PROXIMATE DETERMINANTS AND FERTILITY DIFFERENTIALS IN BENDEL STATE, NIGERIA

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ABSTRACT

The paper examines the contribution of proximate determinants to the understanding of rural-urban and ethnic fertility differentials in Bendel State of Nigeria. The Bongaarts model provides a framework for analyzing the relationships between fertility and its proximate determinants.

The results of the analysis showed that durations of breastfeeding, amenorrhoea and postpartum sexual abstinence are relatively short in Bendel State compared with some other ethnic groups in Nigeria. Higher education, urban residence and participation in modern sector employment are associated with shorter duration of breastfeeding, amenorrhoea and postpartum sexual abstinence and greater use of contraception.

Although the findings of the study suggest that the Bongaarts model will yield better results if applied to large samples, the analysis shows that differences in proximate determinants help to explain fertility differentials. Thus the near equality between fertility levels in urban and rural centres is arrived at through different combinations of proximate indices. Findings suggest the need for a vigorous family planning information programme to improve knowledge about the benefits of smaller families and practice of family planning.

I. INTRODUCTION

Demographic data show that sub-saharan Africa's population growth, birth, and death rates are all higher than in any other continental region. Furthermore, there are fertility differentials not only between nations, but also between geographical regions, ethnic and socio-economic groups within nations in Africa. These differentials in fertility levels are sometimes large. Since only a small proportion in African deliberately control fertility through contraception, explanations for these differentials must, therefore, lie elsewhere (1). Data collected in the 1970s have revealed that a major source of variation in sub-Saharan Africa are variations in proximate determinants of fertility.

Whereas in the past, analyses of fertility tended to look only at the socio-economic determinants, it is now considered that any detailed and comprehensive analysis of factors influencing fertility requires a close examination of (i) proximate of intermediate variables and (ii) socio-economic and environmental background variables which include social, cultural, economic, institutional, psychological, health and environmental variables (2). The level of fertility in a population is directly determined by a set of biological and behavioral factors called the intermediate fertility variables (3) or the proximate determinants of fertility (4). The background variables affect fertility through the proximate determinants which are themselves a function of socio-economic variables. Thus we have:

Socio-economic, cultural, and environmental variables	intermediate fertility variables	fertility

Background variables affect fertility by modifying the proximate determinants. A socio-economic variable can have a negative fertility effect through one set of proximate determinants (for example education and contraception), and a positive effect through another proximate variable (education and reduction of post-partum non-susceptible period). Thus the overall effect of a socio-economic variable on fertility can be positive or negative depending on its total effects on proximate variables.

These offsetting effects have been found to play a crucial role in explaining fertility differentials in sub-Saharan Africa. Variations in fertility among countries, regions and socio-economic strata within countries and between individual women are due to the effects of one or more of the proximate variables (5). Extensive analysis of proximate determinants of fertility using World Fertility Survey data in different countries have been done. An analysis of the Nigerian Fertility Survey data showed that proximate determinants play a role in explaining fertility differentials in Nigeria (6).

This paper examines the contribution of proximate determinants to the understanding of rural-urban and ethnic fertility differentials in Bendel State, Nigeria. Section II outlines the Bongaarts model, the framework used for analyzing the relationships between fertility and its proximate determinants. Section III describes data used for the analysis. Section IV presents the empirical findings of the study, while Section V concludes the paper and raises policy implications.

II. THE BONGAARTS MODEL

Bongaarts (7) has shown that there are seven intermediate variables through which social, economic and cultural conditions affect fertility. They are: marriage, contraception, induced abortion, postpartum infecundablity, fecundability, spontaneous intra-uterine mortality and sterility. He further showed that the first four which he called the principal proximate determinants are responsible for fertility differentials between populations (8).

Each factor is considered as an inhibitor of fertility. Its fertility inhibiting effect is estimated by comparing fertility in the presence and in the absence of the inhibiting effect caused by the factor. Thus a population's actual level of fertility is measured by its total fertility rate (TFR) when the inhibiting effects of all proximate determinants are present. If the effect of celibacy (non-marriage) is removed, fertility rises to TM--total marital fertility rate. If the practice of contraception and abortion are removed, fertility rises further to TN--the total natural marital fertility rate. Finally, if the practice of lactation and postpartum abstinence is removed, fertility increases to TF--the total fecundity rate. Bongaarts has estimated TF to be approximately 15.3 for most populations (9).

