations. Strangely, this school of thought may have influenced audiences around the world to the fact that some families have degenerated into hostile places for women and children. The group undermines the potential of women and children as agents for procreation, large populations, labour force and economic development.

The supporting school argues that marriage generates children, hence increasing population. Economists know that large populations or a huge labour force are required to achieve large output levels. This group believes that the development dilemma in nations is due to lack of skills to manage and expand this 'labour resource'. This group believes the advanced countries are rich and more stable because of their talent in managing resources, population and the extreme and sub-optimal interests of individuals. It believes that women and the family are vital suppliers of labour which is useful for development. Large and healthy families, it says, are needed for the economy to fulfil its purposes. This school of thought also insists that population increase supports economic growth through a larger labour force and that population has nothing to do with poverty and instability.

This school maintains that poorly structured families and societies as well as bad economic policies are factors that foster poverty, de-growth and instability. They see those who are against women and families as naïve and conclude that poverty and female abuse must be eradicated for nations to achieve inclusive growth and economic development. They recommend that poverty and female abuse must be monitored and regulated by national and international laws as well as by strong institutional arrangements. It is this group that may have pressed and obtained the adoption of poverty and gender related support under the millennium development goals (MDGs). Experts believe that nations can only attain relevant MDGs if they address overarching poverty and challenges of gender equality. The global community must also renew its attention to women's economic empowerment and increase investments in their education. Nations should come to terms with the fact that today gains in women's economic opportunities lag far behind women's capabilities, especially in Africa.

This study sees an economic development that is worth sustaining as one where an increase in real per capital GDP must lead to reduction in poverty and/or inequalities (Meier & Rauch, 2005). This paper tests a hypothesis to empirically confirm that an increase in women's involvement in workplaces proxy by labour force participation rates, female (percentage of the female population aged 15-64 years) and women's education, including training and skill acquisition proxy by female secondary school enrolment rates, as factors that are capable of increasing economic growth, reducing poverty and leading to faster economic development.

The overall objective of this study is to show that women's empowerment or equality through equal opportunities in employment and/or education, leads to an increase in real per capita GDP and in poverty reduction and hence to inclusive growth. It is expected that the result of this analysis will enable us to advice societies where women's employment and work related education are hindered or restricted. The rest of the paper is structured as follows. It first looks at women's role in economic development. The next section reviews some relevant literature. It then looks at theories on gender, explains the method of analysis and specifies empirical models. It then moves on to discussing regression results. The last section provides a conclusion.

### 1.1 Role of women in economic development

According to Scholz (2012) it is no longer news to say that women account for more than half of most nations' populations and are a huge talent base. Therefore, issues related to economic development are incomplete without a conversation on gender issues. I prefer to speak on gender equity and not gender equality. Though it is a general belief that more men are more superior in more areas and ways as compared to women, gender equity supports that a fewer women have proved to be superior to some men in certain specific areas and so they must be recognized for this. Investing in girls' education beyond the secondary level, encouraging women's participation in the workforce and boosting their earnings will obviously enhance productivity and foster economic development in a manner that reduces poverty. If it is accepted that women are more than half of most nations' populations and talent base, then it follows that the world is under-using or undermining half its productive capacity if women are not involved. Several studies including those by the World Bank have shown that women are ever there to complement their male folks even in workplaces and that development strategies focusing on gender equality have led to stronger economic development than gender-neutral strategies. However, throughout the world women represent a substantial, underutilized force for economic development. In Asia, for example, women are responsible for 50 per cent of the agricultural output, while nearly 80 per cent of the agricultural labour in African markets is women. Unfortunately, many of these women lack access to necessary agricultural resources, which if freely accessible, could decrease global hunger by 12-17 per cent (Scholz, 2012).

The concept of feminization of poverty is gaining ground with about 1.4 billion people believed to be living in abject poverty on less than U$1.25 per day globally; 70 per cent of these are said to be women. Extreme poverty presents a large obstacle for proper involvement of women and girls in economic transformation processes. Some possible

reasons for this are attributed to some cultural belief systems among indigenous societies which are further compounded by Malthusian theories of birth rate, population and food supply. Tackling issues of gender equality and empowering women so that they can play a more active part in the workforce are not simple problems. Gender advocates must resist those who merely see gender advocacy as a call to re-capture the agitation of the 'Beijing Platform for Action' or re-energizing the gender agenda, or yielding to a call for pacifying a somewhat less privileged group. The world should come to terms with the fact that gender equity is a major way for enhancing productivity. Presently, for many women, there are still physical and psychological consequences of entering the workplace; shame due to poor acceptance, discrimination, harassment or even violence. A crucial part of the solution is investing in women's basic health and education and giving them equal opportunities not only to participate in the workplace but also to earn like their male counterparts. Like men, entrepreneurial minded women should be allowed to access financial facilities. It might also be helpful if they are also adequately prepared to thrive in their primary economic environments, where they can foster success of their local communities. The best solution is one that can fit both their lifestyles and cultures. Scholz (2012) posits that in indigenous societies, women are custodians of traditional knowledge related to resource management. According to her, providing them access to modern technology will offer a perfect opportunity for both empowering local women and encouraging inclusive economic development.

