AN ECONOMIC ASSESSMENT OF THE RELATIONSHIP BETWEEN FERTILITY OUTCOMES AND POVERTY INCIDENCE IN EBONYI STATE, NIGERIA

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ABSTRACT

This study explores the complex link between fertility outcomes and poverty incidence in Ebonyi State, Nigeria. Relying on a household's survey of 590 respondents, descriptive statistics and multiple regression analysis were used to test Becker's microeconomic theory of fertility and assess how socioeconomic factors influence the fertility-poverty nexus. The result of the descriptive statistics reveals that 87.8% of the respondents are predominantly married, and 67.8% live in rural areas (mean: 1.32, median: 1.0, mode: 1.0). The study also found that the majority of the respondents have secondary education (mean: 2.76, median: 3.0, mode: 3.0), and as many as 86.4% of them were employed (mean: 1.75, median: 1.0, mode: 1.0). The result of multiple regression analysis uncovered that larger household size and higher young dependency ratio significantly increase the risk of poverty incidence, while higher household income and education lower fertility and poverty likelihood. Monogamous households were also found to exhibit reduced fertility and poverty. The result further showed that higher food expenditure correlates with greater fertility, while improved employment and more meals per day relate to reduced fertility. The model's high explanatory power (R²=0.823) confirms a strong bond between demographic variables and poverty. This paper, therefore, argues that if the recommendations proffered in this study are considered by the government as a policy framework, it will go a long way not only in breaking the fertility-poverty cycle menace but also in the actualisation of the sustainable development goals (SDGs) both in Ebonyi State and Nigeria in general.

Keywords: *Fertility Outcomes, Poverty Incidence, Demographic Vulnerability, Ebonyi State*
JEL Classification Code: *J13, O15*

1.0   Introduction

The complex rapport between fertility patterns and poverty incidence in sub-Saharan Africa (SSA), particularly Ebonyi State, Nigeria, is a contentious yet inconclusive issue in development debate. The widespread sustained elevated fertility rates experienced in the state have become a source of worry and major concern. While global fertility rates have declined over decades, Ebonyi State, Nigeria, is still bedevilled with high fertility outcomes, exhibiting a total fertility rate (TFR) of 5.3 children per woman (Nigeria Demographic and Health Survey (NDHS), 2023; National Bureau of Statistics (NBS), 2022). This figure is the highest among the southern states of the country and also surpasses both the national average of 5.0 (National Demographic and Health Survey, 2023; National Bureau of Statistics, 2022) and the sub-Saharan Africa (SSA) average of 4.5 children per woman and is also more than double the global average fertility rate of 2.5 children per woman. This resulted in rapid annual population growth (2.6%), the highest in the geopolitical area (National Bureau of Statistics, 2022; Nigeria Demographic and Health Survey (NDHS), 2023). If nothing is done to reverse that trend, the state's population will double in less than 25 years.

Socio-cultural and biological factors, like early marriage, low contraception, high infant mortality, and a strong societal emphasis on having children to help on the farm and perpetuation of family lineage, are some of the factors driving this demographic trend (Feyisetan & Bankole, 2002). Consequently, 42% of Ebonyi's population is under the age of 15, resulting in a remarkably high dependency burden of 107 children for every 100 adults of working age (National Bureau of Statistics, 2022). Similarly, 79.76% of the people in Ebonyi State are poor, making it one of Nigeria's poorest States. Infant and child mortality rates in Ebonyi State are also alarming at 50.76/1000 population and 91/1000 population respectively (National Bureau of Statistics, 2022). This is purely in line with the postulations of Malthusian theory, which links high fertility to poor welfare conditions, poverty incidence and underdevelopment (Malthus, 1798).

High fertility manifests in several harmful ways such as scarce resources dilution, reduced per capita income and savings and limiting investments in healthcare, education, and nutrition (Asogwa & Ugwunta, 2013; Becker, Murphy, & Tamura, 1990). Furthermore, high fertility outcomes increases unemployment (40.80% in Ebonyi), decreases female labour participation, and increases strain on infrastructure, water resources, and arable land and often results in the depletion of human capital and intergenerational poverty incidence (Osobase et al., 2022; Blackstone & Iwelunmor, 2017; National Bureau of Statistics, 2022; Bongaarts, 2017).

In an attempt to restrain the fertility outcomes in both Ebonyi States and other States of Nigeria, two national population policies (1988, 2004) were launched, but unfortunately, the both failed because of factors like lack of political will, inadequate funding, cultural diversity, ethno-religious factors, poverty, low education, and insufficient comprehensive sex education amongst others (Michael & Odeyemi, 2017; Abasiekong & Sibiri, 2010; National Population Commission (NPC) & Inner City Fund (ICF) International, 2014 and National Demographic and Health Survey, 2018). Another revised population policy was launched in 2023, which came on the heels of the recently launched 2021–2025 National Development Plan, but its effectiveness remains uncertain.

