Social Welfare Analysis of Gender Inequality in Education and Employment: Ranking Gender Inequality in Rural and Urban Nigeria with Generalized Lorenz Curves

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Abstract: *This study analyzes the social welfare effect of gender inequality in human capital development (education and employment) across rural and urban Nigeria. Using Nigeria most recent data set on labour force survey by NBS, which captures labour force participation by gender, gender unemployment by educational level and sector, gender schooling ratio, gender population growth rate and economic active participation by gender this study investigated how differently, gender inequality in education and employment affects women across rural and urban regions. To unravel this, we adopted Shorrock and Alkinson Generalized Lorenz approach to welfare dominance and inequality decomposition. We ranked gender inequality on education and employment by rural and urban. The major finding is that female unemployment by educational level is predominant in the urban sectors compared to the rural sectors. Other findings are that gender inequality is higher in labour force participation when compared with education in Nigeria. We therefore recommend that for Nigeria steady economic growth to translate positively to socio-economic of her citizens, the war against gender inequality should go beyond sectoral or zone, it should be generally pursued. Also for the goals of the Transformation Agenda to be fully realised, the current situation of women must be factored into policy formulation and implementation.*
Key word: *Gender inequality, Human capital, and sectoral dominance (Rural and Urban).*

I. Introduction

Despite the global campaign for women empowerment and gender equity, women in Nigeria still form an underclass and lack equality of opportunity, both in the contributions they make to development and the benefits they receive from it. The disparities in gender are significant. The country is ranked 79 out of 86 in the OECD's 2012 Social Institutions and Gender Index and 120 out of 135 countries in the World Economic Forum's 2011 Global Gender Gap Index. This is true of all women in Nigeria, though education, class, ethnicity, kinship, marital status and religion play a role in mitigating or elaborating this effect. The geographical division between the North, mainly Muslim, and the South, predominantly but not exclusively Christian, is also an important dimension of the struggle for gender equality **(Edozie, 2007)**. The religious dimension has become more prominent since 1999, when political liberalisation allowed a greater degree of freedom of worship (British Council Nigeria **(BCN, 2012))**. Like much of Africa countries, quality of life tends to be better in urban communities in Nigeria, owing in part to lack of investment in rural infrastructure and services. There is also a North-South divide between urban centres, because those in the industrial South tend to offer better conditions than those in the North. Within both North and South, State capitals tend to have better conditions than smaller towns in their regions.

Therefore, there are many reasons to be concerned about existing gender inequalities in Nigeria, especially in the major well-being related dimensions such as education, health, employment, or earnings. From the growth as well as equity perspective, such gender inequalities are problematic as they lower well-being and are form of injustice in most conceptions of equity and justice. While such a view would argue for reducing gender inequalities in these dimensions of well-being on intrinsic grounds, recent literature has argued on the instrumental effects of gender inequality on other important development outcomes with a particular focus on economic growth processes **(Stephan and Francesca, 2010).** Without denying the importance of reducing gender inequality on intrinsic grounds, this study will contribution to that latter literature by examining the welfare incidence of gender inequality in education and employment across rural and urban sectors of Nigeria.

Gender inequality in well-being manifests itself in many forms. Empirical evidence shows that men earns more income than women, and women have less access to assets such as land, natural resources and other physical assets, education, technology and credit in developing countries, especially Nigeria. They also experience an unequal "burden", i.e. a higher workload, although the major part of this workload is invisible in

economic accounts. If women participate in the labour market, they tend to occupy jobs of lower status and income. Women also tend to have less decision-making power or less autonomy, both at the level of households and communities and at the level of states. In many societies, laws do not treat women as equal to men. Cultural beliefs and norms often imply that women are seen as second-rank human beings. The physical integrity of women tends to be more in danger than that of men: women are more vulnerable than men to domestic violence and to rape (United Nation Development Program **(UNDP; 2009))**.

Other argument in the literature is that lower education for females compared to men means that, assuming no underlying difference in educational or work potential, the talent pool is inefficiently provided with complementary human capital, which then reduces the average level of human resources in productive employment **(Richard Palmer-Jones, 2008)**. A further argument is that female education generates greater externalities than male education in the form of more and better education of children, improved child survival and health, and better, generally lower, choice of fertility levels which will reduce population growth and thereby boost growth per capita, and well-being **(Schultz, 2002)**. According to **Klasen, Stephan (2007),** while higher rates of growth are associated with greater levels of gender equity, the relationship between gender equity and human capital accumulation is ambiguous since countries with significantly different levels of gender equity, human capital and growth rate exhibit similar returns to education.

It is therefore worthy of note that in Nigeria there have been very little empirical study on the welfare implications of gender inequality on education and employment or the lack of it across sectors (rural and urban) as a tool for informing gender-sensitive policy-making (Gender and Growth Assessment of Nigeria **(GGAN: 2009))**. Hence, this study is designed to contribute to void by decomposing welfare incidence of gender inequality in education and employment across the rural and urban Nigeria.

Thus the rest of this paper is divided into the following captions, review of related literature, overview of gender gap in human capital development in Nigeria, data and method, presentation and interpretation of result, conclusion and recommendations.

II.   Reviews Of Related Literatures (Theories And Evidence)
Theory of Difference in Human Capital Investment

The theory of the differences in human capital investment revealed three main sources of differences in investing in human capital. According to the theory the source include differences in Ability, discrimination/uncertainty of earnings - differing degrees of uncertainty concerning the capacity to transform skills and knowledge into enhanced earnings due to Discrimination, and differing access to borrowed funds for human capital investment.

