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Female Labor Force Participation and Fertility in Nigeria: a Study of Lagos.

Amon Okechukwu Okpala
Louisiana State University and Agricultural & Mechanical College

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The Louisiana State University and Agricultural and Mechanical Col. PH.D. 1984

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FEMALE LABOR FORCE PARTICIPATION AND FERTILITY IN NIGERIA: A STUDY OF LAGOS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Economics

by
Amon Okechukwu Okpala
B.A., Western Kentucky University, 1978
M.A., Western Kentucky University, 1979
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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

LIST OF FIGURES

LIST OF ABBREVIATIONS

I. Theoretical Variables

N = number of children
Q = child quality
C = child services produced and consumed
G = amount of non-child related activities produced and consumed
Y_m = husband's income
Y_f = wife's income
ω = female wage rate
V = household's nonlabor income
Y = total family income
k_1 = index of actions relating to wife's labor market status; $k_1 = 1,2,\ldots,\bar{k}_1$
k_2 = index of actions relating to proportion of wife's nonlabor market time devoted to children; $k_2 = 1,2,\ldots,\bar{k}_2$
k_3 = index of actions relating to proportion of total resources spent on children; $k_3 = 1,2,\ldots,\bar{k}_3$
k = vector of controls; $k = \{k_1, k_2, k_3\}$
$\gamma_L(k_1)$ = parameter relating to wife's labor market participation
$\gamma_q(k_2)$ = proportion of wife's nonlabor market time devoted to children
$\alpha_q(k_3)$ = proportion of total resources spent on children
$h_q(k)$ = number of hours housewife spends on children
$h_g(k)$ = number of hours housewife spends on other household production activities
$X_q(k)$ = amount of goods and services spent on children
$X_g(k)$ = amount of real market goods and services spent on other household production and consumption activities

II. Empirical Variables

Fertility

CEB = children ever born
IFS = ideal family size

FLFP

FLFP = female labor force participation
PWYW = percentage of wife's years worked since marriage
PHDW = percentage of hours of daily work
HDW = hours of daily work

Economic

YH = husband's actual income
YW = wife's actual income
WPI = wife's potential income

Demographic

DMR = duration of marriage
WAM = age at marriage
AGE = wife's age

Background

EW = education of wife
EH = education of husband
EUC = ever used contraceptives
BSH = baby-sitting help from a relative
PBS = paid baby-sitter
MORT = mortality rate.

ABSTRACT

Much attention has been given to the relation between population growth and economic development, and one important aspect of this question is the link between fertility and female labor force participation. Variations in the female labor force participation and fertility relationships have been explained by the maternal role incompatibility hypothesis, which states that an inverse relationship occurs between women's work and fertility only when the roles of worker and mother conflict.

Substantial amount of empirical studies done have supported this hypothesis. This hypothesis implies that a negative relationship between female employment and fertility will depend on the degree that they are competing uses of time. If female employment and fertility are not competing uses of time, one will expect no relationship, or even a positive relation may exist. This hypothesis forms the central issue of this study.

The primary purpose of this dissertation is to examine the relationship that exists between female employment and fertility in Lagos. Some other important issues were addressed, such as, the questions of the role of child-care help on female employment and the effects of some economic and demographic variables on fertility.

The questionnaire utilized in this study categorized female employment into three groups: women employed in the civil service

sector, those that are self-employed and the housewives. Of these three categories, it is expected that the fertility levels for the civil servants will be lower than the rest. This is mainly because the work organization of civil servants is quite formal. For the self-employed, one will expect their fertility levels to be similar to those of housewives.

The results from the regression analysis do support the incompatibility hypothesis. A negative and significant relationship was observed when all the respondents were regressed together. The results do show that as the respondents were grouped according to the economic activities they performed and the level of their work intensity, some measures of incompatibility became better than others.

CHAPTER I

INTRODUCTION

> The Industrial Revolution appeared to dispel gloomy Malthusian predictions regarding people and poverty. Men have had faith ever since that technological progress and economic development could somehow force a finite earth to sustain a growing mass of people. Until recently, that faith seemed justified. Now, as population growth continues unbridled throughout much of the world, many experts have concluded that a new technology alone is not enough to thwart the world's deomgraphic demon..."
> David Kiefer, Chemical & Engineering News, 1968.

Malthus and his followers were the first to state their concern about population growth. His pessimistic predictions failed to match actual experience of his time. During and after his time, Europe and North America prospered instead of sinking deeper into poverty. Population growth was equated instead with economic development and strength. Anyone that looked with dismay at the rapidly expanding populations of Europe and North America was labeled a prophet of doom, who was out of step with the prevailing beliefs in the infallibility of human progress.[1] In view of that, few people worried about population growth.

During the same time period, non-Western parts of the world were living very poorly and their death rates were so high that population growth seemed no immediate threat. Coupled with this was the fact that life expectancy for people living in the under-

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[1]Kiefer, D. M., "Population: Technology's desperate race with fertility." Chemical & Engineering News. Vol. 46, Oct. 7, 1968, p. 121.

developed world prior to World War II was relatively low. As a result, a large family seemed highly desirable.

Following the Second World War, technological developments that had evolved slowly over several decades in Europe and North America were quickly introduced into the Third World. Modern medical and sanitation practices spread rapidly. Some of these new methods were adopted quite widely. The advances in nutrition and public health that lowered death rates in the industrialized world were followed by industrialization, urbanization and increased education. Consequently, birth rates declined along with the introduction of technological developments. In the Third World, these advances fell on a society that was largely illiterate, agriculturally-based tradition-bound, and that favored high birth rates. The advances in nutrition and public health which were introduced to aid in prolonging life in the Third World seemed to have aided greatly in increasing the numbers of people living in poverty and hunger.

Rapid population growth is especially critical with regard to the less developed countries because they are the countries least able to afford the massive increases in their population. Increasing population growth tends to cancel out increases in aggregate output, thereby keeping the low average income levels stagnant. Most less developed countries fall into this category.

Like most less developed countries or developing countries, Nigeria's major source of revenues is from her exports of minerals. For Nigeria, revenue comes mainly from her oil exports. Due to the

big revenue accruing to the government from the oil industry, successive governments have introduced more ambitious Development Plans since 1962 in order to internalize the benefits of these resources. Thus, the development plans that followed the initial receipts of the oil revenue had increased at a colossal rate. The Third Development Plan (1975-1980), for example was about 10 times the size of the Second Plan (1970-1975), and the Second Plan was about 22 times the size of the First Plan (1962-1968).[2] These massive Development Plans could not have arisen but for the oil industry. The question then is why have these massive Development Plans not yet been reflected in the general living conditions of most Nigerians? Instead of an even increase in the standard of living, the income gap has increased during the past two decades, leaving a greater percentage of people living at relatively low levels of income. The income per capita[3] is merely 560 U.S. dollars. Part of the answer to this surprising phenomenon in Nigeria may be due to the rate of population growth. In the past two decades Nigeria's population has increased at a high rate. This may be due to the past and currently high fertility rates, and low child and infant mortality rates.

Most research on fertility and population growth has been

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[2]Nwankwo, G. D. Prof., "The Place of the Petroleum Industry in Nigeria's Economy." Bullion: News from the Central Bank of Nigeria, Oct./Dec., 1982, p. 43.

[3]The author realizes and agrees with some criticisms that have been leveled at the inadequacy of GNP as a measure of a society's well being; but to avoid complicating matters, I ignore that here. For more information, read, "Toward a Steady-State Economy," edited by Herman Daly, pp. 24-26.

carried out in the framework of the demographic transition theory.[4] The demographic transition theory was developed from the demographic history of Western Europe as they experienced the Industrial Revolution. The theory is based on the premise that there is a general pattern of transition from a state of high birth and death rates to a state of low birth and death rates. When the theory was first developed, it was assumed that in the initial stage nations were characterized by high birth and death rates, thereby resulting in a relatively stable population size. As industrialization and urbanization occurred, changes in fertility and mortality occurred. During the transitional stage of industrialization, the death rates fell while fertility rates were still high, resulting in rapid population growth. When these nations were completely industrialized and fully urbanized, the birth rates declined to the level of the death rates resulting in a stable slow growth rate finally.

Some have challenged the assumptions of the demographic transition theory in light of the recent investigation of the historical experience of Western Europe. Evidence seems to indicate that the decline in mortality does not always precede the decline in fertility.[5] Dr. Caldwell, on the other hand, pointed out that there is a persistent strain in demographic theory writings that claim that

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[4]Hawthorn, G., The Sociology of Fertility. London: The Macmillan Company, 1970.

[5]Coale, A. J., "The Demographic Transition Reconsidered," in Intl. Population Conference, Litge: 1973 IUSSP Vol. 1, p. 60.

rationality comes only with industrial, urban society.[6] On the issue of rationality, Caldwell felt that the criteria employed are highly foreign to the less developed world. "What demographic transition theory has always regarded as rational are primarily on Western social ends with economically logical steps to maximize satisfactions, given those ends."[7] On the general assumptions of the demographic transition theory, Caldwell believes that the fertility decline in the Third World is not dependent on the spread of industrialization or even on the rate of economic development; rather, it will be affected by such development in which modernization produces more money for schools, for newspapers, etc. In such a situation, fertility decline will be more likely to precede industrialization and help bring it about than to follow it.[8]

Nevertheless, demographic transition theory has played and will continue to play a valuable role as a guide in fertility and mortality studies. Perhaps it is not merely a historical accident that the period of emergence from the demographic transition coincided with the emergence from underdevelopment in Western countries. It may well be that the changes that led to economic development were also those that made birth rates fall to a level that were consistent with reduced mortality rates.

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[6]Caldwell, J. D., "A Restatement of Demographic Transition Theory," Population & Development Review, 2 No. 3 & 4, Sept. & Dec., 1976, p. 324.

[7]Ibid., p. 327.

[8]Ibid., p. 358.

Whichever line of argument one chooses to pursue, the important thing is that more studies are still called for which will aid in a better understanding of the interrelations between demographic and economic transitions. Hence, the specific objectives of this study, include:

(i) a theoretical derivation and estimation of how female labor force participation affects fertility in Lagos;

(ii) an analysis of the role-incompatibility theory with respect to three kinds of roles performed by married females in Lagos; and

(iii) an analysis of the impact of child-care on female employment.

The framework for the analysis of this study will be based on the new home economics framework. The economic theory of fertility (Becker, 1960; Willis, 1973) asserts that parents desire children for the benefits they generate: "child services." Additional child services can be obtained extensively by having additional children or intensively by devoting additional resources to the upbringing of existing children and thereby raising child-quality levels.

This study utilizes a sample of about 600 married females from Lagos. Information on the demographic and economic characteristics of these women were obtained from the questionnaires distributed. Care was taken to see that the questionnaire should embody Nigerian concepts rather than a translation of foreign concepts. The major part of this study relies heavily on this survey. Some part of the study utilizes some secondary data. The secondary data will be obtained from the information reported by the Nigerian Manpower

Board of Federal Ministry of National Planning and the report of the urban household surveys undertaken by the Nigeria Federal Office of Statistics.

The plan of the study will be as follows:

Chapter II presents an overview of trends in fertility, mortality, age at marriage and labor force participation in Nigeria. The discussion includes the pattern of migration in Nigeria and factors that motivated the movement of Nigerians from rural to urban areas. The labor force participation rates of males and females are examined in a historical perspective. This chapter also contains a brief review of literature on population growth and fertility.

A theoretical derivation and estimation of the models will be included in Chapter III. Also a detailed descriptive analysis of my survey results will be done there.

Chapter IV examines the role-incompatibility theory with respect to the three kinds of roles performed by married females in Lagos. The estimation techniques employed here are ordinary least square regression analysis, multiple classification analysis, and two stage least squares analysis.

Chapter V analyzes the impact of child care on female employment. I will examine the influence of family composition on the employment of mothers.

The final chapter includes the conclusions and the discussion of the limitations of the study.

CHAPTER II

OVERVIEW OF TRENDS IN FERTILITY AND LABOR FORCE PARTICIPATION IN NIGERIA

Although it is quite clear that the Nigerian population is large and growing fast, any discussion of the actual size and growth rate must be approached with considerable caution because the quality of existing demographic information is limited.[9] Accepting the last census of 1963 will imply that Nigeria's population grew from 16 million in 1911 to about 56 million in 1963. If the 1952 census and the 1973 provisional estimates of 79.8 million are accepted, then the annual population growth was 6.2 per cent between 1952 and 1963, and 3.6 per cent between 1963 and 1973.[10] The reason for such a high population growth rate of 6.2 per cent may be due to the significance of the 1950s to Nigeria's historical development. It was the beginning of an era of political and economic awareness. The emerging political elite started seeking the independence of the nation. Increased schooling began to be emphasized coupled with the adoption of sanitary and hygenic habits

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[9] Fapohunda, E. R., "Population, Labour Utilization and Manpower Development," in Structure of Nigerian Economy edited by F. A. Olaloku et al, New York: St. Martins Press, 1979, p. 102.

[10] Mott, F. L. and Olanrewaju L. Fapolunda, The Population of Nigeria, Lagos: Human Resources Research Unit, 1975, p. 2:

A population growth rate of 6.2% appears quite high. This result is not inconsistent with findings of some who also found that Nigeria's population growth rate is relatively high. T. M. Yesufu, "The Politics and Economic of Nigeria's Population Census" in J. C Caldwell & C. Okonjo, The Population of Tropical Africa, New York: Columbia Univ. Press, 1968, pp. 108-16.

which were initiated to aid in combating infectious and contagious diseases. These initial indicators of modernization might have aided in escalating the population growth rate of Nigeria during the 1952-1963 period. This period adequately falls into the beginning of the early stage of the demographic transition of Nigeria; and such periods are expected to be marked with high birth rates and a falling infant mortality rate.

Table 2.1 shows the 1963 census figures distributed over the original political areas. Among the five regions, Lagos showed the

TABLE 2.1

1963 POPULATION OF NIGERIA BY REGIONS

Region	Areas in Sq. Km.	Population	Persons per Sq. Km.
Northern	729,815	29,808,658	41
Eastern	76,364	12,394,464	162
Western	78,876	10,265,848	130
Mid-Western	38,648	2,535,839	66
Lagos	70	665,246	9,504
	923,773	55,670,055	60

Source: Census of Nigeria, 1963 (Lagos Federal Office of Statistics)

highest density with about 9,504 persons per square Km. The Northern region, on the other hand, had the lowest density of 41 persons per square Km. The classification of the 1963 census figures into age-groups is shown in table 2.2. There are more men than women on the average. The overall sex-ratio for Nigeria is 1,020, i.e., 1,020 males per 1,000 females. But between the ages of 15 and 35

TABLE 2.2

THE 1963 POPULATION BY FIVE-YEAR AGE-GROUP AND SEX

Age-Group Years	Total (Thousand)	% of Total Population	Males (Thousands)	Females (Thousands)
0-4	9,549	17.2	4,710	4,839
5-9	8,439	15.2	4,361	4,078
10-14	5,937	10.7	3,255	2,682
15-19	5,251	9.4	2,501	2,750
20-24	6,923	12.4	3,154	3,769
25-29	5,571	10.0	2,606	2,964
30-34	4,326	7.8	2,111	2,215
35-39	2,478	4.5	1,340	1,138
40-44	2,410	4.3	1,309	1,101
45-49	1,168	2.1	682	486
50-54	1,217	2.2	683	534
55-59	463	0.8	277	186
60-64	786	1.4	447	339
65 & Over	1,151	2.0	675	476
	55,670	100.0	28,112	27,558

Note: Figures may not add up to totals because of rounding-off.

Souce: Census of Nigeria, 1963 (Lagos: Fed. Office of Statistics).

the number of females in each five-year age-group exceeds the number of males. At age 35 and over, men consistently out-number women at each five-year age-group. This surprising phenomenon originated from the rural areas where the demographic sample survey showed that mortality was higher among females at ages 20 and above. Mr. Umoh pointed out that high mortality during pregnancy and at childbirth accounted for the excess of males over females at the older ages (Umoh, 1972). A large percentage of the population consists of children below 15 years of age: a little over 43 per cent of the population. This is due to the high fertility rate and a declining mortality rate of the past decades. This segment of the population has been on the rise since 1931; it rose from 37.92 per cent in 1931 to 44.65 per cent in 1963. In addition, in 1963, roughly 2 per cent of the population were over 65 years; therefore, resulting in a large 47 per cent of the Nigerian population dependent on the economically active age group. As long as the fertility levels remain high, the prospect will be that the proportion of the population who are children will remain high, at over 40 per cent.

Fertility Level and Differentials

Birth and death registration is very rare in developing countries. Where birth and death registration is practiced to some extent, it is usually so incomplete as to be useless (Sembajwe, 1981). Until registration is improved demographic studies have to rely on data from censuses and surveys. Even census figures may not be all that reliable; its reliability varies from country to

country. In Nigeria, the link between population numbers and political power have led to the inflation of the results of several censuses. (Sembajwe 1981)

Usually two kinds of information are collected on fertility. One kind gathered easily is that on the number of children ever born alive. Although the data from this kind of information are not usually affected by problems arising from the reference period, they are affected by a number of errors. El-Badry (1965) discusses four major groups of errors associated with this. According to him, errors may arise due to the misunderstanding of the question. This may lead the respondents to give only the number of children who are alive excluding the dead ones. Respondents may also overlook children not residing with the mother or children from other marriages.