According to the World Bank, a two-fold strategy for the economic empowerment of women needs to be followed: empowering them to become active participants in the market place and ensuring that the market place is conducive to them. Again, supporting women is not just good company policy but a policy that actually benefits the corporate world. Studies have proven that firms which employ women in leadership positions have comparable performances and profits with those managed by men. For instance, currently 4.4 per cent of CEOs in the Fortune list of Top 500 companies are women. There are eight women CEOs in the first 100 companies, while there are 14 female CEOs in the next 400 (see Appendix A). Some recent studies have also shown that enhanced female participation in politics changes the role of the government and of governance. A look at the relative performance of countries with women heads of government like Germany (Angela Merkel) and Britain (under Margaret Thatcher) might reveal some useful information (see Appendix B).

Contrary to various beliefs and persuasions, supporting female participation in employment has proven to have a positive impact on family life. It also encourages women to have children based on their families' abilities to support them. Also, countries with family-oriented practices and government funded healthcare have both more working women and higher birth rates than those without gender equality policies.

Gender equality is not just a lofty aspiration of assertive, tough and material minded women contending with masculinity. Instead, it has proven to be the necessary missing link for inclusive development. Studies have shown that women reinvest at least 90 per cent of their earnings and incomes in their households. Hence, allowing women active participation in the workplace gives them more money to spend on food, housing and education to support their families. This is a crucial requirement for reducing poverty and promoting economic

development in a sustainable manner. Supporting women does not benefit just the women but the entire family comprising men and children, and of course society at large.

## 2. Review of literature and theories

### 2.1 Literature

A study by Fosu (2011) on the effects that economic growth has on poverty reduction and income inequalities in advanced and developing countries reveals that growth in the early and mid-1990s in developing countries surpassed that in advanced economies. Yet most of the developing countries doubled their poverty levels. Until recently, economists were satisfied in getting an economy to grow, believing that this singular action put them on the right track of mediating people's needs. But has growth always led to poverty reduction? According to Lin (2012) growth, especially in developing nations is just as likely to lead to income disparities as it is to other related outcomes. It is therefore important for economists to know how growth prosperities are shared and how to ensure that the growth is not distributed among only a few. In most economies women and children are the most excluded.

Ward et al. (2010) explain that gender equality has proven to enhance human capital as educated women can undertake higher-value economic activities. Their study shows that countries that have poor gender equality in education are seldom rich and that economic growth in sub-Saharan Africa, the Middle East and North Africa (MENA) and Latin America since 1960 would have appreciably increased if these regions had adopted gender equality in education; same is the case in East Asia and the Pacific (Ward et al., 2010). Another study by Klasen and Lamanna (2008) shows that estimates of loss of growth as a result of gender inequalities in education range from 0.38 per cent per annum in sub-Saharan Africa to 0.81 per cent per annum in South Asia indicating a growth difference of 11 and 41 per cent respectively; this also presents a marked difference between these regions.

Another study shows that gender equality fosters higher labour productivity. The results show that lack of gender equality in employment led to losses that were over four times higher in economic growth than gender inequality in education in MENA in the 1990s. Seguino and Floro's (2003) study involving several developing economies shows that access to international capital markets is grossly inadequate, such that funds from domestic savings are the only reliable source of new capital investments. Specifically, their results using the ratio of female-to-male earnings and the female share of employment in manufacturing reveal that household savings from female incomes are the main source of domestic funds.

Psacharapoulos and Patrinos's study (2002) shows that children who receive more education are likely to earn higher incomes and that girls benefit more than boys from extra education. In many developing countries this benefit appears more pronounced in secondary and tertiary education than in primary education. Women in the formal sector also receive higher wages than those in the agricultural sector. This implies that expanding opportunities for women, especially in formal sectors will further alleviate poverty (Kingdon and Soderbom, 2007). A study by Smith et al. (2003), estimates that increasing gender equality in South Asia will reduce underweight children under the age of 3 years by 13 percentage points. This

shows that differences in gender equality are positively correlated with differences in childhood nutrition and health.

Several other researches, for example, Dollar and Gati (1999), Klasen (2002) and Klasen and Lamanna (2008), Seguino (2000) estimate the causal relationship between educational opportunities for females and economic growth using econometric analyses. Taken together, the studies reveal that increasing educational opportunities for women leads to higher economic growth. Increasing women's employment and education increases their incomes and thereby reduces poverty levels. An increase in educational attainments increases the growth rate of income irrespective of the gender of the receiver. The argument is that since there are more less-educated women than men in terms of numbers, particularly in developing countries, education of females will naturally lead to greater incomes (Psacharapoulos and Patrinos, 2002).

