Household Economic Analysis of the Effect of Contraceptive Demand on Fertility Outcomes in Ebonyi State, Nigeria

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Abstract
This study investigated the effect of contraceptive demand on fertility outcomes in Ebonyi State, Nigeria and its associated economic implications at the household level. Relying on household survey data from 590 respondents across six local government areas, the study employed descriptive statistical analysis and multiple regression analysis. The result of descriptive analysis uncovered that 87.6% of respondents were aware of contraceptives, yet contraceptive usage remained limited. The average respondent desired 4.66 children but actually had 6.13 children, indicating a fertility gap. Most respondents (67.8%) resided in rural areas, 40.2% had secondary education, and 86.4% were employed. Notably, 65% lacked access to nearby family planning clinics, and the majority of households reported having children out of school. Multiple regression analysis result reveals a statistically significant negative relationship between contraceptive demand and fertility outcomes ($\beta = -0.353$, $p = 0.040$), indicating that increased contraceptive use leads to reduced fertility rates. Age of respondents ($\beta = 0.092$, $p < 0.001$) and desire for children ($\beta = 0.329$, $p < 0.001$) showed positive association with fertility, while urban residency ($\beta = -0.904$, $p < 0.001$), household head education ($\beta = -0.021$, $p = 0.013$), and household income ($\beta = -3.901E-6$, $p < 0.01$) demonstrated negative associations. The study further found that high fertility outcomes constitute a major albatross to household welfare and socioeconomic development. The study therefore recommends increased availability of subsidised modern contraceptives, particularly in rural areas, improved education, especially for women, addressing socio-cultural barriers to contraceptive use, amongst others. These interventions are essential for achieving Sustainable Development Goals 1, 3, and 5, promoting poverty reduction and improved maternal health outcomes.

***Keywords*:** Contraceptive Demand, Fertility Outcomes, Poverty Reduction, Sustainable Development Goals, Ebonyi State.

JEL Classification: I15, J13, O15, R20

Introduction

Elevated fertility outcomes plaguing several sub-Saharan African (SSA) regions, especially Ebonyi State, Nigeria, have remained an albatross to socioeconomic progress. It has also continued to be at the forefront of the economic development debate in SSA countries. While global fertility rates have declined over decades, Ebonyi State is still plagued by 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 (NDHS, 2023; NBS, 2022) and the 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 has resulted in rapid annual population growth (2.6%), the highest in the geopolitical area (NBS, 2022; NDHS, 2023). If nothing is done to reverse that trend, the state's population will double in less than 25 years.

Most existing studies identified early marriage, wife's education, cultural norms, and reliance on crude farming method (which demands more children) as the primary cause of high fertility outcomes in Nigeria **(**Adebowale et al., 2020; National Population Commission (NPC) & ICF, 2023; Nwakeze, 2006**)**, the lack of effective contraceptives demand has been constantly unrecognized. The contraceptive prevalence rate (CPR) in Ebonyi State is very low at 6% and lower than the national average of 17%, leading to high fertility outcomes (NDHS, 2023). The contraceptives demand, through its inverse relationship with fertility, has the potential to reduce poverty incidence and is also central in achieving the UN (2015) Sustainable Development Goals (SDGs). Contraception, fertility outcomes, and economic performance are inextricably linked, and the relationships between them, well documented, although the directionality of these relationships and the mechanisms that drive them are still inconclusive.

Unchecked fertility results in high dependency burden, underdevelopment, poverty, unemployment, low female labour participation and low per capita income (Malthus, 1798; Abeid et al., 2023; Effiong, Udonwa, & Ekpe, 2022; Ugwuozor, Nwakeze, & Odior, 2025). In the lens of Schultz (2009), for every $1 invested in family planning, $4 is saved in other areas like education, public health, water and infrastructure, which translates to an increase in both household welfare and national savings. The effect of contraception on fertility is also one specific mechanism by which contraceptive access can improve women's economic outcomes.

