ALTRUISM AND POPULATION GROWTH IN NIGERIA: DOES GENDER IDENTITY BIAS MATTER

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Abstract

In the attempt to investigate whether gender identity bias matters in the altruism-population growth nexus in Nigeria between 1981 to 2018, the study utilized the Auto Regression Distributed Lag (ARDL) methodology to reveal that indeed gender identity bias matters, given that women are more pro-altruistic to children than men in the face of rising population growth. That is, as women labour participation increase so does their altruism to children's upkeep increases, while the reverse is the case for men. The study suggested that to enhance parental altruism towards the child, the firms and government should institute incentives and strategies that will stimulate female labour participation in the work environment. This has the capacity to not only boost productivity but also increase the per capita income, which will transmit to higher proportions of parental altruism to children.

Keywords: Altruism, Gender, Population, Welfare

Introduction

Altruism connotes the motivation by an individual who considers that someone should benefit instead of self. That is inconveniencing self to ensure the welfare of another person. To this connection Piliavia and Chang (1990) surmise that altruistic behaivour should be voluntarily and intentionally done to benefit another person without the performer of such an act expecting a reward.

Altruistic studies have gained traction amongst scholars to display the diverse nature of works foreclosing diverse results. (For instance, see Sawyer 1966, Wrightsman 1974, Staub, Daniel, Jerzy, &Janusz 1984, Rose-Ackerman 1996, Underwood 2002, Smith 2005, Birchell& Soares 2007). Of these works Birchell and Soares (2007) argue for the correlation between altruism and fertility, wherefore parents tend to observe some attachment to the quality of life towards their children, which will ensure reciprocity towards them in the future. This has the capacity not only to improve the kids' mortality rate but also that of the parents.

Historically, early nineteenth-century Europe and America painted a picture of anti- parental altruistic tendencies towards children, which saw high mortality rate of children as high as 25% but at the twilight of the industrial revolution, there was great improvement leading to 30% to 40% children survival rate. Most recently, given improvements in parental altruism live births mortality rate of children for Europe and America is reported as between 4-7 per 1000 as of 2019 (Rapoport and Vidal 2003, World Bank 2020).

The storyline as painted for developing economies according to Galasso (1999) Rapoport and Vidal (2003) are even worse. The submissions are that women hardly engage their children for two hours per day and men in most instances see the job of child upbringing as a woman's prerogative as such do not even show concern for the quality of life to be attained for such kids. Again, that as women become income enhanced their parental altruistic tendencies decreases. These reasons might be attributable to the high child mortality rate and low life expectancy of 38 per 1000 live births and 51 years as at 2019

respectively (See World Bank 2021).

To posit a good proxy for measuring parental altruism World Bank (2001), highlight the extent of education expenditure as a share of Gross Domestic Product (GDP). To this extent WorldBank (2021) aver public spending on education as a share of GDP is 3% for low-income countries and the corresponding 5% in high-income countries, has shown that globally altruism has improved. The alleviation of poverty, improved liquidity and returns to schooling and literacy have been reasons attributable to such global parental altruistic tendencies.

Population growth connotes the changes recorded in the number of persons in a country over a period. The conjecture between fertility and or population growth versus income by Becker (1960) opened up the frontiers of discourse towards the lynchpin between quality and quantity tradeoff in choices of fertility. The argument is that increased income does not translate to a corresponding increase in population growth or the number of children, but rather enhanced spending on children's upkeep to improve their quality of living. In essence, population growth and altruism share a positive relationship.

Becker (1960) further acknowledges that tastes may vary across families, which invariably transmits to gender-identity biases in altruistic behaivour amongst countries. However, of interest is the gender identity-altruistic relationship, which exhibits an inconsistent pattern. Sometimes, altruistic tendencies are predominant with men than women, while in certain instances, the reverse is the case and in other instances, the sex makes no difference. (See Johnson et al, 1989; Davis, 1994; Chou, 1998; Howard and Paliavin, 2000; Penner et al, 2005). Again, these studies avail that the nature of the help might provide direction on which gender should exhibit such an altruistic behaivour. The cache here is that, given this inconsistency, what is the likely altruistic tendency amongst gender towards a child's quality of life in the face of population growth, while drawing evidence for Nigeria from 1981 to 2018.