While existing studies on fertility were conducted within the ambit of primary health or macroeconomic contexts (e.g., Ezenwanaka, 2021; Effiong, Udonwa & Ekpe, 2022; Undelikwo, Ikpi, & Bassey, 2023), leaving a lacuna in household level economic analyses of the fertility-poverty nexus, specifically in Ebonyi State. This study therefore, addresses this gap by employing household survey data to empirically investigate the rapport between fertility outcomes and poverty incidence in the State.

This study is organized into six distinct sections. Section One presents the introduction. Section Two provides a review of relevant literature and theoretical underpinnings. Section Three deals with the research methodology. Section four focuses on the presentation, analysis, and discussion of the research results. Section Five summarizes the key findings, while Section Six offers policy recommendations and concludes the study.

2.0   Literature Review

2.1   Conceptual Review

2.1.1   Concept of Economic Assessment

In this context economic assessment refers to the systematic evaluation and analysis of economic relationships, impacts, and implications. It involves evaluating the economic costs and benefits associated with different fertility outcomes at the same time using statistical methods to quantify relationships between economic variables. Again, while it examines how

fertility decisions affect individual and household welfare, economic assessment also involves analysing how fertility outcomes influence the distribution and utilisation of economic resources.

2.1.2 Concept of Fertility Outcomes

Fertility refers to the average number of live children produced by women of childbearing age in a particular society. Fertility is a measure of the total number of children born, on average, to each woman during her reproductive years (Momsen, 2004). Fertility rate often refers to as TFR, measures the number of children an average woman would bear if she were to complete her childbearing years and bear children at the same rate as those currently in the age group who have first passed the age of childbearing (Giddens, 1994). In sum, fertility constitutes the incidence of childbearing, which is an exclusive reproductive task of women of childbearing age (15–49). Using economic factor to explain fertility behaviour, Hardiman & Midgley, (1982) argued that, fertility was rationally determined by the costs and benefits of childbearing. There are several measures of fertility, such as total fertility rate (TFR), general fertility rate (GFR), age specific fertility rate (ASFR) and of course crude birth rate (CBR)

2.1.3 Concept of Poverty Incidence

Poverty remains a long-standing yet still important concept. Numerous academics have made an effort to offer various explanations to capture the topic in light of the current circumstances. Because poverty is so multifaceted, there is no one definition that applies to all cases. In general, poverty is defined as not having enough money to pay for food and other essentials of life (Ajakaiye & Olomola, 2003). However, other researchers define poverty as the inability to meet one's nutritional needs. This definition is overly limited because poverty also has an impact on other facets of human existence. Sen (1982), who has a different perspective, describes it as a state of extraordinary suffering, deprivation, dictatorship, a lack of basic human rights, famine and starvation, the mistreatment of women, and environmental degradation

The two main techniques to assessing poverty, according to Wratten (1995), are the use of non-monetary outcomes that take into account people's wellbeing and the use of economic definitions, which is the traditional method. However, development economists support combining these two strategies. Some of them are Poverty Headcount (Incidence), Poverty Gap and Poverty Severity (Squared Poverty Gap) and Traditional Foster-Greer-Thorbecke (FGT) poverty index.

2.2   Theoretical Perspective

The connection between fertility outcomes and poverty incidence in developing countries such as Nigeria has been theorized through various binoculars, each offering different explanations for observed patterns. In his seminal works "An Essay on the Principle of Population" Thomas Malthus seeks to explain the natural pushes and pulls of population fluctuation. Malthus' theory consists of principles, the first of which states that human population grows exponentially with each generation while means of subsistence grows in arithmetic rate, which means that with each generation, the food supply will only increase by the same set number thereby being outstripped by population growth. The model exposes that when income outstrips the equilibrium point, death rates will drop, and fertility rate increases.

The demographic transition theory, originally developed by Notestein (1945), suggests that society's progress through stages of high mortality and high fertility to a situation of low mortality and low fertility as economic development advances. However, this theory seems

Eurocentric and the linear progression has proven inadequate for explaining persistent high fertility in many African contexts.

The Social capillarity theory propounded by Arsene Dumont (1849–1902), posits that high fertility leads to poverty and that the reason for low fertility in countries is to achieve high human capital, high income, and aesthetic development. According to the theory, "The direct cause of decline in fertility rate was the movement of individual from the lower to the upper class and vice versa. The theory observed that, the fertility rate in rural areas is high while it is low in urban areas. The reasons for high fertility rate in rural areas are poverty, illiteracy, orthodoxy and lack of vigour. Dumont, thus detected three principles of fertility and population that are related to the stages of economic and social status development

Becker's (1960) microeconomic theory of fertility, rooted in neoclassical economics, suggests that poverty constrains families' ability to invest in child quality, leading to preferences for quantity as an economic strategy. His household demand model also utilizes the theory of consumer behaviour as a key pillar underpinning fertility decisions of couples. He postulated that children and household durable goods are synonymous. He further argued that there is an inverse correlation between fertility and income. Becker employs the quantity-quality trade-off to analyse the demand for children, highlighting the income and childbearing expenses as the primary economic factors influencing fertility at the family level. Following this microeconomic theory of fertility, Garry Becker sees demand for children as a derived demand. He argues that as wages rise, the "price" of children also increases. As such, the theory further predicted that changes in income and the cost of children (opportunity cost) will affect fertility decisions and outcomes. Since the microeconomic theory of fertility is the most germane of all the theories reviewed in this study, it will therefore be latched on for the theoretical foundation of this study.