Secondly, errors may arise due to memory lapse. Even if the question is well understood, some mothers, especially the elderly tend to forget to include some of their children who have died and some mothers tend to forget to report very young living children.

Thirdly, errors arise because the interviewers fail to reach eligible respondents.

Finally, El-Badry notes that error may arise if interviewers fail to make a correct entry for childless women, i.e., the interviewers may fail to record a "zero", leaving the space blank or filling it with a different mark.

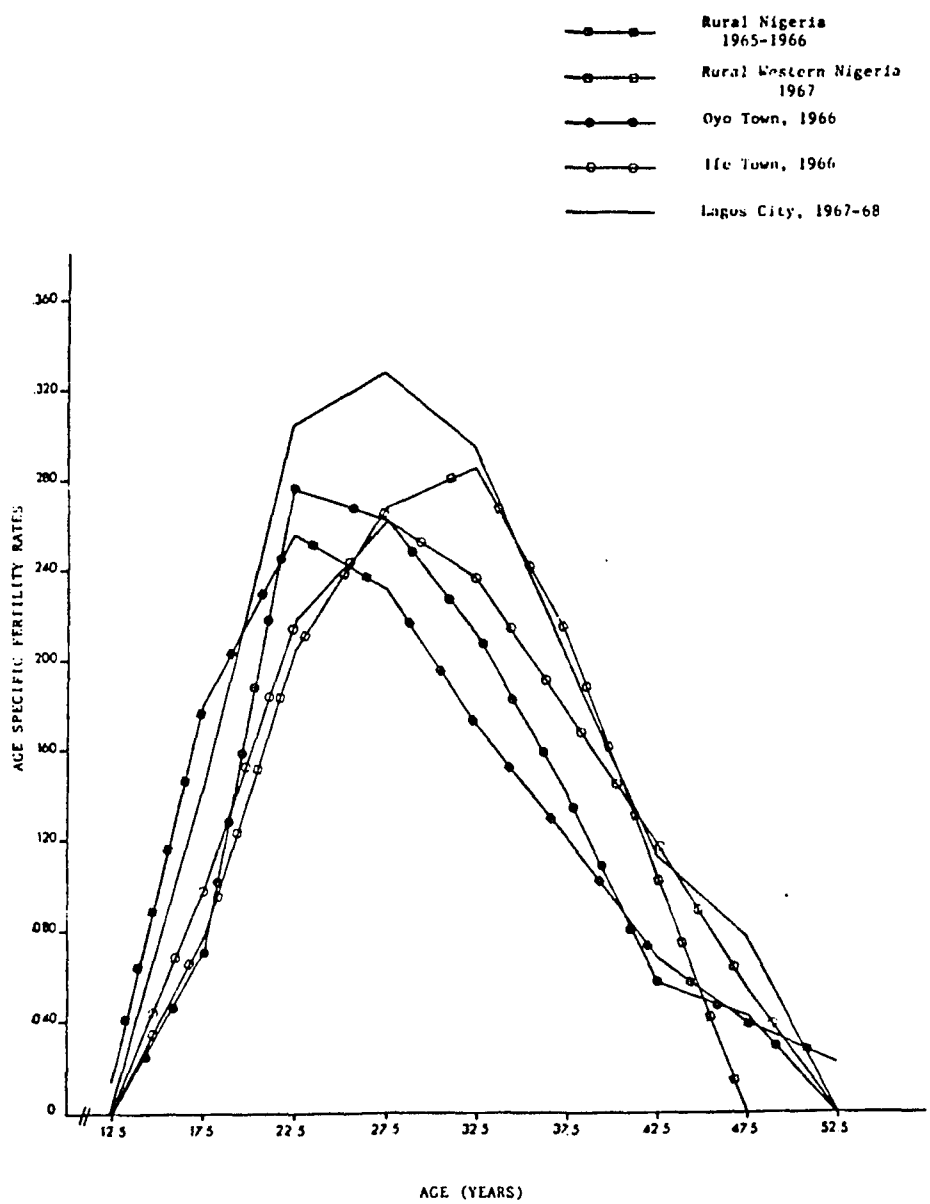
Another kind of fertility information collected is that on children born during a given period, usually the twelve months preceding the survey. This second type of information of fertility

is very useful in measuring the current fertility level, but it often suffers from misunderstanding of the reference period. When the interviewers find it difficult to fix the reference period correctly, mostly to illiterate respondents, the data from such information may be useless.

In a comprehensive study on fertility and infant mortality and child mortality among Yoruba women, Sembajwe (1981) found that the fertility of Yoruba women or of women in areas dominated by Yoruba women who are in the 15-19 age group are usually at a much lower level than that of women from other parts of Nigeria. This is because women from the Northern and Eastern parts of Nigeria marry at a relatively earlier age. This fact is well illustrated in figure 2.1. The figure 2.1 shows that when the curves for rural Western Nigeria, Oyo town, Ife town, and Lagos City (predominantly Yoruba areas) are compared with the curve representing the whole of rural Nigeria, the gap is noticeable around the 15-19 age group. There is a wider gap between rural Western Nigeria and rural Nigeria for the age groups 15-19, and 20-24. For rural Nigeria, the curve tapers off abruptly from age group 20-24 to age group 40-44, and declines gradually thereafter to age group 50-54. On the other hand, the curve for rural Western Nigeria continues to rise and peak in age group 30-34 before it starts an abrupt decline which zeros out in age group 45-49. Sembajwe (1981) stressed that this abrupt decline in fertility among the rural Western Nigerian women when they reach the age group of 45-49 is due to the terminal abstinence practiced by most Yoruba women as they reach the age of 40.

Figure 2.1.

AGE SPECIFIC FERTILITY RATES FOR SELECTED AREAS IN NIGERIA



Sources: F.O.S., Rural Demographic Sample Survey, 1965-1966. (Lagos, 1968)

R. W. Morgan and V. Kanisto, "A Population Dynamics Survey in Lagos, Nigeria". Social Science and Medicine, Vol. 7:1-30.
P. D. Olusanya, "Rural-Urban Fertility Differentials in Western Nigeria." Pop. Studies, Vol. 23, #3, Nov. 1969, p. 368.

Table 2.3

Relative Age Specific Fertility Rates (10-54) and the Mean of the Fertility Curves

Areas	Age Group										
	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	Total	$\bar{m}$
Nigeria Rural	1.2	16.2	23.8	20.7	15.3	11.0	6.1	3.7	2.0	100	28.5
Western Nigeria Rural	—	6.8	17.8	23.4	24.9	18.6	8.5	--	—	100	30.3
Oyo Town	—	6.6	26.2	25.1	20.2	12.4	5.5	4.0	—	100	29.7
Ife Town	—	8.4	18.6	22.4	20.5	15.4	10.0	4.7	—	100	30.7
Lagos City	—	9.9	20.9	22.5	20.3	13.9	7.1	5.4	—	100	30.0

Sources. The calculations were done by Sembajwe based on information from
(a) F.O.S., Rural Demographic Sample Survey 1965-1966 (Lagos, 1968), p. 25.
(b) P. D. Olusanya, "Rural-urban fertility differentials in Western Nigeria," Population Studies, Vol 23, 1969, p. 368.
(c) R. W. Morgan and V. Kanisto, "A Population dynamics survey in Lagos, Nigeria," Social Science and Medicine, vol. 7:1-30.

Relative age-specific fertility rates for some selected areas of Nigeria are shown in table 2.3. The table shows that rural Nigeria has an early peak falling in age group 20-24. Ife town and rural Western Nigeria have similar broad peaks falling in age groups 20-24 and 25-29; while Lagos City has the broadest peak spanning over three age groups; 20-24, 25-29, and 30-34. The highest total fertility rate of 17 percent was recorded for women under 20 years of age for rural Nigeria. The lowest was recorded for rural Western Nigeria and Oyo town. According to Sembajwe (1981), the lower fertility rate among the Yoruba women supports the notion that in Western Nigeria (predominantly Yoruba areas), child-bearing starts relatively later than in the rest of Nigeria.

Mortality Levels and Differentials

Information on mortality is not very adequate. Even where registration facilities exist death registration is generally less complete than birth registration. African parents are very reluctant to register a death except in situations where death certificates are required for burial. Compounding the problem is a common reluctance in most African societies to speak about the dead, especially when it involves infant death. They do not want to be reminded about the sorrowful death of their children and relatives.

The inadequacy of mortality data on African countries will continue to present a serious problem to fertility researchers not well informed of the situation. Sembajwe (1981) believes that patience and probing on the part of the interviewer as well as good

specification of the questionnaire will aid in securing good mortality data from surveys.

Fertility surveys that adequately specify the questionnaire may be able to overcome some of the problems associated with underreporting. As such, most fertility studies in Africa have, therefore, relied on data on the number of children dead of those ever born alive by mothers in a specific age group to estimate infant and child mortality. Although this does not remove the emotional stress attached to talking about the dead, accuracy of mortality information will increase as a result of the combination of a well constructed questionnaire and the recruitment of enumerators that know the survey areas.

The mortality data on table 2.4 shows the percentages of children dead of those ever born alive by women in respective age groups. The table is based on a detailed survey work of Dr. Caldwell et. al. on Western Nigeria. The percentage of children dead are normally expected to increase with age of women except if there had been a catastrophic event such as famine or war that might claim an usual number of deaths--mainly young children.

A good number of researchers agree that high child mortality relative to infant mortality exists in many African nations (Brass, 1971; Cantrelle and Leridon, 1971). Cantrell and Leridon (1971) have suggested that actual child mortality in most African nations seems to be much higher than indicated by the African Standard of Model Life Table System. This may be due to the problems of underreporting of child deaths that exist in most African nations (Sembajwe, 1981). The common causes of the high child mortality relative

Table 2.4

Percentage of Children Dead by Age of Mother

from CAFN1 and CAFN2

Survey Location	Ibadan	Lagos and Western Nigeria
Urban/ Rural	Urban	Urban/ Rural
Researcher	Caldwell et al	Caldwell et al
Date	1973	1973
Age of Mother	%	%
15-19	5	--
20-24	9	13
25-29	12	11
30-34	16	15
35-39	17	16
40-44	23	16
45-49	28	36
Sample Size*	6,606	1,499

*Figures shown refer to female sample.

Source: CAF1

to infant mortality in most African communities are malnutrition after weaning, and communicable diseases such as malaria, measles and dysentery. (Lang, 1970; and Cantrelle and Leridon, 1971).

The almost universal practice of breastfeeding contributes to the degree of difference in mortality rates of children and infants. The long periods of breastfeeding reduce the risks of death in the first year of life but increases those in the second, third, and fourth years of life when breastfeeding is discontinued. Relative reduction in mortality in Nigeria, as well as in most developing countries will depend not only on improved health services, but also on educational programs aimed at improving child nutrition.

Age at Marriage

The average age at marriage varies according to the area of residence. In a survey of Lagos women, Ohadike (1968) reported a mean age at first marriage of 19.8 years. In Western Nigeria, mean age of wives for Ife and Oyo (which are two medium-sized towns) were 20 and 19.4 years respectively; while for rural areas in the same survey was 20.3 years (Olusanya, 1969). In a survey work of the former Eastern Nigeria (now made up of Imo and Anambra states), Exanem (1973) reported that 23.6 per cent of girls were married before attaining their fifteenth birthday.

A study done by Makinwa (1979) on Benin City shows that most of the women in her sample[11] marry at an earlier age than those

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[11]Makinwa, P. K., "Internal Migration and Rural Development in Nigeria: Lessons from Bendle State." 1969, p. 188.

reported in the studies listed above. She found that the mean age of Benin City wives at first marriage to be 18.6 years. Table 2.5 illustrates her findings. The table shows that a sizable proportion of 17.5 per cent are married before they reach the age of 15 and that most of these women marry by the time they are 24 years old. The table also shows that no woman remains unmarried after the age of 34 years. Education of women is closely associated with the age at first marriage. In the same survey of Benin City, Makinwa (1979) observed that the inverse correlation between educational attainment and age at first marriage is particularly

TABLE 2.5

AGE AT FIRST MARRIAGE

Age at Marriage	Number of Women	Cumulative %
Under 15	188	17.5
15-19	578	71.2
20-24	247	94.1
25-29	58	99.5
30-34	5	100.0
Mean Age = 18.6 years.		

Source: Benin Survey, 1977.

noticeable among wives with no education. Table 2.6 shows that the proportion of women married before their fifteenth birthday falls from 22.5 per cent for those with no education to zero per cent for those with high school education and above. Thus, one can say that

education does increase the age at first marriage. Marriage should come later for the better educated wives since a long period of training is necessary to attain these educational levels.

TABLE 2.6

AGE AT FIRST MARRIAGE AND EDUCATION
(TOTAL URBAN SAMPLE)

Age at First Marriage	Level of Education None	Primary & Modern	High School & Above
Under 15	22.5	17.6	0.0
15-19	50.4	64.1	16.7
10-24	20.3	16.9	62.7
25-29	6.3	1.2	19.8
30-34	0.5	0.2	0.8
Total	100.0	100.0	100.0
N	399	551	126

Source: Benin Survey, 1977.

From different survey works done on separate regions of Nigeria, there is an indication that the practice of girls marrying earlier than their fifteenth birthdate is widespread in the Northern, Eastern and Midwestern Regions of Nigeria (Ekanem, 1973).

Socio-economic Factors

The composition and size of the labor force could change even if the absolute size of the population remained constant, due to

some socio-economic factors which influence people's decision to take up employment. If the socio-economic factors change due to changing income levels, education, law, customs and social structures, then it is inevitable that the composition of the labor force would change. Following the estimated figures of 1963 census, 88 per cent of the male population and 27.7 per cent of the women population were in the labor force.[12] Figure 2.2 which illustrates the labor force participation rate shows that the rate for males rose to 96 per cent in the 25-34 years age category; reaching its peak of 98.1 per cent for males in the 35-44 age group, and staying about 94 per cent until after the age of 64.[13]

Female labor force participation rate patterns vary substantially from the general pattern of male labor force participation rate patterns. In some North African countries, women who enter the labor force are relatively small, and the number that remain after marriage and child-bearing is even less. This is partly due to customs and their religious beliefs which tend to place women in their husband's house.

In Nigeria, as in most West African countries, the general shape of the women's labor force participation pattern resembles the male experience, but at a very low rate. Figure 2.2 which also illustrates the women labor force participation rate explains this point. The women's age-specific rates rises to 29 per cent for women in the 25-35 age-group, reaching 35 per cent maximum for

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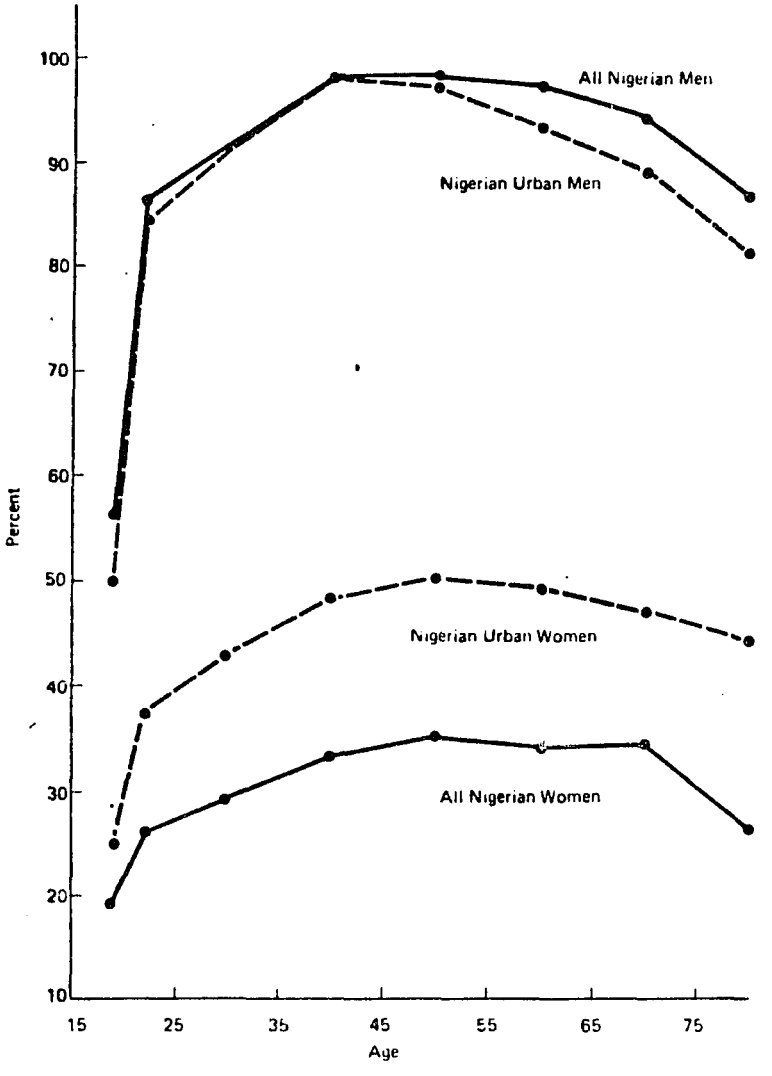
[12]Population Census of Nigeria, 1963 Vol. N, p. 37.