In an attempt to curb the rate of fertility outcomes in Nigeria, two national population policies (1988, 2004) were launched, but regrettably, both failed because of factors like weak political will, poor funding, cultural multiplicity, ethnic cum religious factors, poverty and low education amongst others (Michael & Odeyemi, 2017; Abasiekong & Sibiri, 2010; NPC & ICF, 2014; NDHS,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 is yet to be determined. Some studies (Ezenwanaka, 2021; Blackstone, & Iwelunmor, 2017; Undelikwo, Ikpi, & Bassey, 2023) have also been conducted on the contraceptives–fertility nexus, but they looked away from the resultant economic implications both at the household and aggregate level. While this leaves a lacuna, some of which this study hopes to address by employing household survey data, it also poses a question: what is the effect of contraceptives demand on fertility outcomes in Ebonyi State, Nigeria? This study is organised 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 summarises the key findings, while Section Six offers policy recommendations and concludes the study.

Literature Review

A household refers to a home and the fundamental unit of decision-making. It is defined as one or more persons living together in a single house who share common resources, activities, or expenditures. Households make choices about consumption, labour supply, savings and more and can be modelled as a unified decision-making unit. Their importance lies in being the basic unit for many microeconomic and government models, influencing everything from a family's financial arrangements to national economic policies.

Contraceptives are varieties of drugs, agents, sexual practices or even surgical procedures to deliberately avoid fertility. Contraceptives such as condoms also function to protect their users from contracting sexually transmitted infections (STIs) (Olugbenga, Bello, Abodunrin, &Adeomi, 2011). Contraceptives demand, therefore, is the actual use or consumption of contraceptives. Contraceptive methods can be largely divided into traditional and modern methods (Abiodun & Balogun, 2009). Methods such as rhythm (abstinence), herbal and withdrawal are

grouped as traditional methods, whereas modern contraceptive methods include female sterilisation, the pill, intra-uterine device (IUD), injectables, implants, male condom, female condom, diaphragm, foam/jelly, lactation amenorrhea method (LAM), and emergency contraceptives. (NDHS, 2023).

Fertility outcomes refer to the 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 outcome constitutes the incidence of childbearing, which is an exclusive reproductive task of women of childbearing age (15–49). Using economic factors to explain fertility outcomes, 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).

The association between contraceptive demand and fertility outcomes in developing countries such as Nigeria has been theorised through a range of lenses, each offering different explanations for observed patterns. Economic Theory of Fertility, propounded by Becker, (1960), views children as economic goods, where demand for fertility (children) is influenced by income, the cost of raising children and the availability of contraceptives. Gary Becker further argued that enhanced accessibility and demand for contraceptives reduce the "cost" of fertility control, reducing fertility rates as couples prioritise quality over quantity of children.

In his Proximate Determinants of Fertility Framework, Bongaarts (1982) argued that contraceptive use, marriage patterns and postpartum insusceptibility directly influence fertility outcomes. This means that higher contraceptive demand reduces fertility by increasing the proportion of women protected from unintended pregnancies. The Demographic Transition Model (DTM), on the other hand, describes the historical changes in a population’s birth and death rates as it develops economically and socially. DTM provides context for how fertility outcomes decline in response to socioeconomic changes, including increased contraceptive use. Esterline’s Fertility Supply – Demand framework posits that fertility outcomes are primarily influenced by the demand and supply of fertility (children), and the costs of contraception (fertility regulation). The demand for contraceptives, therefore, arises when couples want fewer children than their natural fertility would produce. This stance implies that higher demand for

contraceptives classically correlates with reduced fertility rates, as couples use contraception to achieve their preferred household size. This model, which serves as the theoretical foundation of this study, recognises desired family size, access to contraceptives, price and knowledge of contraceptive methods as key variables.