For example, if individual A has greater ability to translate schooling into increased labour market productivity and higher earnings than B, then A's demand curve for human capital (D_A) will lie further higher earnings than B's (D_B). Given the interest rate, it will be rational for A to invest in more education than B (see fig. 1 below).

Fig. 1: Difference in human capital development caused by ability and discriminations
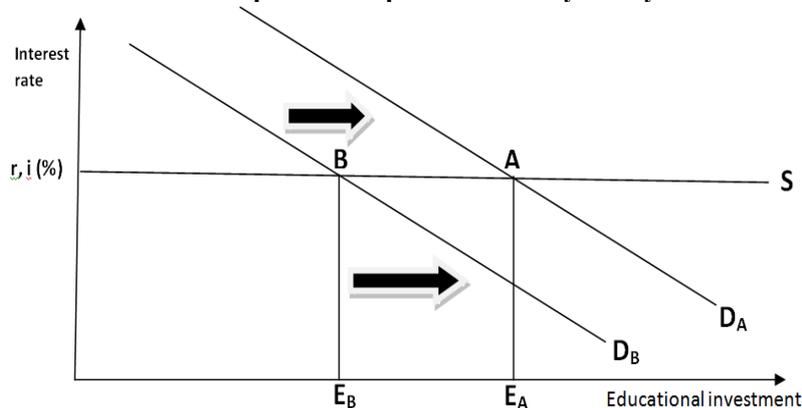
Source: Illustration by the Researchers (2012)

Similarly, if B and A are of equal ability but discrimination reduces the amount of incremental income B can obtain from additional education, it will be rational for B to invest in less education than A. If A has access to financial resources on more favorable terms than B, it will be rational for A to invest in a larger amount of education (see fig. 2).

Fig. 2: Differing access to borrowed funds for human capital investment
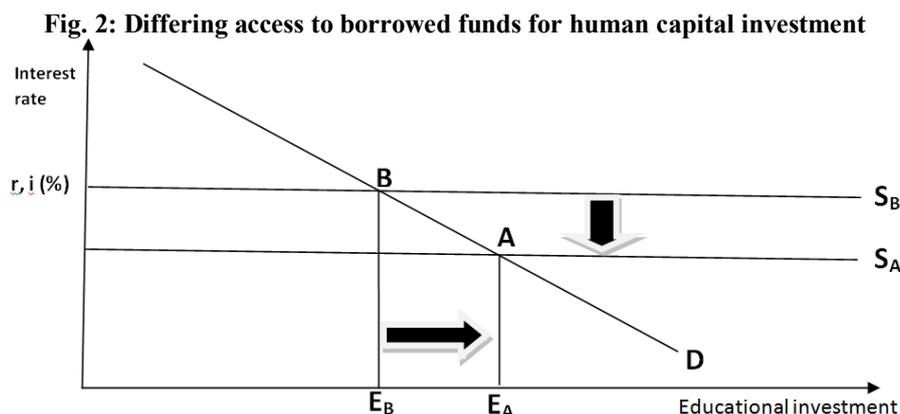
Source: Illustration by the Researchers (2012)

Lukas and Carrie (2007) cited that in many countries, there is a gender income gap which favors males in the labour market. For example, the median full-time salary for U.S. women is 77% of that of U.S. men. Several factors other than discrimination may contribute to this gap. On average, women are more likely than men to consider factors other than pay when looking for work, and may be less willing to travel or relocate,

Wilkinson et al., (2009), the difference in human capital development is due to women not taking jobs due to marriage or pregnancy, but income studies show that that does not explain the entire difference. Men are far more likely to engage in dangerous occupations which often pay more than positions desired and sought by women,

Ahmad et al (2005) explored the relationship between inequality in the access to secondary education and poverty in Bangladesh. In their analysis of household data from 60 villages, they confirmed that inequality in the access to education existed at post primary level. The Marginal return for upper secondary and primary level of education was found higher than for lower secondary education. Poverty and low education have positive but weak effect on children/women ratio and school participation rates are affected by the household's income status and also by the education level of father and mother. Majority of the poor are living in rural areas. It is confirmed in the regression analysis that the poor in the rural areas have low income, low education, high fertility and low investment in education. The most important result of this study is that poverty has negative impact on the education of the poor.

Gender Inequality in Sub-Saharan Africa
It is common knowledge that gender inequality is one of the most pervasive forms of inequality, particularly because it cuts across other forms of inequality, **Franklin, (2007). Yemisi, et al., (2009)** state that different rules, norms and values govern the gender division of labour and the gender distribution of resources, responsibilities, agency and power. These are critical elements for understanding the nature of gender inequality in different societies. Gender segmentation in household arrangements in sub-Saharan Africa is prevalent in the face of highly complex lineage-based homesteads. Yemisi, et al., further noted that **in** some countries such as the Benin Republic, the programmes developed were far from addressing the main concerns of women as they were neither involved in policy making decisions nor were they directly consulted to articulate their needs. In some countries, despite legislative and tenure changes in favour of smallholders, women continued to be placed in a disadvantaged position in terms of access to land.

