Fertility and Welfare: A Cross Sectional Econometric Approach

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Abstract

This study examined the relationship between fertility and welfare. Nigeria is characterized by a relatively high fertility level, and the need still remains for improvement of the welfare level of many households. Using data from NDHS 2018 and employing a two-stage estimation method, it was observed that an increase in the number of children born caused a significant reduction in the likelihood of a household being poor and increased its likelihood of being a rich household. Thus, increasing fertility did not necessarily depress household wealth, instead, it improved household welfare. The effect of welfare on fertility was such that women from households in the poor and middle wealth index were more likely to have a higher number of children born than those who were not in these household wealth categories. Women from rich households were less likely to have more children than those not from rich households. Thus, households with higher welfare levels had lower fertility.

Introduction

The available resources often determine the welfare of individuals, however, since resources have to be shared in a household, the number of household members is important as high fertility increases the household size. High fertility levels have welfare reduction effects when resources do not get to increase along

with the population increase. However, in the long run, the welfare of such households could increase due to increased earnings as a result of additional earnings from adult children. The number of children that a woman has can be influenced by household wealth and income, such that women who are more financially comfortable can afford to meet the needs of more children while enjoying the satisfaction that comes with having them. This tends to increase fertility. This two-way causality has been examined by several studies. However, more often, the emphasis has been on income as well as its endogeneity effect. There is thus the need to consider a broader welfare measure beyond income.

High fertility could be explained by the fact that fertility could improve welfare in agricultural communities where child labour is predominant and more unpaid hands are needed on the family farm. Having many children therefore becomes an asset. The direction of wealth flow also influences fertility levels. Some parents invest in their children so that in their old age, they can be taken care of by the children. Thus the more children they have, the greater the returns. However, among parents who are altruistic, the flow of wealth is one way such that parents spend on their children until they are independent enough to take care of themselves. Such parents also save and plan for the future so that they can still sustain themselves in their old age. This would reduce fertility levels as parents would only have the number of children they can conveniently cater for. As the number of children increases, resources available for expenditure per child and per household member would decline, thus reducing welfare levels. Therefore, we see a possible two-way causality. However, does it hold for the Nigerian case? This study examines the relationship between fertility and welfare in Nigeria using a cross-sectional econometric approach.

Despite the decline in global fertility rate from 3.2 to 2.5 live births per woman, fertility in sub-Saharan Africa still remains the highest in the world, even with a decline from 6.3 to 4.6 births per woman (UN Population 2019). Based on the World Development Indicators (2020), Nigeria had the third highest fertility rate of 5.39 among West African countries after Niger and Mali with 6.91 and 5.88 respectively in 2018. The household final consumption expenditure annual growth rate in 2018 was 5.22, 4.37 and 8.12 for Nigeria, Niger and Mali respectively. In this respect, Mali with a higher fertility rate relative to Nigeria had a higher welfare level. However, Sierra Leone with a lower fertility rate (4.26) relative to Nigeria had a higher

welfare level of 13.26. Thus fertility and welfare relationships differ across countries probably due to their individual peculiarities.

The total fertility rate in Nigeria has fluctuated over the years, increasing from 6.47 births per woman in 1970 to 6.78 in 1980 and declining consistently since 1990 from 6.49 to 6.11, 5.59 and 5.39 in 2000, 2015 and 2018 respectively (WDI 2020). However, it stands as one of the highest in Africa and beyond when compared with 1.50 in Canada, 4.57 in Cameroon, 1.69 in China, 3.87 in Ghana, 2.22 in India, 1.42 in Japan, 3.49 in Kenya, and 2.41 in South Africa. Despite the expectation that increased education and economic growth would lower fertility rates, Nigeria's fertility rate has remained relatively high. Based on the Nigeria Demographic and Health Survey, the total fertility rate was 5.2, 5.7, 5.7, 5.5 for 1999, 2003, 2008 and 2013 respectively. For 2018, the total fertility rate was 5.3 children per woman with a higher rate of 5.9 in rural areas and 4.5 in urban areas.