Empirical Literature

In the arguments of Kalliopuska(1984) family size and altruistic attitudes are unrelated, while others such as Koda and Uroyos(2017) while determining the impact of family size on altruism foreclosed the findings that filial altruism is higher in developing countries and lower in developed economies and that a large family promotes generosity. Further Investigations on the two-sided altruism and level of development Uruyos and Dheera-aumpon (2019) confirms the finding that the levels of development influence the evolving variations in the relationship with parental altruism.

Becker and Barro (1988), Ehrlich and Lui (1991) posit that parental altruism enhances fertility. To this end Boldrin and Jones (2002) Nishimura and Zhang (1995) provide evidence to suggest that with filial altruism then, children are raised as assets. Even though these works do not provide whether it is parental or filial altruism that is predominant in certain climes, which necessitates Horioka's (2014) contributions by stating that Americans and Indians are parentally altruistic, while Japanese and Chinese are pro-filial altruistic.

For Kurzban et al (2015), Blackburn and Cipriani (2005) their argument in a two-sided altruistic model proffers result of those intergenerational transfers from children to parents superseding the reverse causality from parents to children, leading to a decline in fertility in a developing economy.

In the same vein, Rapoport and Vidal (2007) assert that in developing economies natural altruism where there is unconditional parental love for offspring prevails, given poor infrastructure. If such basic infrastructures become tenable, parents' choices of altruism become predicated on cost-benefit considerations. That is endogenous altruism becomes predominant in rich countries. The point is that governments in rich countries subsidize education because of the need to minimize the inadequacy of natural parental altruism. A fact further substantiated by Armellini and Basu (2010) cross-sectional evidence, for a group of 43 countries that confirms the governments in rich countries spending more on education subsidy in comparison to

poor countries. In essence, the government's benevolence towards enhancing education is to cover up for the inadequacy of parental altruistic shortfall by private citizens.

Scholars on altruistic studies have argued on the social desirability of education subsidy, wherefore private returns to human capital are short of social returns. That is human capital having positive spillover on productivity that may not have been privately internalized. (See Rosenzweig and Wolpin 1980, Rosenzweig and Zhang 2009, Lucas 1988, Azariadis and Drazen 1990 and Tamura 1991). To this connection, education subsidy comes in to correct this externality incentive as traced to Smith (2005) who submitted that altruistic traits are predominant with those favoring more government social spending. Acemoglu and Angrist (1999), Bils and Klenov(2000), and Krueger and Lindahl(2000), Black, Devereux, and Salvanes (2005) Angrist, Lavy, and Schlosser(2010) however, questioned the efficacy of this positive externality argument.

The idea is that in countries where parents are less benevolent, the rate of education support is higher because a pragmatic government must correct for a shortage in educational investment by subsidizing learning.

For Italy, Cigno and Rosati (1992,1996) found out that self-interest is the rationale that precipitates behavioural tendencies towards the savings and fertility nexus. Brezis (2002) aptly captures this fact given the suggestions of the preponderance of non-altruism palpable amongst various classes in the fertility and economic growth relationships. The argument is that altruism evolves given changes in social norms and the economic environment.

To this connection, Eisenberg and Strayer (1987), Skarin and Moely (1976) in their submission on the altruistic behaivour amongst gender based on socialization norms predicts that males become competitive and assertive, while females socialization norms depict that of being caring, subservient, and dependent. That is females perform the role of a care provider, which is in contradiction to that of males. This will indeed affect the extent to which

each gender will render altruism to the child. However contrastingly, Piliavin and Unger (1985) argue that men and women have sharedequal roles in the rendition of altruism to the subject in question. The differential roles noted is that while women exhibit altruistic behaivour at both low-levels and high-levels scenarios, the altruistic act for men comes into effect at high-level scenarios (Piliavin& Chang 1990). For DeFleur(2010), Baldwin, Perry, and Moffitti (2004) Torstick and Faier (2009) submitted that societal norms impact substantially on the altruistic traits of gender. That is the way or roles societal provides for each gender will navigate their understanding of the performance of altruistic goals as also acknowledged by Howard and Piliavin (2000:117) that "who helps depend heavily on the nature of the help required".