[13]Ibid., p. 37.

Figure 2.2

Age-Specific Labor Participation Rates



Source: *Census of Nigeria, 1963*, (Lagos: Federal Office of Statistics), Vol. IV, pp 37, 38.

those in the 45-54 age-group and does not fall below 30 per cent until after the age of 75.[14]

Data that explain the current Nigerian labor force participation rate is hard to get. One can only hope to draw a picture of the situation from the surveys done by the Nigerian National Manpower Board on the Nigerian Household. Two tables will aid in a descriptive explanation. In Table 2.7 the percentage distribution of the working age population and labor force as components of total sampled population is illustrated. Table 2.8, on the other hand, illustrates the distribution of sampled urban population and labor force by age and sex. From these two tables, the highlights of the labor force participation rates for various age-groups, based on the 1974 sampled survey can be summarized as follows:

(i) the participation rate for males and females combined rose rapidly from 39 per cent for the age-group 15-19 years to a maximum of 88.7 per cent for the age-group of 45-49 years, and declined thereafter;

(ii) the participation rates for males were higher than those for females for all the age-groups;

(iii) the overall participation rate for the females was about half of that for males; and

(iv) the participation rate for females was highest for the broad age-group 40-54 years.

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[14] Fapohunda, E. R., "Population, Labour Utilization and Manpower Development," in Structure of Nigerian Economy, edited by F. A. Olakolu et al, New York: St. Martins Press, 1979, p. 104.

TABLE 2.7

PERCENTAGE DISTRIBUTION OF WORKING-AGE POPULATION (15-55) YEARS) AND LABOR FORCE AS COMPONENTS OF TOTAL SAMPLED POPULATION

STATE	Working-Age Population as % of Total Population			Labor Force as % of Total Working Age Population (Participation Rate)		
	M	F	MF	M	F	MF
Benue Plateau	54.3	54.4	54.4	80.9	24.3	55.4
East Central	52.3	45.1	49.0	87.0	53.0	72.7
Kano	47.4	52.5	52.2	85.3	9.7	45.3
Kwara	46.2	57.1	51.6	90.7	78.2	83.8
Lagos	56.0	52.6	54.3	87.2	54.7	72.2
Mid-West	45.2	47.2	46.2	84.3	48.4	66.3
North-Central	52.8	57.3	54.9	84.9	23.1	54.3
North-East	55.0	57.0	55.9	86.2	20.6	54.0
North-West	46.8	58.3	52.6	88.0	48.7	65.9
Rivers	51.5	50.4	51.0	79.1	61.2	70.8
South-East	50.3	46.4	48.3	84.0	58.3	71.5
West	48.6	54.5	51.5	80.9	68.1	74.2
ALL STATES	50.4	53.6	51.9	84.6	47.8	66.2

Source: Report of the Labor Force Sample Survey, 1974; done by the Nigerian Manpower Board

TABLE 2.8

DISTRIBUTION OF SAMPLED URBAN POPULATION (15-55 YEARS) AND LABOR FORCE BY AGE AND SEX

Age-group	Sampled Population (15-55 Yrs.)			Labor Force			Participation Rates		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
15-19	1,254	1,228	2,482	574	393	967	45.8	32.0	39.0
20-24	876	1,237	2,113	731	553	1,284	83.5	44.7	60.8
25-29	1,082	1,265	2,347	1,034	587	1,621	95.6	46.4	69.1
30-34	798	873	1,671	778	435	1,213	97.5	50.1	72.6
35-39	688	596	1,284	681	357	1,038	99.0	59.9	80.8
40-44	564	418	982	547	267	814	97.0	63.9	83.0
45-49	456	270	726	450	194	644	98.7	71.9	88.7
50-54	346	181	527	329	113	442	95.1	62.4	83.9
Exact 55	69	54	123	65	27	92	94.2	50.0	74.8
Total	6,133	6,122	12,255	5,189	2,926	8,115	84.6	47.8	66.2

Source: Report of the Labor Force sample survey, 1974; done by the Nigerian Manpower Board.

From (iv) above one can infer that childbearing is an important factor which mitigates against female participation in the labor force since most females in that broad age category have completed child-bearing activity. A graphic representation of the labor force participation rates (based on the 1974 sampled population) which is illustrated in figure 2.3 reveals that the greatest gap between the male and female participation rates occurred in the age-group 25-30 years, which is the child-bearing age.

One can state that Nigeria is quite a populous country, if not the most populous country in Africa. The recent estimates show that the population is increasing rapidly. Also, as was pointed out earlier, the participation rate of Nigerian women in the labor force is quite impressive for a LDC.[15]

Lagos, on which the the present study is centered, was until recently the capital of Nigeria. Table 2.9 illustrates the population of Lagos and the suburbs (1921-1963). The table indicates that Lagos territory and the suburbs have experienced some rapid population increases. According to the United Nations 1975 estimates, Lagos territory was estimated to be inhabited by about 1,476,837 people. These figures indicate that Lagos territory has experienced very rapid population increases especially in the past four decades. Most of the increases have been contributed by immigration involving people from other parts of Nigeria and other West African countries. These immigrants mainly wish to avail

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[15]"Report of the Labour Force Sample Survey 1974" National Manpower Board, Nigeria, 1979.

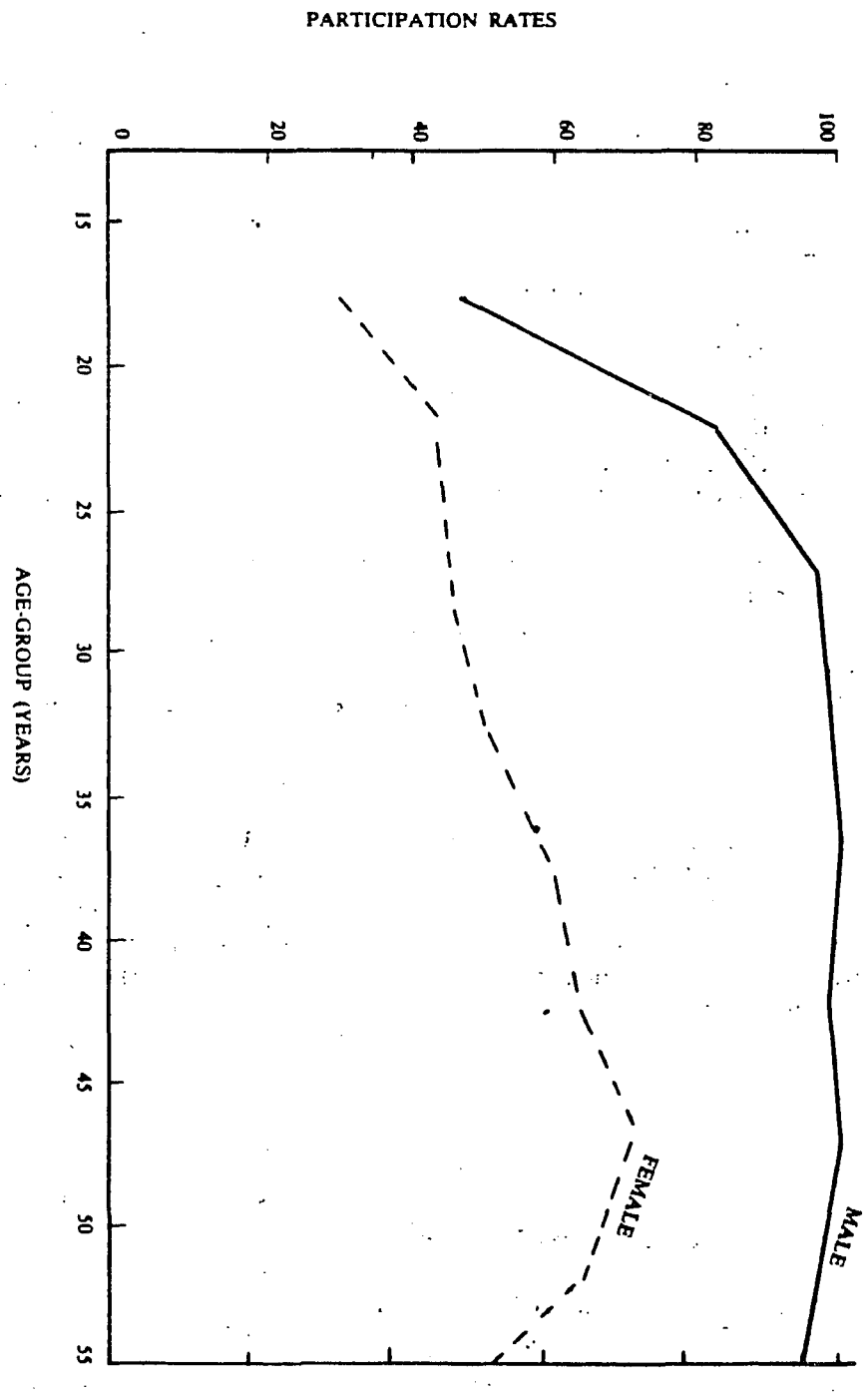
PARTICIPATION RATES
0
20
40
60
80
100
15
20
25
30
35
40
45
50
55
AGE-GROUP (YEARS)
FEMALE
MALE

Figure 2.3

TABLE 2.9

POPULATION GROWTH IN LAGOS AND THE SUBURBS; 1921-63

Census Area	Population 1921	Population 1931	% Increase	Population 1952	% Increase	Population 1963	% Increase
Lagos Territory	99,690	126,108	28.5%	267,407	112.05%	665,246	148.78%
Meja Division	36,000	79,076	119.66%	112,879	42.75%	525,767	365.78%
Rural Districts	135,414	198,912	46.89%	238,432	19.87%	778,321	226.43%

Source: Nigeria Census, 1963, 1952

themselves of the economic opportunities that exist in the area. In view of this, Lagos is made up of people of diverse ethnic origin who migrated mainly for economic reasons. Most of these immigrants have at least an average level of Western style of education, and they seek to avail themselves of the high status positions in commerce and government offices that are available. Besides these, there exist original inhabitants of Lagos, usually referred to as the Lagosians. Some of the Lagosians are engaged in fishing and trading. Their women are predominantly petty-traders. Their educated males and young females take up high paying jobs in commerce and government offices.

Review of Literature

The literature is full of articles listing factors that determine population growth and fertility. One of these is the work done by James Kocher (1975). He points out that the decline in overall fertility and population growth will occur when the rural population of the less developed countries are participating in the development process. This is due to the fact that a greater proportion of the population of the LDCs are still living in rural areas in spite of the rapid urbanization and the rural-urban migration that is occurring. In view of these facts, Kocher stressed that for a sustained overall decline in fertility to occur, rural development is essential.[16]

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[16]Kocher, J. Rural Development, Income Distribution, & Fertility Decline. Connecticut: Key Book Service, Inc., 1973, pp.

Repetto (1979) emphasized the contribution of economic inequality to fertility and population growth. Utilizing aggregate data, he showed that the more unequal the distribution of income is within a community, the higher the aggregate birth rate and the faster the rate of population growth.[17] He pointed out that this view which is applicable to individual nations composed of rich and poor households also applies to the world community of rich and poor nations as well. High fertility and rapid population growth in his view is fostered by economic inequalities.

Repetto and Kocher seem to be in a sort of basic agreement; which is, that inequalities in income levels in any society will tend to foster high overall levels of fertility and population growth. In Kocher's view, the reason for the inequalities in income levels in living standards is due to the dichotomy of the economy of most less developed countries. Due to the dual nature of the economy of most LDCs, the rural economy is engaged in basic traditional agriculture (which encourages high fertility levels and subsequently large families), while the urban economy is based on industry and commerce.

88-92. Kocher stressed that "economic development" as conventionally defined is quite misleading; despite generally satisfactory rates of growth in per capita income during the past two decades, living conditions in many parts of the world have not improved as expected. Rather living conditions in many parts of the world have not improved and inequalities have increased. He stressed that true development is "a process of sustained improvements in living conditions with ever greater equality in their distribution;" where attention is focused on rural development. p. 6+.

[17]Repetto, Robert, Economic Equality & Fertility in Developing Countries, Washington, D.C.: Resources For The Future, Inc., 1979, p. 1.

On the impact of education on fertility, McGreevey and Birdsall (1974) found an inverse relationship between education and completed family size. They pointed out that it is one of the most clearcut correlations found in the literature. The same point was stressed in a paper by Mason et al (1981). They found that the higher the educational level of a couple the higher their efficiency in controlling fertility for a given target of family size. Repetto stressed a double-effect. First the higher the educational levels of adults are the more its impact in reducing fertility because of the increased opportunity costs of child-bearing and rearing. Secondly, the increased educational levels of couples will increase the effectiveness of controlling fertility by utilizing the appropriate contraceptive devices; it will also help in postponing their age at marriage and subsequently help them in developing their preference for quality rather than quantity of children.

Although there are lots of claims and counter-claims in the literature about the importance of a particular factor in influencing fertility and population growth, one point is very clear; and it is that fertility rates and population growth are results of a multiplicity of factors interacting on one another. The degree of impact of any particular factor may depend on the country being studied (the culture of the people and family structure, to mention two factors); in short, the overall value system of the people. In view of this, one can very well agree that a good understanding of the society being studied is of paramount importance. When an inadequate understanding of the society exists, the results from such analysis will definitely be misleading. Dr. Caldwell noted

the same when he said that "fertility research in developing countries suffers...from three severe limitations: ethnocentricity, an obsession with modernization, and a restriction of the scope of the investigation to the point where the questions supply their own answers."[18] The most harmful distortion relates to the way the nature of the family both as a social and economic unit is perceived by a researcher with inadequate understanding.

Female Labor Force Participation and Fertility

Much attention has been given to the relation between population growth and economic development, and one important aspect of this question is the link between fertility and female employment. Many have argued that the participation of married women in the labor force is associated with smaller families. This relationship is more consistent with studies done on developed countries (DC's).

Utilizing American national survey data, Jeanne C. Ridley (1959) tested the hypothesis that the degree to which a woman's activities are centered outside the family is inversely related to family size. Using cross tabulations she found Expected Family Size to decrease as work duration increased for all age groups.

Using Swedish data, Myrdal S. Klein (1965) found that women who had worked had lower children ever born (CEB) than those who had not. In addition, they found that full-time workers had lower CEB than part-time workers.

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[18]Caldwell, J. C., Population Studies, March, 1977, p. 7.

Stanley Kupinsky (1971) evaluated the effect of female labor force participation (FLFP) on the relationship between fertility and socioeconomic status. He found that years worked since marriage as a percentage of years married was negatively related to both actual and expected fertility. He also found out that the FLFP-fertility relationship to be more strongly negative for upper status women than for lower status women. This was, however, for women with rural background. For those with urban background, the FLFP-fertility relationship was much the same for all socioeconomic groups.

Groat, Workman and Neal (1976) also considered the effects of status, classifying jobs into different categories, from low status jobs to high status jobs. They found job status to be negatively related to several fertility measures after age, education, religion and marriage duration were controlled. They also found work experience since marriage to be negatively related to CEB, but unrelated to ideal family size (IFS).

The above studies from DC's show a great degree of uniformity. They all find some type of negative relationship between FLFP and fertility. Full-time workers were found to have lower fertility than part-time workers. The results from all the above studies show that a strong consensus emerges from studies of DC's. Such similar consensus do not emerge from studies of LDC's. Some studies find a negative FLFP-fertility relationship, while others find a positive relationship and some no relationship at all.

In their study of Turkey, Stycos and Weller (1967) found no significant relationship between CEB and current FLFP after age,

education and rural-urban residence were controlled. They found that fertility differentials in Turkey are associated with residence and education but not with employment.

Sidney Goldstein (1972), on the other hand, found a positive relationship in Thailand. He found the CEB for women in the labor force was quite higher than that for women not in the labor force. However, this relationship did not exist in urban areas. Bindary, Baster and Hollingsworth (1973) found in their aggregate data from Egypt that the child-woman ratio was positively related to female employment in rural areas, but negatively related in urban areas.

In their study of three Latin American countries, Miro and Rath (1965) found that currently working women had lower CEB than non-working women. Women 35 and over who did not work had larger families than those working away from home. Using cross section data from Puerto Rico, T. Paul Schultz (1969) regressed the crude birth rate on the FLFP rate and a number of other background variables. He found FLFP to have a significant negative effect on fertility.

Thus studies from the LDC's on the FLFP-fertility relationship present no consensus whatsoever. For the DC's it is safe to say that a negative relationship exists between FLFP and fertility. Virtually all studies find some kind of negative relationship in spite of the various measures they utilized for both FLFP and fertility.

The story is quite different for LDC's. There is no consensus even on the existence of a FLFP-fertility relationship, let alone its direction, strength and cause. Given this lack of consensus,

does it imply a lack of adequate information on LDC's? Stanley Kent (1976) believes that part of the reason for such inconsistent results on LDC's is because the studies employ different time references. Some use current measures of FLFP and fertility, others use cumulative measures since marriage and others use combinations of current and cumulative measures. Since these measures represent different aspects of FLFP and fertility behavior, studies employing one set are apt to produce different results than studies employing another set.[19]

The different measures of FLFP employed in the studies are particularly important for LDC's. FLFP and fertility are expected to have a negative relationship only to the degree that they are competing uses of time. If FLFP and fertility are not competing uses of time, there will be little reason to expect such a relationship to exist. As such, FLFP-fertility relationship will differ according to the type of work that defines FLFP, plus the degree to which performing that type of work and caring for children are competing rather than complementary uses of time. (Smith, 1976)

When distinctions are made between the types of work one is considering, the FLFP-fertility relationship in LDC's may become considerably less jumbled. As such, this study will distinguish three separate economic activities performed by married women in Lagos, Nigeria.