Many studies of this nature have documented the effects of contraceptive demand on fertility outcomes. The majority of these studies were conducted within the ambit of community health and failed to elucidate the economic implications of the resultant fertility outcomes. Sanchez-Perez and Ortega (2018) examined the levels and trends of contraceptive prevalence and demand for married and sexually active unmarried adolescent women aged 15–19 in Latin America and sub-Saharan Africa using the linear mixed model and aggregate data from 120 DHS surveys for 34 developing countries. Also using the proximate determinants framework, separating adolescents by marital status, the study estimated the effect of adolescent contraceptive use and marital status on fertility and the impact of meeting current demand. The study found that increasing contraceptive prevalence has already reduced adolescent fertility by 6.8% in Latin America and 4.1% in sub-Saharan Africa.

Utilising data from the United Nations and other demographic surveys, Kantorová & Bongaarts (2024) examine global trends in contraceptive use and their relationship with fertility decline from 1970 to 2021. This study, which deployed a multi-faceted methodological approach to analyse global and regional trends in contraceptive use and its relationship with fertility transitions, found that contraceptive prevalence (CPR) among women of reproductive age doubled from 25.2% in 1970 to 50.2% in 2021, with significant regional variation. Eastern Asia and Latin America achieved CPR levels around 60%, while Sub-Saharan Africa lagged at 28%. The study further discovered that a rise in contraceptive use is closely linked to fertility decline, supporting demographic transition theory.

Wright et al. (2023) carried out a cross-sectional study exploring the link between Contraceptive Use and Fertility Control among 1445 women of reproductive age, 15–49 years in Rural and Urban Communities of Lagos, Nigeria. The study adopted a cluster sampling technique and a pre-tested, interviewer-administered electronic questionnaire. The study, which relied on SPSS for data analysis, found that about 32.4% of the respondents were rural dwellers and 67.6% were urban residents. The overall mean age was 31.7 ± 7.8 years. In addition, the study pointed out that the desire to preserve fertility, a lack of future necessity,

intolerable side effects and a lack of marital support are the main deterrents for not using contraceptives.

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 the year 2000. Factors identified as strong predictors of demand for children are the 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.

In their study, "What determines fertility among women in Nigeria? A disaggregated analysis using Poisson Regression, Agbutun, Iheonu, Anyanwu, & Ineghenehi, (2020) utilised the 2013 NDHS data and employed the Standard Poisson regression and the Ordinary Least Squares for estimation. The result of the study revealed that maternal education, income, contraceptive use, access to health centres, place of residence, age and age at first birth all had a significant impact on fertility rate.

Ekholuenetale, Owobi, & Shisi, (2022), relying on a sample of 496,082 respondents from 2006–2021 Demographic and Health Surveys data. Investigated the socioeconomic Position in Modern Contraceptive Uptake and Fertility Rate among Women of Childbearing Age in 37 sub-Saharan countries. The study found that increasing women's socioeconomic position can increase contraceptive use, which implies a reduction in fertility and improved maternal healthcare service utilisation. Bongaarts (2017) utilised OLS and fixed-effect regression to examine the effect of contraceptive demand on fertility in 40 developing countries, including SSA. The result of this longitudinal study revealed that there exists low demand and use of contraceptives in the SSA region, where the TFR is 4.5, which is higher than the world average of 2.5, leading to a high fertility rate and rapid population growth in the region. The preceding reviews offered significant insights into the contraceptives-fertility nexus. Nevertheless, most of those studies were conducted in the health domain and largely relied on Demographic Health Survey (DHS) data, whose analysis is devoid of economic connotation. These identified gaps provide the motivation for the current study, which aims to address some of them.

Research Methodology

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, IzziIkwo, 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. All the households in Ebonyi state constitute the population of this study. According to the Nigerian Population Commission (2006) census figures, the state is made up of 456,540 households. This information was sourced from the Abakaliki office of the Nigerian Population Commission in Ebonyi State.

Given the large 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: $n = n_0/ + \frac{n0-1}{N}$, where n is the sample size, N is the population size, and n_0 is the standard Cochran's sample size (approximately 385 to 400)**.** This means that 400 households are scientifically acceptable. In agreement with Umeh, (2018), who suggested that sample size should be increased by 10% to 30% to compensate for non-response rate, the sample size for this study was 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. Multi-stage sampling technique was adopted to select six (6) Local Government Areas that were surveyed out of the thirteen Local Government Areas in Ebonyi State.