Generally speaking there is evidence that growth has a positive effect on gender equality in education. According to Dollar and Gati (1999), gender equality in education has proven to be effective in promoting growth for countries with social and cultural institutions that allow women to take advantage of better education. Another study by Dollar and Gati reveals that all aspects of gender inequality including educational opportunities, improve as a country's per capita GDP rises above $2,000 per annum. This has been variously attributed to readily available opportunities and incentives in education in rich economies, where there are incentives to educate girls. Deviations to the positive effects of gender equality on economic growth have also been recorded in some instances, for example, not all jobs are wage equality jobs, some require hard labour and can only be done by men. Supporting studies show that gender wage inequalities are associated with increased exports of labour-intensive goods (Busse and Spielmann, 2006; Seguino, 2000).

Higher schooling leads to better incomes, since it allows people to make decisions about life-choices associated with higher wages such as moving out of the agricultural sector into a higher skilled job in say the formal sector. Studies have shown that when one is working in a particular sector, a person may need up to 10 years of schooling to make a meaningful difference in wage appreciation. This is the reason why the rapid expansion of compulsory primary education in Africa has had little impact on both income and economic growth (Bigsten et al., 2000; Knight et al., 1992). Another factor may be the quality of primary education in Africa though there is paucity of data for quantifying and verifying the impact of primary education on incomes and growth (Hanushek and Woβmann, 2007).

According to Bloom & Canning, (2008), educated girls and women are likely to have fewer children, leading to a lower dependency ratio which is positively correlated with an increase per capita output thus providing a 'demographic dividend'. This is believed to have accounted for about one-third of the economic growth in East Asia since the late 1970s. Sadly, in Latin America this same 'demographic dividend' has failed to lead to an increase in per capita output because growth was hindered by macroeconomic and political instability (Bloom and Canning, 2008).

## 2.2 Theories

*Feminist-Gender Theories:* According to Chodorow (1989) the feminist theory seeks to clarify the nature of gender inequalities by examining women's social roles, experiences, interests and feminist politics in a variety of fields. It focuses on analysing gender inequalities in issues including discrimination and operations against women, sexual objectification and patriarchy (Brabeck and Brown, 1987; Gilligan, 1977; Lerman, 1990). Feminist theories explore the process of creating and displaying knowledge. They present themes like 'Are there women's ways of knowing or doing things and women's knowledge?' and 'How does the knowledge produce by women about themselves differ from those produced by men about women?' (Bartowski and Kolmar, 2005a). Feminist theorists project the 'feminist stand point knowledge' which attempts to replace 'the view from nowhere' with a 'view from women's lives' (Bartowski and Kolmar, 2005b).

According to the Stanford Encyclopaedia of Philosophy women are systematically subordinated and bad faith exists when women themselves surrender to this subordination, for instance, subjection to the belief that it is the will of god for a man to be accepted as the dominant party in all economic activities. Simone de Beauvoir labels such women 'mutilated' and 'immanent'. He further argues that patriarchal or male ruled marriages are both a distortion of the meaning of a couple and an institution in transition (Bergoffen, 1992; de Beauvoir, 1952, 1999). Feminist theories first emerged as early as 1792 in publications such as *The Changing Woman* that gave credence and paid tribute to and gave glory to women who in the end populated the world but were punished without any form of exclusion by the same laws that failed to protect their rights (Bartowski and Kolmar, 2005a, 2005b).

*Theories on the Social Construction of Gender:* Some believe that gender behaviour is mostly due to social conventions, although some opposing theories also exist. To buttress their arguments they note that children find out how to categorize themselves by gender as early as the age of three, when they start learning about gender roles from their parents and neighbors. According to Cahill, (1986) boys discover how to manipulate their physical and social environment using their physical power or other tricks, while girls learn to subject themselves as objects to be viewed (Kent, 1993). Fenstermaker (2002) posits that promoting gender-segregated activities for children helps legitimize male and female behavioural differences. According to Gilbert, the existence of gender roles was magnified and extended to labour divisions for males and females, with males considered to be hierarchical and characteristically at an advantage (Eagly, 1997; Wood and Eagly, 2002). Cherlin (2010: 93) defines gender as involving a situation where a social order is based on the domination of women by men. Agricultural societies are predominantly patriarchal. According to Eagly and others, the consequences of gender role segregation are sex-type social behaviour (Eagly et al., 2004) because role segregation along gender lines pre-shares social norms descriptively and prescriptively.

*Alcott Parson's View:* Alcott Parson made a model of a nuclear family. His view is used to compare the traditional view of gender roles during the industrial age with the liberal view. The two views illustrate extreme positions on gender roles (Table 1). Model A is used to describe total separation of male and female roles, while Model B explains complete

harmony between gender roles (this is an illustration based on the culture and infrastructure in the United States).

Insert Table 1 about here

In today's liberal-individualistic society, individuals' behavioural patterns are found to resonate between these two extremes, hence behavioural patterns at the two edges may tend to obscure. Roles (including gender roles) are no longer fixed, but are constantly negotiated between individuals.