2.3   Empirical Evidence

There have been few existing micro studies that investigated at the geographical regional level the relationship between fertility outcomes and poverty incidence. Oghenekewwe (2024) investigates the relationship between fertility rates and poverty in Nigeria using data from 1980 to 2016 and a modified Solow model. The study employs a Structural Vector Autoregressive (SVAR) framework to analyze the direction of causality between fertility rates and poverty, finding a strong positive correlation where high fertility rates significantly contribute to poverty. The results indicate that fertility rates have a more substantial impact on poverty than vice versa, with poverty rates being highly elastic to changes in fertility rates. The study attributes this relationship to the lack of social safety nets and family support programs in Nigeria, which worsen the economic burden of larger households, leading to inadequate healthcare, limited education, and limited economic opportunities. The findings therefore underscore the need for targeted efforts to reduce fertility rates as a means of alleviating poverty and promoting sustainable economic growth in Nigeria.

Using data from the 2013 Nigeria Demographic and Health Survey (NDHS). Wusu & Amoo (2014) investigated the relationship between fertility outcomes and poverty reduction in Nigeria. The study relied on logistic regression to analyze how fertility-related factors, such as age at first marriage, age at first childbirth, number of living children, and modern contraceptive use, influence poverty levels. The results reveal that modern contraceptive use, delayed marriage, and delayed childbirth are positively associated with poverty reduction, while a higher number of living children is negatively associated with poverty reduction. The study concludes that traditional fertility behaviours, such as early marriage and high fertility rates, are significant barriers to poverty reduction in Nigeria, despite the country's reported economic growth.

Adebowale et al. (2020) examined the dynamics of poverty-related fertility disparities in Nigeria using data from four rounds of the Nigeria Demographic and Health Survey (NDHS) conducted between 2003 and 2018. The authors employ descriptive statistics, logistic regression, and negative binomial regression models to analyze the relationship between household wealth and fertility, focusing on women from poor and rich households. The findings reveal that women from poor households consistently have higher fertility rates, measured by the mean number of children ever born (CEB) and total fertility rate (TFR), compared to women from rich households. The study's use of a robust dataset (NDHS) spanning 15 years and a combination of both logistic and binomial regression models in analysis presented a clearer understanding of the factors that determine high fertility in Nigeria is a major feat. However, the fact that the analysis focuses largely on individual-level factors, rather than structural and economic factors that may influence both fertility and poverty, such as unemployment, income inequality, and access to family planning services limits the analysis depth.

Makau (2021) investigated the bidirectional relationship between fertility and economic growth in Kenya from 1977-2019. Using descriptive statistics and regression analysis with data from World Development Indicators and KNBS, the study aimed to explore how fertility affects economic growth, how economic growth impacts fertility, and the causal relationship between these variables. Findings revealed that capital stock growth positively influenced economic growth, while total fertility rate had a negative impact, aligning with demographic transition theory and studies by Bongaarts (2017)

Using data from the world development indicators, Oyedele, (2022) examined the effect of fertility on household welfare in Nigeria during the period of 1980 to 2020. The study which relied on autoregressive distributed lag (ARDL) model and bounds cointegration test found that fertility had a negative, but significant effect on household consumption per capita in the short run with the second lag of squared total fertility rate showing statistical significance at the 5% level. This finding suggests that the welfare impact of fertility decisions manifests with a delay, possibly reflecting the time required for children to impose substantial costs on household resource. However, the study further revealed the existence of a U-shaped relationship that suggests the possibility of a demographic dividend in the long run. This finding implies that while high fertility initially depresses welfare, there exists a threshold beyond which additional population growth may contribute positively to economic outcomes through an expanded working-age population. Notwithstanding, the study fails to admit that fertility rate and welfare likely have bidirectional causality that may not be fully addressed by merely adding control variables and lags.

Geng, (2024) investigated the socioeconomic impact of Nigeria's high fertility rate and its influence on the country's economic development. While the methodology of the study is mainly more descriptive than econometric, the research latches on more than one data sources which includes World Bank statistics, UNICEF reports, and demographic surveys to construct a comprehensive picture of Nigeria's demographic challenges. The findings of the study reveal that cultural factors, poor educational attainment, and low labour market participation contribute to sustained high fertility rates, particularly in rural areas. As much as the study supplied valuable insights on the subject matter, it however, fails to adequately situate the study within accepted theoretical frameworks (e.g., demographic transition theory, human capital theory, or development economics models). Secondly, the study didn't pay attention to the effect of high fertility on household's poverty rating.