To ensure that the items in the instrument (questionnaire) used are reliable, a pilot study was carried out in a different LGA (Izzi) other than the selected ones with thirty (30) participants. The 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 the instrument. The Alpha-Cronbach test indicated that the value ranges from 0.6 to 0.8, which are acceptable values for measuring reliability, according to Griethuijsen *et al.* (2014). Ethical approval to conduct the study was sought from the University of Lagos Research and Ethics Committee (UNILAGREC/23/12/001**).** The study was also carried out in strict conformity with all ethical expectations and standards.

Easterlin's framework suggests that actual fertility (C) depends on the demand for children (Cd), the supply of children (Cn), and the costs of fertility regulation (Rc), with contraceptive demand (Dc) and use (Uc) mediating the outcome. This can be represented in a unified equation as follows:

$$C = Cn - Uc.\ (Cn - Cd).\ Uc \quad (1)$$

Contraceptive use depends on demand (Dc= Cn − Cd) and regulation costs (Rc)

$$Uc = \frac{Dc}{Dc+Rc} = \frac{Cn-Cd}{(Cn-Cd)+Rc} \quad (2)$$

Substitute Uc into the main equation:

$$C = Cn - \left(\frac{Dc-Cd}{(Cn-Cd)+Rc}\right).(Cn - Cd) \quad (3)$$

Simplify:

$$C = Cn\ -\frac{(Cn-Cd)2}{(Cn-Cd)+Rc} \quad (4)$$

Equation 4 implies that actual fertility outcomes (C) depend on natural fertility (Cn), desired fertility (Cd), and contraceptives or fertility regulation costs (Rc). In determining the effect contraceptives demand has on fertility outcomes, the study followed Easterlin & Crimmins (1985) fertility supply–demand framework, which provided the foundation for analysing contraceptives use and fertility outcomes in relation to household income, price and desire for children. Hence, given the cross-sectional model:

$$Y_i = \alpha_i + \gamma_i X_i + \epsilon_i\ (I = 1, 2\ldots n) \quad (5)$$

Where Y is the dependent variable, X is the vector of independent variables, ϵ the error term, and i is i-th local government areas in Ebonyi state. From the foregoing, the model was further expanded to capture salient control variables germane to the study as follows:

$$FEO_t = \phi\alpha_0 + \alpha_1 CD + \alpha_2 RESI + \alpha_3 EDU + \alpha_4 HED + \alpha_5 DCH + \alpha_6 Y + \alpha_7 PR + \alpha_8 AGE + \varepsilon \quad (6)$$

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	
CD	Respondents' contraceptive demand (actual use)	-ve
RESI	Urban Residency	-ve
EDU	Respondents educational background	-ve
HED	Household head's educational background	-ve
DCH	Desire for Children	+ve
Y	Household Income	-ve
PR	Price of Contraceptives	+ve
AGE	Respondents' Age (Years)	+ve

Source: Authors computation, 2025

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 continuous dependent variables and multiple independent variables (Leech, Gliner, Morgan, & Harmon, 2003). The general form of the multiple regression model is expressed as:

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

Where, Y = Dependent variable (outcome of interest), β0= Intercept (constant term), β_1, β_2, ..., β_k = Regression coefficients, X_1 X_2 … X_k = Independent variables (predictors) and ϵ = Error term.

Presentation and Analysis of Results

In this study, a 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.

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 the same manner, the mode

of 2 suggests that the 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 settings. The median and modal value of 1 each support a frequency table showing that the greater majority of the respondents live in a monogamous home.

Table 2a: 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		

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

Table 2b: Socio-demographic Characteristics of Respondents (Contd.)

Variable	Frequency (N)	Percentage (%)
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%) favour 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 imply 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, and mode of 1.