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[19]Smith, Stanley, "Women's Work and Fertility in Mexico City," The University of Michigan, 1976.

The following chapter will describe the model employed, the data, the household characteristics based on the surveyed informations and variables description.

CHAPTER III

THEORETICAL MODEL, DATA DESCRIPTIONS AND VARIABLES DESCRIPTION

Female labor force participation (FLFP) and fertility relationship is usually examined within a static one-shot optimization model which assumes that demand for children is in direct competition with demand for other commodities within the household. In view of the fact that households must operate within a given budget constraint, there is a limit to the extent to which competing commodities can be demanded at any given period of time. If husband and wife are fully employed, one would expect that family income is maximized. Since children form part of the household demand, some of the time the wife would have invested in earning money income elsewhere for the family is diverted into child-bearing activities. Increase in the number of children would obviously increase the demand for other goods since the children must be fed and clothed. As such, wife's input of time appears highly important in this type of model.

This chapter will briefly examine the New Home Economic approach to fertility and discuss some modifications mostly relevant to the less developed countries (LDC's). This chapter will also discuss the data and the household characteristics based on the information obtained from my survey work.

New Home Economic Approach to Fertility

This literature grew mainly from Becker's theory of time allocation. In the modern theory of the family, the husband and wife are taken as one unit having preferences including marital fertility. In short, the New Home Economic Approach merely views fertility within the framework of consumer demand theory.

The family in essence undertakes production and consumption activities and over its life cycle maximizes utility subject to the capabilities and earning power of its members and the environment it is faced with.

Usually, the aim is to derive the demand for children and to investigate income and price effects, substitution effects and elasticities of all kinds. Additionally, attention is also given to finding out the shadow price of the housewife's time and, to examining the degree of substitution between quantity and quality of children.

The household aim is assumed to be the maximization of the discounted sum of utility from child services (C) and other goods and services (G). As such, let the utility depend on amounts of child services and other goods and services consumed, that is,

$$(1) \quad u = u(C, G)$$

In (1), G is a composite commodity and gives the amount of all goods and services except children consumed by the household. The household in this framework is viewed as a producer of both C and G. One may assume a special form of the function in (1), where;

$$(2) \quad U = C^{\eta} G^{1-\eta} \qquad 0 < \eta < 1.$$

where η and $(1-\eta)$ are elasticities of utility with respect to C and G. Obviously, there exist positive but diminishing marginal utility with respect to both child services and G.

Production Function for the Household

We begin by relating the time spent by the housewife in the labor market, time she spends on children and the proportion of total resources spent on children to the index of actions (k_1, k_2, k_3).

If γ_L is the ratio of hours worked by the housewife to the maximum hours she can work, then,

$$(3) \quad \gamma_L(k_1) = \frac{k_1 - 1}{\bar{k}_1 - 1}, \; k_1 = 1, 2, \ldots, \bar{k}_1$$

where k_1 is an index relating to wife's labor market status, and $\gamma_L(k_1)$ is a parameter relating to wife's labor market participation. The functional form in equation (3) is chosen because when $k_1 = 1$, $\gamma_L = 0$, and when $k_1 = \bar{k}_1$, $\gamma_L = 1$.

$\gamma_L = 0$ means that the housewife is not in the labor force,

$\gamma_L = 1$ means full-time work, and

$0 < \gamma_L < 1$ signifies part-time employment.

If γ_q is the proportion of wife's nonlabor market time devoted to children, then,

$$(4)\quad \gamma_q(k_2) = \frac{k_2 - 1}{\bar{k}_2},\ k_2 = 1, 2, \ldots, \bar{k}_2,$$

where k_2 is the index of action representing wife's nonlabor market time devoted to children, and $\gamma_q(k_2)$ is the parameter relating to wife's proportion of nonlabor market time devoted to children. Clearly, $0 \leqq \gamma_q < 1$, implying that not all nonlabor market time can be devoted to children. If there are zero children, then all time is devoted to producing G goods. Nonlabor market time not spent on children is necessarily spent on G.

If α_q is the proportion of total resources spent on children, then

$$(5)\quad \alpha_q(k_3) = \frac{k_3 - 1}{\bar{k}_3},\ k_3 = 1, 2, \ldots, \bar{k}_3$$

where k_3 is the index relating to the proportion of total resources spent on children, and $\gamma_q(k_3)$ is the function representing total resource proportion spent on children. One can spend zero resources on C where there are no children. At the same time not all resources can be spent on children only. These two constraints can be represented by $0 \leqq \alpha_q < 1$. Once again, the model assumes that resources not spent on children are automatically spent on other household activities.

Suppose $\bar{H}$ represents the total number of hours available to the wife for market work and household production purposes, and let $\bar{H}_L$ be the maximum hours she can spend in the labor force, then; $\gamma_L\bar{H}_L$ gives one the hours she actually spends working in the labor force market, and $(\bar{H} - \gamma_L\bar{H}_L)$ will give the hours available

for household production purposes.

From the above, one can define h_q, the hours spent on children as;

(6) $h_q = \gamma_q(\bar{H} - \gamma_L\bar{H}_L) = h_q(k)$, where $k = \{k_1, k_2, k_3\}$, represents a vector of controls.

In the same way, hours spent on goods G, i.e., h_g, can be expressed in the form of:

(7) $h_g = (1 - \gamma_q)[\bar{H} - \gamma_L\bar{H}_L) = h_g(k)$.

This is based on the fact that hours not spent on children are automatically spent on goods production.

If we assume a given female's wage, $\omega > 0$; then wife's income can be expressed as

(8) $Y_f = \omega\gamma_L\bar{H}_L = Y_f(k)$

where Y_f is wife's income.

Assuming that $\gamma_L = 0$, (i.e., implying that housewife does not work in the market) Y_f, then is zero. The overall resources of the family during any time period is the total sum of husband's income, wife's income and household nonlabor income. This can be expressed as:

(9) $Y = Y_m + Y_f + V = Y(k)$

where Y is total resources of the family at any point in time,

Y_m is husband's income at any time, and

V is household's nonlabor income at any time.

Supposing the price of market goods used in producing child services is P_q, then total market goods spent in producing child services, X_q can be expressed as;

$$(10)\quad X_q = (\alpha_q Y)/P_q = X_q(k)$$

Also the market goods and services used in producing G-goods, X_g, can be expressed as,

$$(11)\quad X_g = [(1 - \alpha_q)Y]/P_g = X_g(k)$$

where P_g is the price of nonchild-related market commodities.

Let the production function of the household for G goods and services be expressed as;

$$(12)\quad G = G_o h_g^{\lambda} X_g^{(1-\lambda)}; \qquad 0 < \lambda < 1,\ G_o > 0$$

where λ and $(1-\lambda)$ are respectively the elasticities of the output of good with respect to time and market commodities.

From (12) $\dfrac{\delta G}{\delta h_g} = \lambda G_o h_g^{(\lambda-1)} X_g^{(1-\lambda)}$

$$\frac{\delta G}{\delta X_g} = (1-\lambda) G_o h_g^{\lambda} X_g^{-\lambda}$$

Clearly, $\dfrac{\delta G}{\delta h_g}, \dfrac{\lambda G}{\delta X_g} > 0$ and also one can verify easily that $\dfrac{\delta^2 G}{\delta h_g^{\,2}}$, $\dfrac{\delta^2 G}{\delta X_g^{\,2}} < 0$, implying that the marginal productivities of time and market commodities are positive but diminishing. See appendix B for the verification of the second order condition.

Given (10) and (11), it follows that the amount of goods and services produced will depend on the vector of controls specifically,

k_1, k_2, and k_3; that is,

(13) $G = G(k)$.

The amount of child services[20] produced and consumed (C) will depend on the number (N) and quality (Q) of children, expressed as,

(14) $C = 1 + C_o N^{\psi} Q; \qquad 0 < \psi < 1, \; C_o > 0.$

Child quality (Q) can be defined as;

(15) $Q = f(h_q/N, \; X_q/N);$

implying that parents set equal level of child quality per child. As such h_q/N and X_q/N are the amounts of time and goods devoted to each child.

It is obvious from equation (14) that some substitutability exists between the quality index and the number of children. In the Third World, many factors influence the degree of substitutability which include the motives for having children. For example, as a source of old age security, quantity and quality may be substituted.

From the production function for child quality, equation (15) one can assume a functional form, f, that allows the first and

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[20]The elasticity of C with respect to Q will be unity if we did not have "1" before $C_o N^{\psi} Q$. The need for this nonhomogeneity arises because one does not want C = 0 when N = 0. Equation (14), C = 1 when N = 0 implying that with zero children utility is derived only from goods and services consumption; as such, the utility function under such a situation will collapse to $U = G^{1-\eta}$.

second order conditions to hold, as shown below.

$$\frac{\delta Q}{\delta h_q}, \frac{\delta Q}{\delta X_q} > 0 \text{ and } \frac{\delta^2 Q}{\delta h_q^2}, \frac{\delta^2 Q}{\delta X_q^2} < 0.$$

This means that the marginal productivity of time in the production of child quality is positive but diminishing. The same is applicable to the marginal product of market commodities.

The above brief illustration of the new home economic approach to fertility can be examined in detail if one chooses. In the above illustration, some special forms of functions were assumed; which actually need not be the case. In spite of that, the usual aim of the household in this model is the maximization of the utility function [the one illustrated in equation (1)] subject to the appropriate production functions and the full income constraints.

Developing Countries and New Home Economics

Modification of this theory relevant to the behavior of developing countries was first suggested by Easterlin (1973). It was argued that parents' demand for children may outstrip their ability to produce them. This is particularly relevant under a regime of subsistence agriculture where children contribute to family income, child raising costs are low, and child mortality is high.

The above modification is definitely called for when one is studying the rural areas. Since this study is based on information gathered from Lagos (a highly industrialized city), where the majority of the females who are working are either employed as civil servants or self employed as traders, such a modification is

not necessary.

Another important modification is one relating to the distinction among types of employment opportunities. Labor force participation decisions of women can be viewed from the point of view of a decision to work or not to work. As such, FLFP and fertility studies in countries such as the United States do find consistently negative relationship between FLFP and fertility. This is due to the fact that virtually all work is done in settings quite incompatible with caring for children. In developing/underdeveloped countries there exist substantially different types of employment opportunities for women outside the modern labor market. In Lagos, there exists a distinction of activities performed by women ranging from the self-employed petty-trader to the professionals employed with the government. "This distinction among types of employment opportunities is important in a discussion of the determinants of fertility because the structural relationship between labor force participation and fertility may be different for different types of employment."[21] Thus, the FLFP-fertility relationship will differ depending on the type of work involved, and the degree to which performing that type of work and caring for children are competing rather than complementary uses of time.

Another modification that is essential when one is concerned with LDC's is the information about contraceptive knowledge and

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[21]Lee, Bun Song & Adrienne M. McElwain, "Development of an Econometric Fertility Modelfor Less-Developed Countries: An Examination of Fertility, Age at Marriage, & Female Labor Force Participation in Korea," Interim Report prepared for the Agency for International Development, Research Triangle Institute (214-1536) May, 1981.

usage. Also important is information on the mortality rate. Mortality rate and contraceptive usage information is highly essential in aiding fertility analysis of Third World nations. As such, the present study accommodates these applicable modifications in order to be able to analyze effectively the fertility behavior in Lagos City.

Data

This study utilizes a sample of 568 currently married females which I surveyed during the summer of 1983 in Lagos City, Nigeria. The married females interviewed are within the age group of 15-49. In some cases, information on the demographic and economic characteristics of these women was obtained from personal interviews. The sample was stratified by measures of household monthly income and household physical area. Blocks were selected within an area and clusters of dwellings were chosen from each of the blocks.

The questionnaire utilized in this study can be divided into two parts. The first part contains information about age, type of employment engaged in, etc.; in short it contains information about fertility, female labor force status, and economic matters.

For fertility, two variables were considered as possible measures of household fertility; the number of live births and the number of surviving children of the household head. The latter which can be viewed as a proxy for a more theoretically correct measure of fertility will actually be easier to get from the respondents. This is because in Nigeria, like in most African nations, infant deaths are regarded as very sorrowful events that should not

be mentioned once they have happened. Thus, an interviewer will encounter some obstacles in trying to obtain information about the number of live births, which may include those that died as infants. This point was well brought out by Sembajwe in his study on the Yorubas of Western Nigeria. He pointed out that "there is a common reluctance in most African societies to speak about the dead, expecially when these are children, and to give detailed information about them."[22] Despite the ease of collecting information on surviving children, the number of live births is probably the better measure of parental efforts to produce a family and has a further advantage of being better suited to studying the effects of child mortality on fertility.

On the question of the employment status, three categories were chosen. They are, women employed in the Civil Service, self-employed businesswomen and housewives. Although one can categorize women activities in several ways, it is my view that the three categories chosen here are a good representation of economic activities performed by women in Lagos. Some studies (Arowolo, 1977) grouped women according to the type of job performed. He grouped women according to the following types of work: teaching, nursing, clerical, sewing, petty trader, big business, and housewives. Such a detailed grouping is not that essential since all the teachers, clerks and nurses are mostly employed by the government and as such

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[22]Sembajwe, I. S. L. Fertility and Infant Mortality Amongst the Yoruba in Western Nigeria. Canberra: The Australian National Univ. Press. 1981, p. 31.

work under the same condition of service. In this study, teachers, clerks, nurses and professionals will come under the civil servant category. In Nigeria, the government is the major employer and as such all employees are under the same condition of service. Although a female manager may have more flexibility with regards to her time of reporting to duty than a female clerk, they both are eligible for the same length of maternity leave under the civil service employment. Instead of separating the petty traders from the so-called big businesswomen, I will group them together under one category as the self-employed businesswomen, since women engaged in these kinds of activities usually are the owners themselves.

The second part of the questionnaire is concerned with information about fertility attitudes. Questions in this section include issues about knowledge and usage of birth controls, whether respondents have a relative helping in childcare activities or whether respondents have a paid baby-sitter. Also questions about the preference of a male child or the importance of a male child are included.

The information obtained from the questionnaire will aid one in analyzing the FLFP-fertility relationship in Lagos City. The ideal model will contain exact measures of all the variables mentioned in the theoretical section and the applicable modifications noted above. My data set falls short of this ideal. Proxies of some variables which were omitted had to be estimated. Apart from the variables that were estimated some were totally omitted for lack of information on them. One such variable is the child quality variable. In view of these facts, the data set does contain a number of gaps.

However, it does contain extensive information on fertility, contraceptive use and some socioeconomic characteristics. The remainder of this chapter will describe the household fertility pattern/characteristics based on information obtained from the data set, and the variables utilized in this study.

Household Characteristics

My survey reveals patterns similar to what Dr. Caldwell discovered in Ibadan, Nigeria. He found the Yoruba fertility to be quite high, and with little or no evidence of a decline. The evidence from Caldwell's 1973-75 survey program indicated that the adjusted total fertility ratio for all surveyed women was 7.4. The fertility of Lagos women aged (15-49) is high. As table 3.1 indicates, the mean number of children borne by women (15-49) age group is 4.5 in Lagos (for all interviewed women). And when the group is divided into two subgroups, the employed and the unemployed, a different pattern exists. For the employed women (this includes the civil servants and the self-employed) the mean number of children born by women aged (15-49) is 4.1 while for the unemployed housewives the mean is 5.0. This is quite consistent with what one expects, that employed married women are by and large expected to have smaller number of children than housewives. Except for the (15-21) age group, all unemployed women and those in home-related activities show a higher average CEB than those in gainful occupations. The explanation for the slightly higher mean number of children ever

Table 3.1

Average Number of Children Ever-Born to the Head of the Household by Age Group and Employment Status

Age Group	Employed		Housewives		All Interviewed Women	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
15-21	37	2.1	21	1.6	58	1.9
22-28	132	2.8	40	3.3	172	3.1
29-35	141	4.3	29	5.7	170	5.0
36-42	87	5.4	31	7.0	118	6.2
43-49	49	5.7	21	7.3	70	6.5
All Women	446	4.1	142	5.0	588	4.5

N: Sample Size

$\bar{X}$: Mean number of live births

born by the employed women in (15-21) age group may be because women in this age group are more eager to achieve their desired number of children as early as possible in order to concentrate on their economic activities; whereas the unemployed housewives in the (15-21) age group are in no hurry. This observation may be further explained by the fact that the mean CEB for the unemployed women was substantially higher in subsequent age groups.

A pattern similar to that in Caldwell's survey of Ibaden City (CAFN1) is revealed in my survey regarding the impact of education on fertility. Caldwell's Ibadan City survey reveals that the average number of children ever born by women over 45 years of age declines by one child from women with only primary school education through those with higher education. However, women with no education in Ibadan recorded lower fertility than those with primary education. (Caldwell, 1982). The same was reported by David Lucas' (1976) survey research in Lagos.