The fertility impact of the four principal proximate variables are measured by four indices in the Bongaarts model. Each index takes a value between zero and one. It is equal to one if there is no fertility inhibiting effect, and equal to zero if fertility-inhibition is complete. A multiplicative model was derived to quantify the relationship between these four indices and the total fertility rate. The central equation of the model is:

$$TFR = Cm \times Cc \times Ca \times Ci \times TF \quad (1)$$

where TFR is the total fertility rate, Cm is the index of proportions married, Cc is the index of contraception, Ca is the index of abortion, and Ci is the index of postpartum infecundability. TF is the total fecundity rate and is usually assumed to be equal to 15.3. Each of the indices can be calculated as follows:

$$Cm = TFR/TM \quad (2)$$
$$Cc \times Ca = TM/TN \quad (3)$$
$$Ci = TN/TF \quad (4)$$

where the fertility rates are as previously defined.

However, in most applications, the indices are directly estimated from observed measures of intermediate fertility variables as follows:

$$C_m = \sum\left[\frac{m(a)g(a)}{\sum g(a)}\right] = \frac{TFR}{TM} \quad (5)$$

where: m(a) is age-specific proportions of women currently married (obtained from household data); g(a) is age-specific marital fertility rates obtained from the fertility schedules, (g(a) 15-19 is usually estimated as 0.75 x g(a) 20-24 (10).

$$Cc = 1 - [1.08 \times u \times e] \quad (6)$$

where u is the average proportion of married women currently using contraception, e is the average use-effectiveness of contraception. (1.08 is a correction factor to adjust for the fact that women do not use contraception if they know or believe that they are sterile).

$$Ca = \frac{TFR}{TFR + 0.4 \times TA \times (1+u)} \quad (7)$$

where TA is the total abortion rate. TA is usually assumed equal to one in most developing countries since reliable estimates of TA are not available.

$$Ci = \frac{20}{18.5 + i} \quad (8)$$

where i is the duration in months of the postpartum infecundability' period, defined for each woman as whichever is longer---amenorrhoea or abstinence.

These indices were estimated using data collected in a Bendel State study. The results are presented in the rest of the paper.

III. DATA SOURCES

The data base for this analysis of a survey conducted in Bendel State, Nigeria between March and October, 1985 (11). The objective of the study titled "Women's Status and Fertility in Bendel State" was to analyze the relationships between women's status variables and their fertility behaviour. A multi-stage sampling approach was adopted. Five major ethnic groups were the focus of the study--the Binis, Ishans, Bendel Ibos, Urhobos and the Itsekiris. One "urban" and two rural communities inhabited mainly by each ethnic group were selected. Thus there were five urban and ten rural centres included in the study. A household questionnaire was administered in each household. Women eligible for interview in each household were ever-married women 15-50 years of age. Altogether 1,713 households and 2,146 female questionnaires were analyzed.

The household questionnaire recorded demographic characteristics of household members such as sex, date of birth, age, education and marital status. The female questionnaire borrowed from the WFS core questionnaire and modules. Information was collected on the duration of breastfeeding, amenorrhoea and postpartum sexual abstinence for the last two live births immediately preceeding the interview. Only data for the next to last birth (closed birth interval) are analyzed in this paper. This is because the interview truncated the respondents' reproductive history and information on the open birth interval is thus incomplete. In particular, information on the open birth interval did not distinguish between women who were still breastfeeding, amenorrhoeic or abstaining and those who had stopped.

The results presented are likely to be influenced by the biases usually associated with retrospective data collection. Since women keep no records of the exact durations of postpartum variables, there is a tendency to approximate durations and report them in fractions of a year (e.g. a quarter, half, three-quarters) or at values such as 12, 18, or 24 months (12). Sometimes, landmarks in a child's physical development, such as when a child begins crawling, standing or walking are used to determine durations of postpartum variables. Thus in many studies there is a tendency towards heaping of durations of postpartum variables in multiples of 3 or 6 months (and of age in multiples of five years). Sometimes, however, cultural norms may prescribe durations of twelve or twenty-four months. Thus it is not always clear how much of the observed pattern is genuine and how much is due to digital preferences.