*Geert Hofstede's Views:* Hofstede uses masculinity and femininity to refer to male assertiveness and female nurturance. In his work masculinity is used to portray a structure that is predominantly individualistic where self-enhancement leads to self-esteem. It is also used to refer to an arrangement in which social gender roles are clearly distinct. In it, men are expected to be assertive, tough and focused on material success and women must remain modest, tender and concerned with the quality of life. Men must continue to be ambitious, competitive and strive for material success; they are also expected to respect whatever is big, strong and fast. Men expect women to serve and care for children, the weak and for the non-material aspects of life. On the other hand, femininity is made to stand for a system in which social gender roles overlap, that is both men and women are supposed to be modest, tender and concerned about the quality of life. Dominant traits of the feministic culture are collectiveness, caring for others and concern for the quality of life for all. It permits overlapping social roles for both sexes, such that men need not be ambitious or competitive but may go for a different quality of life than material success; men must respect the small, weak and slow. Modesty and relations are important characteristics of feminine cultures (Hofstede, 1980, 1986, 1998; 2001; Hofstede and De Mooij, 2010).

## 3. Methods

Researchers use various methods to validate their stated null hypothesis which is usually specified as a negation of the objective. Usually, data availability and an investigator's expertise define his approach. To effectively explore the major dimensions of the arguments of this paper which has the objective of showing that women's empowerment – unlimited by their gender, either through employment or education -- will lead to an increase in output per capita and poverty reduction the study chose Nigeria with less than moderate women's involvement in economic and corporate activities for the period 1970-2012 using World Bank data. The linkage model is Meier & Rauch's, (2005) which portrays an economic development worth sustaining as one where an increase in real per capita GDP is not counteracted by increases in either poverty or inequality. This study used the Bound Testing technique popularized by a number of scholars (Pesaran et al., 2001; Pesaran and Shin, 1999; Pesaran and Smith, 1998). The two relevant models are:

**Output per capita and the women's empowerment model**

(1) $RPGDP = f(LAPAR, WEDU)$

(2) $RPGDP = \alpha_0 + \alpha_1 LAPAR + \alpha_2 WEDU + U_1$

**Poverty reduction and the women's empowerment model**

(3) $POVL = f(LAPAR, WEDU)$

(4) $POVL = \beta_0 + \beta_1 LAPAR + \beta_2 WEDU + U_2$

where RPGDP is used to represent real per capital GDP and LAPAR, WEDU and POVL are used to represent labour participation rates proxy by labour force participation rates, female (per cent of female population aged 15-64 years), women's education, training and skill acquisition and then poverty level at the international poverty standard of US$ 1.25 per day.

The methodological approach to support gender balancing entails finding out how the degree of women's education in the education proxy by female secondary school enrolment rate (WEDU) and women's employment or acceptance in workplaces proxy by female labour force participation rates (LAPAR) affect both output per capita and poverty reduction. This is with a view to advising societies where women's education and employment is hindered or restricted. The methodology adopted for the empirical results determines the relationship between output per capita and poverty level, which are separately endogenized, and WEDU and LAPAR are treated as exogenous variables that are used to explain them, using the Bound Testing technique (Pesaran et al., 2001). World Bank data for 1970-2012 are used for this.

First, we have to confirm that neither of our time-series are I(2) by applying the DF GLS (ERS) test to the levels of RPGDP, POVL, WEDU and LAPAR and then reconfirming the result with the KPSS test. In both none of the variables are I (2). Next, the study conducted a granger causality test using the Toda-Yamamoto (1995) test to confirm that there is causality separately from RPGDP and POVL as the two endogenous variables to WEDU and LAPAR the two exogenous variables (but not vice versa). This confirms that $\Delta$RPGDP and $\Delta$POVL are rightly endogenous or exogenous for unrestricted ECMs.

The representative equation for the first of the two models in vector form can be presented as:

(5) $$\Delta RPGDP_t = \beta_0 + \Sigma\beta_i \Delta RPGDP_{t-i} + \Sigma\gamma_j \Delta WEDU_{t-j} + \Sigma\gamma_j \Delta LAPAR_{t-j} + \theta_0 RPGDP_{t-1} + \theta_1 WEDU_{t-} + \theta_2 LAPAR_{t-1} + e_t$$

## 4. Data

The data used in this study are from the World Bank for the period 1970-2012. There are two models involved in the analysis: output per capita and women's empowerment model; and the poverty reduction and women's empowerment model. The dependent variables for these two are real per capita GDP (RPGDP) which is the GDP divided by population, and poverty level (POVL), that is, poverty level at the international poverty line of US$1.25 per day respectively.

The independent variables for both output per capita (RPGDP) and poverty reduction (POVL) models can be separately described as:

The output per capita model has K+1=3, with its explanatory variables comprising labour participation rates and women's education. The labour participation rates (LAPAR, +) and women's education (WEDU, +) are proxy by female labour force participation rates and female secondary school enrolment rates respectively. The positive sign '+' is used to represent a-priori expectations, that is, the expected positive effect of the exogenous variables (LAPAR, WEDU) on the endogenous variable-real per capita output.

The poverty reduction model also has K+1=3. The regressors likewise include labour participation rates (LAPAR, -) and then women's education (WEDU, -). These variables are proxy by female labour force participation rates and female secondary school enrolment rates respectively. Again, the negative sign '-' is used to explain the expected negative effect of the exogenous variables on the poverty level (POVL) in the second model.