Smith (2016), Salmon (2004), the birth order or the position someone holds in the family do affect the gender and the extent of the performance of altruistic behaivour, which will transmit to the children. The summary is that literature is inconsistent on gender relationship to altruism as acknowledged in Amato (1990), Batson (1998), Howard and Piliavin(2000), Johnson et al(1989), Khanna et al(1992), Penner et al(2005) that men are more helpful in certain instance, while in others women are more helpful and yet in others, the sex makes no difference.

Altruistic traits amongst gender biases can also be traced to the nature of family given that the traits exist for those raised in a two-parent family having these traits as much as those raised by a female-only. Nevertheless, for gender identity biases of those raised by males such altruistic traits are low. The conclusions reached by Piliavin and Chang (1990) suggest that females more than ever stimulate altruistic behaivour than their male counterparts. Dinkha et al (2012) further substantiate this fact that overall, as recorded in literature, women are more altruistic than men in the face of rising population growth. Nevertheless, does this assertion hold for Nigeria given the assertion that altruism varies across countries? This is the crux of the current study.

Theoretical Literature

Becker (1960) in positing for the theory of fertility argued for the treatment of children in economic analysis to be synonymous to consumer durables like cars or houses. In this regard, the assumption of choice and preferences comes to bear. This enables an explanation for fertility trends been caused by shifts in taste, which are precipitated by changes in income and relative prices. Again, the argument for quantity-Versus-quality for the fertility choice of children, specifically the quality dimension made it possible to observe empirically the effect of income on fertility choice. The argument is that there is the absence of substitutability of demand for children, which the quality dimension enables for switching by the consumer to the quality of children he/she would love to have in the event of changes in income. This relationship as conjectured by Becker (1960) show that fertility does not always decline with income but at high-income levels a positive income-fertility relationship is evidenced to exist. The argument is that income elasticity for children's demand depends on whether child quality or quantity responds stronger to income changes. This is traceable to the variation in the knowledge of birth control at particular income levels. Since consumers do not have the same knowledge or skills at controlling fertility, it is observed that fertility declines at low-income levels but takes an upward trajectory at high-income levels. Overall, given the quantity-versus-quality fertility choice relationship to changes in income, Becker (1960) argues for a low-income elasticity of child quantity and high-income elasticity of child quality. The extension of Becker's theory of social interactions saw Becker and Tomes (1974) argue that child quality (i.e. spending per child) does not only depend on parental inputs but it is also affected by endowments, which can take the form of inheritance, public investments, human capital, technology. The evolving consequence of endowment is that income elasticity of child quality tends to be high at low-income levels. This is attributable to the fact that for low-income parents the endowment fraction takes a larger fraction of the child quality spending.

Methodology

The presence of mixed order of integration as depicted by the Unit root test results have

justified the use of the Auto-Regressive Distributed Lag (ARDL) technique. Pesaran, Shin, popularized this technique and Smith (2001) for secondary-based study given the small and finite size of the data, which enables the use of the Bounds test to verify the existence of a long-run relationship amongst variables of interest, wherefore; short-run estimates are derived from the Error Correction Model (ECM). Post-diagnostic test of heteroscedasticity, autocorrelation, and model misspecification tests are also investigated to give validity and forecasting power to the model specified for estimation.

Model Specification

The theoretical underpinning of the study draws strength from Becker's (1960) theoretical prepositions on fertility that argues for a positive relationship between income and the quantity versus quality demand in fertility choice of children. To this connection, we have that;

$$A = F(I) \quad (1)$$

where A= altruism growth proxied as the percentage of education expenditure on Gross National Income is depicted as Eduex. This connotes the extent government spends on education as a stopgap against private sector non-participation.

I= Income earned for participation in the economy.

But given that either parent can earn Income we have

$$Income = F(M1, F1) \quad (2)$$

Where MI =Labor participation rate, male (% of male population ages 15+)

FI= Labor participation rate, female (% of female population ages 15+)

Thereafter substituting eqn. (2) into eqn (1) we have

$$A = F(M1, F1) \quad (3)$$

The extension of Becker's theory of social interactions birthed Becker's and Tomes (1974) prepositions that spending on child's quality in the face of population growth is

also a function of other endowments to include public investments, human capital, and technology. (See also Mulligan 1997).