Esteve-Volart 2004 and Blackden et al (2007) reported that regardless gender gaps in employment, there are a number of closely related arguments. First, there is a similar argument that it imposes a distortion on the economy as do gender gaps in education. It artificially reduces the pool of talent from which employers can draw upon, thereby reducing the average ability of the workforce **(e.g. Esteve-Volart 2004).** Such distortions would not only affect dependent employed, but similar arguments could be made for self-employed in agricultural and non-agricultural sectors where unequal access to critical inputs, technologies, and resources would reduce the average productivity of these ventures thereby reducing economic growth (see **Blackden et al 2007**). As self-employment (including in agriculture) is included in our empirical assessment, these arguments might have some empirical relevance in accounting for the results.

Stella, A. (2007) suggested that gender inequality in employment can reduce economic growth via demographic effects. They suggested that gender inequality in employment would be associated with higher fertility levels which in turn reduce economic growth. According to **Seguino (2000a, b)** the impact of gender gaps in pay on international competitiveness imply that gender gaps in employment access would also reduce

economic growth as it would deprive countries to use (relatively cheap) female labour as a competitive advantage in an export-oriented growth strategy.

Porter, et al., (2010) argued that the importance of female employment and earnings for their bargaining power within families demonstrates that female employment and earnings increase their bargaining power in the home. This not only benefits the women concerned, but their greater bargaining power can have a range of growth-enhancing effects.

Klasen, and Porter (2008) stated that there is a growing but still rather speculative and suggestive literature that has collated evidence that workers, on average, appear to be less prone to corruption and nepotism than men. If these findings prove to be robust, greater female employment might be beneficial for economic performance in this sense as well.

Wilkinson et al., (2009), the difference in human capital development is due to women not taking jobs due to marriage or pregnancy, but income studies show that that does not explain the entire difference. Men are far more likely to engage in dangerous occupations which often pay more than positions desired and sought by women,

Okpukpara & Chukwuone (2001) used data from the Child Labour Survey, 2000-01, to investigate the role of a child's household and community characteristics in urban, rural as well as north and south zones on the child's school attendance in Nigeria. Their findings confirm that more children participate in schooling in urban, south and non-poor households and more male children are enrolled than female children. However, in terms of background characteristics, it is interesting to note that the education of fathers has a stronger impact in increasing the probability of child school attendance than the education of mothers, while poverty, though positive, has a very weak influence on child school attendance (< 3 per cent), though the influence is stronger on girls than boys. For instance, the marginal effect of poverty on girl's education is 21 per cent while this is only 5 per cent for boys in rural Nigeria.

Klasen (2002) argued that increase in women's education boosts their wages and that returns to education for women are frequently larger than that of men. Also that, increase in female education improves human development outcomes such as child survival, health and schooling explored that lower female education had a negative impact on economic growth as it lowered the average level of human capital.

Chaudhry (2007) investigated the impact of gender inequality in education on economic growth in Pakistan. The secondary source of time series data drawn from various issues has been used. In his regression analysis, he estimated a set of regressions which shows a moderate explanatory power. The variables, overall literacy rate, enrolment ratio, ratio of literate female to male have positive and significant impact on economic growth. It was found that gender inequality in initial education reduces economic growth. The results in this study are consistent with those of **Klasen (2002).** Both agreed that Gender inequality in education directly and significantly affects economic growth.

Okojie (2002) has examined the linkages between gender of household, education and poverty of household in Nigeria and used the data of National Consumer Expenditure Survey (NCES) of 1980, 1985, 1992 and 1996. Author has used FGT index to measure the headcount ratio, depth and severity of poverty. He found out that in 1985 poverty was higher in male-headed households as compared to female-headed households; in 1996 poverty was same in both male and female-headed households. In 1992 poverty was higher in female headed households than male-headed households. Results also showed that the female-headed households experienced lower poverty but inequality was higher among them. In Nigeria, education, rural-urban residence, household size and main economic activities have major influence on welfare of households. Results of multivariate analysis showed that poverty in female-headed households was greater than male-headed households, and with high level of education, the probability of households being poor was decreased.

III. Overview Of Gender Gap In Human Capital Development In Nigeria

Difference areas of human capital development that equality of access will positively affect the lives are given in the literature to include, Health, Education, Work or earnings, Power and Decision making as well as control over economic resources. Any deprivation from these will amount to welfare lost in respective of the gender.

Gender Gap in Education sector in Nigeria

Education is long recognised as a fundamental right. It imparts skills, knowledge and competences that are pivotal to human development and improved quality of life. In doing so, it brings wide ranging benefits. However, in Nigeria the gender gap favouring boys in school enrolment has been found to be consistently high. Gender imbalance in school enrolment occurs whenever there is a disparity in the access of males and females to education. The obvious disparity between boys and girls is found in overall enrolment (see table 1 below). Some Nigerian parents tend to give priority to the schooling of boys rather than girls especially in large families where funds are insufficient. Gender imbalance in school enrolment is prevalent in Nigeria because the country is a

highly patriarchal society. The Nigerian girl child is more likely not to enroll in school or drop out of the school system as a result of poor socio-economic status of parents, early marriage, premarital pregnancy, household duties, and parents' preference for the education of boys rather than girls and sexual harassment.