Utilizing 1993 and 1997 household data from Indonesia Family and Life Survey (IFLS) Kim et al., (2009) analysed the relationship between fertility and poverty for Indonesia. The study employed the use of Difference-in-Difference estimator, Probit model and propensity score

matching method in their analysis. The study found that additional child decreases household consumption per person by 20 per cent within four years. When the estimates of equivalence scales implied by the Indonesian sample were applied, the effect of a child on household consumption was still negative, but the magnitudes are in the range of 20 to 65 per cent of that found with the per-capita expenditure. The study further found that higher educational expenditure, a proxy for private goods, is negatively associated with fertility, with a 1% increase in educational expenditure linked to a 0.23–0.25% decrease in the likelihood of a new birth. They therefore, concluded that given that household preference for consumption of private goods such as children's education is negatively associated with fertility, the test for household bargaining supports the model of the unitary household as a valid assumption for examining the relationship between fertility and household consumption.

Nwakeze, (2006) examined the determinants of demand for children in Anambra state, Nigeria. Logistic Regression Technique was used to analyse cross-sectional data from 1787 households in a survey conducted in the state in year 2000. Factors identified as strong predictors of demand for children are wife's level of participation in decision-making, occupation, place of residence and husband's education. Wife's education is a weak predictor of demand for children. This supports the assumption that female education is a necessary but not sufficient condition to guarantee fertility decline

Asogwa & Ugwunta (2013) investigated the effects of uncontrolled fertility on Nigeria economic growth. The study made use of World Bank data spanning 51 years (1961–2011) to ascertain the relationship between the population growth offshoot and economic growth in Nigeria. They found that high fertility and birth rates contribute positively to high population growth and negatively impact per capita income, thereby leading to high poverty, inadequate housing, poor sanitation, low standards of living, high unemployment rates and inflation, and high pressures on existing infrastructural facilities.

The forgoing reviews undoubtedly provided ample insights into the topical issue of fertility-poverty nexus, however, majority of all the studies were either time series in nature or relied on Demographic Health Survey (DHS) data and very few household surveys and even none in the study area. These identified gaps provide the foundation and motivation for the current study, which aims to address them.

3.0   Methodology

3.1   Study Area

The study was conducted in Ebonyi State, Nigeria. It was created in 1996 from parts of Enugu State and Abia State. The state of Ebonyi is geographically partitioned into three senatorial zones, namely; Ebonyi North, Ebonyi Central, and Ebonyi South. Additionally, it consists of thirteen local government areas (LGAs), namely Abakaliki, Ebonyi, Ishielu, Ohaukwu, Izzi Ikwo, Ezza North, Ezaa South, Afikpo North, Afikpo South, Ivo, Ohaozara, Ohaukwu, and Onicha LGAs. According to the National Population Commission, (2006) national census, the state has a population of around 2.177,947 million people, with 456,540 households. The estimated population for 2022, according to the National Bureau of Statistics, (2022), is 3,242,500. Ebonyi State covers an area of 5,935 square kilometres and is situated at coordinates 6 degrees 15 minutes north and 8 degrees 05 minutes east. While75% of the population live in rural areas with farming as a major occupation, 76% of the population according to the National Bureau of Statistics in 2022 is poor.

3.2   Population of Study

This study, as already stated, is targeted at Ebonyi State, Nigeria. The population of Ebonyi State, according to the 2006 population census by the Nigerian Population Commission, was estimated at 2,176,947. In order to adequately capture the target population of Ebonyi State, the research focuses extensively on the household population in Ebonyi State, which, according to the Nigerian Population Commission, (2006) census figure, is 456,540 households, which forms the population for the study. This information was sourced from the Abakaliki office of the Nigerian Population Commission in Ebonyi State.

3.3   Sample Strategy and Size

Given a large target population of 456,540 households in Ebonyi State, Cochran's (1977) modified formula for sample size in a finite population was adopted. It is given as: n = n_0 + (n_0 - 1)/N, where n is the sample size, N is the population size and n0 is the standard Cochran's sample size (385) approximately 400. This means that 400 households are scientifically acceptable. Umeh, (2018) and Glenn, (1992) suggested that sample size should be increased by between 10% to 30% in order to compensate for non-response rate and persons the researcher is unable to meet or contact. Therefore, the sample size for this study is discretionally increased by 50% to also ensure adequate representation of variables of interest especially the female headed-households which represent 36% of households in Ebonyi state. As such, 600 households were selected. The multi-stage sampling technique was adopted to select six (6) Local Government Areas that was surveyed out of the thirteen Local Government Area's in Ebonyi State.

3.4   Validity and Reliability of Research Instrument

The research instrument for this study is self-administered structured questionnaire. The reliability and validity tests are necessary to ensure that the estimates got from a study are useful. To ensure the items in the instrument used are reliable, a pilot study was carried out at in a different LGA (Izzi) other than the selected ones with thirty (30) participants Alpha Cronbach test was further carried out. The Alpha-Cronbach reliability test was preferred because of its efficiency in testing the reliability of constructs as well as showing the "quality" of an instrument. The Alpha-Cronbach test showed that the value ranges between 0.6 and 0.8 which are acceptable values in measuring reliability according to Griethuijsen et al. (2014). Ethical approval to conduct the study was sought from the University Lagos Research and Ethics Committee (UNILAGREC/23/12/001). The study was also carried out in conformity with all ethical expectations and standards.