Table 3 presents the descriptive statistics of contraceptives and fertility behaviour of the 590 households surveyed. Ever heard of contraceptives or contraceptives awareness has a mean of 1.24, median of 1.00, mode of **1** and range of 1-2. This implies that about 87.6% of the respondents are aware of contraception, as

supported by the mode (1). In the same way ever used any contraceptives manifested the following descriptive statistics: 1.62 for mean, 2.00 for median, 2 for mode, 0.487 for SD, and a range of 1-2. The figure revealed that a reasonable number of the respondents have used contraceptives. The relatively small standard deviation supports a bimodal variable.

Table 3: Descriptive Statistics of Contraceptives and Fertility Behaviour of Respondents

Variables	Mean	Median	Mode	Std Deviation	Min	Max
Ever heard of Contraceptives	1.24	1	1	0.598	1	2
Ever used any Contraceptives	1.62	2	2	0.487	1	2
Price of Contraceptives	4.27	5	5	1.356	1	5
Nearness to Family Planning Clinic	1.69	2	2	0.889	1	2
Desire for Children	4.66	5	5	1.134	2	8
Fertility Outcomes	6.13	5	5	1.664	0	7
Number of Children out of School	1.44	1	1	0.934	1	2

Source: Author's Field Survey Computation (2025)

Price paid for contraceptives purchase with a mean of 4.27, median and mode of 5, SD of 1.356 and range of 1 – 5 indicate that most respondents who purchase contraceptives fall within the highest category, with notable concentration at the upper end. The somewhat high standard deviation (1.356) shows considerable variation in prices paid, possibly due to differences in contraceptive types or access points. Nearness to family planning clinic exhibits a mean value of 1.69, median and mode of 2 each and range of 1-2. Those figures imply that most (65%) of the respondents lack access to a nearby family planning clinic, as suggested by the mode (2).

The desired number of children as expressed by the respondents reveals a mean of 4.66, a median of 5.00, a mode of 5, an SD of 1.134, and a range of 2-8 children. This figure implies that respondents desire an average of approximately 5 children. The mode (5) and median (5) indicate a central tendency at this value. However, with the standard deviation (1.134) and the range, there is a moderate variability in fertility preferences, reflecting different socioeconomic and cultural backgrounds. Fertility outcomes or the actual number of children have a mean of 6.13, a median of 5.00, a mode of 6, an SD of 1.664, and a range of 0-7. This skewness in the central tendency implies that while most respondents' children revolve around 5-6 per woman, some of the respondents have up to 7 children, elevating the mean number of children. This pattern is common in high-fertility regions with very limited awareness or access to contraceptives (Bongaarts,

2017). The moderate standard deviation (1.664) suggests clustered data around the mean (6.13), with restricted spread. The presence of respondents having from 0 to 7 children per woman in Ebonyi State highlights variability, though outliers are absent. In all, the above statistics portray high fertility outcomes obtained in Ebonyi State with moderate variability, akin to patterns observed in regions with slow demographic transition.

Numbers of children out of school are found in the majority of the surveyed households, as suggested by the results of the descriptive statistics, given the mean (1.44), median (1), and mode (1). SD (0.934) and a range (1-2). This figure is a concerning indicator of educational access or affordability in Ebonyi State, likely reflecting broader socioeconomic challenges. The relatively increased mean and the predominance of 1 ("Yes") responses are consistent with findings from regions where educational deprivation is linked to poverty, fertility, and low access to contraceptive services (UNESCO, 2022; United Nations, 2021). The variability as presented by the SD (0.934) underscores socioeconomic disparities in educational access. For example, low-income households often report higher rates of children out of school due to costs, labour demands or lack of infrastructure (World Bank, 2021).

Ascertaining the reliability of the key variables and internal consistency of the research instruments used in this study is essential, so that findings of the study can be trusted for meaningful interpretation. As such, Table 4 presents the reliability test results.

Table 4: 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 4) 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 contraceptives demand and fertility 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.