Although my survey did not obtain substantial information from married women with no education, I was able to obtain adequate information from married women who attended/completed primary school, attended/completed secondary school and attended/completed university education. Within these three groupings I was able to include married women who attended technical or commercial schools. Table 3.2 indicates the mean fertility for each educational level by age group. The mean CEB for those who had some primary school education or completed primary school is higher than the rest. Those with some university education or the equivalent have the lowest mean CEB of 3.7. A comparison of the age-group category across the different educational levels of my respondents will help illustrate that education has a powerful impact on fertility. For each age group, those with some or completed primary education demon-

Table 3.2

Average Number of CEB to the Head of the Household
By Age Group and Educational Qualification of Women

Age Group	Attended or Completed Primary School		Attended or Completed Secondary School/Equivalent		Attended or Completed University Education/ Equivalents	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
15-21	10	2.0	33	1.9	0	0.0
22-28	37	4.0	100	3.0	25	2.5
29-35	55	5.8	80	4.2	34	3.4
36-42	42	7.2	54	5.6	26	4.0
43-49	25	7.6	27	6.6	19	4.9
All Women	169	5.3	294	4.3	104	3.7

N: Sample size.

$\bar{X}$: Mean number of live births

strated a higher level of mean CEB than the rest. It is unfortunate that a less than significant number of my respondents have no education. It is difficult to find out if their fertility level is higher than the fertility level of respondents with only primary education, as was the case with Caldwell's Ibadan survey (CAFN 1) and Luca's Lagos survey (1976).

The overall high levels of fertility among Lagos women is consistent with the views and desires of most of the community. This can be seen from the responses to survey questions set out in the next few tables. Tables 3.3 through 3.6 summarize various fertility attitudes and characteristics of Lagos women. The questions asked in this part of the questionnaire are identical to those asked by Caldwell in his survey of Western Nigeria in 1973. In the first question shown in table 3.3, 69% of the respondents agreed that childbearing is the most important thing a woman can do, while 92% agreed to the same question in Caldwell's survey in 1973. The reason for such a difference may be because Caldwell's survey covered both rural and urban areas while my survey covers only an urban area. One will obviously agree that respondents from rural areas will be more likely to agree that childbearing is the most important thing a woman can do.

The percentage of respondents that agreed to the second question in table 3.3 was rather surprising. The question was intended to determine the relative importance of a male child to the respondents. In Caldwell's 1973 survey of Western Nigeria, 58% of the respondents agreed to the same question, while 65% of my respon-

Table 3.3

Fertility Attitudes in Lagos 1983; Selected Responses to Specific Questions (Percentage of Total Respondents)

Questions		Responses	Percentage given that response (Married women only)
1)	Is bearing children the most important thing a woman can do?	Agree	69
		Disagree	31
2)	A husband and wife have five daughters and no sons and wonder if that is enough children. If you are in such position will you have more children?	Yes	65
		No	35
3)	What do you think is the best number of children to have?	1-3	5
		4	18
		5	16
		6	15
		7	6
		8+	2
		Up to God to decide	38
4)	Do you have knowledge of any birth-control device?	Yes	56
		No	44
5)	If you do have knowledge of any birth-control device, have you used any?	Yes	58
		No	42
6)	Do you have a relative staying with you that is helping you in housework/child-care duties?	Yes	66
		No	34
7)	Or, do you have a paid baby sitter?	Yes	24
		No	76
Overall total respondents			588

Source: Lagos Survey, 1983.

Table 3.4

Fertility Attitudes in Lagos, 1983; Selected Responses to Specific Questions
(*Respondents That Completed Primary School/Below Primary*)

Questions	Responses	Percentage given that response, by age-groups (15-21)	(22-28)	(29-35)	(35-42)	(43-49)
1) Is bearing children the most important thing a woman can do?	Agree	90	76	78	79	85
	Disagree	10	24	22	21	15
2) A husband and wife have five daughters and no sons and wonder if that is enough children. If you are in such a position will you have more children?	Yes	100	78	85	88	96
	No	0	22	15	12	4
3) What do you think think is the best number of children to have?	1-3	0	0	2	0	4
	4	0	16	4	0	0
	5	0	16	7	2	11
	6	10	8	11	22	11
	7	10	3	9	12	15
	8+	0	0	2	7	4
	Up to God to Decide	80	57	65	57	55
4) Do you have knowledge of any birth-control device?	Yes	10	27	28	12	22
	No	90	73	72	88	78
5) If you do have knowledge of any birth-control device, have you used any?	Yes	100	60	33	54	33
	No	0	40	67	46	66
Total # of responses/age group		10	37	54	42	27=170

Table 3.5

Fertility Attitudes in Lagos, 1983; Selected Responses to Specific Questions
(Respondents that Attended or Completed Secondary Schools/Equivalents)

Questions	Responses	Percentage given that response, by age-groups (15-21)	(22-28)	(29-35)	(35-42)	(43-49)
1) Is bearing children the most important thing a woman ... ?	Agree	65	77	62	72	74
	Disagree	35	21	38	28	26
2) A husband and wife have five daughters and no sons and wonder if that is enough children. If you are in such a position will you have more children?	Yes	72	60	61	72	78
	No	28	41	39	28	22
3) What do you think think is the best number of children to have?	1-3	7	7	9	0	4
	4	30	26	16	7	4
	5	15	20	19	15	11
	6	15	19	17	19	11
	7	2	3	4	7	15
	8+	0	1	1	2	11
	Up to God to Decide	30	25	34	50	44
4) Do you have knowledge of any birth-control device?	Yes	61	63	63	70	74
	No	39	37	37	30	26
5) If you do have knowledge of any birth-control device, have you used any?	Yes	36	48	73	63	55
	No	64	52	27	37	45
Total # of responses/age group		46	101	82	54	27=310

Table 3.6

Fertility Attitudes in Lagos, 1983; Selected Responses to Specific Questions
(Respondents that Attended or Completed University Education/Equivalents)

Questions	Responses	Percentage given that response, by age-groups (15-21)	(22-28)	(29-35)	(35-42)	(43-49)
1) Is bearing children the most important thing a woman can do?	Agree	0	48	44	42	26
	Disagree	0	52	56	58	74
2) A husband and wife have five daughters and no sons and wonder if that is enough children. If you are in such a position will you have more children?	Yes	0	28	26	35	16
	No	0	72	74	65	84
3) What do you think think is the best number of children to have?	1-3	0	10	12	12	5
	4	0	59	29	42	47
	5	0	17	26	27	11
	6	0	10	18	21	11
	7	0	0	9	0	5
	8+	0	0	0	0	0
	Up to God to Decide	0	4	6	8	21
4) Do you have knowledge of any birth-control device?	Yes	0	79	88	96	84
	No	0	21	12	4	16
5) If you do have knowledge of any birth-control device, have you used any?	Yes	0	78	67	52	69
	No	0	22	33	48	31
Total # of responses/age group		0	29	34	26	19=108

dents answered yes. I was expecting that a lesser percentage of my respondents could have answered "yes" to the question in view of the fact that all my respondents are from an urban center. Nevertheless, although the fertility levels in Lagos have declined during this decade, the general attitude towards the importance of a male child is still very strong. It is important to mention that the degree of preference for a male child over a female child decreases with education. This fact can be observed by comparing tables 3.4, 3.5 and 3.6. For all age groups the percentage that answered yes to the second question decreases as the educational level of the respondents increases. The same is applicable with the first question's responses.

When the respondents were asked what they think is the best number of children to have, less than 30% of all the respondents agreed that four and below is the ideal; while as many as 38% of all the respondents answered that it is up to God to decide. Caldwell (1982) pointed out that the "up to God" response is neither an evasive nor a superstitious reply. The respondents merely mean that these matters (i.e. fertility decision) are really beyond their control and to attempt more control would probably achieve little.[23] When the respondents were grouped according to their educational levels (tables 3.4-3.6), the percentage of each category that answered "up to God" decreased as the level of education increased for all age groups. These tables also show that the

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[23]Caldwell, John, "Fertility and the Household Economy in Nigeria," in Theory of Fertility Decline by Dr. John Caldwell, London: Academic Press Inc., 1982, p. 21.

knowledge and usage of birth control devices are more widespread with the highly educated. With this summary information about the household characteristics of my survey finished, the next section of this chapter will describe the variables chosen for the analysis.

Variables

There are some problems involved in choosing variables that can truly test the theoretical model. First, an economic model presents conceptual variables that may exist only in an abstract sense, which an investigator cannot precisely measure. Another problem may be due to oversight. This may result when an investigator is unable or fails to include relevant questions in this questionnaire. In both cases, proxies must be constructed.

The empirical variables fall into five categories. The first are the fertility variables which are meant to reflect the fertility levels. Second are the FLFP variables, chosen to reflect the amount of time worked during marriage and the incompatibility of that type of work with childcare. Third, are the economic variables. Fourth are the demographic variables which help in indicating the couple's stage in the life cycle. And finally we have the background variables.

The following section will describe the empirical variables chosen to act as proxies for the model. Prediction will be made regarding the effects of each exogenous variable on FLFP and

fertility; and these predictions will be based on the implications of the theoretical model and the findings of other empirical studies.

The fertility variables chosen to act as proxies are Children Ever Born (CEB), and Ideal Family Size (IFS). CEB in this study is simply the total number of live births a woman has ever had. It is a measure of the actual fertility prior to my survey time. Another fertility measure utilized is IFS. It is the number of children a woman would choose to have if she were asked exactly the number she wanted. Neither of the two is a perfect proxy for fertility. CEB may have an advantage of dealing with actual occurences, but it is still an incomplete measure for women who have not yet completed their childbearing years.

IFS has the advantage of dealing only with the desired number and as such is applicable to women in all stages of life. In spite of this advantage it also has its disadvantages. The answer given by respondents in regard to the question about the desired fertility may strongly be influenced by the psychological condition of the respondents at the time of interview. In view of this, IFS is a very loosely defined measure of fertility plans and subsequently may not be a very reliable indicator of fertility. It is employed in this study to provide a basis for comparison.

Four variables will be utilized as proxies for FLFP variables. The first is wife's years of work since marriage (WYW). The second variable utilized here is the percentage of wife's years worked since marriage (PWYW). This variable measures the amount of woman's time as a percentage of married life for any type of work. Two other variables utilized for FLFP proxies are the hours of daily work (HDW) and percentage of hours of daily work (PHDW).

Demographic variables

The demographic variables are duration of marriage (DMR), age of the woman (AGE), age at marriage (WAM). These variables were included to take account of the fact that the women were at various stages in their married lives during the time of the interview. Since AGE = DMR + WAM the three variables will not be used in an equation at the same time. DMR and WAM will be used in most cases.

DMR will of course have a positive effect on fertility and will probably have a positive effect on FLFP measures dealing with the percentage of married life spent working. There should be a negative relationship between WAM and fertility. This is because a higher age at marriage means that a woman has fewer fecund years left, consequently cumulative fertility is expected to be lower. The effect of WAM on FLFP is expected to be positive because a higher age at marriage may be an indicator for preferences for nonfamily related activities.

Background Variables

The background variables are Wife's Education (EW), Husband's Education (EH), Ever Used Contraceptives (EUC), Baby Sitter Help from a relative (BSH) and Mortality Rate (MORT). EW and EH are the number of years of schooling completed by the wife and husband respectively.

These variables are thought generally to be important determinants of FLFP and fertility. There is evidence on the existence of

a negative relationship between fertility and the parent's educational level (T. W. Schultz 1973). According to Lee and McElwain (1981) much of the evidence "indicates a nonlinear relationship between mother's education and the number of children: while there seems to be a large difference in fertility between women with a primary education and those with secondary educations, there exists little difference between women with secondary education and those with a college education."[24] Fertility may be influenced by parents educational attainment in a couple of ways. The more educated parents may have preference for higher quality children and subsequently may have fewer children. The second element is the time cost of child care which is an opportunity cost consisting of time foregone by the parents, especially the wife, as a result of having to divert time from paid employment to child-rearing activities. Since time is incorporated in the production of child services, the cost of an additional child will be higher for more educated parents.

Other background variables like MORT and EUC are especially important with LDC's. MORT is generally found to have a positive impact on birth rates in LDC's (Schultz, 1969). The impact of mortality on fertility operates through two mechanisms, the replacement response and the insurance response. The evidence indicates that parents respond to child loss either in advance by attempting more births than the number of surviving children desired or after the fact by attempting to replace children who die (Schultz, 1971).

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[24]Lee, Bun Song and Adrienne M. McElwain. Development of an Econometric Fertility Model for Less-Developed Countries: An Examination of Fertility, Age at Marriage, and FLFP in Korea. Research Triangle Institute, 1981 p. 4-27.

One can say that the replacement response is a reaction to actual child deaths in a family while the insurance response is a response based on uncertainty and the biological limitations on lifetime reproduction. The mortality measure utilized in this study is the measure of the actual child mortality rates for a household and it is used here to capture the replacement effect.

The EUC variable is quite important in determining fertility levels in LDC's. This is because the availability of birth control devices is not as pervasive as in DC's. EUC is expected to have a negative effect on fertility and a positive effect on FLFP variables. "A woman's decision to use birth control methods is a conscious decision undertaken in conjunction with her decisions concerning quality and quantity of children, and labor force participation."[25]

Economic Variables

The economic variables utilized are Husband's Income (YH) and Wife's Potential Income (WPI). The estimation of potential income has plagued economists for some time especially when one is dealing with respondents not currently in the labor market. The method I chose for estimating potential income in this paper is regressing the annual income of working mothers on several background characteristics, and applying the resulting regression coefficients to the background characteristics of all women to derive estimates of their potential income. This method of estimating potential income

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[25]Ibid., p. 4-59.

has been used before by Gronau (1973) and McCabe and Rosenzweig (1975), but it is subject to some problems. A wage estimate of this type is affected by a "Selectivity bias" since the potential wage of nonworking women may not be identical to wages for working women with the same set of background characteristics. Also, the effects of work experience are overlooked. As such, potential wages for older nonworking women are apt to be biased upwards.

The effects of work experience biases may not be a serious problem in this study, because the variable I am estimating is not wage at a particular point in time but rather the potential lifetime wages as viewed from the date of marriage. Potential wages of all women with identical characteristics are the same at marriage due to the fact that post-marital experience of work has not yet had a chance to play any role.

To estimate wife's potential wage I used the wage and background characteristics of women working in the civil service sectors. This gave me a sub-sample of 285 women. I did not include the sub-sample of businesswomen, because the tendency that they will understate their actual income is very high. In Nigerian society self-employed people have the tendency to usually understate their actual income level because of tax purposes and also for the fear of revealing their actual income to a relative who needs some financial help (Caldwell, 1977). This is less likely to happen with people formally employed in the civil service sectors.

The dependent variable used in this regression is the natural logarithm of income (ln income). The natural logarithm of income is chosen because the distribution of wages tends to approach a

log-normal density function in most societies.[26] The independent variables used originally for the income regression were education of wife (EW), wife's education squared (EWSW), age at marriage (WAM), age (AGE), age squared (AGESQ), and husband's educational attainment (EH), which was employed here as an index of husband's occupational status. These produced an R^2 of .448, as shown in table 3.7. When EW and AGESQ were dropped, AGE increased its level

Table 3.7

OLS Regression Coefficients Showing Effects of Six Independent Variables on the Natural Logarithm of Wife's Income

Independent Variables	(1) β	(1) t	(2) β	(2) t
Wife's Education (EW)	-0.079	-1.22		
Wife's Edu. Sq. (EWSQ)	0.006	2.45	0.003	8.43
Age at Marriage (WAM)	0.020	3.20	0.021	3.38
Husband's Edu. (EH)	0.024	4.50	0.022	4.33
Age (AGE)	0.041	1.34	0.011	2.61
Age Sq. (AGESQ)	-0.0004	-1.01		
Intercept	3.89		3.81	
R^2	0.448		0.444	
N = 285				

of significance and the R^2 lowered slightly to .444. This difference in R^2 was found to be insignificant using an F-test. The remaining variables were significant at .05 level, and all had positive effects on income. They were the ones chosen to construct the variable WPI (Wife's Potential Income).

This estimate of wife's potential income is far from perfect. This is partly due to its incomplete information on the amounts of

[26] McCabe and Rosenzweig (1975), p. 18.

work and exact pay scales coupled with the bias sample which subjects the analysis to a selectivity bias. In addition, the estimation ignores some explanatory variables that might be important determinants of income, and there is no guarantee that the estimate of potential income represents a wage scale rather than some scale of socioeconomic status. Despite these shortcomings, such estimate of potential earning power is needed because lifetime decisions of FLFP and fertility are based on expected future earnings, rather than on current earnings (Smith, 1976). Second, to include all the respondents in the potential income regression calls for the inputation of wage estimates to nonworkers who have no direct income information. In spite of its weaknesses, the potential income estimation method employed in this study is the best available under these circumstances. The ultimate test will be its performance in the empirical analyses that follow.

The question now is what effects are YH and WPI expected to have on FLFP and fertility? The husband's actual income is expected to have a negative effect on FLFP: the higher the husband's actual income, the lower should be the wife's labor force participation. For the effect of YH on fertility one encounters two effects; the income effect which is positive and the substitution effect which is negative. One might expect the income effect to dominate mainly due to the fact that husband's time is not usually subject to trade-off between market and home activities.