Table 1: National Summary Statistics of School Enrolment by Gender, 2004 - 2012

Indicator Name	2004	2005	2006	2007	2008	2009	2010	2011	2012
School enrollment, preprimary, (% gross)									
Female	14.14	13.90	15.41		12.52	11.85	13.30	12.16	11.82
Male	14.17	14.08	15.23		11.94	14.04	13.48	13.04	12.85
Primary completion rate, (% of relevant age group)									
Female	71.84	74.95	80.19	71.56	64.03	65.65	68.87	64.77	63.22
Male	86.91	89.99	100.50	89.00	74.36	75.04	77.44	72.69	69.67
School enrollment, primary, (% gross)									
Female	91.61	92.56	94.24	87.33	78.92	77.12	77.59	73.02	69.86
Male	108.55	108.95	108.79	98.22	88.17	85.65	84.96	77.90	72.97
Gross intake ratio in first grade of primary education, (% of relevant age group)									
Female	105.40	103.15	101.45	96.47	83.64	84.42	80.48	75.00	70.35
Male	123.22	119.88	116.76	107.47	93.65	92.44	90.27	80.98	74.66
School enrollment, primary, (% net)									
Female	61.47	62.11	63.23	60.41	54.60	53.35	53.67	51.33	49.56
Male	70.59	70.84	70.71	67.82	60.88	59.14	58.67	55.67	53.21

Source: World Bank country specific economic indicator (Nigeria, 2013)

Gender inequality in education deprives girls with similar innate abilities to boys of opportunities to develop their human capital and participate in a series of growth-supporting economic activities. Assuming declining marginal productivity of education, gender inequality results in less able boys than girls becoming educated; Gender, Growth Assessment of Nigeria **(GGAN: 2009).** According **(Schultz 2002),** Gender imbalance in education lowers the average human capital available in the economy, results in inefficiency of public resources and slows down economic growth**.**

While the gender gap at the primary level is narrowing in Nigeria, there is still a wide gap at the secondary and tertiary levels of education. At the secondary level for example, in 2006, males were 56.4 percent of the enrolment while females were 43.6 percent. The figure remained stable for males in 2007 while that of females dropped to 43.3 percent (table 2). The trend of disparity in enrolment continued. In 2010, it was 54.2 percent for males and 45.8 percent for females.

Table 2: Percentage Distribution of Enrolment in Secondary Schools (Public & Private) by Sex

Year	Male	Female
2006	56.4	43.6
2007	56.7	43.3
2008	50.1	49.9
2009	54.3	45.7
2010	54.2	45.8

Source: Ministry of Education Digest of Statistics 2010

Nationally women account for over 56% of about 59,760,000 illiterate Nigerians (as per 2010 Federal Ministry of Education Digest of Statistics). National Population Commission (NPopC) 2011 estimates put the population at 67,000,000. Gender disparity in adult literacy remains significant in the country. While outstanding gains have been recorded in Nigeria on enrolment of girls'' and boys in primary schools, the country is still far from attaining universal primary education.

The efforts successive governments in Nigeria have made in strengthening education sector have not yielded the desired goal, since there are still huge differences in the level of education across zones (Table 3). The south in general performs better than the north, with over 80 per cent attendance rates for both boys and girls at primary level, in comparison to 50 per cent for boys and 40 per cent for girls in the North West and north east zones. Interestingly, though not surprisingly, there is a sharp decline in attendance of both boys and girls post-primary across the country. While the gender gaps again are not substantial in the south, in fact they favour

girls in the South East; the pattern for the north continues to disadvantage girls by over 10 percentage points, similar to the primary level.

Table 3: Net Attendance Ratio (2009)

	Primary School			Secondary School		
	Male	Female	Total	Male	Female	Total
Urban	71	68	69.5	47.2	45.3	46.3
Rural	60.2	51.1	55.7	31.7	25.9	28.7
N Central	71.4	68.9	70.2	42.7	32.6	37.7
N East	49.5	39.1	44.4	22.9	14.9	19.1
N West	49	34.2	41.7	19.8	9.5	14.7
S East	82.4	78.3	80.2	44.9	51.4	48.5
S South	83.2	81.1	82.2	51.6	51.5	51.5
S West	81.2	84.6	82.8	62.2	59.9	61
National	63.7	56.5	60.1	37.5	32.6	35.1

Source: GGAN (2009).

Distance to school also has a large negative effect on child schooling, indicating the importance of access to school in increasing participation of children. At the age of 17 years, the probability of drop out among girls is 23 per cent compared to 12 per cent for boys in urban areas; **(GGAN: 2009).** The regional variation can partly be explained by the practice of seclusion and early marriages in the north, but also an inherent suspicion of 'western' education, associated with the influx of missionaries in the south, though to varying degrees in Nigeria's post-colonial history. This has led to gendered differences even within the north, with fewer girls and boys in North West and North East Nigeria likely to attend 'modern' schools, while marriage at puberty for girls still remains a widely accepted norm in Kano and Bauchi, leading to a withdrawal of girls after primary schooling, many rural boys miss this opportunity too, being enrolled for several years in Quranic schools that do not equip them with any marketable skills, making such boys to stand at a disadvantage in the labour market (see **GGAN: 2009**).