The result of the regression analysis in Table 4 demonstrated that age in years exerts a statistically significant and positive influence on fertility outcomes ($\beta = 0.092$, $p < 0.001$)**.** This result aligns with the finding of Bongaarts (2017), who posits that age is central in determining women's fertility behaviour. This indicates that older women are more predisposed to have a greater number of children than younger ones because older women, having had greater opportunity to amass money and attain economic stability, are more inclined to have higher fertility outcomes than their younger counterparts (Becker, 1960). All these findings can be associated with the life-cycle theory of fertility (LTF). LTF asserts that individuals determine reproductive choices according to their economic resources and limitations throughout their lives (Modigliani & Brumberg, 1954).

Place of residence (RESI) ($\beta = -0.251$, $p < 0.001$) manifested a statistically significant, yet negative impact on fertility outcomes. This suggests that individuals residing in urban areas with higher socioeconomic status tend to have fewer children compared to those in rural areas because of their level of education and exposure, and better family planning access. This negative effect highlights the critical role of contraceptive demand in shaping fertility behaviour. This result is consistent with the findings of Dasgupta, Wheldon, Kantorová, & Ueffing, (2022), who found that wealthier households tend to have lower fertility rates due to increased contraceptive use and delayed childbearing.

Table 5: Multiple Regression Results

Variables	Coefficients	Standard Error	T- Statistics	Significance
C	1.082	0.787	1.374	0.17
AGE	0.092	0.009	9.984	0.000
RESI	-0.904	0.16	-5.645	0.000
EDU	-0.011	0.01	-1.155	0.249
HED	-0.021	0.008	-2.485	0.013
DCH	0.329	0.063	5.199	0.000
Y	-3.90E-06	0	-3.737	0.000
PR	8.16E-06	0	1.352	0.177
CD	-0.353	0.17	-2.076	0.040
F-Statistics	39.469			0.000
Correlation Coefficient (R)	0.675			
R-squared	0.455			
Adjusted R-squared	0.444			

Source: Authors' Field Survey Computation (2025)

Educational status (EDU) of the respondents ($\beta = -0.011$, $p = 0.249$**)** appears not statistically significant but is negatively correlated with fertility. This implies that women's educational attainment does not significantly predict fertility outcomes or the number of children in Ebonyi State. This stance, in a way, contradicts studies like Caldwell, (1999) that found a strongly significant negative correlation between women's education and fertility. This finding is not unconnected with Ebonyi State's strong attachment to cultural norms and values, where most women lack autonomy.

In like manner, the educational status of the household head (HED) ($\beta = -0.021$, $p = 0.013$) reveals a negative and statistically significant influence on contraceptive use on fertility outcomes. This supports the findings of Götmark, & Andersson, (2020) and Kebede et al. (2021), who opined that household education plays a pivotal role in fertility decisions. The desired number of Children's (DCH) coefficient of **(**$\beta = 0.329$, $p < 0.000$) is highly significant and positively related to fertility outcomes. It means, therefore, that women who desire more children will ultimately have more children. These findings are in sync with findings of Bongaarts, (2017), which emphasise the persistence of pro-natalist position in certain populations like Ebonyi State, as well as highlighting the notion that individual decisions significantly influence fertility outcomes.

Household income (Y) with coefficient **(**$\beta = -3.901E\text{-}6$, $p< 0.01$) showed an inverse relationship between income and fertility. This result is in line with both

Becker's (1960) economic theory of fertility stance and the studies' a priori expectation. This result implies that higher household income is associated with lower fertility, as found by Becker et al. (1960) and Doepke, (2015), quantity–quality tradeoff. As wealthier families see children as investment goods, they invest more in fewer children rather than having larger families.

Price of contraceptives (PC) **(**β = 8.155E-6, p = 0.177) exhibits a positive and statistically insignificant relationship with fertility. This implies that the amount spent on contraceptives does not significantly impact the number of children the people of Ebonyi State currently have. By extension, the result, which aligns with the findings of Undelikwo, Ikpi, & Bassey, (2023), suggests that while the amount spent on contraceptives may influence fertility, other factors, such as access and sociocultural barriers common in Ebonyi State, may reduce its effectiveness. Contrarily, contraceptives demand (CD) (β = -0.353, and P = 0.040) exhibits a negative but significant relationship with fertility outcomes. This stance suggests that a unit increase in contraceptive demand or use will lead to a 0.353% reduction in fertility outcomes in Ebonyi State. These findings are consistent with Bongaarts, (2017).