The income and substitution effects of WPI on FLFP are easier to predict. The income effect of WPI on FLFP is negative while the substitution effect is positive. It is expected that the substitu-

tion effect will probably dominate because most Nigerian women's income are fairly small. For this reason, a positive effect of WPI on FLFP is expected.

The impact of WPI on fertility is harder to estimate because it involves more partial effects. The income effect alone depends on the fraction of family income made up by wife's income and the elasticity of N (the number of children) with respect to family income. The substitution effect on the other hand depends on the proportion of the total child cost that is accounted by the wife's opportunity cost and the work-childcare compatibility. Based on these observations, the overall impact of WPI on fertility will depend on the magnitude of these individual effects. Usually, the relationship between WPI and fertility is expected to be positive, but a negative coefficient would not be inconsistent with economic theory.[27]

This section has discussed in detail all variables that were obtained from the survey questionnaire. However, the variables that will be employed in the analyses that follow will be those that should have direct influence on either FLFP or fertility.

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[27]Snyder, Donald W., "Economic Determinants of Family Size in West Africa," Demography Vol. 11 (Nov. 1974), p. 617.

CHAPTER IV

FLFP-FERTILITY RELATIONSHIP AND ROLE INCOMPATIBILITY

The previous chapter has set the stage for an empirical analysis of the FLFP-fertility relation by briefly outlining the theoretical model that produces testable implications regarding variables that affect FLFP and fertility, and by constructing empirical variables that can serve as proxies for the conceptual variables. This chapter will focus on the empirical investigation of the FLFP-fertility relationship.

The empirical work will be presented in three sections. The first section considers the variables expected to influence both FLFP and fertility, and determines the magnitude, direction and significance of the explanatory variables' effects on various measures of FLFP and fertility. The second section considers the role incompatibility theory with respect to these data. The final section deals with the possible interpretations that might exist between FLFP and fertility, directly or indirectly. The reader is referred to the list of abbreviations found at the beginning of the dissertation.

Determinants of FLFP and Fertility

Two statistical methods will be utilized here to explore the determinants of FLFP and fertility. They are the Multiple Classifi-

cation Analysis (MCA) and Ordinary Least Squares Regression Analysis (OLS). MCA gives the gross and net effects on a dependent variable. MCA can handle correlated predictors, non-linear relationships and predictors with nominal measures.[28] The shortcoming of MCA is that it does not contain the usual tests for significance levels or the summary measure for the net effects of an independent variable which OLS regression usually provides. Both methods will be utilized here.

Fertility determinants: Tables 4.1 and 4.2 give the summary results of MCA's in which CEB and IFS are the dependent variables and wife's age (AGE), duration of marriage (DMR), wife's education (EW), wife's reported income (YW), and husband's reported income (YH) are the explanatory variables.[29] These tables show the mean fertility levels for women in each category of all the five independent variables and the adjusted means (i.e. adjusted for the effects

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[28]Smith, Stanley Kent, "Women's Work and Fertility in Mexico City," Unpublished dissertation, The University of Michigan, 1976, p. 124.

[29]Categories for the independent variables were chosen mainly for two objectives. First, to maximize the differences among the categories with respect to the dependent variables and also at the same time maintain fairly similar numbers of respondents in each category. With EW, the main concern was to maximize the differences among the categories with respect to the impact exerted on the dependent variables. Thus EW was subdivided according to respondent's attendance of primary school, secondary school/ its equivalent or university education/equivalent EW > 9 relates to respondents with some/completed primary school; EW (9-14) relates to those who attended or completed secondary education; and EW (15+) is for respondents who attended or completed university education. As pointed out in the section on Household Characteristics in the last chapter, the fertility patterns of these three groups are distinctly different. MCA helps in substantiating this fact.

Table 4.1. Multiple Classification Analysis of Effects of Five Independent Variables on CEB

Variables + Category	N	Mean	Adj. Mean
AGE			
<27	134	1.93	3.27
27-31	168	3.89	4.26
32-37	156	5.40	4.79
38+	101	6.60	5.14
DMR			
<5	124	1.48	2.36
5-9	157	3.49	3.80
10-15	145	5.44	5.15
16+	133	6.78	5.90
EW			
<9	163	5.64	4.97
9-14	263	3.87	4.21
15+	129	3.58	3.73
YW			
<125	159	4.92	4.59
125-240	144	3.81	4.36
241-360	118	3.85	4.12
361+	138	4.60	4.18
YH			
<300	126	3.69	3.97
300-449	131	4.26	4.36
450-700	174	4.28	4.36
701+	128	5.10	4.61

Grand Mean : 4.33
R^2 : 0.631

Table 4.2. Multiple Classification Analysis of Effects of Five Independent Variables on IFS

Variables + Category	N	Mean	Adj. Mean
AGE			
<27	134	5.88	6.11
27-31	168	5.93	6.09
32-37	156	6.34	6.29
38+	101	6.80	6.31
DMR			
<5	124	5.39	5.63
5-9	157	5.91	6.03
10-15	145	6.40	6.35
16+	133	7.03	6.71
EW			
<9	167	7.22	6.87
9-14	263	6.07	6.16
15+	129	5.10	5.37
YW			
<125	159	7.08	6.65
125-240	144	6.06	6.18
241-360	118	5.68	5.98
361+	138	5.74	5.85
YH			
<300	126	6.44	6.15
300-449	131	6.29	6.23
450-700	174	5.95	6.17
701+	128	6.17	6.21

Grand Mean : 6.19
R^2 : 0.272

of the other four explanatory variables). These tables give a general idea of the relationship between the independent variables and the dependent variables.

The effects of AGE and DMR are quite straight-forward. With few exceptions CEB and IFS increase with age and duration of marriage before and after adjustments are made. EW has a strong negative effect with CEB and IFS for both means. In the last section I pointed out that a negative income-fertility relationship is not contrary to economic theory. In this section, the MCA show that the wife's actual income to be negatively related to CEB and IFS.

The effect of husband's earned income on fertility is hard to predict. For CEB (both for the adjusted and unadjusted mean) there is an inverted U-shaped effect. For the IFS there is no discernable pattern that holds. The conclusion to be drawn from these facts would seem to be that husbands income plays no large role in fertility especially when adjustments are made for other explanatory variables.

The MCA results give useful fertility information about differences in fertility among categories of the independent variables but it cannot handle continuous independent variables nor does it provide one with the summary measure for the net effects of the independent variables. Because of this important reason OLS regression analysis was also used. The dependent variables chosen from the information contained in the questionnaire were CEB and IFS, and the explanatory variables chosen were Wife's Potential Income (WPI), the natural log of husband's income (LnYH), Wife's Education measured in years (EW), Wife's Education Squared (EWSQ), Husband's Education measured in years and its square respectively (EH) and

(EHSQ), the mortality rate (MORT), calculated as CEB minus the number of surviving children divided by CEB, wife's age at marriage (WAM), whether the respondent has a babysitter that is a relative (BSH), duration of marriage (DMR) and Ever Used any Contraceptives (EUC). BSH and EUC are dummy variables. BSH has a value of 1 if the respondent has a relative staying with her that is helping her in housework/child care duties, and a 0 otherwise. The results are shown in Table 4.3.

Table 4.3 OLS Regression Coefficients Showing Effects of 11 Independent Variables on Two Fertility Measures

	Dependent Variables			
	CEB		IFS	
	Coefficients	t-ratio	Coefficients	t-ratio
WPI	13.726	4.00	7.388	2.26
LnYH	0.398	3.29	0.023	0.20
EW	0.150	2.03	-0.049	-0.69
EWSQ	-0.051	-4.60	-0.024	-2.27
EH	-0.2333	-2.53	0.004	0.05
EHSQ	-0.005	-2.13	-0.009	-4.07
MORT	1.077	3.20	1.272	3.97
WAM	-0.361	-3.42	-0.233	-2.32
BSH	0.303	2.13	0.109	0.80
DMR	0.119	3.10	-0.020	-0.56
EUC	-0.430	-3.14	-0.726	-5.56
Intercept	-56.190	-4.19	-22.851	-1.78
R^2	0.629		0.346	
Mean	4.54		6.24	

The economic variables are both highly significant with respect to their impacts on CEB. WPI and LnYH both have a positive effect on fertility which is consistent with my earlier prediction. But the impact of MYH on IFS is highly insignificant. WPI does have a positive significant effect on IFS.

For the demographic variables, one will observe that their effects on CEB are highly significant. The impact of WAM on CEB was negative, as originally predicted, while the effect of DMR on CEB was positive as predicted. The impact of demographic variables on IFS are highly insignificant.

The effect of EW and EWSQ on CEB confirmed the nonlinear relationship predicted earlier. EW has a significant positive effect on CEB while the EWSQ has a significant negative effect on CEB. This implies that wife's education (mainly at the primary stage) has a nonlinear effect on fertility. This may be due to the fact they are mainly the group that generally experiences high mortality and as such they try to ensure that their ideal number of children will not be drastically reduced by mortality. As the wife's education increases, the preference for higher quality children increases and subsequently they may have fewer children. Also, one would expect that the mortality levels of respondents will decrease as they obtain more education and as such there will be little or no need for the insurance response.

Another background variable utilized in this analysis is MORT. As predicted, MORT was found to be positively related to CEB. It was found to be significant at less than the 1% level. The same was found with EUC; with a negative effect as predicted. MORT and EUC are both significantly related to IFS, with a significance level of less than 1%. Each had the predicted effect.

The analysis so far has not considered directly the role of age in fertility determination. Although age is, of course, implied when WAM and DMR are included in the same equation as shown in

Table 4.3, close attention was not paid to the effects of age itself. To accomplish that, a number of regressions were run for three age groups: women under 30, women between 30-39 and women 40 and over. These results are illustrated in Table 4.4. Some interesting patterns do emerge.

The first interesting pattern that emerges from the analysis of age's impact on fertility is the role WPI plays. The WPI of younger women is strongly positively related to fertility. As they age the degree of significance lowers and when they are 40 and over WPI ceases to play any significant impact on fertility decision. This may be due to the diminished possibility of having children at later age.

Another interesting observation is the way the role of MORT declines as one gets older. The fertility levels of younger women are strongly affected by mortality rates. As the age of the respondents increase, the impact of mortality rate increases up to some point, and thereafter starts to play an insignificant role in fertility. From 40 and over MORT ceases to play any significant role and probably the respondents might have achieved their desired number of children. It is interesting to observe that during the early years of marriage, child mortality has a very significant impact on fertility. The biological fecundity of women aged 40 and over may play a role in the diminished influence of mortality on fertility.

Determinants of FLFP. Tables 4.5 and 4.6 give the results of MCA's in which PWYW (the percentage of wife's years of work since

Table 4.4. Regression Analysis Showing the Effects of 11 Independent Variables on Fertility (CEB) for Three Age Groups.

	CEB	
	Coefficients	t-ratio
Women Aged Less than 30: N = 262.		
WPI	49.99[a]	8.17
LnYH	0.042	0.34
EW	0.141[c]	1.76
EWSQ	-0.158[a]	-8.31
EH	-1.060[a]	-7.50
EHSQ	-0.002	-0.92
MORT	0.709[a]	2.54
WAM	-1.489[a]	-7.77
BSH	0.183[c]	1.42
DMR	0.135[b]	2.07
EUC	-0.321[a]	-2.69
Intercept	-197.09	-8.22
R^2	0.678	
Women Aged 30-39: N = 212.		
WPI	25.857[a]	3.95
LnYN	0.385[b]	2.24
EW	0.093	0.94
EWSQ	-0.085[a]	-4.17
EH	-0.519[a]	-3.20
EHSQ	-0.004	-1.05
MORT	2.038[a]	3.12
WAM	-0.798[a]	-4.19
BSH	0.102	0.47
DMR	0.001	0.01
EUC	-0.304[c]	1.30
Intercept	-101.778	-3.87
R^2	0.603	
Women Aged 40+: N = 82.		
WPI	5.702	0.36
LnYH	1.189[a]	2.60
EW	0.575[b]	1.98
EWSQ	-0.048	-0.98
EH	0.132	0.28
EHSQ	-0.013	-1.13
MORT	1.088	0.51
WAM	-0.024	-0.07
BSH	0.424	0.74
DMR	0.141[c]	1.57
EUC	-0.824	-1.21
Intercept	-33.58	-0.51
R^2	0.389	

[a]Significant at .01; [b]Significant at .05; [c]Significant at .20.

Table 4.5. Multiple Classification Analysis of Effects of Five Independent Variables on PWYW

Variables + Category	N	Mean	Adj. Mean
AGE			
<27	134	0.47	0.39
27-31	168	0.56	0.52
32-37	156	0.52	0.54
38+	101	0.46	0.61
DMR			
<5	124	0.67	0.72
5-9	157	0.54	0.54
10-15	145	0.46	0.44
16+	133	0.37	0.35
EW			
<9	167	0.28	0.45
9-14	263	0.56	0.53
15+	129	0.72	0.55
YW			
<125	159	0.14	0.20
125-240	144	0.60	0.58
241-360	118	0.67	0.62
361+	138	0.71	0.70
YH			
<300	126	0.33	0.48
300-449	131	0.51	0.54
450-700	174	0.61	0.53
701+	128	0.54	0.48

Grand Mean : 0.51
R^2 : 0.446

Table 4.6. Multiple Classification Analysis of Effects of Five Independent Variables on PHDW

Variables + Category	N	Mean	Adj. Mean
AGE			
<27	134	0.21	0.24
27-31	168	0.25	0.25
32-37	156	0.26	0.24
38+	101	0.22	0.22
DMR			
<5	124	0.24	0.23
5-9	157	0.25	0.24
10-15	145	0.24	0.24
16+	133	0.22	0.25
EW			
<9	167	0.16	0.23
9-14	263	0.27	0.25
15+	129	0.29	0.23
YW			
<125	159	0.07	0.07
125-240	144	0.29	0.28
241-360	118	0.30	0.30
361+	138	0.33	0.34
YH			
<300	126	0.18	0.25
300-449	131	0.23	0.24
450-700	174	0.28	0.24
701+	128	0.26	0.23

Grand Mean : 0.24
R^2 : 0.512

marriage) and PHDW (the percentage of hours of daily work outside the home) are the dependent variables. The explanatory variables are AGE, DMR, EW, YW and YH as previously illustrated. The tables again show the gross and net effects of membership in any category upon the two FLFP measures as shown by the means and adjusted means.

The impact of AGE is the same for the two FLFP measures. FLFP measure in each case first rises with age and then falls, both before and after adjustments have been made for the impact of other independent variables.

For DMR, the pattern is not as consistent. For PWYW, the effect of DMR is consistently a negative one for both means, and no clear cut pattern of effect could be discerned from the results on PHDW.

EW has a strong positive effect on PWYW both before and after adjustments were made for the impact of other explanatory variables. For PHDW the positive impact exists only with the unadjusted means. For the adjusted means an inverted u-shaped effect becomes apparent. The strong positive effect of EW on PWYW implies that the more educated a woman is, the more the number of years of her married life, the more willing she is to invest in working outside the home.

The effect of wife's actual income on the two FLFP rate measures is quite strongly positive for the adjusted and unadjusted means. Husband's earned income, on the other hand, has an inverted u-shaped effect on the two FLFP rate measures.

Regression analysis were again run in order to obtain summary results and to test the level of significance. The explanatory variables chosen here are WPI, LWYH, EW, PBS, DMR and WAM. One could easily notice by comparison that not all variables employed in the analysis of fertility (Table 3.9) are utilized here. The only explanation is that one will under normal conditions expect the determinants of fertility and FLFP not to be the same. As such, the explanatory variables shown in Table 4.7 are in my view

Table 4.7. OLS Regression Analysis Showing the Effects of Six Explanatory Variables on PWYW and PHDW.

	Dependent Variables			
	PWYW		PHDW	
	Coefficients/t-ratios		Coefficients/t-ratios	
WPI	0.166	0.285	0.082	0.098
	(1.19)	(5.80)	(1.41)	(6.09)
LnYH	0.096	0.089	0.038	0.036
	(3.82)	(3.71)	(3.61)	(3.62)
EW	0.011		0.002	
	(0.92)		(0.48)	
PBS	0.092	0.091	0.055	0.055
	(2.71)	(2.69)	(3.90)	(3.89)
DMR	-0.013	-0.015	-0.002	-0.03
	(-4.94)	(-6.42)	(-2.16)	(-2.76)
WAM	0.015	0.012	-0.001	
	(2.61)	(2.65)	(-0.25)	
Intercept	-1.295	-1.697	-0.432	-0.498
	(-2.64)	(-7.62)	(-2.11)	(-5.62)
R^2:	0.30	0.30	0.169	0.167

the essential ones, without introducing the simultaneous nature of FLFP and fertility. The results from the two regressions are quite interesting.