A look at the household wealth index showed that a greater percentage of rich households were found in urban areas (38%) while only 6% of households in rural areas fell within the richest quintile. In urban areas, 4%, 8%, 19%, 31%, and 38% of households were in the poorest, poor, middle, richer and richest household wealth quintiles respectively, while for rural residents, 32%, 29%, 21%, 12%, and 6% of households were in the poorest, poor, middle, richer and richest household wealth quintiles respectively. The highest percentage of richest households (48%) was in the South West compared to the North East and North West with 5% and 9% respectively. The number of children per woman was 6.7, 6.2, 5.6, 4.6, 3.8 for the poorest, poor, middle, richer and richest household wealth quintiles, thus showing a declining fertility with increasing wealth index (NDHS 2018).

Not much empirical evidence exists on the welfare effect of fertility, especially for developing countries. Also, only a few existing studies have used micro data. There are also limited studies that have considered welfare measures such as the wealth index, which help to capture the economic status of individuals and households. This is important as the relationship between fertility and welfare could be sensitively influenced by the measure used for welfare as found in Kim et al. (2015) who, using another welfare measure, rendered the correlation between fertility and household welfare indecisive. This study will therefore attempt to answer the following questions:

1. What effect does fertility have on welfare?

2. Is there a two-way causal relationship between fertility and welfare?

Review of the Literature

Various studies exist on the effect of welfare and other factors on fertility, however, only a few have examined the welfare effect of fertility. Studies that have examined the effect of welfare on fertility have mostly been for developed countries, which usually have several welfare programmes for the unemployed, the elderly and single mothers, among others. Explaining the relationship between fertility and welfare, Kim et al. (2005) found a positive and significant relationship between fertility and household welfare when welfare was measured using consumption per person, although the relationship was sensitive to the equivalence scale used. The correlation between fertility and household welfare was indecisive when share of food to total expenditure was used as a welfare measure. The possible endogeneity of fertility has been explained only by a few studies, which have revealed that some factors that determine fertility can also determine welfare levels for instance (Kim et al., 2005).

Other studies have also shown that improved welfare levels promote high fertility, however, the control for the possible endogeneity of welfare was not considered. Bhattacharyya (1975) tried to capture rural and urban differences in the income inequality measure and found that with improved standard of living in rural areas compared to urban areas, fertility levels declined. A review of the literature by Moffit (1998) showed that the presence of welfare benefits (including unemployment benefits and welfare benefits to single mothers) tended to influence the fertility behaviour of women towards an increase. Examining the use of welfare reforms to reduce fertility among minors in the United States, Lopoo and DeLeire (2006) found that the annual percentage fertility decline was larger among teenagers who received welfare benefits than among those who did not. Some countries with low fertility have sought to reverse the demographic trend using various fertility incentives. For instance, investigating whether higher governmental support for families encouraged parents to have more children, Gauthier and Hatzius (1997) found that a positive fertility effect was obtained. As government support became more generous, fertility levels were seen to increase in the UK (Brewer et al., 2008).

The findings on the effect of improved welfare on fertility are inconsistent; while in some cases improved welfare reduced fertility, in some others it encouraged an upward trend. Variations in welfare programmes that increase welfare benefits were found to lower fertility levels among women in the United States (Schultz, 1994). Rank (1989) also found that women with welfare benefits had relatively lower fertility and also, the longer women were on welfare, the lower their fertility. Some studies have found no significant effect, such as Kearney (2002), who analysed the incremental effect of welfare benefits on fertility using state-level panel data in the United States. He found no significant decline in higher order births among women with relatively higher welfare participation rates. Thus despite the increasing welfare benefits, there was no response by women towards reducing the number of additional births.