Information on contraceptive knowledge and use was also collected. Women were asked whether they had ever heard of a number of family planning

methods (before and after prompting). They were also aksed if they had ever used or were currently using any of the methods they had heard of. A birth history table provided information on children ever born by birth-order, year of birth age, sex, whether the child was alive or dead and cause of death if dead.

Data collected thus provides some basis for estimating the indices of proximate determinants defined earlier. The estimates are, however, likely to be sensitive to the small sample sizes, especially of subgroups, and in particular the estimates of total fertility rates which were based on age specific birth rates for 1984, the last complete year before the survey.

IV. EMPIRICAL FINDINGS

1. Nuptiality Patterns:

Age at Menarche

The majority of women in the sample had their first menstrual period between the ages of 10-14 years (69.8 per cent). Thirty-two women (1.5 per cent) had their first period between ages 9-10 years, 24.3 per cent between ages 11-12 years, 44.0 per cent between 13-14 years and 26.9 per cent between ages 15-16 years.

Age at Marriage

Majority of respondents (54.4 per cent) married between ages 15-19 years, most of them were married by age 24 years (94.4 per cent). Mean age at marriage was 17.99 years.

Duration of Marriage

Majority of respondents had been married ten years and more (73.6 per cent). An overwhelming majority (95.8 per cent) were in their first marriages, 3.4 per cent had been married twice, and 0.4 per cent thrice; 3.1 per cent had been separated or divorced while 1.1 per cent had been widowed.

Marriage Type

Majority of respondents were in monogamous marriages (55.5 per cent), 18.5 per cent were polygamous first wives, while 25.3 per cent were polygamous higher-order wives. The majority (74.3 per cent) were first wives of their husbands, 19.6 per cent were second wives while 3.8 per cent were third wives.

2. Fertility Levels:

Mean children ever born (CEB) was 4.66 children. CEB showed significant variations between ethnic groups (table not shown), it is highest among Binis and lowest among Itsekiris. It is generally higher among rural than among rural residents except among the Ishans and Itsekiris. This may be due to recall errors or under-reporting among dead children. Furthermore, mean desired family size was 6.93 children, there was little variation between ethnic groups or by rural-urban residence.

3. Proximate Determinants of Fertility:

Table 1 shows rural-urban and ethnic differences in postpartum variables.

Table 1

Mean Values of Proximate Variables by Rural-Urban Residence and Ethnic Group

Residence/ Ethnic Group	N	Mean Breat-Feeding	Mean Amen-orrhoea	Mean Absti-nence	Mean age at Marriage	% Heard FP	% Current Use FP
All	2129	11.1	8.4	8.0	18.0	46.9	15.0
Rural	1008	11.7	9.0	8.7	18.3	35.6	7.9
Urban	1121	10.6	7.9	7.3	17.7	57.5	21.7
Bini —All	341	10.1	7.3	6.3	17.7	34.4	13.7
Rural	145	10.4	8.9	6.8	17.3	–	–
Urban	196	9.9	6.0	5.8	17.9	–	–
Ishan—All	431	13.0	9.7	10.0	17.4	34.8	10.6
Rural	223	14.4	11.3	11.5	18.1	–	–
Urban	208	11.4	7.9	8.3	16.7	–	–
W.Ibo—All	321	12.7	10.5	9.5	18.9	81.0	21.5
Rural	139	12.8	10.6	11.3	19.7	–	–
Urban	182	12.5	10.5	8.0	18.3	–	–
Urhobo—All	605	10.9	8.1	7.2	18.0	38.9	12.2
Rural	255	12.3	7.7	7.0	18.4	–	–
Urban	350	9.8	8.4	7.4	17.7	–	–
Itsekiri—All	285	8.5	7.0	7.5	18.1	49.0	18.4
Rural	224	8.4	7.1	7.8	18.1	–	–
Urban	61	8.6	6.3	6.5	18.4	–	–
Others—All	161	11.1	7.3	7.4	18.2	65.2	21.7
Rural	31	11.7	7.7	8.9	18.4	–	–
Urban	130	11.0	7.3	6.9	18.1	–	–

Breastfeeding

Mean duration of breastfeeding for the whole sample was only 11 months. Only rural Ishans and rural Urhobos and Ibos have mean durations of up to one year. Results suggest that observed durations of breastfeeding in Bendel State are relatively short, shorter than among ethnic groups in other parts of Nigeria (13).