To this connection eqn. (3) becomes

$$A = F(M1, F1, POP, GDPpc, HCI, TEK) \quad (4)$$

Wherefore:

(i) Population (POP) connotes the changes in population growth that determines or shapes altruistic traits for parents.

(ii) The Gross Domestic Product per capita (GDPpc) is taken as a proxy for income distribution, which explains an individual's quality of life given the average income earned per person in a particular geographical space.

(iii) Based on Uroyos and Dheera-aumpon (2019) that subscribes to development been a major determinant of altruism, the work substitute's economic growth for Human capital index (HCI). This index by World Bank seeks to measure how much capital each country loses through lack of education and health. In other words, which countries are best in mobilizing the economic and professional potentials of citizens.

(iv) dditionally, given the argument of improvements in productivity that are tied to faster innovation and more investments in human capital as structured by endogenous growth models (See Arrow 1962, Romer 1987 Uzawa-Lucas 1965). The entrance of technical progress into the model is enabled and depicted as TEK.

Taking the explicit form of equation (4) as well as introducing the disturbance term given the ever-changing dynamics of the Altruism-Income nexus equation as modified we have

$$EDUEX_t = \delta_0 + \delta_1 MI_t + \delta_2 FI_t + \delta_3 POP + \delta_4 GDPpc + \delta_5 HCI + \delta_6 TEK + u_t \quad (5)$$

Where: all variables are as defined elsewhere in the work. Nevertheless, μt = Stochastic error term and $_0$ to $_6$, are the respective estimated coefficient parameters. The data is sourced from World Bank Development Indicators (WBDI) and National Bureau of Statistics (2018). The data spans the period 1981 to 2018.

A priori Expectation: $_1$, $_2 < 0$; $_3 > 0$; $_4 > 0$; $_5 > 0$; $_6 > 0$

The re-specification of equation (5) into the Auto Regression Distributed Lag (ARDL) equation for estimation we have

$$\Delta EDUEX_t = \omega_0 + \sum_{i=1}^{n} \omega_{1i} \Delta EDUEX_{t-i} + \sum_{i=0}^{n} \omega_{2i} \Delta POP_{t-i} + \sum_{i=0}^{n} \omega_{3i} \Delta GDPpc_{t-i} + \sum_{i=0}^{n} \omega_{4i} \Delta HCI_{t-i} + \sum_{i=0}^{n} \omega_{5i} \Delta TEK_{t-i} + \sum_{i=0}^{n} \omega_{6i} \Delta MI_{t-i} + \sum_{i=0}^{n} \omega_{7i} \Delta FI_{t-i} + \gamma_1 POP_{t-1} + \gamma_2 GDPpc_{t-1} + \gamma_3 HCI_{t-1} + \gamma_4 TEK_{t-1} + \gamma_5 MI_{t-1} + \gamma_6 FI_{t-1} + \rho_1 ECT_{t-1} + \mu_{1t} \quad \ldots\ldots\ldots (6)$$

Note: ? = Differenced Operator; ? = Short run parameter estimates; ? = Long run Parameter estimates; ? $_0$= Constant term.; ECT= lagged by one year, which represent the Error correction term linking long and short run equilibrium given a distortion; ? = the adjustment parameter estimator. Other variables are as defined elsewhere in the paper.

Results And Discussion

Table 1 presents the descriptive statistics of all the variables used in the work. The description is structured around some central measures of tendencies to include mean, maximum and minimum values.

Table 1: Descriptive Statistics of the Variables of Interest from 1981 to 2018

Description	POP	EDUEX	GDPpc	HCI	TEK	MI	FI
Mean	2.58	1.51	10.65	6.51	2.95	64.8	54.1
Maximum	2.72	5.11	13.39	7.59	8.14	67.2	55.3
Minimum	2.49	0.85	7.52	5.87	0.22	58.2	48.1

Source: Extract from e-views 10 output.

NB: Total observations at 38

A cursory look at table 1 reveals that the Population Growth (POP), which has averaged 2.58% throughout the study reached a maximum of 2.72% in the year 1981, while in the year 1997 it recorded the lowest growth rate of 2.49%. This behaivour can be attributable to the drop in child mortality following increasing percentages of birth rates according to World Bank 2019 reports.