Education has been found to significantly reduce fertility levels and this is consistently shown in the literature. Dreze and Murthi (1999) found that education explained low fertility levels in India. The negative effect of education on fertility was shown by Wusu (2012). Osili and Long (2007) also confirmed the negative effect of education on fertility in Nigeria and the effect is larger when endogeneity is controlled for. Other supporting literature includes Rank (1989).

Other determinants of fertility have also been identified. Using panel data, Dreze and Murthi (1999) found that low child mortality and preference for sons lowered fertility levels in India. However, development indicators such as urbanization and poverty reduction had no significant association with fertility.

Examining the determinants of fertility in seventeen OECD countries, Rovny (2011) found that active labour market policies and generous work and family policies encouraged higher fertility rates, while the presence of employment protection legislation and rules concerning hiring and firing hindered the growth of fertility rates.

Wusu (2012) also found that while self-employment increased fertility, working away from home had a negative effect. Rank (1989) however found that women who were received welfare assistance/benefits were less likely to have more children than those who were not on welfare. This shows more of an income effect, as such parents would prefer to reduce fertility due to reduced or lean resources. This is because despite the additional time available to such

women for fertility activities, the lack of resources encourages them to lower fertility, which also reveals their preference for quality children.

Methodology

The model

Following Blandy (1974), families maximize utility, which is a function of income per household member and family size, subject to the budget constraint of the family income. However, due to the potential endogeneity of fertility in the welfare model, we proceed to examine their interrelationship.

We therefore present a simultaneous equation for the model as:

$$U = f(F, E, X) \tag{1}$$

$$W = a_0 + a_1F + a_2E + a_3X \tag{2}$$

$$F = a_0 + a_1W + a_2E + a_3X \tag{3}$$

Increasing fertility is expected to depress household welfare due to reduction in household resources per member. Household welfare increase is also expected to increase fertility since with increased resources, parents become encouraged to have more children, especially with the existing cultural norm which places great emphasis on having children and more children is preferred to less. Fertility is measured as the number of children ever born by a woman. Household welfare is a dichotomous variable; it is measured as a wealth index categorized into poor, middle and rich households. Other regressors include the woman's characteristics such as educational attainment; household characteristics including the age and sex of the household head, household size, household assets; and environmental characteristics such as place of residence.

Data, source and estimation procedure

A nationally representative sample was used for the study and was obtained from the Nigeria Demographic and Health Survey 2018, published by the National Population Commission Abuja, Nigeria

and The DHS Program ICF Rockville, Maryland, USA. The survey protocol was reviewed and approved by the National Health Research Ethics Committee of Nigeria (NHREC) and the ICF Institutional Review Board.

Information used was obtained from the women in the survey and the sample for the study comprised 21,792 women within the reproductive ages of 15-49 years. The women included in the sample had at least one child each. The descriptive statistics of the data are presented in Table 1.

Based on an endogeneity test, an instrumental variable estimation method was employed. Thus a two-stage estimation method was used involving the ordinary least squares and the maximum likelihood estimator for the logit model. We estimated a welfare model for three categories, thus having three binary outcome models of probability; that a woman is in a household with either a poor wealth index, a middle wealth index or a rich wealth index. A fertility model was also estimated. In order to control for possible heteroskedasticity, robust estimations were conducted and robust standard errors were obtained.

Results and Discussion

The mean and standard deviation of the variables are presented in Table 1. A greater percentage (45.6%) of the women were from poor households. As high as 43.7% had no education, while 32.4% had secondary education. Most of the household heads (89.5%) were male. More women (64.6%) were resident in rural areas. The mean number of children ever born was 4.1 (women included in the sample had at least one child and a maximum of 17 children).

Test for endogeneity

In the welfare model, the number of children ever born was instrumented for using duration of abstinence. In the fertility model, welfare was instrumented for using ownership of a car by the household. The instruments were found to be relevant and valid as they explained the endogenous variable but did not significantly explain the dependent variables. Based on an endogeneity test, the number of children ever born was found to be endogenous since its residual was significant in the welfare model as shown in Table 2.