Amenorrhoea

Corresponding to relatively short periods of breastfeeding, duration of amenorrhoea is also short, averaging 8.4 months for the entire sample. Duration of amenorrhoea was longest among rural Ishans and Ibos.

Abstinence

Observed postpartum sexual abstinence is also of relatively short durations averaging only eight months. It is only among rural Ishans and rural Ibos that periods of up to ten months are observed. When asked the appropriate length of sexual abstinence to be observed after childbirth, 23.6 per cent approved durations of 1-3 months, 31.2 per cent approved 4-6 months, 18.8 per cent approved 7-9 months, 18.7 per cent approved 10-12 months. That is, 92.3 per cent approved abstinence periods of one year or less, which coincided with observed behaviour of the majority of the women. Data thus suggest that observed durations of sexual abstinence are traditionally short in Bendel State and may not necessarily reflect socio-economic status or levels of development.

Age at Marriage

Reported mean age at marriage is unexpectedly slightly lower for urban (17.7 years) than for rural (18.3 years) women. The higher rural age at marriage is accounted for by the Ishans, Ibos, Urhobos and other ethnic groups. However, given the higher levels of illiteracy in rural areas, this finding could be due to age misreporting (age at marriage was obtained by subtracting reported date of marriage from date of birth). Also differences in age at marriage appear to reflect differences in community practices (see appendix I).

Family Planning

Nearly half of the women (46.9 per cent) had heard of at least one family planning method, with greater proportions being aware of family planning in urban areas. Similarly, current use (and ever use) levels are higher in urban areas. Data suggest that knowledge and use levels are relatively high in Bendel State given the low national percentages reported by the Nigerian fertility survey report (14). Knowledge and use levels are lowest among the Binis, Ishans and Urhobos. The majority of users were using modern methods of contraception. Very few respondents identified abstinence as a contraceptive method.

Socio-economic Factors and Proximate Variables

Table 2 shows differentials in proximate variables by selected socio-economic variables. Results are similar to earlier findings in Nigeria (15).

Table 2

Proximate Variables and Socio-economic Factors

Socio-economic Variable N	N	Mean CEB 1968	Mean Breast-feeding (months) 1894	Mean Amenor-rhoea (months) 1894	Mean Abstin-ence (months) 1897	Mean Ageatal Marriage 2129	% Heard of FP 1968	% Current use FP 1968
Age								
15-19	49	1.1	9.5	7.2	7.1	15.9	61.2	16.3
20-24	239	2.2	9.4	7.6	7.4	17.2	58.8	15.8
25-29	443	3.6	10.2	7.6	6.9	17.8	50.7	13.9
30-34	410	5.0	10.8	8.0	7.8	17.4	46.6	15.8
35-39	392	5.6	11.4	8.7	8.1	18.7	45.7	16.8
40-44	267	5.8	12.1	9.0	8.2	18.2	43.3	14.4
45-49	259	6.1	12.5	9.5	9.8	19.1	44.0	14.3
Education								
None	720	5.2	12.9	9.2	8.5	17.7	31.3	9.9
Primary	994	4.6	10.9	8.6	8.2	17.9	48.6	11.0
Secondary	263	3.7	8.9	6.7	6.7	18.2	66.4	27.6
Tertiary	150	4.0	7.4	6.3	5.8	19.4	86.7	46.7
Labour Force Status								
NLF	145	3.8	10.2	6.9	6.9	18.3	61.6	15.8
Formal	222	4.1	8.3	7.0	5.9	19.2	77.5	38.1
Informal	1714	4.8	11.5	8.7	8.3	17.8	42.6	12.2
Income								
0 - 50	713	4.9	12.5	9.9	9.5	17.7	47.2	10.6
51 -100	563	4.6	11.1	7.6	7.4	17.5	37.2	10.9
101-200	375	4.4	9.9	7.7	6.8	18.8	59.9	22.8
201+	177	4.6	8.5	7.0	6.8	18.8	69.1	37.6
NLF	142	4.0	10.8	7.4	7.4	18.5	52.1	13.9
Marriage Type								
Mono-gamous	1190	4.9	11.2	8.4	7.8	17.9	56.3	18.1
Polyg-first	390	5.0	11.4	8.6	8.0	17.9	38.8	12.2
Polyg-others	523	3.9	10.8	8.4	8.5	18.2	34.0	10.7
Husband's Education								
None	558	4.9	12.5	9.0	9.0	18.1	28.3	10.4
Primary	822	4.8	11.5	8.8	8.3	17.9	49.3	10.2
Secondary	430	4.5	9.9	7.5	6.9	17.8	57.4	22.5
Polytechn	195	4.2	10.0	8.1	6.9	17.8	57.1	23.9
University	107	4.3	8.6	6.6	6.8	19.5	75.7	34.6

NLF - Not in the labour force.