Education expenditure (EDUEX) as a percentage of Gross National Income, which is a proxy for altruism, did average 1.51% from 1981 to 2018. In 1981, it recorded a maximum value of 5.11%. This is attributable to efforts made by both the private and public sectors towards revamping the sector as portrayed by Odeleye (2016). However, over two decades, it continually until 2018 to maintain a minimum value of 0.85% as reported by the 2019 World Bank Report. It was observed that public sector participation in the provision of educational facilities has dwindled over the period.

The Gross Domestic Product per capita income (GDPpc), which measures the income index of the population, hovered around 10.65 units throughout the study. It recorded maximum and minimum values of 13.39units and 7.52units in the year 2018 and 1981 respectively.

The Human Capital Index (HCI) reported a maximum performance of 7.59 index points by the year 2016 as well as a minimum value of 5.87 index points by the year 1981. The period reported an average performance of 6.51 index points for HCI

The Technical Progress (TEK) index was reported at an average of 2.95 basis points from 1981 to 2018. In the year 2018, the maximum value of 8.14 basis points was reported while in the year 1981 a value of 0.22 basis points was reported as the lowest value. Reasons attributable to the performance of GDPpc, HCI, and TEK is traced probably to the behavioural traits inherent in citizens' education, the status of health and educational infrastructure, inflation, and general well-being of the Nigerian citizenry (Anyanwu et al 2015)

The labour participation rate for men and women at ages 15 and above who represents

men and women who contribute their services to the productive system or are economically active have averaged 64.7% and 54.1% respectively over the period 1981 to 2018. Men and women's contributions as active members to the productive process peaked in year 1990 and 2010 at 67.2% and 55.2% respectively. However, by the year 2016 both men and women labour participation evidenced their lowest values of 58.2% and 48.1% respectively. The reasons of such poor performance according to Congressional Budget Office Report (2018) Richer, Chapman and Mihaylov (2018) is traceable to less generous maternity and child-care policies; higher incarceration rates; poorer health outcomes and less spending on the job retraining as well as job-search assistance programs; harsh economic conditions; changes in the demographic conditions and caregiving traits. The presence of these issues will naturally account for the optimum performance of this indictor as earlier observed in years 1990 and 2010.

Augmented Dickey-Fuller (ADF) Unit Roots Tests

The Augmented Dickey-Fuller (ADF) test of stationarity is a tool deployed to observe whether the variables of interest exhibit unit-roots to cause spurious results. The estimation of these results is shown in table 2.

Table 2: Augmented Dickey-Fuller Unit Root Test at Level and 1st Difference

Variable	Level	1st Difference ADF t-statistic	5% Critical Value	Prob. Value	Order of Integration
POP	Non-Stationary	-5.49	-2.95	0.0001	I(1)
EDUEX	Stationary	-6.88	-2.95	0.0000	I(0)
GDPpc	Non-Stationary	-3.34	-2.94	0.0204	I(1)
HCI	Non-Stationary	-4.14	-2.97	0.0034	I(1)
TEK	Non-Stationary	-5.86	-2.95	0.0000	I(1)
MI	Non-Stationary	-4.31	-2.95	0.0018	I(1)
FI	Non-Stationary	-2.94	-2.94	0.0507	I(1)

Source: Extract from e-views 10 output.

A cursory look at Table 2 highlights that except for EDUEX, which shows stationarity at level, form I(0), all the other variables became stationary at first difference I(1) . The benchmark to arrive at this decision is predicated on the absolute value of the t-statistic been greater than the 5% critical value. Given that the Unit root results are at a mixed order of integration of I(0) and I(1), it is again justified for the use of Auto Regression Distributed Lag (ARDL) methodology instead of Ordinary Least Squares, which has the capacity, in this instance to churn out spurious results for the study.

Lag Selection Criteria

To the foregoing connection, given the justification towards utilizing the ARDL methodology, it becomes pertinent to estimate the lag length selection criterion, whose results are tabulated in table 3. This ensures that optimum lags are selected to guide against model over parameterization, which has the capacity to spiral out spurious results.