Table 1: Descriptive statistics

Variable	Mean	Standard Deviation
Number of children ever born	4.063	2.615
Probability that a household is poor	0.456	0.498
Probability that a household is in the middle	0.210	0.408
Probability that a household is rich	0.334	0.472
No education	0.437	0.496
Primary education	0.156	0.363
Secondary education	0.324	0.468
Post secondary education	0.082	0.275
Woman is unemployed	0.320	0.467
Woman is employed	0.680	0.467
Woman's age	29.731	7.192
Number of antenatal visits	6.020	12.137
Age at first birth	19.690	4.395
Household size	6.875	3.756
Male-headed household	0.895	0.306
Female-headed household	0.105	0.306
Age of household head	41.714	12.260
Household has no car	0.895	0.307
Household has a car	0.092	0.288
Household has no TV	0.563	0.496
Household has a TV	0.424	0.494
Urban residence	0.354	0.478
Rural residence	0.646	0.478

Table 2: Test for endogeneity

Variable	Residual coefficient	t-statistic	Probability
Number of children ever born	0.628	4.47	0.000
Probability that a household is poor	-0.042	-2.30	0.022
Probability that a household is in the middle	-0.152	-3.61	0.000
Probability that a household is rich	-0.003	-0.15	0.877

The probability that a household is poor and the probability that a household is in the middle wealth index were endogenous in the fertility model. However, the probability that a household is rich was not endogenous in the fertility model and would therefore not be instrumented for as shown in Table 2. We thus proceed to estimate the fertility model and the three categories of the welfare model.

The welfare model (Determinants of welfare)

The estimates of the welfare model are presented in Table 3. Model 1 is the probability that a household would be poor. The overall model was statistically significant. The number of children ever born was found to have a negative significant effect. Thus, an increase in the number of children a woman has had a reduction effect on the probability that a household would be poor. This gives more insight on the increased fertility usually seen among poor households, especially rural households. This could be due to their use of child labour whereby children are seen as a potential source of increase in household income. This is usually the case for predominantly agricultural communities where child labour on the farm is treasured. Child labour is also common in the informal sector even in non-agricultural communities. An increase in household size significantly increased the likelihood that a household would be poor. This could be explained by the reduction in resources per head due to additional persons in a household. Female-headed households were less likely to be poor than male-headed households. The older the household head, the less likely that the household would be poor. Households in rural areas were more likely to be poor than urban households. Having a primary, secondary and a post secondary education significantly reduced the likelihood of a household being poor. The positive effect of education could be linked to the increased job

opportunities and increased earnings that come with higher educational attainment. Household assets such as the ownership of a car and a television significantly reduced the likelihood of being poor. All the regressors were highly statistically significant.

Table 3: Estimates for the welfare model

Variables	Coefficient(z-statistic)		
	Model 1	Model 2	Model 3
Number of children ever born	-0.606(-4.35)*	-0.117(-1.11)	0.603(4.08)*
Woman's education			
No education	RC	RC	RC
Primary education	-0.958(-15.29)*	0.683(13.05)*	0.732(10.07)*
Secondary education	-2.515(-13.02)*	0.295(1.97)	2.407(11.91)*
Post secondary education	-3.866(-14.26)*	-0.820(-4.17)*	3.807(14.86)*
Household characteristics			
Household size	0.144(4.18)*	0.044(1.69)	-0.154(-4.24)*
Male-headed household	RC	RC	RC
Female-headed household	-0.179(-2.48)**	0.279(5.14)*	0.031(0.42)
Age of household head	0.018(3.26)*	0.008(1.91)	-0.019(-3.17)*
Household has no car	RC	RC	RC
Household has a car	-1.943(-17.14)*	-0.557(-7.42)*	1.821(21.20)*
Household has no TV	RC	RC	RC
Household has a TV	-3.383(-60.10)*	0.278(5.64)*	3.093(59.65)*
Urban residence	RC	RC	RC
Rural residence	1.598(29.35)*	0.064(1.35)	-1.499(-28.70)*
Wald chi2	6179.78	584.88	6580.69
Prob >chi2	0.0000	0.0000	0.0000

* and ** imply significance at 1% and 5% levels respectively.