3.5   Theoretical Framework

The microeconomic theory of fertility provides the theoretical foundation for this study as stated earlier. This theory sees demand for children as derived demand. Drawing from microeconomic theory of fertility, we assume that there are only two goods, child (X_c) with the price P_c (opportunity cost) and child (X_g) with the price P_g and the family income is exogenous variable (Y). A family utility function follows that of Cob Douglass, given as $(U(Xc, Xg) = X_c^{\alpha} X_g^{\beta})$. Then the family will optimize their utility subject to budget constraint.

$$\underset{X_c^{\alpha} X_g^{\beta}}{\mathbf{Max}}\, U(X_c, X_g) = X_c^{\alpha} X_g^{\beta} \qquad \text{Subject to: } P_c X_c + P_g X_g \qquad (1)$$

$$L = X_c^{\alpha} X_g^{\beta} + \Lambda(Y - P_c X_c - P_g X_g) \qquad (2)$$

$$X_c = \frac{\alpha Y}{(\alpha+\beta)P_c} \tag{3}$$

$$X_g = \frac{\beta Y}{(\alpha+\beta)P_g} \tag{4}$$

By maximizing utility, Xc is the Marshallian demand for fertility as a function of income and opportunity cost and other related variables. The demand for children will rise as income levels rise, whereas the demand for children will fall when opportunity costs rise in accordance with other associated variables.

3.5.1   Model Specification

In determining the relationship between fertility outcome and poverty incidence in Ebonyi State, the study follow Becker (1960) microeconomic theory of fertility model which provided the base for analyzing fertility outcomes in relation to household income and poverty level. As such, the following model was then specified:

$$FEO_i = \beta_0 + \beta_1 PO_i + \beta_2 X_i \ldots + \epsilon_i \tag{5}$$

Where,
FEOi is the dependent variable and the fertility outcome for respondent i.
POi is the independent variable and the Poverty incidence variables for respondent i (constructed from income, food expenditure, housing, and savings data).
Xij is the Control variables for respondent i (education, employment, household size,).
β0 is the Intercept.
β1, β2, are the Coefficients to be estimated.
ϵi: error term.

From the foregoing, the model was further expanded to capture salient poverty incidence variables as follows:

$$FEO_t = \beta_0 + \beta_1 Y + \beta_2 EMP + \beta_3 SAV + \beta_4 FEX + \beta_5 NOM + \beta_6 EDU + \beta_7 HS + \beta_8 HT + \beta_9 RESI + \beta_{10} YDEP + \epsilon_i \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \tag{6}$$

3.6   Definition of Variables

Understanding the variables used in analysis in any research is important because it ensures clarity, consistency, and accuracy in the study. Table 1 therefore, shows the definition and description of the key variables used in this study.

Table 1: Definition of Variables

Variables	Definition	Apriori Expectation
FEO	Fertility outcomes. It means the actual number of children by the respondent	
Y	Respondents household income	+ve
EMP	Employment status of the respondents	-ve
SAV	Household Savings (Household income minus expenditure)	-ve
FEX	Household expenditure on food consumption	-ve
NOM	Households Number of meals per day	+ve

EDU	Respondents educational background	-ve
HS	Respondents household size (Number of people in the household)	+ve
HT	Respondents household type (Monogamous or Polygamous)	+ve
RESI	Respondents place of residence (Rural or Urban)	-ve
YDEP	Young dependency burden. This means the number of children below 14 years	+ve

Source: Authors computation, 2025

3.7   Method of Data Analysis

The econometric estimation techniques adopted in this study are Descriptive Statistics and Multiple Regression Analysis. Multiple Regression analysis on the other hand has proved to be an appropriate method for the analysis of data involving multiple independent variables (Leech, Gliner, Morgan, & Harmon, 2003). It's strengths in handling continuous dependent variables, interpretability, and predictive capabilities make it the most appropriate choice for this study given the nature of the research questions and the continuous data structure.

The general form of the multiple regression models is expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k + \epsilon. \qquad \ldots\ldots\ldots \qquad (7)$$

Where,
Y = Dependent variable (outcome of interest)
β_0 = Intercept (constant term)
$\beta_1, \beta_2, \ldots, \beta_k$ = Regression coefficients
$X_1 X_2 \ldots X_k$ = Independent variables (predictors)
ϵ = Error term

4.0   Presentation of Results

In this study, sample size of 600 respondents was selected; however only 590 respondents gave full responses to the questionnaire, giving a response rate of 98.33%. The analysis was therefore, based on 590 respondents.