Table 3: VAR Lag Order Selection Criteria

Criteria/Lag Length	0	1	2
Sequential Modified Test Statistic (LR)	-Not Available	629.8	232.58*
Final Prediction Error (FPE)	1.68e-05	4.57e-14*	1.49e-17
Akaike Information Criterion (AIC)	8.86	-10.90	- 19.254*
Schwarz Information Criterion (SC)	9.17	-8.44	-14.638*
Hannan-Quinn Information Criterion (HQ)	8.97	-10.04	-17.64*

Source: Extract from e-views 10 Output: Note: * indicates lag order selected by the criterion.

The overview of table 3 shows that the optimum lag length of two lags is selected given the usage of the AIC method as well as the reportage of almost all the selection criterion depicted by the asterisk. The lags selected enables for the determination of a parsimonious and well-fitted model.

Bounds Co-Integration Tests

Verifying the existence of long-run relationship amongst the variables of interest forecloses the need to carry out the Bounds Test of Cointegration. The results are reflected in table 4 for perusal.

Table 4: ARDL Bounds Cointegration Test

Dependent Variable	D (POP)			
Selected Model	ARDL (1,3,0,0,0)			
F-Bounds Test	Null Hypothesis: No levels relationship			
Test Statistics	Value	Signif.	I(0)	I(1)
		Asymptotic: n =1000		
F-Statistic	9.459	10%	1.99	2.94
K	4	5%	2.27	3.28
		1%	2.88	3.99

Source: Extract from e-views 10 output.

The decision to the acknowledged presence of long run relationship amongst the variables presuppose that the F-statistics need to be above the Upper bound value I (1). Via observation, of the results, the F-statistics reported at 9.46, which is greater than 3.28 being the upper bound I(1) at a 5% level of significance. Thus, conclusions are drawn to the effect of the existence of a long-run association between the variables utilized in this study. Given the existence of cointegration based on the Bounds Test, it becomes pertinent for the estimation of the short-run and long-run models, whose results are presented in table 5 panel A & B.

Estimation of the ARDL Long Run and Short Run Models

Variable	Dependent Variable: EDUEX	
	Coefficient	t-statistic
Constant	29.56	1.42
POP	-30.25	-2.09**
GDPpc	-0.61	0.37
HCI	6.81	2.19**
TEK	-0.17	-0.67
MI	-0.48	-1.33
FI	0.77	1.48

Note: *, **, and * depict significance at the 10%, 5% and 1% levels respectively**
Source: Extract from e-views 10 output.

The long-run estimates reveal that population growth and Human Capital Index are strong predictors or influencers of altruism towards children in Nigeria within the time of the study. It means that a percentage increase in population growth has the capacity to reduce altruism towards children in Nigeria by 30.2%. This might not be unconnected to Uruyos and Dheeera-aumpon (2019) that conjectures parental altruism being related to the level of development. That as a nation's poverty profile increases, given rising population growth, it will affect the per capita income. This has negative implications on the ability to render care to others even to children in whom natural parental love is bestowed. This thinking is also in tandem with the

negative relationship GDPpc (i.e. per capita income) correlates with altruism even though it is not statistically significant but theoretically and economically plausible. In a similar vein, the foregoing discourse as articulated by Uruyos and Dheeera-aumpon (2019) Armellini and Basu(2010) Rosenzweig and Wolpin 1980, Rosenzweig and Zhang 2009, Smith (2005), that human capital having positive spillover on productivity that may not have been privately internalized. These further explanations on the positive and significant relationship between human capital and altruism. That is a percent rise in HCI will lead to a 6.81% increase in altruism in Nigeria. Even though the gender identity bias estimates based on a bird's view observation of the results as depicted in table 5 did not offer statistical significance as such, conclusions might suggest that they are not strong predictors of altruism towards children. Nevertheless, the a priori or theoretical relationship suggests insights into this unfolding event, more so that gender identity bias is at the crux of this investigation. To this extent, submissions in this regard are justifiable as credence is laid on the import of F-statistics, which has reported a strong joint significance of the independent variables on the dependent variable towards explaining the existing phenomenon.