Gender Healthcare Gap in Nigeria

In Nigeria statistics have show that more women are dying from the epidemic of HIV/AIDS than men. In 2008, it was estimated that 55.2 percent of those who died of HIV/AIDS were women. In 2009, the figure was 55.1 percent while in 2010 it was 55 percent (see table 4 below). This state of things may not be unconnected with the research based finding that women are more vulnerable than men to contracting HIV due to biological, social, economic and cultural pressures. Unequal gender relations within and outside the family often limit the ability of women to protect themselves from HIV/AIDS. Lack of knowledge of HIV among young women may also be a contributing factor. On the average, it is estimated that 55.7 percent of New HIV infections in Nigeria between 2008 and 2010 were females (Gender Statistics Newsletter **(GSN, 2011)).**

Table 4: Gender Estimate of Annual Death by HIV/AIDS in Nigeria

Year	Male		Female		Total
	Number	%	Number	%	
2008	198,198	88,742	44.77	109,456	55.23
2009	192,000	86,178	44.88	105,822	55.12
2010	181,774	81,728	44.96	100,046	55.04

Source: Federal Ministry of Health and Gender Statistics Newsletter

Another health profile study by Federal Ministry of Health (2006-2008) gave an estimate of over 55% (2010) of people living with HIV/ AIDS in Nigeria as women compared to 44.3% recorded for men.

Table 4: Number persons affected with HIV in Nigeria by sex

Year	Male		Female		Total
	Number	%	Number	%	
2008	329,984	146,137	44.30	183,845	55.71
2009	336,379	149,095	44.32	187,284	55.68
2010	339,016	150,351	44.35	188,665	55.65

Source: Federal Ministry of Health and Gender Statistics Newsletter

In terms of work, women's participation in labour force in the country remains low with a large gap between the participation of women and men. Even among the employed, women in the country to a large extent engage in vulnerable employments being either owner-account workers or contributing family members in rural and urban (see fig 3).

Fig 3: Gender Distribution of Persons that never had Pay - Job in Nigeria, (2009)
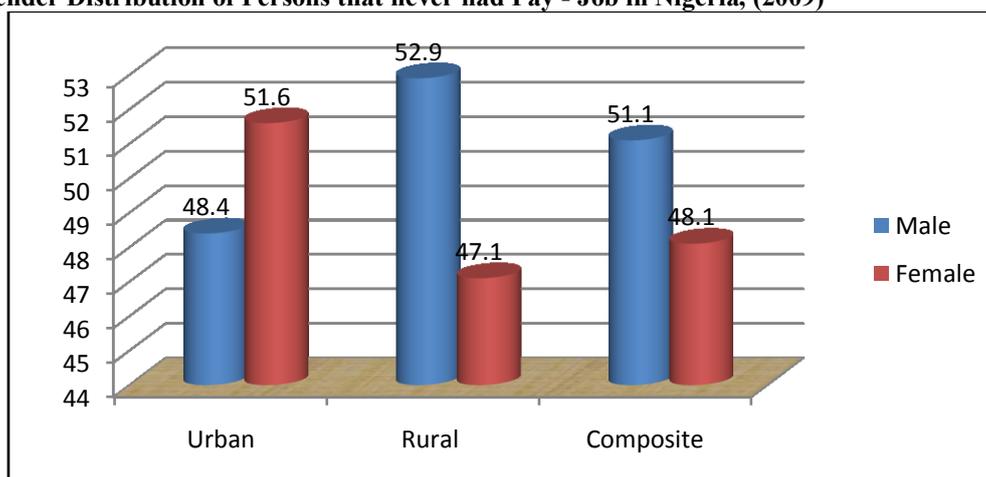
Source: data from NBS (2011); plotted by the researcher.

Over the years many Nigerian women have entered traditionally male dominated occupations. However, they are still rarely employed in jobs with power, authority and status or traditionally male blue-collar occupations. Relative to total employment, women are under represented among legislators, senior officials and managers in the public sector. In the country, lack of gender balance in decision making positions in government persists.

Table 5: Summary of seats held in National Assembly by type and Sex

LEGISLATORS	2007		2011	
Senate	**Number**	**%**	**Number**	**%**
Men	100	91.7	101	92.7
Women	9	8.3	8	7.3
Total	**109**	**100**	**109**	**100**
House of Reps.				
Men	334	92.8	338	93.9
Women	26	7.2	22	6.1
Total	**360**	**100**	**360**	**100**
Both Houses				
Men	434	92.5	439	93.6
Women	35	7.5	30	6.4
Total	**469**	**100**	**469**	**100**

SOURCE: Quarterly Publication of National Bureau of Statistics (NBS, 2012)

In Nigeria women remain under-represented in the National Assembly where only 6.4% of seats are occupied by women. The share of women among Ministers is 25% compared to 75% of men. There is no executive governor among the 36 in the country that is a woman. The situation is similar at the state and local government council level. In the private sector women are Chief Executives in some large companies but the number re-mains low relative to men.

Table 6: Summary of Gender Gap in Nigeria

Indicators	Male	Female	Difference
Population & Families	%	%	%
1. Population 2006	49	51	2
2. Early Marriage	7.2	92.8	85.6
Health			
3. Percentage living with HIV Aids (Estimate 2010)	44.3	55.7	11.4
4. Life Expectancy (HDR 2008)	48	52	4
Education			
5. Youth Literacy in Any Lan-guage	86.0	79.0	7
6. Adult Literacy in Any Lan-guage	68.5	60.0	8.5
7. Adult Illiteracy	31.5	40	8.5
8. Primary School Enrolment (2010)	53.4	46.6	6.8
9. Secondary School Enrol-ment (2010)	54.2	45.8	8.4
10.Tertiary Enrolment: NCE (2009)	51.1	48.9	2.2
Polytechnic (2010	72.3	27.7	44.6
University (2010)	61.6	38.4	23.2