4.1   Socio-demographic Characteristics of Respondents

The mean age of the respondents is 34.52 with the majority (19.3%) of the respondents falling within the age range of 30 -34. In much the same manner, the mode of 2 suggest that overwhelming majority (87.8%) of the respondents are married, while about 12.2% representing 72 respondents are widowed (Table 2). The mean (2.37) being greater than the mode suggests that the distribution is skewed since some categories of the respondents in Ebonyi State fall between married, and widowed.

Most of the respondents 428(72.5%) in table 2 are from monogamous households, whereas just 162(27.5%) live in polygamous setting. The median and modal value of 1 each supports frequency table showing that greater majority of the respondents live in a monogamous home.

Table 2: Socio-demographic Characteristics of Respondents

Variable	Frequency (N)	Percentage (%)
Age Range of Respondents		
15 –19	40	7

20 – 24	106	18
25 – 29	107	18.1
30 – 34	114	19.3
35 – 39	102	17.3
40 – 44	90	15.2
44 – 49	30	5.1
Total	590	100
Mean = 34.52, Median = 34, Mode = 40		
Marital Status of Respondents		
Married	518	87.8
Widowed	72	12.2
Total	590	100
Mean = 2.37, Median = 2, Mode = 1		
Respondents Household Type		
Monogamous	428	72.5
Polygamous	162	27.5
Total	590	100
Mean = 1.24, Median = 1, Mode = 1		
Religion of Respondents		
Christianity	541	91.7
Traditional Worship	49	8.3
Total	590	100
Mean = 1.17, Median = 1, Mode = 1		
Respondents Place of Residence		
Rural	400	67.8
Urban	190	32.2
Total	590	100
Mean = 1.32, Median = 1, Mode = 1		
Respondents Educational Status		
None	42	7.1
Primary	209	35.4
Secondary	237	40.2
Tertiary	102	17.3
Total	590	100
Mean = 2.76, Median = 3, Mode = 3		
Respondents Employment Status		
Employed	510	86.4
Unemployed	80	13.6
Total	590	100
Mean = 1.7, Median = 1, Mode = 1		

Source: Author's Field Survey Computation, (2025)

Christianity with a whopping frequency of 541 representing 91.7% of the respondents proved to be a more popular religion in Ebonyi State, while 49(8.3%) favours Traditional worship. The statistics for religion of the respondents show that the mean is 1.17, median is 1, mode is also 1. The above figures imply that overwhelming concentrations of respondents in code 1

suggest that almost 95% of them are Christians with minimal representation from other religions.

In the case of place of residence, greater number 400(67.8%) of the respondents live in rural areas, while 190(32.2%) live in urban areas. Place of residence having the mean of 1.32, median of 1.00, mode of 1.00, reveals that majority of the respondents live in rural areas. This is also evident from the values of mean and median being 1, and the mean of 1.2 leaning towards rural, but with some urban representation.

Respondents educational status reveals that 237(40.2%) of the respondents attained secondary education, 209(35.4%), attained primary, while 102(17.3) have tertiary education, and 42(7.1%) didn't go to school. The mean value of 2.76, the median value of 3.00, and the modal value of 3 implies that since the mean is very close to 3, which is the value of the median and mode, most of the respondents have secondary education.

The employment status of the respondents reveals that about 86.4% of the respondents are employed and 13.6% are unemployed, given the mean value of 1.7, median of 1.00, mode of 1.

4.2   Reliability Test

Ascertaining the reliability of the key variables and internal consistency of the research instruments used in this study is very essential, so that findings of the study can be trusted for meaningful interpretation. As such, Table 3 presents the reliability test results.

Table 3: Reliability Test Result

Instruments	Scale Statistics					Reliability (Cronbach's Alpha)
Source	No. of Items	No. of Samples	Mean	SD	CV	R_s
Socioeconomic Determinants	23	590	20.02	7.39	0.37	0.646
Contraceptives Demand	15	590	15.76	6.69	0.43	0.776
Fertility Behaviour	13	590	12.08	4.16	0.34	0.759
Income and Expenditure	8	590	17.14	7.13	0.42	0.835

Source: Authors Field Survey Computation, (2025)

The reliability test (Table 3) results of the key variables reveal Cronbach's Alpha values of 0.646, 0.776, 0.759, and 0.835 for socioeconomic determinants (23 items), contraceptive demand (15 items), fertility behaviour (13 items), and income and expenditure (8 items), respectively. This suggests that the research instruments demonstrate acceptable to satisfactory reliability for measuring the key constructs in the fertility and poverty study. All four scales exceed the minimum acceptable threshold of 0.60 for exploratory research, meaning that the instrument is reliable enough for plausible statistical analysis and drawing valid conclusions about fertility-poverty relationships in Ebonyi State.