## 5. Empirical results

### 5.1 Output per capita and women's empowerment model

The first step is to determine the appropriate lag length based on AIC criterion and SC. For AIC a maximum lag of 1 is suggested for $\Delta RPGDP_t$ but 0 is suggested based on SC. SC was found suitable and it was adopted. With the earlier lag specifications in mind the result ended with the following specification for the unrestricted ECM. The result is the long-run model used for the Bound Testing-ARDL. Bound Testing was only done after confirming that there is the absence of a serial correlation in the residual and there is the presence of dynamic stability.

The value of the F-statistic in the Wald test is 2.99. The (K+1) = 3 variables (RPGDP and LAPAR; WEDU) in output per capita and women's empowerment model. Hence, K=2 in the Bounds Test tables of critical values. Now we have to look at the usual Table CI (iii) of Pesaran et al. (2001), which is the relevant table used here. Please note that the intercept of our model is not constrained and there is no linear trend term included in the ECM. The lower and upper bounds for the F-test statistic at the 5 per cent and 1 per cent significance levels which have the values [3.79, 4.85] and [5.15, 6.36] respectively. Since the value of the F-statistic is 2.99 below the lower bounds at the 5 per cent significance level we can conclude that there is a long-run relationship between the two time-series at 5 per cent but no co-integration is suggested.

In addition, from Table 2, the t-statistic on RPGDP (-1) is -2.30. When we look at Table CII (iii) of Peseran et al. (2001), we find that the I(0) and I(1) bounds for the t-statistic at the 5 per cent and 1 per cent significance levels are [-2.86, -3.53] and [-3.43, -4.10] respectively. This confirms a similar outcome as earlier at the 5 per cent significance level since the value also falls below the lower bound.

$$(6) \qquad RPGDP_t = \alpha_0 + \alpha_1 LAPAR_t + \alpha_2 WEDU_t + v_t$$

If Eq 6 is estimated by OLS, and the residual series $\{Z_t\}$ is constructed, a *regular* (restricted) ECM can be fitted. In Table 2, the Bounds Test using the t-statistic of the endogenous RPGD

(-1) and the F-statistic are developed through the Wald test by imposing a restriction on the coefficients of RPGDP (-1), LAPAR (-1) and WEDU (-1) to 0 in our estimated model.

1. Insert Table 2 about here
2. Insert Table 3 about here

From Table 3 it can be seen that the coefficient of the error-correction term, $ECMR_{t-1}$, is correctly signed and significant. This now confirms co-integration between the dependent and independent variables. Table 2 shows that the long-run multiplier between LAPAR and RPGDP is –[(44.27098)/(-0.206514)] = 214.37. This result implies that in the long run, an increase of 1 unit in LAPAR will lead to a rise of 214.37 units in RPGDP. While an increase of 1 unit in WEDU will lead to a decrease of 17.54 units in RPGDP. This means that empowering women through labour participation, that is, allowing them equal chances in workplaces and employment will support economic development such that just a per cent increase in their participation will increase output per capita by over 214 per cent. The second result looks rather contrary to a-priori expectations. It, however, conforms with Dollar and Gati's (1999) result which appears to suggest that gender equality based on women's education will be impactful only for nations whose real per capita GDP is high enough, say above $2,000. Another study shows that for very poor countries education levels below the tertiary level have no significant impact on output per capita. But that is where a worker is involved in the organized formal sector. Here also remember that this study used secondary enrolment rates. Nevertheless, the result could be interpreted to mean that secondary level education is not sufficient for a woman to seek white collar employment but indigenous women at that level could be trained and orientated for self-income generation. In fact indigenous women have proved impactful with little skill upgrades in informal vocations within their rural communities.

### 5.2 Poverty reduction and the women's empowerment model

A maximum lag of 1 is suggested for $\Delta RPGDP_t$ based on both AIC and SC. Relying on this lag structure, we unrestricted ECM specifications in Table 4 for the long-run model.

Insert Table 4 about here

The value of the F-statistic of the Wald test is 3.468 and we have (K+1)=3 variables (POVL and LAPAR; WEDU) in our model. Going to the Pesaran et al. (2001) Bounds test Table CI (iii), the intercept of our model is not constrained and no linear trend term was included in the ECM. The lower and upper bounds for the F-test statistic at the 5 per cent and 1 per cent significance levels are [3.79, 4.85] and [5.15, 6.36] respectively. Since the value of F-statistic is below the lower bounds at the 5 per cent significance level, we can conclude that there is a long-run relationship between the two time series at 5 per cent but this infers no co-integration. In addition, the t-statistic on POVL (-1) is -2.63 as per Table 3. When we look this up in Table CII (iii) in Peseran et al. (2001), we find that the I(0) and I(1) bounds at K=2 for the t-statistic at the 5 per cent and 1 per cent significance levels are [-2.86, -3.53]

and [-3.43, -4.10] respectively. This confirms similar results as earlier at the 5 per cent significance level.

If we estimate the levels model:

$$(7) \qquad POVL_t = \alpha_0 + \alpha_1 LAPAR_t + \alpha_2 WEDU_t + v_t$$

by OLS, and construct the residuals series, $\{Z_t\}$, we can fit a *regular* (restricted) ECM.