As the labour participation rate of males 15 years and above increases, it has the propensity to increase the extent of altruism behaivour of males towards children. This might be explained by Eisenberg and Strayer (1987), Skarin and Moely(1976) assertions that socialization norms, which ascribe roles of subservience dependency and caregivers to females and those of competitiveness and assertiveness to men. These entrench social norms might lead to reduced altruism of men to children as well as explanations for the negative relationship between improved technical efficiency and innovation, (which is observed with curiosity). In essence, the way or roles society provides for each gender will navigate their understanding of the performance of altruistic goals as also acknowledged by Howard and Piliavin (2000).

The argument that with increasing women labor participation, the more their altruistic

exposure for their children seems to strengthen as articulated by Birchell and Soares (2007). The findings of this study probably reveal this positive relationship. However, Rapoport and Vidal (2003) provide contrary submissions that as women become income enhanced their parental altruistic tendencies decreases.

The summary of the epicenter of the study, which seeks to ask whether gender identity bias matters are addressed from the foregoing discussion that indeed gender identity bias matters in the long run, even though the statistical significance paints a story of gender bias been a weak predictor of altruism in Nigeria. However, submissions are made based on the economic relationship, which reveals that the male gender exhibit a negative relationship with altruism towards children as against the female gender that shows a reverse relationship in this regard. It means that the more women participate in labour, the more enhanced their altruistic attitudes to children while the reverse is the case for increases in male participation in labour, which shows that as such labour participation increases of men, the less they become altruistic towards their children.

Table 5B: Regression Results for Equation 6: Short Run Estimates

Variable	Dependent Variable: D(EDUEX)	
	Coefficient	t-statistic
D(EDUEX (-1))	0.29	3.86***
D(GDPpc)	0.21	4.46***
D(POP)	-0.32	-0.82
Ect	-0 .06	0.000***

R-Squared = 0.95; Adjusted R-Squared=0.94; DW=2.19; F-Statistics(prob.) = 1186.1(0.000)

Note: * **and * depict significance at the 10%, 5% and 1% levels respectively**
Source: Extract from e-views 10 output.

The short-run estimates show a significant effect of previous altruistic traits on the current state of altruism. That is a percentage increase in previous altruistic traits towards children increases its current state by 0.29%. Further findings reveal that per capita income (GDPpc) in the short run exhibit a positive influence on altruism towards kids, given its statistical significance at 1%. That means a

percentage increase in per capita income leads to a concomitant 0.21% movement in altruism towards children. The short-run behaivour of per capita income is in contra wise with the long run. That is while a negative relationship between per capita income and altruism towards kids is observed in the long run, the short-run relationship reveals a positive relationship. The probable reasons for such seemingly short-run positive effects between per capita income and altruism towards kids can be traced to Rapoport and Vidal's (2007) allusions that government in most instances tries to bridge the gap to minimize the inadequacy of natural parental altruism. That is most of the time altruism towards kids is absent but government actions in subsidizing education provide a shadow price as a cost to such negligence by parents. Again, Omeje and Ogbu (2015) also acknowledge that the influx of innovation and technology has the capacity to guarantee an enhanced human productivity that will precipitate such initial positive effects between per capita income and altruism towards kids in the short run. This eventually diminishes in the long run, given the law of diminishing returns, as such placing a burden on the living standards of the people, to stimulate negative attributes to the per capita income-altruism to kids nexus. These are additional grounds to provide for the probable reasons for the mixed results.

Population growth in the short run has a similar relationship with the long run, which posit negative association with altruistic behaivour towards kids. The only variations in the results stem from the fact that while the short-run results show absence of been a strong predictor, the long run results is on the reverse.

Error Correction Term (ECT) shows the quantum and length of time it takes for convergence to equilibrium when an innovation or shock is introduced into the system. To this end, it takes in the current year, for convergence or recovering to be achieved at 6%, in an event of a disturbance to the system. The length of time to achieve equilibrium in the event of such a shock, given that altruism towards kids are caregiving attributes, it could take the system about 15years and 6months to achieve stability.