As expected, mean durations of breastfeeding, sexual abstinence and amenorrhoea increase with age, while contraceptive knowledge and use decrease with age. Also the higher respondent's and husband's education, the shorter durations of postpartum variables, the higher age at marriage and the higher contraceptive knowledge and use levels. Furthermore, participants in modern sector employment observe shorter durations of breastfeeding and abstinence than those in the informal sector; they also marry at older ages, and have higher contraceptive knowledge and use levels. Higher income is also associated with shorted durations of postpartum variables, higher ages at marriage and greater contraceptive knowledge and use. Monogamy does not appear to have any significant relationship with postpartum variables, but monogamously married women have higher contraceptive knowledge and use levels than polygamously married women. Regression analysis showed education to be the most important variable influencing proximate determinants (15).

V. APPLICATION OF THE BONGAARTS MODEL

Tables 3-6 illustrate the application of the Bongaarts analytical framework to Bendel State. The model was applied to the entire sample, rural, urban and ethnic subgroups.

Table 3 presents estimates of TFR, TM and proximate determinants of fertility. TFR and TM are calculated using births to women in 1984.

Table 3

Estimates of TFR, and Indices of Proximate Determinants of Fertility

Subgroup	TM	TFR	Prevalence of contraception u	Use-effectiveness e	Postpartum infecundability i (mths)
All	8.77	5.66	0.149	0.847	9.89
Rural	10.03	5.70	0.086	0.869	10.34
Urban	8.03	5.60	0.208	0.842	9.45
Ethnic Group					
Bini	7.85	5.02	0.127	0.819	8.40
Tshan	8.30	5.08	0.104	0.898	11.49
Ibos	10.65	6.82	0.202	0.766	12.43
Urhobos	9.78	6.76	0.133	0.855	9.09
Itsekiris	6.27	4.00	0.201	0.892	8.64
Others	8.53	6.15	0.192	0.870	8.94

Table 3 shows that marital fertility rates were high in 1984. Urban women had slightly lower fertility rates than rural women. Among ethnic groups, the Itsekiris had the lowest fertility rates, while the Ibos had the highest TFR.

The prevalence of contraception (u) also varies between subgroups. It is higher among urban than rural women as expected. Usage is lowest among Ishans and Binis. Use-effectiveness levels (e) are high because most of the women claim to be using modern contraceptive methods, mainly the pill which can be bought over the counter in drug stores, and to a lesser extent the IUD. The weights used for use-effectiveness are the same as those used in analysing the Nigerian Fertility Survey data (17). Furthermore, the postpartum infencundable period (i) is also generally short for the subgroups; it is longest among Ibos and Ishans and lowest among Binis and Itsekiris.

Table 4 shows estimates of the indices of proximate determinants.

Table 4

Estimates of Indices of Proximate Determinants And Model Estimate of TFR

Subgroup	Cm	Cc	Ca	Ci	TFR
All	0.65	0.86	1.0	0.70	5.99
Rural	0.57	0.92	1.0	0.69	5.54
Urban	0.70	0.81	1.0	0.72	6.25
Ethic Group					
Bini	0.64	0.89	1.0	0.74	6.45
Ishan	0.61	0.90	1.0	0.67	5.63
Ibos	0.64	0.83	1.0	0.65	5.82
Urhobos	0.69	0.88	1.0	0.73	6.78
Itsekiris	0.64	0.81	1.0	0.74	5.87
Others	0.72	0.82	1.0	0.73	6.59

Index of Proportions Married, Cm

The index of proportions married is unexpectedly low, unusually low in the rural ares (the low rural proportion is accounted for by three communities with values for Cm of 0.46 (Illeh), 0.56 (Egba) and 0.61 (Ugbokhare) respectively. (Table not shown). The proportions of currently married female household members in age group 15-19 years were much lower than expected, probably because many in this age group are at school. (Female school attendance rates in Bendel State are relatively high, especially since 1979 when schools were opened in almost every village in Bendel State). However,

it could also be due to reporting errors, that is, reporting all children as living in the household.