Now, the Bounds Test based on the t-statistic of the endogenous RPGD (-1), and the F-statistic is developed later through the Wald test. This is done by imposing a restriction on the coefficients of RPGDP (-1), LAPAR (-1) and WEDU (-1) to 0 in our estimated model.

Insert Table 5 about here

The introduction of an AR (1) in Table 5 is simply to correct for residual serial correlation, which will be present without it (possibly based on data deficiency and not specification problems). Please note that the estimation sample was adjusted by five observations to account for the first difference of the lagged endogenous variable used in deriving AR (1) estimates for this model. Also note that in Table 5 the coefficient of the error-correction term, $ECM_{t-1}$, is not only correctly signed but significant, which was not so without AR(1) introduction. The magnitude of this coefficient implies that nearly 86 per cent of any disequilibrium in the endogenous variable is corrected by exogenous variables within one period (one year). This result is as expected with co-integration between the dependent and independent variables.

From Table 4 the long-run multiplier between LAPAR and POVL is – [(-1.7448)/-0.3344)=-5.217. This result implies that in the long run, an increase of 1 unit in LAPAR will lead to a decrease of 5.217 units in POVL. While the multiplier between WEDU and POVL is – [(0.6862 /(-0.3344)] = 2.051, that is, an increase of 1 unit in WEDU will lead to an increase of 2.051 units in POVL. This means empowering and not restricting or hindering women's full involvement in workplaces and employment will decrease the level of poverty but education at the secondary level will probably have an opposite impact. Specifically, the result shows that a per cent increase in women's labour participation will decrease poverty levels by over 5 per cent although women's education does not appear to reduce poverty; this outcome is supported by Giles (2013).

## 6. Summary and conclusion

This study showed that female labour participation rates alone will increase real per capita GDP by over 214 per cent and reduce poverty by over 5 per cent. According to projections by facts on hunger and poverty, there are over 1.4 billion poor people in the world, and 98 per cent of these undernourished persons live in developing countries. Given that women alone constitute about 70 per cent of this underprivileged class and are at least 50 per cent of most nations' population and talent base, it is clear that achieving gender equity especially in developing countries through active involvement of women in income generating activities (workplaces for educated women and specific skill upgrades and then self-

employment for indigenous women), could prove the single most important factor needed to accelerate inclusive growth for Africa and the entire global South. This will not only ensure an increase in real per capita GDP but also reduce poverty and/or inequality in the region. Further, based on the assertion that at least 90 per cent of women's incomes are not used by women for themselves alone but on their entire families, gender equity could be the missing link necessary for facilitating the much desired inclusive growth and development in Africa. The empirical results of this study are interesting as they show that secondary level education does not impact positively on both output per capita and poverty reduction.

These results appear to suggest that education beyond this level is probably a tool to further enhance women's workplace effectiveness, which is peculiar to countries at the lower levels of development where women below the tertiary level of education are not bold enough to challenge the usual socio-cultural inhibitions that limit most women's roles to full time dependent housewives. In fact, gender studies in developing countries including those by Dollar and Gati, (1999) support the fact that both socio-cultural factors and education below the tertiary level may prevent women from effectively contributing to economic development in nations with real per capita GDP below $2,000.

It can therefore be concluded that women's full participation in workplaces and/or income earning jobs, leads to economic development. Gender equality in labour participation can therefore guarantee a constant increase in both real per capita GDP and a reduction in poverty, educational levels notwithstanding. Hence, if women at different educational levels, especially indigenous women, are given equal opportunities in workplaces and/or income generation processes, nations are bound to achieve inclusive growth and economic development that they currently lack. The emphasis here is on equity and not necessarily on equality. For instance, not all jobs are gender equal jobs like jobs requiring hard labour. Policymakers should therefore take note of these points.

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Table 1: The Alcott Parson Gender Model

| | Model A – Total role segregation | Model B – Total integration of roles |
|---|---|---|
| Education | Gender-specific education and high professional qualifications are important only for a man. | Co-educative schools, same class content for girls and boys, same qualifications for men and women. |
| Profession | The workplace is not the primary area for women; career and professional advancement is deemed unimportant for women. | For women, career is just as important as for men; equal professional opportunities for men and women are necessary. |
| Housework | Housekeeping and childcare are the primary functions of a woman; participation of a man in these functions is only partially wanted. | All housework is done by both parties in a marriage in equal shares. |
| Decision making | In case of a conflict, a man has the last say, for example in choosing the place to live, choice of school for children and what to buy. | Neither partner should dominate. Solutions do not always follow the principle of following a concerted decision. Status quo is maintained if disagreements occur. |
| Childcare and education | A woman takes care of a major part of these functions; she educates children and cares for them every way. | Man and woman share functions equally, depending on who is readily available to take on the work. |

Source: Adapted from Alcott Parson.

Table 2: Output per capita and women's empowerment model – Lag Selection based on SC.