Post Diagnostics:

Table 6 has presented diagnostic results of the model robustness tests to include serial correlation, heteroscedasticity, and stability

Table 6: Residual Diagnostic Tests

Type of Tests	P-Value
Breusch –Godfrey Serial Correlation LM Test	0.2111**
Heteroskedasticity Arch Test	0.1**
Cusum and Cusum Squares. Tests (see fig 1)	Stable**

Source: Extract from e-views 10 output **significant at 5% level

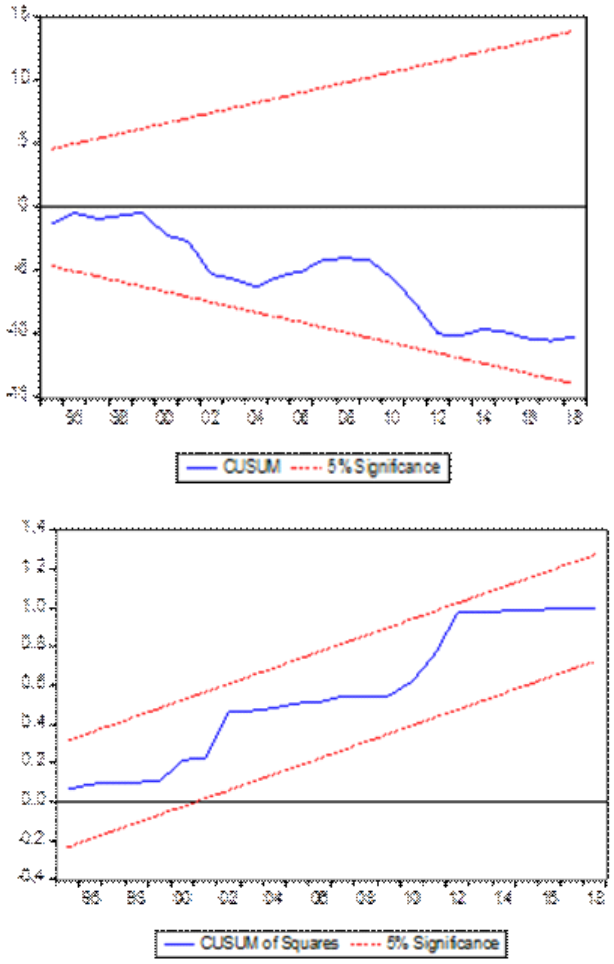

Fig 1: Cusum and Cusum Squares Stability Test

The confirmation of the robustness of the model specified is listed in table 6, which shows that the forecasting power of the model is largely appropriate as denoted by the insignificant probability values of the tests at 5% level of significance. In essence, the model's residuals are largely devoid of the presence of serial correlation and heteroskedasticity threats. Again, the model is properly specified. Fig 1 also suggests that the residuals of the models are stable for each of the estimated parameters, given that the trend line is bounded by the 5% level of significance. This implies that severe threats of Multicollinearity are decimated to minimum levels. Thus, one can conclude that the parameter estimates are valid and can be relied upon for forecasting.

Conclusion

The ARDL methodology is utilized to investigate whether Gender bias matters in the altruistic attitudes to children while taking evidence from Nigeria between 1981 and 2018. Indeed, the findings suggest that gender bias matters are given that women pro-altruism to children is greater than men, in the face of rising population growth. That is, as women's labour participation increases so do their altruism to children upkeep increases. The reverse is the case for men. Other findings show that in the face of increasing population, which places a negative burden on per capita income and productivity as such transmitting negative impulses to parental altruism towards children, especially in the long run. To add to these long-run effects, as the human capital improves so does altruistic tendencies to children enhances.

Short run effects as observed around per capita income is contra wise to the long run dynamics. To this connection, to enhance parental altruism towards the child, incentives, and strategies by the firms and government should be instituted to stimulate female labour participation in the work environment. This will not only boost productivity but also increase the per capita income as such enabling higher proportions of parental altruism to children.

Additionally, in trying to stem the positive trajectory of population growth which has negative implications on parental altruism to the children, strategies such as delay in marriages and reproductive periods noticed

amongst girls will benefit population control and vice versa increase altruistic capabilities of parents to their kids. On the other hand, if population growth is to be encouraged then the government and private sector should seek novel strategies in the form of enhanced technology to increase productivity in the short and long run, which can support the increasing population via profitable investment activities that will lead to increasing female labour participation. The end game effect of these actions is that of enhancing the parental altruistic traits towards children.

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