The model summary of the regression analysis reveals that the correlation coefficient (R) value of 0.675 implies a very strong positive correlation between the dependent and independent variables. The model also explains 45.5% of the households' fertility outcome as indicated by the coefficient of determination (R^2) of 0.455 with an adjusted R^2 of 0.444, which suggests a moderate level of explanatory power, which could mean that other factors not captured here might also influence fertility. Again, the closeness of adjusted R^2 to the R^2 indicates that the model is robust and not over-fitted. This means that the predictors included are important in understanding fertility outcomes, although there is room for improvement by introducing other variables to further fine-tune the model. The standard error of the estimate is 1.242. This presupposes the average deviation of fertility outcomes as observed from the predicted value is 1.242, meaning that the model's prediction is relatively close to the actual observed value. A good fit. F-statistic (12,567) equals 39.469 and **(p < 0.001)** equally reveals that the model is significant. These values indicate that the predictors collectively have a significant effect and effectively explain the variation in the fertility outcome in Ebonyi State.

The marginal effect (AME) of AGE (0.092) means that as women grow older, there is a higher odds of having more children, which is consistent with global

demographic trends. The AME of age also implies that for every additional year to the age of Ebonyi State women, there is most likely to be a 9.2% increase in their fertility outcomes, holding all other factors constant. The positive AME for place of residence (RESI) (-0.904) indicates that living in urban areas significantly reduces the demand for children by about 90.4%. This is largely due to better exposure and better access to contraceptives and, generally, family planning facilities in urban areas. AME for both Respondent's Education (EDU) (-0.011) and Education of Household Head (HED) (-0.021) reveals a negative effect on fertility outcomes. This denotes that for every additional year in school, demand for fertility will most likely reduce by 1.1% for the respondents and 2.1% for the household head, respectively.

Conclusion and Policy Recommendations

Relying on descriptive statistics and multiple regression analyses, this study investigated the effect of contraceptive demand on fertility outcomes and its associated economic implications in Ebonyi State, Nigeria. Findings reveal a strong link between contraceptive demand and fertility outcomes in Ebonyi State, Nigeria. Contraceptive demand manifested a statistically significant, negative association with fertility outcomes, meaning that as contraceptive demand increases, fertility tends to decrease and vice versa. This finding is consistent with prior research. Bongaarts, (2017). Specifically, the age of the respondents, desire for children and price of contraceptives positively correlated with fertility outcomes in Ebonyi State. However, the study also showed that lower fertility outcomes are equally associated with urban residency, education level of the respondents and household head, household income and demand for contraceptives in the same State. The coefficient of determination (0.455) and adjusted R^2 (0.444) imply that the model has a moderate level of explanatory power. While the closeness of R^2 to adjusted R^2 signifies that the model is robust enough and not over-fitted, the F-statistic (12.567) equals 39.469 and ($p < 0.001$) suggests that the model is significant.

In conclusion, therefore, this study maintains that contraceptive demand is undoubtedly a major factor in curbing fertility outcomes, especially in Ebonyi State. The elevated fertility outcomes in the state significantly hinder household welfare and socioeconomic development. As such, addressing low contraceptive use is crucial for the economic prosperity of the state. These findings consequently provoke the need for immediate interventions aimed at increasing contraceptive access and demand, especially in rural areas, to lower fertility

outcomes. That way, SDGs 1, 3, and 5 will be realised. Based on the findings, the study recommends that the government and policymakers should increase the awareness and availability of highly subsidised modern contraceptives, particularly in rural areas, to boost usage. This can be done in partnership private sector or donor agencies; improvement in education is needed, especially for women and household heads, as this harms fertility outcomes. Efforts should be made to address the socio-cultural barriers and pro-natalist views that contribute to high fertility, as highlighted by the significant positive relationship between the desired number of children and actual fertility; and ensure effective execution of the 2023 National Population Policy through adequate funding and political commitment.

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