Dependent Variable: D(RPGDP)-

Method: Least Squares

Date: 09/20/14 Time: 21:46

Sample (adjusted): 1972 2012

Included observations: 41 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -1707.944 | 605.5341 | -2.820558 | 0.0079 |
| D(RPGDP(-1)) | -0.028457 | 0.186201 | -0.152827 | 0.8794 |
| D(LAPAR(-1)) | -17.78911 | 30.79369 | -0.577687 | 0.5673 |
| D(WEDU(-1)) | -10.97332 | 8.677845 | -1.264521 | 0.2146 |
| RPGDP(-1) | -0.206514 | 0.089752 | -2.300945 | 0.0277 |
| LAPAR(-1) | 44.27098 | 15.53831 | 2.849151 | 0.0074 |
| WEDU(-1) | -3.622759 | 2.696283 | -1.343612 | 0.1880 |

| | | | |
|---|---|---|---|
| R-squared | 0.249577 | Mean dependent var | 26.96601 |
| Adjusted R-squared | 0.117150 | S.D. dependent var | 116.6297 |
| S.E. of regression | 109.5854 | Akaike info criterion | 12.38554 |
| Sum squared resid | 408304.3 | Schwarz criterion | 12.67810 |
| Log likelihood | -246.9035 | Hannan-Quinn criter. | 12.49207 |
| F-statistic | 1.884632 | Durbin-Watson stat | 2.007640 |
| Prob(F-statistic) | 0.112117 | | |

Table 3: Output per capita and women empowerment model – ECM.

Dependent Variable: D(RPGDP)

Method: Least Squares

Date: 09/24/14 Time: 13:30

Sample (adjusted): 1974 2012

Included observations: 39 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 11.52921 | 20.70278 | 0.556892 | 0.5812 |
| D(RPGDP(-1)) | 0.839739 | 0.280315 | 2.995701 | 0.0051 |
| D(LAPAR(-1)) | 24.37466 | 25.99113 | 0.937807 | 0.3550 |
| D(WEDU(-1)) | -14.19223 | 8.139897 | -1.743540 | 0.0903 |
| ECMR(-1) | -1.147525 | 0.328017 | -3.498375 | 0.0013 |

| | | | |
|---|---|---|---|
| R-squared | 0.301959 | Mean dependent var | 26.05726 |
| Adjusted R-squared | 0.219836 | S.D. dependent var | 119.5850 |
| S.E. of regression | 105.6257 | Akaike info criterion | 12.27689 |
| Sum squared resid | 379330.6 | Schwarz criterion | 12.49017 |
| Log likelihood | -234.3993 | Hannan-Quinn criter. | 12.35341 |
| F-statistic | 3.676932 | Durbin-Watson stat | 1.832932 |
| Prob(F-statistic) | 0.013604 | | |

Table 4: Poverty reduction and women's empowerment model– Lag Selection based on SC.

Dependent Variable: D(POVL)

Method: Least Squares

Date: 09/20/14 Time: 21:25

Sample (adjusted): 1972 2012

Included observations: 41 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 78.69093 | 27.42229 | 2.869598 | 0.0070 |
| D(POVL(-1)) | -0.329937 | 0.147541 | -2.236232 | 0.0320 |
| D(LAPAR(-1)) | 3.141741 | 1.814242 | 1.731710 | 0.0924 |
| D(WEDU(-1)) | -0.135510 | 0.472124 | -0.287023 | 0.7758 |
| POVL(-1) | -0.334446 | 0.127168 | -2.629957 | 0.0127 |
| LAPAR(-1) | -1.744798 | 0.658779 | -2.648532 | 0.0122 |
| WEDU(-1) | 0.686163 | 0.252447 | 2.718050 | 0.0103 |

| | | | |
|---|---|---|---|
| R-squared | 0.376846 | Mean dependent var | 0.778049 |
| Adjusted R-squared | 0.266878 | S.D. dependent var | 7.295910 |
| S.E. of regression | 6.246945 | Akaike info criterion | 6.656314 |
| Sum squared resid | 1326.827 | Schwarz criterion | 6.948875 |
| Log likelihood | -129.4544 | Hannan-Quinn criter. | 6.762849 |
| F-statistic | 3.426858 | Durbin-Watson stat | 1.826291 |
| Prob(F-statistic) | 0.009387 | | |

Table 5: Poverty reduction and the women's empowerment model – ECM with AR (1).

Dependent Variable: D(POVL)

Method: Least Squares

Date: 09/24/14 Time: 19:27

Sample (adjusted): 1976 2012

Included observations: 37 after adjustments

Convergence achieved after 15 iterations

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 1.477315 | 2.484830 | 0.594534 | 0.5565 |
| D(POVL(-1)) | -1.017365 | 0.206155 | -4.934960 | 0.0000 |
| D(LAPAR(-1)) | 3.273302 | 1.590211 | 2.058408 | 0.0480 |
| D(WEDU(-1)) | 0.114442 | 0.442959 | 0.258359 | 0.7978 |
| ECM(-1) | -0.865400 | 0.339221 | -2.551139 | 0.0159 |
| AR(1) | 0.539685 | 0.219577 | 2.457839 | 0.0198 |