Power and Decision Making			
10. Ministers (2011)	757(20)	23 (6)	54 (14)
11. Parliamentary Seats both houses (INEC)	93.6	6.4	87.2
12. State House of Assembly (INEC 2011)	94.5	5.5	89%
13. Permanent Secretaries (MDAs 2010)	96.5	3.5	93
14. Directorate (MDAs 2010)	90.8	9.2	81.6

Source: Quarterly Publication of National Bureau of Statistics (NBS, 2011)

IV. Data Sources And Analytical Framework

Data Source

The data for gender unemployment by educational level and sector, gender schooling ratio, gender population growth rate is sourced from the Quarterly Publication of National Bureau of Statistics (NBS, various years) and NBS Annual Abstract of Statistics 2012 while economic active participation by gender sourced from FAO data base.

Analytical Framework

This section highlights how ordinary Lorenz curves fail to rank inequality distributions on welfare grounds, whenever ordinary Lorenz curves cross or the Lorenz dominating distribution has a lower mean. Therefore, Generalised Lorenz (GL) curves are introduced and the Shorrocks' Theorem is presented, which in many cases allows to overcome the limitations of the Lorenz dominance approach. When attempting to rank gender inequality on welfare grounds using Lorenz curves, one the following cases occurs:

   i)   the dominating distribution has a higher or equal mean;
   ii)   the dominating distribution has a lower mean;
   iii)   there is no domination of one distribution over the other (Lorenz curves cross).

Welfare prescriptions set by Shorrocks are very similar to Atkinson's, but we are now comparing GL curves. This is necessary because Atkinson's results do not cover those cases where the dominating distribution has a lower mean or where Lorenz curves cross. It is worth noting that for all cases where Atkinson's results hold, GL curves and Lorenz curves give the same information, i.e. Lorenz dominance implies and is implied by GL dominance. In addition, for equal mean distributions, whenever Lorenz curves cross, GL curves also cross. This is due to the fact that ordinates of both GLs are obtained by multiplying the ordinates of the Lorenz curves by a constant, i.e., the mean income which is the same for the two distributions.

In the first case, Atkinson's Theorem allows us to conclude that the dominating distribution is welfare-superior; in the other two cases, Atkinson's Theorem does not allow any conclusive judgement about welfare superiority of one distribution with respect to another. Fortunately, in many circumstances, both cases, may be solved by using GL curves, as developed by Shorrocks (1983). The GL curve is obtained as follows:

➢ The *x*-axis records the cumulative proportion of population, as in standard Lorenz curves. Its range is therefore (0,1).

➢ The y-axis records the cumulative mean of the figure, i.e. the mean gender distribution by education and employment is calculated by taking the cumulated distribution of a given share of the population, divided by the total population, as follows:

$$GL\left[\frac{ij}{P}\right] = \frac{\sum_{i=1}^{n}\sum_{j=1}^{k} x_i y_j}{P} \quad \text{-- (1)}$$

where:

$i;\ i = 1,....n$ is the position of the rural population by gender and educational level;

$j;\ j = 1....k$ is the position of the urban population by gender and educational level;

P = the total number of individuals in the distribution;

$x_i y_j$ = the education level of the rural and urban population

$\sum_{i=1}^{n}\sum_{j=1}^{k} x_i y_j$ = the cumulated education level of the rural and urban population.

GL ordinate range is therefore $(0, \overline{y})$, i.e., the end-point of the GL curve is the mean education level of the rural and urban population. This implies that sectoral education and employment with a lower mean distribution than another distribution can never be the GL dominating distribution. At least, at the end point, the educational distribution with a higher mean will dominate the one with a lower mean.

V.   Results And Findings

The Generalized Lorenz (GL) Curve conducted using the survey data compiled by the National Berueau of Statistics (NBS), which captured the distribution of unemployment by gender, educational levels and sector, [the Annual Abstract (2012)], shows clearly how gender inequality in education and employment impacted on rural and urban welfare. As demonstrated in the analysis, higher gender inequality in education and employment are associated with higher unemployment and lower welfare (table 7).

Table 7: Rural and Urban Unemployment by Educational level and Gender Inequality

Table 7a: Urban Unemployment by educational level

EDUCATIONAL LEVEL	Ranks (A)	% Cum. Share of Pop (hor.axis L/GL) (B)	Distr. of Unempld (U) (C)	Cum. (D)	% Cum. Share of U (ver.axis of L) (E)	Cum. Ave. U (vert.axis GL) (F)
Never Attended	9	10	2	2	0.6	0.2
Primary	1	20	17	19	6.1	1.9
JSS	8	30	18	37	11.9	3.7
Voc/commercial	7	40	31	68	21.9	6.8
SSS	10	50	31	99	31.8	9.9
NCE/OND	5	60	32	131	42.1	13.1
B.a/B.Sc & others	2	70	36	167	53.7	16.7
M.Sc/M.A	6	80	36	203	65.3	20.3
Doctorate	3	90	41	244	78.5	24.4
Others	4	100	67	311	100.0	31.1
Total			**311**			
Average			**31.1**			

The estimated welfare distribution shows that female unemployment in urban sectors dominated that of rural sectors (see column C and G of table 7b) at some stage, but was overlapped as educational level increases. This evidence is also reflected by the mean female unemployment and the calculated GL cumulated average female distribution, which shows that the urban female unemployment is worst-off compared with the rural sectors.