RC is the reference category.

Model 2 is the probability that a household has a middle wealth index. The overall model was statistically significant. The number of children ever born had a negative but insignificant effect. Thus, fertility has no significant effect on the wealth of households in

the middle wealth index. The likelihood that a household would be in the middle wealth index was more if a woman had primary education than if she had no education. Thus, if a woman had primary education, it increased the wealth advantage of her household. Secondary education was insignificant. However, women with post-secondary education were significantly less likely to come from households with a middle wealth index. Having higher educational attainments therefore increased wealth advantage even beyond the middle wealth index. Household characteristics such as household size and age of the household head were insignificant. Female-headed households were more likely to have a middle wealth index than male-headed households. Household assets such as owning a car reduced the likelihood that a household would have a middle wealth index, while having a television increased the likelihood and was highly significant.

Model 3 is the probability that a household would have a rich wealth index. The overall model was statistically significant. The number of children ever born had a positive significant effect such that higher fertility increased the likelihood that a household would have a rich index. Just as in model 1, we see a positive welfare effect of fertility. This is consistent with Kim et al. (2005), who found a significantly positive relationship between fertility and welfare. The peculiarities of communities in some developing countries, which include child labour with regard to increasing household earnings, could be a possible explanation for this effect. The woman's education increased the likelihood that a household would be rich. Women with primary, secondary or post-secondary education were more likely to come from richer households than those with no education. This can be explained by the greater opportunity for increased earnings that is associated with higher educational attainment. An increase in household size reduced the likelihood that a household is rich. The sex of the household head was insignificant, however, the household was less likely to be rich as the age of the household head increased. The ownership of household assets such as a car and a television significantly increased household welfare. Households who had a car and a television were more likely to be rich than those without those assets. Rural households were less likely to be rich compared to households in urban areas. This is not surprising, as urban areas tend to have more infrastructure and an investment-enabling environment than rural areas. Thus, uneven development tends to give urban households an advantage over rural households.

The fertility model (Determinants of fertility)

Model 1 is the fertility model presented in Table 4 where only two household welfare categories are used — probability that a household is poor and the probability that a household is rich. Women from poor households were significantly more likely to have more children than those from households that are not poor. Thus, residing in a poor household increases fertility level.

Table 4: Estimates for the fertility model

Variables	Coefficient (t-statistic)	
	Model 1	Model 2
Probability that household is poor	0.050(3.90)*	_
Probability that household is not poor	RC	RC
Probability that household is in the middle class	_	0.224(3.90)*
Probability that household is not in the middle class	RC	RC
Probability that household is rich	-0.139(-6.77)*	-0.139(-6.77)*
Probability that household is not rich	RC	RC
Woman's Education		
No education	RC	RC
Primary education	-0.126(-4.45)*	-0.352(-7.06)*
Secondary education	-0.141(-4.13)*	-0.377(-9.73)*
Post-secondary education	-0.107(-1.84)	-0.183(-4.27)*
Woman is unemployed	RC	RC
Woman is employed	-0.057(-3.52)*	-0.093(-5.00)*
Woman's Age	0.312(188.44)*	0.313(185.44)*
Number of antenatal visits	-0.002(-3.52)*	-0.004(-6.07)*
Age at first birth	-0.299(-119.26)*	-0.299(-119.24)*
Household Characteristics		
Age of household head	-0.010(-14.61)*	-0.011(-14.72)*
Household size	0.100(32.87)*	0.096(32.08)*
Urban residence	RC	RC
Rural residence	-0.106(-3.54)*	-0.011(-0.61)
F-statistic	5424.80	5424.80
Prob > F	0.0000	0.0000

* and ** imply significance at 1% and 5% levels respectively.