| | | | |
|---|---|---|---|
| R-squared | 0.343555 | Mean dependent var | 0.883784 |
| Adjusted R-squared | 0.237677 | S.D. dependent var | 7.681529 |
| S.E. of regression | 6.706829 | Akaike info criterion | 6.791523 |
| Sum squared resid | 1394.428 | Schwarz criterion | 7.052753 |
| Log likelihood | -119.6432 | Hannan-Quinn criter. | 6.883619 |
| F-statistic | 3.244814 | Durbin-Watson stat | 1.781794 |
| Prob(F-statistic) | 0.018019 | | |

| | |
|---|---|
| Inverted AR Roots | .54 |

Appendix A

List of women CEOs in Fortune 500 companies (as of October 16, 2015)

| CEO | Company | 2015 Fortune 500 ranking |
|---|---|---|
| Mary Barra | General Motors | 6 |
| Meg Whitman | Hewlett-Packard | 19 |
| Virginia Rometty | IBM | 24 |
| Indra K. Nooyi | PepsiCo, Inc. | 44 |
| Marillyn Hewson | Lockheed Martin | 64 |
| Safra A. Catz | Oracle | 81 |
| Irene B. Rosenfeld | Mondelēz International | 91 |
| Phebe Novakovic | General Dynamics | 100 |
| Carol Meyrowitz | The TJX Companies, Inc. | 103 |
| Lynn Good | Duke Energy | 116 |
| Ursula M. Burns | Xerox Corporation | 143 |
| Deanna M. Mulligan | Guardian Life Insurance Company of America | 254 |
| Barbara Rentler | Ross Stores | 269 |
| Debra L. Reed | Sempra Energy | 270 |
| Kimberly Lubel | CST Brands | 277 |
| Sheri S. McCoy | Avon Products Inc. | 322 |
| Susan M. Cameron | Reynolds American | 337 |
| Denise M. Morrison | Campbell Soup | 342 |
| Kathleen Mazzarella | Graybar Electric | 445 |
| Ilene Gordon | Ingredion | 462 |
| Lisa Su | Advanced Micro Devices | 473 |
| Jacqueline C. Hinman | CH2M Hill | 480 |

Source: Wikipedia.

Appendix B

Female world leaders currently in office (as of **January 22, 2015)**

| No. | Country | Picture | Leader | Period in office | Notes |
|---|---|---|---|---|---|
| 1 | Germany |  | Chancellor Angela Merkel | Nov. 22, 2005 - | elected |
| 2 | Liberia |  | President Ellen Johnson-Sirleaf | Jan. 16, 2006 - | elected |
| 3 | Argentina |  | President Cristina Fernandez de Kirchner | Dec. 10, 2007 - | elected |
| 4 | Bangladesh |  | Prime Minister Sheikh Hasina Wajed | Jan. 6, 2009 - | elected |
| 5 | Lithuania |  | President Dalia Grybauskaite | Jul. 12, 2009 - | elected |
| 6 | Trinidad and Tobago |  | Prime Minister Kamla Persad-Bissessar | May 26, 2010 - | elected |
| 7 | Brazil |  | President Dilma Rousseff | Jan. 1, 2011 - | elected |
| 8 | Kosovo |  | President Atifete Jahjaga | Apr. 7, 2011 - | elected |
| 9 | Denmark |  | Prime Minister Helle Thorning-Schmidt | Oct. 3, 2011 - | elected |
| 10 | Jamaica |  | Prime Minister Portia Simpson Miller | Jan. 5, 2012 - | elected |
| 11 | South Korea |  | President Park Geun-hye | Feb. 25, 2013 - | elected |
| 12 | Slovenia |  | Prime Minister Alenka Bratusek | Mar. 20, 2013 - | elected |
| 13 | Cyprus (North) |  | Prime Minister Sibel Siber | Jun. 13, 2013 - | appointed |
| 14 | Senegal |  | Prime Minister Aminata Touré | Sep. 3, 2013 - | appointed |
| 15 | Norway |  | Prime Minister Erna Solberg | Oct. 16, 2013 - | elected |
| 16 | Latvia |  | Prime Minister Laimdota Straujuma | Jan. 22, 2014 - | elected |

| | | | | | |
|---|---|---|---|---|---|
| 17 | Central African Republic |  | President Catherine Samba-Panza | Jan. 23, 2014 - | appointed |
| 18 | Chile |  | President Michelle Bachelet | Mar. 11, 2014 - | elected |
| 19 | Malta |  | President Marie-Louise Coleiro Preca | Apr. 7, 2014 - | elected |
| 20 | Poland | | Prime Minister Ewa Kopacz | Apr. 7, 2014 - | elected |
| 21 | Switzerland | | President Simonetta Sommaruga | Jan. 1, 2015 - | appointed |
| 22 | Croatia | | President Kolinda Grabar-Kitarovic | Feb. 18, 2015 - | elected |

Source: Wikipedia.

Note: **'**Elected**'** refers to women leaders who were elected in democratic elections, including both direct and parliamentary elections. 'Appointed**'** refers to leaders who were appointed to office by a ruling party or executive, and were thus not specifically elected to their posts.