4.3   Multiple Regression Analysis

Household income (Y) (β = -0.187, P = 0.000) reflects a negative and statistically significant association with fertility outcomes in Ebonyi State households as found in Table 4. This means that higher household income is often associated with lower fertility and, subsequently, better welfare and economic standards, suggesting the absence of poverty. Invariably, higher household income causes the household to escape poverty. This result aligns with economic theories suggesting that wealthier families prioritise fewer children for quality upbringings (Becker, 1960; and Becker, Murphy, & Tamura, 1990)

Household savings (SAV) (β = 0.054, P = 0.028) show a positive and statistically significant relationship with fertility in Ebonyi State. This may be as a result of increased financial security (enhanced welfare) associated with increased savings allowing for more children. Higher household savings ultimately decrease the likelihood of poverty. This result aligns with the findings of Mba, Isiugo-Abanihe, & Nwokocha, (2023), which maintained that higher household savings could lead to additional child because such families will have the money to support bigger families, which lowers the chance of living in poverty.

Food expenditure (FEX) (β = 0.110, P = 0.005) also implies that in Ebonyi State, expenditure on food has a positive and significant rapport with fertility outcome. In other words, increased food expenditure is synonymous with high fertility and larger household size. High fertility results in child population structure, high dependency burden, and ultimately leads to lower welfare and poverty (National Bureau of Statistics, 2022). This result is in sync with Malthus's (1798) stance.

Number of meals per day (NOM) (β = -0.149, P = 0.000), manifests a negative but statistically significant link between fertility and poverty incidence in Ebonyi State. The result therefore, suggests that households with less number of children have meals per day. This may indicate better economic conditions where families with have fewer children enjoy higher welfare standards and quality nutrition.

Accordingly, in Table 3, Household type (HT) (β = -0.635, P = 0.000) manifests a statistically significant negative relationship with fertility outcome and poverty incidence in Ebonyi State. This means that an increase in certain household types (monogamy) in Ebonyi State leads to a decrease in fertility and subsequently a reduction in poverty incidence.

Table 4: Multiple Regression Analysis on fertility outcome and poverty incidence in Ebonyi State

Variables	Coefficients	Standard Error	Z-Statistics	Probability
Constant (C)	4.676	0.294	15.894	0.000
Household Income (Y)	-4.35E-06	0.000	-4.526	0.000
Household Income (SAV)	4.55E-06	0.000	2.207	0.028
Household Food Expenditure (FEX)	8.75E-06	0.000	2.822	0.005
Households no of meals per day (NOM)	-0.457	0.088	-5.184	0.000
Household Type (HT)	-2.365	0.163	-14.549	0.000
Respondents Employment Status (EMP)	-0.436	0.071	-6.116	0.000
Respondents Education (EDU)	-0.012	0.005	-2.701	0.007
Household Size (HS)	0.611	0.022	28.153	0.000

Respondent's Place of Residence (RESI)	-0.119	0.09	-1.324	0.186
Young Dependency Burden (YDEP)	0.548	0.198	7.675	0.006
F-Statistics	292.032			0.000
Correlation Coefficient (R)	0.907			
R-squared	0.823			
Adjusted R-squared	0.821			
Durbin Waston	2.176			

Source: Authors Field Survey Computation, (2025)

Monogamous households, for instance, have lower fertility outcomes, smaller household sizes, better welfare status, and eventually a lesser probability of being poor. This result aligns with the findings of Haakenstad et al. (2022) and Graff & Bremner (2014), which claim that lower fertility serves as a conduit for escaping poverty and achieving a demographic dividend.

Employment status (EMP) (β = -0.131, P = 0.000) also shows a statistically significant but negative relationship with fertility outcomes and, by extension, poverty incidence in Ebonyi State. This means that a unit increase in women's employment in Ebonyi State brings down fertility outcomes by 13.1%. This result is in line with both a priori expectation and economic theory. Women in employment tend to delay childbirth or most often have fewer children than their counterparts who are not employed. This result is consistent with the findings of Oyedele (2022) and Owoo (2021). Respondents education attainment (EDU) (β = -0.054, P = 0.007) indicates yet a negative and statistically significant relationship with poverty in Ebonyi State. This implies that in Ebonyi State, a year's increase in education can reduce demand for children and poverty incidence by 5.4%. This result supports existing studies showing that education leads to a reduction in fertility, promotes smaller family sizes, and eradicates poverty (Yadassa et al., 2023 and Bongaarts, 2017).

Household size (HS) (β = 1.318, P = 0.000) reveals a positive but statistically significant correlation with fertility and poverty. This means that a larger household size, which is typical of the study area, is a result of high fertility outcomes, which is also a harbinger of poverty. This result is in sync with the study conducted by Anyanwu, 2013, and Effiong, Udonwa & Ekpe, (2022). Thus, additional children or persons, on average, cause a substantial decline in household savings rates and levels, increase the financial costs of bearing and raising children, reduce the work participation and wage income of mothers, and reduce the proportion of school-age children attending school. The ultimate result is a vicious cycle of poverty, particularly in large-population areas. Therefore, a high fertility outcome puts intense pressure on both the household's resources and social amenities, potentially leading to poverty. This is supported by studies conducted by Osobase et al. in 2022 and Blackstone & Iwelunmor in 2017. Increased numbers of children result in a high dependency burden and unending expenditures, which erode a household's meagre income and savings and lead to poverty.