The demographic variables DMR and WAM used in this analysis behaved as predicted earlier. It was predicted that WAM will have a positive impact on FLFP and that DMR may have a negative impact on FLFP. Table 3.13 shows that WAM has a significant positive effect on PWYW but an insignificant negative effect on PHDW. The significant positive effect of WAM on PWYW may be an indication of preference for nonfamily related activities. Surprisingly EW which was earlier thought to exert a highly significant positive effect on FLFP rate was found to be insignificant even at a 20 percent level of significance. With these data, EW does not play such an important role in deciding the participation of women in the labor force. Another surprising finding is the positive effect that husband's income has on the wife's labor force participation rate. It was earlier predicted that a negative effect is most likely to exist. The results clearly show a highly significant positive effect.

Findings. This section has tried to answer some questions regarding the determinants of FLFP and fertility as it pertains to this study. WAM was found to have a negative relationship with fertility and a positive relationship with FLFP. DMR was found to have a negative effect on FLFP and a positive effect on fertility. Husband's income was found to be positively related to fertility and FLFP.

Another interesting finding is the impact of mortality on fertility as one moves from one age group to another. It was found that the impact of mortality on fertility declines as women get older. This is because as infants grow and mature the probability

that they will die from their exposure to infections from the environment decreases. As the women age and watch their surviving children grow, mortality ceases to influence the fertility decisions, plus the fact that biological fecundity is less at older age.

FLFP-Fertility Relationship and the Incompatibility Theory

In the previous section an attempt was made to establish the variables that affect fertility and FLFP in Lagos by employing two types of statistical techniques: the Multiple Classification Analysis (MCA) and the Ordinary Least Squares (OLS). This section will examine the relationship between wives' employment and fertility in Lagos City.

It is commonly known that the manner in which women's employment and childbearing relate to each other is by no means constant (Piepmeier and Adkins 1973, and Standing 1978). As pointed out already in the literature review section of chapter two, most studies on industrialized countries usually find that the amount of wives' work is inversely related to the number of children they bear, while this relationship is often zero or positive in the developing countries.

Variations in the FLFP-fertility relationship found in the literature have been explained by the so-called maternal role incompatibility hypothesis (Weller, 1968, and Stycos and Weller, 1967). This hypothesis states that an inverse relationship between women's work and fertility occurs only when the roles of worker and mother conflict. Two institutions are usually utilized in most specifications in determining the conflict level between working

and mothering. The first is the organization of production and second is the organization of childcare, especially the availability of reliable parental surrogates. It is argued that the inverse employment-fertility relationship found in industrial settings is mainly because industrial organization of production removes work from the home. Consequently, most industrial workers are usually not close to their children while at work, and cannot remove themselves on short notice. (Goldstein, 1972, Hass, 1972). In the rural Third World nations, production is often "household-based or family controlled," so that women from these areas tend to enjoy greater proximity to their children while at work.[30]

The other factor utilized in most specifications to determine this conflict level is the availability of parental surrogates. "Because most Third World women often have female relatives or servants living with them or close by, they are thought to enjoy inexpensive, reliable babysitting help to a much greater extent than do women in urban and industrial settings."[31] In view of this, it has been argued that whether the work of Third World women combine easily with caring for children or not, they are able to work without feeling pressures to limit their fertility.

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[30]Mason, K. O. and V. T. Palan, "Female Employment and Fertility in Peninsular Malaysia: The Maternal Role Incompatibility Hypothesis Reconsidered," Demography, Vol. 18, No. 14, Nov. 1981 p. 551.

[31]Ibid., p. 551.

Role Incompatibility Measures

The most common way utilized in the measure of role incompatibility has been by the use of the urban-rural dichotomy. It is usually presumed that conflicts between working and mothering are greater in urban areas than in most rural areas. (Bindary et al., 1973; Goldstein, 1972; Stycos and Weller, 1967). A couple of studies (Gendell et al., 1970; Hass, 1972) have also used women's occupations or job location (whether at home or away) to measure role incompatibility. This taps the work organization factor more precisely than does residence, although it does ignore the importance of parental surrogates.

These two most common ways in which role incompatibility are measured have their shortcomings. The urban-rural dichotomy assumption may seem reasonable but residence may likely be associated with a variety of economic activities. Within both the rural and urban sectors, there are compatible and incompatible types of work. As such the rural-urban breakdown is only a very crude incompatability measure.

The classification of work by location is also not a good measure of incompatibility. The studies utilizing this measure do not make clear the extent to which work organization explains the employment-fertility relationship. Work away from the home will be less compatible with childcare than work at home if the away-from-home work is itself incompatible.

To understand if work organization and the composition of household affect the FLFP-fertility relationship, requires more

precise measurement of these variables. It is important to point out at this stage that although this study is unable to provide a completely unambiguous measure of role incompatibility conditions, it offers the advantage of considering several groups of women's economic activities and the availability of babysitting help from either a relative or a paid babysitter. Another advantage which this study offers is the fact that the data utilized here is basically of a primary source. Specifically, the data include attitude items that directly give one some insight on women's perceptions of role incompatibility in Lagos.

The questionnaire specifically addresses itself to three types of economic activities performed by women in Lagos. Some studies of LDC's have tried to divide women's occupation into categories ranging above five (Arowolo, 1977). It is my belief that such grouping is much too detailed to give one a good measure of role incompatibility. Therefore, this study will categorize female economic activities into three main groups: females employed in the Civil Services, self-employed women, and housewives. The Civil Service category includes women working in all government ministries and corporations, and it embraces all types of activities from clerical and teaching jobs to women employed as managers. I grouped women working in government ministries or corporations into one category because they all are under the same code of conduct, implying that they are under the same condition of service, and fringe benefits, and subsequently under the same work organization.

The category for the self-employed include different varieties of economic activities performed by women. They are self-employed

and their activities may be either petty-trading, medium scale trading or sewing. The common factor among women in this category is the fact that they are self-employed and are not bound by any employer's code of conduct. Consequently, they can be very flexible with their work time schedule.

The third category includes women who are housewives. They are usually not engaged in any form of formal economic activity outside the home. In some instances, as I observed during the interview, one comes across some housewives that are engaged in economic activities around the house. Such activities usually range from hair-dressing to other minor petty-trading activities which are very small in scale, and are centered around the home.

Of these three categories it is expected that the economic activities performed by women in the first category may tend to be incompatible with child rearing. The reason is that the work organization of civil servants is quite formal. Therefore, the fertility levels of women employed in the civil service sector will be quite low relative to the rest of the categories.

For the self-employed businesswomen, one will expect that their activities, although performed away-from-home, may not be incompatible with child rearing. Therefore, their fertility levels may not be that different from that of women who are housewives.

The empirical analysis presented in the previous section considered the variables that were expected to influence both FLFP and fertility, the direction of the effect and their respective significance levels. This section first considers whether any significant relationship does exist between FLFP and fertility in

Lagos City. Also comparisons will be made between workers (i.e., civil servants and businesswomen) and non-workers (i.e., housewives), and most importantly, comparisons among various types of economic activities performed by women. But before these analytical comparisons, the paragraphs that follow discuss the fertility attitudes in Lagos City according to wife's occupation.

Some Aspects of Fertility-Attitude

Selected responses to specific questions were grouped according to wife's occupation and age-group. Tables 4.8 to 4.10 illustrate the findings of the fertility attitudes of Lagos married women. The overall information presented is based on my 1983 survey of 588 married females in Lagos City.

An examination of the three tables will show that for each age group, a higher percentage of the respondents that are housewives agreed that child-bearing is the most important thing a woman can do, than the rest of the respondents. For housewives, about 78 per cent of all the respondents agree that child-bearing is the most important thing a woman can do, while for the self-employed women the percentage that agreed to the same question is 73; and 61% of the civil servants agreed to the same question. This result is not at all surprising because one would expect the civil servants, who are relatively more educated, to find other fulfillments in life besides child bearing.

The response from the respondents to question two (which again was meant to examine the importance of a male child to the respon-

Table 4.8
Fertility Attitudes in Lagos, 1983, Selected Responses to Specific Questions
(Respondents that are Housewives by Occupation)

Questions	Responses	Percentage given that response, by age group (15-21)	(22-28)	(29-35)	(36-42)	(43-49)
1) Is bearing children the most important thing a woman can do?	Agree	76	78	79	74	81
	Disagree	24	22	21	26	19
2) A husband and wife have five daughters and no sons and wonder if that is enough children. If you are in such a position, will you have more children?	Yes	95	78	86	87	95
	No	5	22	14	13	5
3) What do you think is the best number of children to have?	1-3	5	2	0	0	5
	4	14	13	0	3	0
	5	14	23	17	0	9
	6	10	5	7	16	14
	7	7	8	10	10	5
	8+	0	0	0	3	5
	Up to God to Decide	52	50	66	68	62
4) Do you have knowledge of any birth-control device?	Yes	29	35	21	29	29
	No	71	65	79	71	71
5) If you do have knowledge of any birth-control device, have you used any?	Yes	0	57	67	67	67
	No	100	43	33	33	33
Total # of respondents/age group		21	40	29	31	21=142

Table 4.9
Fertility Attitudes in Lagos, 1983, Selected Responses to Specific Questions
(Respondents that are Business Women by Occupation)

Questions	Responses	Percentage given that response, by age group (15-21)	(22-28)	(29-35)	(36-42)	(43-49)
1) Is bearing children the most important thing a woman can do?	Agree	78	57	74	75	82
	Disagree	22	43	26	25	18
2) A husband and wife have five daughters and no sons and wonder if that is enough children. If you are in such a position, will you have more children?	Yes	78	71	76	78	82
	No	22	29	24	22	18
3) What do you think is the best number of children to have?	1-3	22	9	4	3	0
	4	45	17	10	3	0
	5	0	6	6	8	5
	6	0	17	12	33	5
	7	0	14	6	8	22
	8+	0	3	10	6	5
	Up to God to Decide	33	34	52	39	63
4) Do you have knowledge of any birth-control device?	Yes	45	57	34	67	50
	No	55	43	66	33	50
5) If you do have knowledge of any birth-control device, have you used any?	Yes	75	40	47	54	45
	No	25	60	53	46	55
Total # of respondents/age group		9	35	50	36	22=152

Table 4.10
Fertility Attitudes in Lagos, 1983, Selected Responses to Specific Questions
(Respondents that are Civil Servants by Occupation)

Questions	Responses	Percentage given that response, by age group (15-21)	(22-28)	(29-35)	(36-42)	(43-49)
1) Is bearing children the most important thing a woman can do?	Agree	64	72	53	65	52
	Disagree	36	28	47	35	48
2) A husband and wife have five daughters and no sons and wonder if that is enough children. If you are in such a position, will you have more children?	Yes	64	48	51	57	33
	No	32	52	49	43	66
3) What do you think is the best number of children to have?	1-3	4	5	10	0	7
	4	29	37	22	16	26
	5	10	21	21	25	22
	6	18	18	21	14	11
	7	4	1	2	6	7
	8+	0	0	1	4	7
	Up to God to Decide	36	19	23	35	19
4) Do you have knowledge of any birth-control device?	Yes	68	68	77	71	81
	No	32	32	23	29	19
5) If you do have knowledge of any birth-control device, have you used any?	Yes	26	55	70	69	77
	No	74	45	30	31	23
Total # of respondents/age group		28	97	91	51	27=294

dents), was as expected. Housewives once again consistently show a greater degree of male-child importance than the rest, for each category consistently. For the age group (15-21) 95% of all interviewed housewives agree that they will have more children if they find themselves in the condition specified in question two of table 4.8, while 78% and 64% of all the respondents who are either businesswomen or civil servants, respectively, agreed to the same question. This remarkable result is found with every age-group.

For the question about the best number of children to have, over 50% of the respondents that are housewives stated that the issue is up to God to decide. A lesser percentage of the businesswomen and civil servants agree that the decision is up to God. For the question about the knowledge and usage of any birth-control device, a very small percentage of the housewives (about 29%) say that they do have knowledge of birth-control devices. This is consistently true for all the age-groups. Surprisingly, a high percentage of those that have some knowledge of birth-control devices have used some birth control one time or another in their life time. For the businesswomen, about 51 percent of them acknowledged some birth-control device knowledge; of which about 52 percent of them have used birth-control at least once in their life time. The results for the civil servants are as expected. A very high percentage of the civil servants (about 73 percent) have knowledge of some form of birth-control device. Among the civil servants with some knowledge of birth-control, about 59 percent stated they have used some birth-control at least once in their life time.

Cross tabular analysis of fertility differential by occupation reveal an interesting finding. As reported in table 4.11, the table shows the pattern of reported CEB by interviewed women according to age and employment type. Housewives and businesswomen equally show a higher mean CEB than those respondents in civil service employment. This is not a surprising result. The overall mean CEB for housewives is equal to that of businesswomen (about 5.0 each), but the mean distribution among the age-groups are not identical. The businesswomen have a higher mean CEB for the first two age-groups (i.e., 15-21, and 22-28), but a lower mean CEB for the later three age groups (i.e., 29-35, 36-42, and 43-49). The reason for these fertility differences may be that businesswomen are more eager to complete their fertility level plans early in their married life and subsequently concentrate on their business activities, while the housewives are in no such rush, and consequently have their fertility distributed accordingly throughout their fertile years. Nevertheless, overall, the fertility mean of housewives is not that different from those of businesswomen as I earlier predicted. The businesswomen being self-employed removes possibly the structure of formal work organization which will tend to make their work incompatible with child rearing and subsequently create the need for a smaller family size.

Some aspects of fertility attitudes do emerge from this analysis. The most important is the overall mean CEB of civil servants, which as pointed out earlier, is much lower than the means of the other two groups. Another important finding is that a greater percentage of the civil servants have knowledge of some birth-control device

Table 4.11
Average Number of Children Ever-Born by Age Group and Employment Status

Age-Group	Civil Servants		Businesswomen		Housewives	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
15-21	28	1.7	9	3.1	21	1.6
22-28	97	2.5	35	3.9	40	3.3
29-35	91	3.8	50	5.2	29	5.7
36-42	51	5.0	36	6.1	31	7.0
43-49	27	5.1	22	6.5	21	7.3
All Women	294	3.6	152	5.0	142	5.0

N : Sample Size.

$\bar{X}$: Mean number of live births.

and also have used some than the rest of the respondents. This result is not surprising at all since one would expect that females employed in a formal working organization will have a greater need for birth-controls than the businesswomen or housewives.

Although these findings are not that conclusive, since the method of analysis utilized in this section is not controlled, they nevertheless shed light on some aspects of fertility attitudes of women in Lagos City. The next section will employ different methods of analysis: The Multiple Classification Analysis and Regression Analysis.

Results. Table 4.12 shows the fertility differences between women who are housewives and those who are currently in the labor force. The table also shows the fertility levels of women involved in different economic activities and also the intensity of their involvement. There seems to be a clear-cut pattern that emerges from this table. The unadjusted and adjusted means (adjusted for

Table 4.12. Means and Adjusted Means of CEB for FLFP Measures (For All Respondents)

	N	Mean	Adjusted Mean
Housewives	133	5.15	4.54
Workers	426	4.09	4.28
Housewives	133	5.15	4.54
Businesswomen	138	5.00	5.28
Civil Servants	284	3.60	3.49
< 8 HDW (Part-time)	284	4.77	4.59
≧ 8 HDW (Full-time)	275	3.90	4.09
≦ .50 PWYW	297	4.83	4.70
> .50 PWYW	260	3.78	3.93

wife's age and wife's education) show that housewives have a higher CEB than workers (i.e. civil servants and businesswomen together). When the respondents are grouped according to the economic activities performed, the unadjusted mean for the housewives was higher than that of businesswomen and civil servants. But for the adjusted mean, the mean CEB of businesswomen was higher than that of housewives and civil servants.

Table 4.12 also shows the impact of work intensity on fertility. Intensity is defined as hours of daily work (HDW) and percentage of years of wives involvement in the labor force (PWYW). For the hours of daily work, intensity of work was grouped into two categories: less than eight hours of daily work (i.e., part-time work) and eight or more hours of daily work (i.e., full-time work). It was found that among all the respondents that are either civil servants or businesswomen, the part-time workers have about half a child more than full-time workers both for the unadjusted and the adjusted means. For the PWYW, intensity of work was again grouped into two categories: respondents who have been in gainful employment for half or less than half of their married life and those who have been in gainful employment for more than half of their married life. It was found that the respondents that have been in any kind of gainful employment for less than or equal to half of their married life have a much higher CEB, both for the unadjusted and adjusted means. This shows that the higher the percentage of married life that has been spent working (whether in the civil service sector or as a self-employed woman), the lower is the CEB.

Table 4.13 is a more detailed analysis. It shows the impact of work intensity on fertility for the employed (i.e., civil servants and businesswomen). For the civil servants, part-time workers show a considerably higher mean CEB than those that work more than full-time workers. The same picture emerges for the businesswomen.

Table 4.13. Means and Adjusted Means of CEB for FLFP Measures (for Civil Servants and Businesswomen)

	N	Mean	Adjusted Mean
	For Civil Servants		
< 8 HDW	114	3.95	3.89
≧ 8 HDW	171	3.18	3.22
≦ .50 PWYW	92	3.86	3.82
> .50 PWYW	193	3.31	3.33
	For Business-Women		
< 8 HDW	35	5.89	5.89
≧ 8 HDW	104	5.08	5.08
≦ .50 PWYW	72	5.42	5.42
> .50 PWYW	67	5.13	5.13

For the PWYW, women employed in the civil service jobs who have worked less than or half of their married years display a higher fertility level than the group that have worked more than half of their married years. Again, the same picture emerges for the businesswomen. A consistent pattern does emerge from this table: the higher the degree of work intensity (measured in hours of daily work and percentage of wife's married life devoted to outside employment), the lower the CEB, for both the civil servants and businesswomen. The same result was observed in a study of Mexico

City that employed the MCA technique. According to Stanley Smith (1976), full-time workers have lower CEB than non-workers and part-time workers.