Index of Contraception, Cc

There is a slight variation in the index of contraception between groups, it has the highest inhibiting effect among the Itsekiris and the lowest among the Ishans.

Index of Abortion, Ca

This has been assumed to be equal to 1.0 for each subgroup in the absence of reliable data (as in other developing countries).

Index of Postpartum Infecundability, Ci

There is little variation in Ci, the index of postpartum infecundability. It has the greatest inhibiting effect among the Ishans and Ibos who observe the longest reported durations of breatsfeeding and abstinence in the study. There is only a slight difference between urban and rural areas.

From these indices, the total natural marital fertility rate, TN, the total marital fertility rate, TM and the total fertility rate, TFR, can be calculated in Section II under the assumption that TF is 15.3. The results are presented in Table 5.

Table 5

Model Estimates of TN, TMFR, and TFR
From Proximate Determinants

	TF	TN	TM	TFR
All	15.3	10.71	9.21	5.99
Rural	15.3	10.56	9.71	5.54
Urban	15.3	11.02	8.92	6.25
Ethic Group				
Bini	15.3	11.32	10.08	6.45
Ishan	15.3	10.25	9.23	5.63
Ibo	15.3	9.95	8.25	5.28
Urhobos	15.3	11.17	9.83	6.78
Itsekiris	15.3	11.32	9.17	5.87
Others	15.3	11.17	9.16	6.59

$$TN = TF \times Ci$$
$$TMR = TN \times Ca \times Cc$$
$$TFR = TM \times Cm$$

Total Natural Marital Fertility Rate, TN

Postpartum abstinence produces a reduction in the natural fertility level, with TN varying from 9.95 among the Ibos (with the highest i) to 11.32 among the Itsekiris and Binis (with the lowest i). The reduction in fertility varies from 3.98 to 5.35 births among ethnic groups, a reduction of 4.74 births in rural and 4.28 in urban areas.

Total Marital Fertility Rate, TM

The difference between TM and TN is fairly modest given the relatively low levels of contraceptive use. It leads to a further reduction of 2.1 births in urban and 0.75 births in rural areas. Among ethnic groups, the highest reduction is among the Itsekiris, with a reduction of 2.15 births as against 1.24 births among the Binis, 1.02 births among the Ishans and 1.70 births among the Ibos.

Total Fertility Rate, TFR

This combines the impact of all the proximate fertility variables. Fertility (estimated by the model) is higher among urban than rural women, and highest among Binis and Urhobos when all proximate determinants are accounted for. The index of marriage Cm has a strong effect reducing TFR in rural areas below urban fertility rates.

The figures above are estimates derived from the model. Observed TFR and TM are shown in Table 3. A comparison of estimated TFR with observed TFR shows overestimation in TFR for urban women (0.65 births) and for Binis and Itsekiris of over one birth, and an under-estimation for Ibo women. The Spearman's rank correlation coefficient between observed and estimated TFR for ethnic groups was estimated (18). The results show poor correlation between observed and estimated TFR. This could be due to factors such as small sample sizes for ethnic groups, under-reporting of births especially of deaths, rounding up of durations of breastfeeding and postpartum sexual abstinence, unusually high/low fertility in 1984 or the assumption of a TF of 15.3 for all subgroups.

Total Fecundity Rate, TF

Table 6 shows estimation of total fecundity rate for all groups using equation.

$$TF = \frac{TFR \times Ca \times Cc \times Ci}{Cm} \qquad (9)$$

The expected range of TF varies from slightly below 13 to a little over 17 births per woman in most populations (Bongaarts, 1978). It should be noted, however, that the equations defined earlier produce only approximate values for TF, TN, TM and TFR because they assume that TF is fixed at 15.3.