The GL estimation of the cumulated average female unemployment result in table 7a and 7b, columns F and J, show a reduction of gender inequality in the rural sector compared with the urban sector.

Table 7b: Rural Unemployment				
Distr. of Unempld (U) (G)	Cum. (H)	% Cum. Share of U (ver.axis of L) (I)	Cum. Ave. U (vert.axis GL) (J)	Diff. Cum. Ave. U (K)
0	0	0.0	0	0.2
5	5	2.0	0.5	1.4
8	13	5.2	1.3	2.4
21	34	13.6	3.4	3.4
30	64	25.6	6.4	3.5
30	94	37.6	9.4	3.7
36	130	52.0	13	3.7
38	168	67.2	16.8	3.5
39	207	82.8	20.7	3.7
43	250	100.0	25	6.1
250				
25				

Even though the estimated GL (presented in table 7) shows a Pareto improve equity in education and employment in the rural sector, that is, reduction in female unemployment in this sector, the result failed to show comparison between equity and welfare distributions of rural and urban sectors (see fig 4).
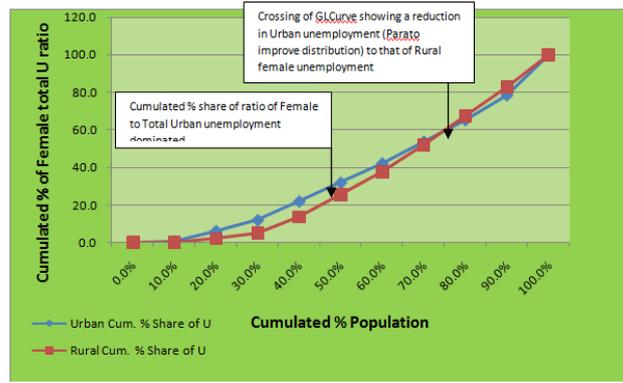
Fig. 4: Ordinary Lorenz Curve showing overlapping welfare case of gender inequality changes in rural and urban Nigeria.

The reasons why the Ordinary Lorenz curve failed to detect welfare superiority (reduction of gender inequality) is because it is based on cumulative shares of unemployment distributions by educational level. Hence, the lower levels of female education and the aggregated distributions of female education and employment in Nigeria receive a greater cumulative share in rural sector (see fig. 4 and compare columns E and I in table 7a, above), causing crossing or overlapping of Lorenz curve.

Also the crossing of Lorenz curves can occur when there is a Pareto improvement in the ratio of female schooling, employment and income distribution, as in the rural sector and thus failed to perform as indicators of welfare superiority. This is because there is no Lorenz dominance, it only cross each other, (as can easily be seen by the cumulative female unemployment share in table 7a, columns B and I, and figure 4). Whereas on these cases, the Ordinary Lorenz curve does not allow us to draw welfare judgment concerning reduction in gender inequality in these sectors, the GL curves allow us to draw welfare judgment, were female unemployment dominates in the urban sectors compared to the rural sectors. This was achieved by ranking rural and urban female unemployment distribution on welfare grounds looking at Generalized Lorenz (GL) dominance analysis.

We estimated the GL curve ordinates for urban and rural distributions (see columns F and J in table 7b), and the two GL curve are plotted in figure 5. This is a prove that the protracted gender inequality in Nigeria which resulted in low educational qualifications of majority of the active female labour force population, leading to higher female unemployment, are dominantly in the urban sector compared to the rural sector.
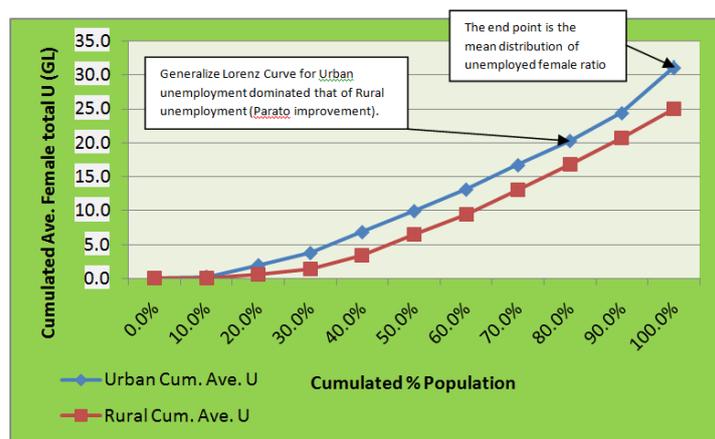
Fig. 5: Generalized Lorenz Curve showing inequality induced average female unemployment by sector (urban and rural)

This result also demonstrated how some of the policy measures gear towards reduction of gender inequality by the past administrations in Nigeria, such as Universal Basic Education (UBE) programs, initiated during the Obasanjo administration, the 'growth with equity' policy initiated in Yar'Adua/Goodluck administration etc., has redirected the growth pattern of female schooling and unemployment mostly in the rural sector (see fig. 5 below).