RC is the reference category.

Women residing in rich households were more likely to have lower number of children ever born than women who were not from rich households, and this is highly significant. This is contrary to the apriori expectation that increasing household resources would encourage parents to have more children. It is also contrary to the findings of Moffit (1998) and Brewer et al. (2008) that increasing welfare levels increase fertility.

Women who had primary and secondary education were less likely to have more children than those with no education. Women with secondary education were also less likely to have more children than those with no education. This confirms the finding by Wusu (2012) and Osili and Long (2007) that education has a reduction effect on fertility. Post-secondary education was however not significant.

Women who were employed were less likely to have increasing number of children than those who were unemployed. This could be explained by the fact that more time is required to be devoted to work, which reduces the time available for childbearing and child care. This is in line with Wusu's finding (2012), which showed that employment forms, such as self–employment, which afford women some proximity to their children while working encouraged higher fertility than working away from home. However, the income effect associated with unemployment was shown in the study by Rank (1989) in which fertility was found to be lower among unemployed women.

The number of children ever born reduced with increasing number of antenatal visits. This is to be expected since antenatal services and programmes offer medical services as well as increase the awareness of women on the importance of family planning and proper child spacing.

Fertility was found to increase as a woman's age increased. However, after a certain age it is biologically expected to decline just as Rank (1989) found the effect of age to be quadratic. The age at which a woman has her first birth had a negative effect as fertility levels significantly declined with its increase. This shows that early childbearing contributes to increasing fertility levels in the country. Thus, there is the need to discourage teenage pregnancy and child marriages, as they both contribute to early child bearing. The older the age of the household head, the less the number of children ever born. Increasing household size was found to increase the number of children ever born. This could be explained by the childcare support a

woman easily gets from members of the household at no financial cost, which encourages more fertility. Surprisingly, rural households were found to have less number of children ever born than urban households.

Model 2 is the fertility model where the two categories of welfare used include the probability that a household has a middle wealth index and the probability that a household is rich. Women from middle wealth index households were significantly more likely to have more children than those from a household that is not in the middle wealth index, as shown in Table 4. Women residing in a rich household were more likely to have less children than women who are not from a rich household. Thus, while fertility increased among middle wealth index households, it declined among rich households. Education had a negative significant effect on fertility. Women who have primary, secondary and post-secondary education are less likely to have more children that those with no education. This is consistent with Wusu (2012) and Osili and Long (2007), who also found a negative education effect in Nigeria. Women employment also had a negative fertility effect such that women who were employed had lower number of children than those who were not employed. Being employed reduces the time available to a woman for child bearing and childcare since she has to share her time between work and fertility activities.

A woman's age had a positive effect and this could be explained by the cumulative effect of the total number of children over her lifetime. The number of antenatal visits had a negative effect implying that an increasing number of antenatal visits caused a reduction in fertility. This is not surprising as these visits expose women to family planning and child spacing information that help reduce fertility. The older the age at which women have their first birth, the lower the number of children ever born. This negative effect was highly significant. Fertility was found to decline with increasing age of the household head. Thus, older household heads are more likely to have completed their desired childbearing than younger ones who are just beginning to build their families. An increase in household size caused fertility levels to rise significantly. This could be due to the fact that a large household size provides childcare and child rearing support to women, which could encourage them to increase their desired number of children.

Whether a woman resides in an urban or rural area was insignificant.

Conclusion

This study examined the relationship between fertility and welfare, controlling for heterogeneity and endogeneity. The findings revealed that increasing fertility levels did not necessarily depress household wealth. An increasing number of children ever born significantly reduced the likelihood that a household was poor but increased its possibility of being a rich household. The effect of fertility on welfare was such that having more households with higher wealth indices would significantly reduce fertility. Women from households who are in the poor and middle wealth indexes were more likely to have a higher number of children ever born than those who are not in these household wealth categories. Women in a rich household were less likely to have more children ever born than those who are not from a rich household. Thus, while increased fertility improved household welfare, households with already high welfare levels had lower fertility. The woman's education actually lowered fertility levels and increased the welfare of the household. Women employment was found to have a fertility reduction effect.