Table 6

Estimates of Total Fecundity Rate From Observed TFR and Estimates of Proximate Determinants

Subgroups	Cm x Ci x CC x Ca	TFR	TF
All	0.39	5.66	14.51
Rural	0.36	5.70	15.83
Urban	0.41	5.60	13.66
Ethnic Group:			
Binis	0.42	5.02	11.95
Ishan	0.37	5.08	13.73
Ibo	0.35	6.82	19.48
Urhobo	0.44	6.76	15.36
Itsekiri	0.38	4.00	10.53
Others	0.43	6.15	14.30

$$TF = \frac{TFR \times Ci \times Cc \times Ca}{Cm}$$

From table 6 it can be seen that most of the subgroups are within the expected approximate range for TF, except for the Binis, Itsekiris and Ibos. The estimates suggest that the Binis and the Itsekiris are less fecund than other subgroups, while the Ibos are exceptionally fecund. The low TF value for the Binis is accounted for by the Utekon community with an estimated TF of 8.38 (see appendix I). This could be due to misreporting of births or of proximate determinant variables. Among Itsekiris, the low TF is accounted for by the Koko community where observed TFRs, CEBs and TM are among the lowest observed for all communities. The very high TF for Ibos is accounted for by Agbor and Idumuogo, despite the relatively high reported levels of contraceptive use and long durations of postpartum variables. It is however possible that they are more fecund than other subgroups, or that reported fertility for 1984 is exceptional.

According to Bongaarts (19), variations in fertility not explained by the four principal proximate determinants could be due to various factors such as: errors in the measurement of the proximate determinants, errors in model specification (omission of important factors or stochastic covariance among factors), deviations of TF from 15.3, errors in observed TFRs, the assumption of absence of abortion, and the assumption that all births are legitimate. A combination of all or some of these factors could be responsible for the discrepancies in the results presented. Only births to ever-married women were recorded. Also, there could have been under-reporting of births, especially of dead children, age heaping, and misreporting of durations of

postpartum variables. It could also be due to differences in the secondary proximate determinants subsumed in the value of TF. The results could also have been sensitive to sample size, leading to measurement errors in the proximate determinants and in TFR. It could also be due to timing mismatch of some of the variables. For example, Cm and Cc are current status variables as at the time of the survey (1985), TFR measures births in 1984, while Ci measures retrospective postpartum behaviour (of different years for different women).

While the findings suggest that the Bongaarts model will yield better results when applied to large samples, the analysis has shown that differences in proximate determinants help to explain some of the observed fertility differentials among women in the sample. Thus the near quality of fertility rates in urban and rural centres is arrived at through different combinations of proximate indices. Observed rural fertility is due to slightly longer durations of postpartum variables, lower contraceptive use and low levels of proportions married in the younger age groups. Urban women achieve almost the same fertility as rural women through shorter durations of postpartum variables, higher contraceptive use and slightly higher proportions married among women.

VI. SUMMARY AND CONCLUSIONS

This paper has tried to explore the contribution of proximate determinants to fertility differentials in Bendel State of Nigeria. The results of the analysis are summarized below:

1) Almost all women breastfeed their children, durations varied by ethnic group and was generally longer in rural than in urban areas.

2) Durations of breastfeeding, amenorrhoea and postpartum sexual abstinence are relatively short compared with reported durations in some other parts of Nigeria and Africa (20). It is not clear from this study to what extent observed patterns conform to traditional norms or are a result of erosion of traditional norms. However, durations varied between communities.

3) Postpartum variables varied with socio-economic factors. Thus higher education, urban residence, participation in modern sector employment and higher incomes are associated with shorter durations of breastfeeding, amenorrhoea and postpartum sexual abstinence and greater use of contraception. Modernization allows persons to substitute contraception for traditional means of spacing births.

4) Proximate variables help to explain observed fertility differentials between the subgroups analyzed. It has been shown that longer durations of postpartum non-susceptible periods can inhibit fertility. It is likely that with rising education and increasing urbanisation, the relatively short postpartum non-susceptibility period will grow ever shorter. There is thus a

potential for even higher marital fertility rates if levels of contraceptive use do not rise substantially to compensate for shorter postpartum non-susceptible periods. Bongaarts (21) has estimated that a population with contraceptive prevalence of 10 per cent and postpartum non-susceptible period of twelve months has a TM of 9.0. Contraceptive prevalence would have to rise to at least 20 per cent if the postpartum period falls to 9 months and total marital fertility rate is not to increase, and it would have to increase to 30 per cent if the postpartum period is reduced to 6 months.