Notice once again that in figure 5, GL distribution of unemployment by educational level in the rural sector show more welfare improvement compared to that of the urban sector, since after the normalization the

urban female unemployment dominated. Given GL improvement in rural sector over the urban, and if the decision-makers are human capital investment–seeking and inequality–averse, according to the Shorrocks' Theorem, the rural sector are welfare-superior compared to the urban sector (pro-poor growth). Welfare superiority of rural sector, as signaled by its GL improvement, is implied by the fact that the Social Welfare Function (SWF) of the decision-maker, as made explicit in Shorrock's Theorem, not only favours transfers from richer to poorer, but also favours income increases of the poor (in this case the rural poor compared to their urban counterpart). Thus, even in the absence of transfers, additional income accruing to an individual without damaging any other individual is good news for the decision-makers (government), hence, encouraging gender competitiveness and, on the long-run improve the nation's socio-economic welbeing.

Finally, the Two-way Generalized Lorenz analysis also shows that gender inequality is more prevalent, and still on the increase, in the labour market compared to the educational sector in Nigeria. As earlier explained, the reasons for this results is because aggregate gender inequality in all sectors, eventually cumulated in the labour market with higher unskilled female labour, higher ratio of female to total unemployment and lower ratio of female to total earnings, as observed in Nigeria (see table 7).

VI.   Summary Of The Analytical Findings

This analysis has shown, so far, that both Ordinary Lorenz curves (OLC) and the Generalized Lorenz (GL) curves (Atkinson's and Shorrock's Theorem), are powerful tools for ranking different human capital distribution on welfare grounds. In many cases, when Ordinary Lorenz curves fail to provide a conclusive answer, GL curves can succeed. However, unlike the case of the complete specification of a SWF, these tools may give a 'partial ordering' of a set of gender human capital accumulation, as there might be cases where both Lorenz and GL curves do not allow any conclusive welfare judgment, as seen in the previous analysis of figure 2 (cross dominance Lorenz curve). Nevertheless, the results show, among other things, that gender gaps in education and employment impacts negatively rural and urban welfare as it would deprive the female labour (relatively cheap) as a competitive advantage in an export-oriented growth strategy.

Though there is a remarkable reduction of gender inequality in education, the overall inequality in Nigeria is still very high, and until things are done urgently and rightly, the objective of achieving 35% gender equity in all sectors (Millennium Development Goal) in Nigeria before the year 2015 may remain as dreams.

Policy Implications

While our results suggest that changing the composition of the labour force to include more females (without reducing male participations) would have a positive effect on welfare, a more realistic policy implications would be to develop an employment-intensive growth strategy that makes particular use of females. Thus, the results suggest that current barriers to female employment are not only disadvantageous to females, but also appear to reduce their wellbeing.

We can claim here that this study is a kind of reaffirmation of some findings from a large literature suggesting that gender inequality in education and employment also have a significant negative impact on the welfare and other development goals such as reductions in fertility, child mortality, and under-nutrition. Thus reducing existing gender inequality in education and employment will not only promote growth, but also further these other valuable development goals. There is a growing but still rather speculative and suggestive literature that has collated evidence that female workers, on average, appear to be less prone to corruption and nepotism than men (**World Bank/UK DFID, 2007; Seguino, Stephanie and Maria Sagrario Floro, 2003).** If these findings prove to be robust, then greater female employment might be beneficial for the fight against corruption in public officers and for economic performance in Nigeria in this sense.

VII.   Conclusion

The challenge of increasing general living standard (welfare) of Nigeria is, as suggested here, to a considerable extent linked to the role played by women in the society. The cost of discrimination toward women in education, employment and other wellbeing sectors of the economy are not only harmful to the women concerned, but also impose cost for the entire society. For example, in Nigeria, gender gaps in education might automatically lead to gender gaps in employment, particularly in the formal sector, where employers will prefer educated workers and thus will not consider applications of uneducated women. Conversely, if there are large barriers to female employment or gender gaps in pay, rational parents might decide that education of girls is not as lucrative which might therefore lead to lower demands for female education and resulting increasing gender gaps in education. Thus gender gaps in education and employment are closely related to each other.

We observed also, in the process of this study that women are still, in the twenty first century, very much discriminated against in both education and economic activities globally. Though in Nigeria gender gap in education has been reduced from high levels, but gender gaps in employment remain pervasive. In contrast to some developed countries, where export-oriented industries have led to a reduction of the gender gap in the

labour market in the last decades, increased female education in Nigeria has not translated into higher labour market participation. Nigerian women in this case are encountering structural barriers in employment but those barriers may also be social, cultural, and ideological (**World Bank; 2004).**

Regarding the growth costs of these gender inequalities, some studies reviewed in literature argued that: Firstly, gender inequality in education reduces economic growth. Secondly, gender inequality in education in Nigeria continues to harm growth, but by decreasing amounts. This is due to the fact that gender gaps in education have been sharply reduced there over. As a result, we expect gender inequality in education to play a decreasing role in harming growth prospects in Nigeria. While this is true in an absolute sense, it is not always true in a relative sense.

Limitation of the Study

As these analyses are suggestive that significant constraint to women welfare in Nigeria appears to be the substantial gender inequality persisting in education and employment, we want to emphasize here that the assessment of the gender inequality in employment is based on data for labor force participation rates that are measured with error and are often not fully comparable internationally. It is highly lamentable that comparable labor force participation and employment data, to cover a wider range were not found in Nigeria, but was obtained from the estimate in National Bureau of Statistics Abstract database of labor force participation and employment by gender for Nigeria. This is despite the fact that increasing numbers of household and labor force surveys are undertaken in this country, but the results are not used to generate consistent and comparable data on employment, labor force participation and other labour market indicators.

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