Policies to protect children from child labour and keep them productively busy through increased school enrollment and participation would help adjust the psychology of parents and help them view high fertility as increased responsibility on their part, as they would need to provide for their children and not view them as a source of increased earnings for the household. Fertility reduction strategies should focus on intentionally improving household economic status.

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Disclosure Statement

There is no conflict of interest.

Data Availability

The data used is secondary data from the Nigeria Demographic and Health Survey 2018 published by National Population Commission Abuja, Nigeria and The DHS Program ICF, Rockville, Maryland, USA (2019). It is available on the DHS website (https://dhsprogram.com).

References

Bhattacharyya, A.K. (1975). Income inequality and fertility: A comparative view. *Population Studies,* 29(1), 5-19.

Blandy, R. (1974). The welfare analysis of fertility reduction. *The Economic Journal*, 84(333), 109-129.

Brewer, M., Ratcliffe, A., and Smith, S. (2008). Does welfare reform affect fertility? Evidence from the UK. IFS Working Papers, No. 08, 09, Institute for Fiscal Studies (IFS), London.

Dow, T.E., Archer, L., Khasiani, S., and Kekovole, J. (1994). Wealth flow and fertility decline in rural Kenya 1981-92. *Population and Development Review*, 20(2), 343-364.

Dreze, J., and Murthi, M. (2001). Fertility, education and development: evidence from India. *Population and Development Review*, 27(1), 33-63.

Gauthier, A.H., and Hatzius, J. (1997). Family benefits and fertility: An econometric analysis. *Population Studies*, 51(3), 295-306.

Kim, J., Engelhardt, H., Prskawetz, A., and Aassve, A. (2005). Does fertility decrease the welfare of households? an analysis of poverty dynamics and fertility in Indonesia. Vienna Institute of Demography Working Papers, No. 06/2005, Austrian Academy of Sciences (ÖAW), Vienna Institute of Demography (VID), Vienna.

Kearney, M. S. (2002). Is there an affect of incremental welfare benefits on fertility behavior? A look at the family cap. National Bureau of Economic Research Working Paper 9093. http://www.nber.org/papers/w9093.

Lopoo, L.M., and DeLeire, T. (2006). Did welfare reform influence the fertility of young teens? *Journal of Policy Analysis and Management*, 25(2), 275-298.

Moffitt, R.A. (1998). The effect of welfare on marriage and fertility. In welfare, The family, and reproductive behavior: Research Perspectives. National Academic Press. National Academy of Sciences.

National Population Commission Abuja, Nigeria and The DHS Program ICFRockville, Maryland, USA 2019. Nigeria Demographic and Health Survey 2018.

Osili, U.O., and Long, B.T. (2007). Does female schooling reduce fertility? Evidence from Nigeria. NBER Working Paper No. 13070. http://www.nber.org/papers/w13070

Rank, M.R. (1989). Fertility among women on welfare: Incidence and determinants. *American Sociological Review,* 54(2), 296- 304.

Rovny, A.E. (2011). Welfare state policy determinants of fertility level: A comparative analysis. *Journal of European Social Policy*, 21(4), 335-347. doi:10.1177/0958928711412221

Schultz, T.P. (1994). Marital status and fertility in the United States: Welfare and labour market effects. *The Journal of Human Resources*; Madison, 29(2), 637.

World Bank Group. (2019). *World Development Indicators (2019)*. The World Bank.

World Fertility and Family Planning 2020. United Nations Department of Economic and Social Affairs, Population Division.

Wusu, O. (2012). A reassessment of the effects of female education and employment on fertility in Nigeria. *Vienna Yearbook of Population Research*, 10, 31- 48.