What policy implications do these findings have ? Given the already short durations of postpartum variables and low contraceptive use levels, there is a need for vigorous promotion of contraceptive information and services to improve knowledge about contraception among wives and their husbands. In the sample, only 39.48 per cent of women and 22.7 per cent of husbands approved of family planning. Reasons given by women for disapproval include: desire for many children (24.3 per cent), alleged risk associated with family planning (15.1 per cent), dislike of the idea by husband or respondent (17.7 per cent), immoral/unAfrican (11.6 per cent) and ignorance (11.6 per cent). Similar reasons were given for nonuse of family planning. There is thus a need for a more active family planning education information programme for Nigerian families.

Secondly, the pronatalist attitude of Nigerian women is a contributory factor to low contraceptive usage. In the study, 71.2 per cent of respondents and 75.4 per cent of husbands wanted more children at all ages, and desired family size was also high. There is thus a need to explain the benefits of smaller families to Nigerias.

Finally, given the impact of education on fertility and proximate variables, CEB, age at marriage, durations of postpartum variables, contraceptive knowledge and use, there is a need to promote female education, especially at higher levels. It is therefore encouraging that in Bendel State, higher proportions of females are enrolled at school in recent years.

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FOOTNOTES

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9. J. Bongaarts (1978) in fn. 7.

10. J. Bongaarts (1978) in fn. 7

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15. R. Lestaeghe, H. Page and O. Adegbola, "Childspacing and Fertility in Lagos", in H. Page and R. Lestaeghe (eds), Child-spacing in Tropical Africa, (1981), pp. 147-179. See also G. Santow, and M. Bracher, "Patterns of Postpartum Sexual Abstinence and Their implications for Fertility in Ibadan, Nigeria", in H. Page and R. Lestaeghe (eds), Childspacing in Tropical Africa, (1981), pp. 201-219.

16. C.E.E. Okojie, in fn. 11, Volume II

17. O. Adegbola, in fn. 6.

18. Estimated Spearman's Rank Correlation Coefficient for the relationship between observed and calculated TFR was 0.143 showing very poor correlation between observed and estimated figures.

19. J. Bongaarts, (1978) in fn. 7.

20. R. Lestaeghe in fn. 1. See also H. Renan and A.K. Audu, "Breast-feeding and Abstinence Among Hausa Women", Studies in Family Planning, 12 (May, 1981), pp. 233-237, and G. Oni, "Effects of Women's Education on Postpartum Practices and Fertility in Urban Nigeria, Studies in Family Planning, 16, (Nov/Dec. 1985), pp. 321-331

21. J. Bongaarts, (1981), in fn. 7.

Appendix

Proximate Variables by Community

Community	N	Mean CEB	Mean DFS	Mean Breast-feeding	Mean Amenor-rhoea	Mean Abstin-ence	Mean Age at Marriage	% Heard FP	% Current Use FP
•Benin City	274	4.55	6.6	9.6	5.7	5.6	18.1	52.1	19.8
Utekon	90	5.34	5.7	8.6	8.3	7.9	17.2	4.8	1.2
Egba	63	6.57	6.3	13.2	10.4	5.2	18.1	25.0	13.0
•Irrua	197	5.14	7.8	12.1	8.3	8.8	16.5	35.7	19.3
Ugbokhare	118	4.03	7.3	12.2	9.2	9.6	18.4	39.6	2.0
Illeh	103	5.70	8.0	16.6	13.5	14.0	17.6	23.2	4.0
•Agbor	176	5.11	6.7	13.3	11.3	8.5	18.0	91.2	38.2
Ekwuoma	72	5.24	7.6	9.8	7.6	8.7	20.8	86.5	5.0
Idumuogo	66	5.83	6.7	16.2	14.1	14.6	18.4	66.0	6.0
•Orerolipe	248	4.42	7.1	10.1	8.9	7.7	17.7	38.0	14.5
Ovu-Inland	98	4.33	7.1	12.1	9.8	7.9	18.0	29.0	2.1
Aladja	116	4.28	7.9	14.6	5.8	5.4	18.7	32.6	12.5
•Warri	232	4.24	6.5	9.0	6.8	6.5	18.1	77.3	21.1
Koko	150	3.98	6.1	8.2	8.0	8.7	17.5	36.2	7.9
Abe-Ugborodo	137	3.72	7.2	8.7	6.2	7.0	18.9	31.3	20.3

• Urban