Place of residence (RESI) (β = -0.119, P = 0.186) showed a negative but not significant relationship with poverty in Ebonyi State. This means that people living in urban areas have high likelihood of having fewer children and escaping poverty. It is so because people in urban areas are better educated and exposed to better health facilities and economic opportunities.

In Ebonyi State, the youth dependency ratio (YDEP) (β = 0.548, P = 0.006) exhibited a positive and statistically significant association with poverty levels. This implies that a substantial population of children (ages 0–14) in the state, stemming from elevated fertility outcomes, frequently strains resources (e.g., education, healthcare, employment) for the working-age population, hence negatively impacting household savings, labor productivity, and economic growth, which exacerbates poverty rates. This means that societies like Ebonyi State with larger youth populations relative to working-age adults face heightened poverty risks. This result also aligns with the findings of Effiong, Udonwa & Ekpe (2022), and Haakenstad et - al., (2022) which posit that higher youth dependency ratios perpetuate cycles of poverty by straining household resources, reducing savings, and limiting investments in education and healthcare.

4.3   Model Summary

Table 4 reflects the model summary of the regression analysis for this study. The correlation coefficient's value (R) is 0.907, which implies a very strong positive correlation between the dependent and independent variables. The model also explains 82.3% of the differences in the fertility outcomes of the households, as shown by an R^2 (0.823) and an adjusted R^2 (0.821). This means that it has a very high level of explanatory power and a satisfactory fit. This means that all the variables captured in the model influence fertility and poverty.

Again, the closeness of adjusted R2 to the R2 indicates that the model is robust and not over-fitted. This means that the predictors included are important in understanding poverty and fertility outcomes relationship; although there is room for improvement by introducing other variables to further fine-tune the model. The standard error of the estimate is 0.703. This presupposes the average deviation of fertility outcomes as observed from the predicted value is 0.703; meaning that the models prediction is relatively close to the actual observed value. A very excellent fit. The Durbin-Waston Statistic (2.176) confirms the absence of autocorrelation which affirms the reliability of the regression results.

4.4   Analysis of Variance (ANOVA)

Table 4 reveals that the model is significantly significant given that F-statistic (9,564) equals 292.032 and (p < 0.001). These values indicate that the predictors collectively have significant effect and therefore, effectively explain the variation in the fertility outcome in Ebonyi State. This high significance means that the model as a whole is an excellent fit for the data.

5.0   Summary of Findings and Conclusion

The study explores the link between fertility outcomes and poverty in Ebonyi State using descriptive and regression analyses. Findings reveal a negative relationship between household income and fertility, indicating wealthier families favour fewer children. Household savings also influence fertility; as financially secure families can support larger households. High food expenditure correlates with increased fertility and larger household size, young population and greater dependency burdens, raising poverty incidence. Fewer meals per day also associate with higher fertility and poverty incidence. Monogamous households show lower fertility and improved welfare, reducing poverty. Women's employment and urban area residence correlate negatively with poverty, as employed women tend to delay childbirth and invest in education and careers. Education is linked to lower poverty incidence. The model demonstrates a strong fit with R^2=0.823 and adjusted R2 of 0.821 respectively, highlighting key socioeconomic factors influencing fertility and poverty. The Durbin-Watson value of 2.176 signifies the absence of autocorrelation. The study concludes that fertility and poverty are closely connected through various pathways. Breaking the fertility-poverty cycle requires addressing systemic inequities and empowering women. This

research offers a diagnostic framework and strategic guide for equitable development amid Ebonyi State's high fertility, rapid population growth, and economic challenges.

5.1   Recommendation

Following the findings of this study, it is suggested that:

i.   Ebonyi State Government should ensure increased sensitization and rural access to free or highly subsidized contraceptive services by introducing mobile family planning clinics in the rural areas. In doing this, government should also partner with community leaders to reduce socio-cultural resistance to contraceptive use. As such, Multi-sectoral interventions are required, including financial subsidies, behavioral change programs, religious engagement, and improved rural healthcare access. By implementing these policies, the government can enhance family planning outcomes and support sustainable population growth in Nigeria.

ii.   Increased investment in skill acquisition and Improvement on employment and economic opportunities for women in Nigeria especially in Ebonyi State and the need for policymakers to focus on promoting Women's Economic Empowerment. Some effective actions to support the increase in women's economic empowerment may come in the form of small business cash infusions, otherwise known as "business grants" and conditional cash transfers (CCTs).

iii.   To support and sustain the success of rural households, policymakers should consider introducing agricultural subsidies, modern farming techniques, and improved market access. This will strengthen food security programs and improves access to nutritious food, particularly for low-income households. Promote diversified diets and nutritional education

iv.   In sum, social protection policies would provide much needed support for marginalized and otherwise extremely vulnerable Female-headed households (FHHs) segments of the population. By implementing these targeted interventions, policymakers can effectively address the root causes of poverty and improve the well-being of households in Ebonyi State.

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