In tables 4.12 and 4.13 the mean effects of age and education of wives were netted out through the use of MCA. This is satisfactory for the comparisons of the adjusted fertility rates among FLFP groups, but it does not show the effects of age and education themselves on the FLFP-fertility relationship. These effects can be illuminated by dividing the sample into age and education sub-groups, and comparing the fertility of women in various FLFP categories for each sub-group. This is done for CEB in table 4.14, where three age categories (less than 30, 30-39, and 40 and over) and three education categories (less than 9 years, 9-14 years, and 15 and more years) are combined into nine age-education sub-groups. For the education grouping, the category of less than nine years consists of respondents that completed or attended elementary school, the 9-14 years of schooling category consists of those that completed or attended high schools or its equivalent; and finally, the respondents with 15 or more years of schooling are those that have a university education or its equivalent.

The first panel of the table shows that for most of the age and education sub-groups, workers have substantially lower CEB than nonworkers except for sub-groups of respondents that are less than 30 years old and have completed less than 9 years or 9-14 years of schooling respectively. In the second panel, the CEB of civil servants is substantially lower than the CEB of businesswomen in most of the age-education sub-groups except in cases with insignifi-

Table 4.14. CEB/Woman by Age, Education and FLFP Measures

Age	Education	N	Not Employed During Interview	Employed
<30	<9	75	3.72	3.94
30-39	<9	62	7.65	6.36
40+	<9	30	7.74	7.07
<30	9-14	136	2.15	2.45
30-39	9-14	98	5.57	5.03
40+	9-14	30	7.80	6.25
<30	15+	53	1.00**	2.49
30-39	15+	53	----*	4.04
40+	15+	22	----*	5.10
			Traders/ Businesswomen	Civil Servants
<30	<9	32	4.15	3.00
30-39	<9	31	6.16	7.17*
40+	<9	15	7.07	----**
<30	9-14	109	3.43	2.19
30-39	9-14	91	5.78	4.61
40+	9-14	20	6.44	6.09
<30	15+	53	2.50	2.48
30-39	15+	53	4.20**	4.02
40+	15+	21	----*	4.69

*Less than five persons per category.
**5-9 persons per category.

cant number of persons per category. This may be due to the fact that more educated women especially for the higher age groups are employed in the civil service jobs. These types of jobs require high educational skills and are generally regarded as being quite incompatible with child-rearing.

The analysis thus far indicates that women working in the modern sector, in most of the age-education sub-groups, have a lower CEB than those that are either housewives or self-employed businesswomen. Thus, the analysis shows that women have some trade-off between fertility and certain types of work.

The MCA and the cross tabulation results given so far present a partial picture of the FLFP-fertility relationship, but do not provide tests for judging the significance of the fertility differences among FLFP categories. Such tests are available through the use of OLS regression analysis.

Models chosen to estimate the incompatibility hypothesis in the literature can be written in the following form:[32]

$$CEB = \beta_o + \beta_1 W + \beta_2 I + \beta_3 (W \cdot I) + \sum_{i=1}^{m} \lambda_i X_i + \varepsilon$$

where CEB is the number of children ever born,

W is the number of years worked since marrying,

I is a dichotomous measure of the level of role incompatibility,

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[32] Ibid., p. 555.

W'I is the interaction between work experience and role incompatibility,

X_i are control variables and

ε is a stochastic disturbance term.

The analysis in this section will employ a model identical to the above;

$$CEB = \beta_o + \beta_1 Z + \sum_{i=1}^{m} \lambda_i X_i + \varepsilon$$

where Z represents different measures of FLFP and X_i are control variables (age, marriage duration, wife's years of formal schooling completed and babysitting help).

Fertility was chosen as the endogenous variable in this model and FLFP as the exogenous variable even though the two may be jointly endogenous. Although parameters estimates from this model may be biased with respect to the best theoretical specification, they nonetheless are sufficient for my major analytic purpose here, which is to understand the conditions under which the FLFP-fertility relationship has a particular sign. The next section will examine causal interaction that may exist between FLFP and fertility.

A number of regressions were run on the fertility variable (CEB) with the control variables. These regression coefficients are shown in table 4.15. These regression coefficients show the differences in fertility for various classes of workers. Unfortunately these regressions do not contain nonworkers due to lack of information. But the analysis does provide ample opportunity for the comparison of fertility differences among workers.

Table 4.15. OLS Regression of Some FLFP Measures (Adjusted for DMR, AGE, EW and BSH) for CEB

FLFP Measures		Coefficients	t-ratios	R^2
		For All Respondents		
1)	PWYW	-0.425	-2.12	0.604
2)	PHDW	-1.33	-2.79	0.606
		Civil Servants		
3)	PWYW	-0.679	-2.08	0.523
4)	PHDW	-2.301	-1.41	0.519
5)	≦ .50 PWYW	-0.740	-0.56	0.550
	> .50 PWYW	-1.523	-2.09	0.550
6)	< 8 HDW (Part-Time)	-0.082	-0.41	0.576
	≧ 8 HDW (Full-Time)	-0.215	-1.08	0.464
		Businesswomen		
7)	PWYW	-0.095	-0.20	0.469
8)	PHDY	-3.824	-2.29	0.489
9)	≦ .50 PWYW	0.469	0.32	0.388
	> .50 PWYW	-0.906	-0.69	0.563
10)	< 8 HDW (Part-Time)	-0.074	-0.23	0.479
	≧ 8 HDW (Full-Time)	-0.149	-1.34	0.513

For all the respondents, the two FLFP measures were found to be significantly negatively related to fertility. A different pattern emerges when the respondents were grouped according to the economic activities they perform. PWYW, PHDW were found to be significantly negatively related to fertility for the civil servant at 5% and 20% level of significance respectively. For the businesswomen PWYW was found to be highly insignificantly related to fertility; while PHDW was significantly negatively related to fertility. Civil servants who have worked more than half of their married life have significantly lower fertility than those who have worked less than half of their married life. For the businesswomen, those that have worked more than half of their married life have lower fertility relatively. For the full-time and part-time workers, it was observed that for the businesswomen full-time workers have lower fertility than part-time workers although the level of significance is quite low.

Overall, the picture that emerges shows that women in work classifications thought to be incompatible with child rearing have in most instances a significantly lower fertility than the others. Also, within each work classification, full-time workers and workers that have worked for a greater proportion of their married lives have lower fertility than part-time workers and workers that have worked for a lower proportion of their married years respectively.

Conclusion: Several aspects of fertility attitudes were observed in this section. The most important is that the fertility levels of civil servants is lower than that of businesswomen and

housewives. Also, that not much difference exists between the fertility levels of businesswomen and that of housewives. The lower fertility level of civil servants is quite as expected if one considers the nature of their work organization, which as argued earlier is much more incompatible with child rearing. It was also observed that a much greater percentage of civil servants have knowledge of some birth control devices.

Several other things stand out. First, there is a negative relationship between the two FLFP measures (i.e. PWYW and PHDW) and fertility for all the respondents grouped together, and these relationships are highly significant. Second, when the respondents were grouped according to the economic activities performed, some measures of incompatibility performed better than others. For example, the breakdown by work intensity (full-time or part-time, and $\leqq$ .50 PWYW or > .50 PWYW) results to fertility differences that are illustrated by their respective coefficients and t-ratios in table 4.15.

The analysis performed so far assumes that life time choices of fertility and FLFP are made at marriage and that these choices do not change over time and that interactions do exist between FLFP and fertility (Smith, S. R., 1976; and Mason and Palan, 1981). The section that follows explores the possibility that fertility and FLFP can be related to each other.

Interaction Effects

Most theoretical models of FLFP-fertility relationships do imply that interactions do exist between FLFP and fertility. If the lifetime choices made at the time of marriage do vary over time, it implies that non-causality no longer holds. As such, FLFP and fertility can influence each other either directly or indirectly over time.

Even if FLFP and fertility exert no direct causal influence on each other, they may in some way exert some important indirect effects through the explanatory variables. This means that an explanatory variable may affect fertility differently for civil servants than businesswomen or housewives. As an example, one would expect that the WPI should have considerably less impact on the fertility of housewives than for civil servants. This is because women who do not work presumably value their non-market time more highly than their potential income, otherwise they should be working.[33]

The results in table 4.16 are interesting. First, they do conform to the expected effect of WPI on fertility. WPI has a larger and more significant positive effect on fertility for the civil servants than the rest. This may indicate that WPI has considerably more effect on fertility for civil servants than for the rest of the respondents. The WPI coefficient for civil servants

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[33]Smith, S. K., "Women's Work and Fertility in Mexico City," Unpublished dissertation, The University of Michigan, 1976, p. 163.

is highly significant while that for housewives is only significant at the 0.20 level.

Another interesting result is the effects of EW on fertility. For the civil servants, the coefficient is quite large, highly significant and negative. For the businesswomen, the coefficient is positive and significant at .01 level. It would appear that for

Table 4.16. OLS Regression Coefficients Showing Effects of Independent Variables on CEB for Sub-sample of Women Who Are Either Civil Servants, Businesswomen, or Housewifes

	CEB					
	Civil Servants		Businesswomen		Housewives	
WPI	7.205	(2.28)	-7.460	(-3.69)	5.298	(1.50)
LnYH	-0.007	(-0.03)	0.212	(1.05)	0.681	(3.20)
EW	-0.693	(-3.21)	0.457	(4.04)	-0.417	(-2.15)
EH	-0.164	(-2.90)	0.122	(2.25)	0.139	(-1.67)
MORT	0.655	(1.10)	2.193	(2.20)	0.872	(1.41)
WAM	-0.168	(-2.05)	0.286	(3.78)	-0.110	(-0.94)
BSH	-0.001	(0.00)	0.591	(1.77)	0.356	(1.16)
PBS	-0.159	(-0.72)	0.538	(1.72)	-0.633	(-1.32)
DMR	0.174	(5.33)	0.337	(10.13)	0.211	(4.87)
EUC	-0.350	(-1.73)	-0.546	(-1.70)	-0.782	(-2.76)
Intercept.	-22.350		26.791		-21.487	
R^2	0.480		0.603		0.742	
Mean	3.74		5.37		5.31	
D-W	1.83		1.87		1.89	

Note: Ratios of regression coefficients to standard errors are in parenthesis.

the civil servants, the factor that plays an important role on fertility is education.

Some results are quite puzzling. For example, EUC has a much larger coefficient, which is negative, and highly significant, for the businesswomen than for the civil servants. This implies that

EUC (Ever Used Contraceptives) has a more depressing effect on fertility of businesswomen than that of civil servants.

The results presented so far show that significant interaction effects exist between FLFP and various independent variables. Thus, even if one assumes that there is no direct causal relationship between FLFP and fertility, an important indirect relationship could still exist through the independent variables. To investigate this, I will utilize the Two Stage Lease Squares Regression Analysis (2SLS).

The model utilized will consist of two simultaneous equations. In order to identify these equations, the number of exogenous variables excluded from each equation must be at least as large as the number of endogenous variables included, less one. The variables excluded in a given equation should be unrelated to the dependent variable. Although it is very desirable to be able to choose the excluded variables on the basis of the underlying theory, it is impossible in the present model because most of the variables are assumed to affect the endogenous variables involved here. However, it turns out that some exogenous variables significantly affect one endogenous variable but not the other, and these are the likely candidates for exclusion from one of the equations. Several variables were tried for each endogenous variables, and the ones ultimately chosen were the ones that could explain the largest amount of variance in the equation. Although the choice of excluded variables can be expected to have important effects on the results, in the present study that was never the case.

The exogenous variables used in this analysis were EUC, EW, WAM, MORT, BSH, DMR, EH, WPI, LnYh and PBS; and the endogenous variables were CEB, and PWYW. The model is in the form of:

$$CEB = f_1 (WIP, LnYH, EW, EH, MORT, WAM, BSH, DMR, EUC, PWYW);$$

$$PWYW = f_3 (WPI, LnYH, DMR, PBS, WAM, CEB)$$

As one can notice, the two equations are all identified. Mortality rate is assumed as an exogenous variable in this study, although it may be thought of as an endogenous variable in some fertility studies. In any case, the main concern here is to examine the causality between FLFP and fertility.

Table 4.17. 2SLS Regression Coefficients Showing Effects of PWYW and CEB on Each Other (For All the Respondents)

Variables	Dependent Variables			
	CEB		PWYW	
WPI	-1.920	(-1.72)	0.068	(0.39)
LnYH	0.303	(1.31)	0.119	(3.77)
EW	0.055	(0.72)	0.013	(1.09)
EH	-0.0004	(-0.01)		
MORT	1.193	(3.11)		
WAM	0.094	(1.88)	0.020	(2.66)
BSH	0.345	(2.20)		
DMR	0.297	(10.12)	0.0001	(0.009)
EUC	-0.555	(-3.42)		
PBS			-0.087	(-2.50)
PWYW	0.870	(0.44)		
CEB			-0.046	(-1.05)
Intercept.	6.730	(1.48)	-0.991	(-1.64)
R^2	0.597		0.306	
D-W	1.565		1.32	

Note: Ratios of regression coefficients to standard errors in parentheses.

The results of the 2SLS regression for all the respondents is shown in table 4.17. The 2SLS regression shows fertility to be insignificantly positively related to FLFP while the OLS regression shows fertility to be negatively related to FLFP. At the same time, FLFP shows an insignificant negative relationship with fertility. This inconsistency is hard to explain. Table 4.18 shows results that were observed when the respondents were grouped according to the types of jobs they engage in. For the civil servants and businesswomen both the OLS and 2SLS regressions analysis consistently show

Table 4.18. 2SLS Regression Coefficients Showing Effects of PWYW and CEB on Each Other and Other Explanatory Variables (For Civil Servants and Businesswomen)

	Dependent Variables			
Variables	Civil Servants		Businesswomen	
	CEB	PWYW	CEB	PWYW
WPI	8.968 (2.25)	0.645 (3.07)	-4.52 (-0.67)	-0.318 (-0.96)
LnYH	0.101 (0.35)	0.044 (1.10)	1.29 (0.78)	0.097 (2.22)
EW	-0.881 (-2.31)	-0.072 (3.24)	0.446 (1.62)	0.024 (1.02)
EH	-0.173 (-2.78)		-0.053 (0.19)	
MORT	0.621 (0.98)		2.720 (1.12)	
WAM	-0.165 (-1.92)	0.006 (0178)	0.330 (1.81)	0.023 (1.66)
BSH	-0.029 (-0.12)		-0.148 (-0.13)	
DMR	-0.252 (-0.94)	-0.016 (1.24)	0.177 (0.71)	-0.001 (-0.06)
EUC	-2.346 (-0.68)		-1.196 (-0.96)	
PBS		0.078 (2.11)		-0.033 (-0.51)
PWYW	-2.346 (-0.68)		-10.966 (-0.71)	
CEB		-0.012 (-0.26)		-0.005 (-0.54)
Intercept.	-28.271	-2.172	14.907	1.085
R^2	0.4536	0.2765	0.2068	0.1229
D-W.	1.95	1.92	1.99	1.93

Note: Ratios of regression coefficients to standard errors in parentheses.

fertility to be negatively related to PWYW (as illustrated in tables 4.15 and 4.18); although they show different levels of significance.

From table 4.18, PWYW has a negative effect on CEB for both civil servants and housewives, and CEB has negative effects on PWYW. This is consistent with the negative relationship found when MCA technique was employed earlier in this chapter. Another point is that the ratios of coefficients to standard errors are much smaller than those found using OLS. This analysis shows fertility to be negatively related to FLFP; however, the relationships are largely insignificant with respect to the 2SLS analysis. Similar results were obtained as shown in table 4.19 which illustrates the regression coefficients for the effects of PHDW and CEB on each other. In view of this, the relationship between FLFP and fertility which were shown earlier to be significant when few controls were used is seen to be largely non-causal in nature.

An interesting hypothesis does emerge; that excess fertility which is likely to be common in LDC's causes a change in the FLFP plans that were made at marriage. This change was mostly found to be negative in this study. Although the model implies that fertility should have a negative effect on work that is incompatible with child rearing, it was also found that some types of work thought to be compatible with child-rearing were also found to be negatively related to fertility (although much depends on the type of work intensity measure utilized).

Conclusion: This section has shown that interaction does exist between FLFP and some other variables affecting fertility.

Table 4.19. 2SLS Regression Coefficients Showing the Effects PHDW and CEB on Each Other and Other Explanatory Variables(For Civil Servants and Businesswomen).

Variables	Dependent Variables			
	Civil Servants		Businesswomen	
	CEB	PHDW	CEB	PHDW
WPI	8.46(2.54)	0.066(].38)	-9.10(-2.32)	0.10(1.06)
LnYH	0.15(0.47)	0.023(2.49)	0.29(0.75)	-0.002(-0.15)
EW	-0.80(-2.83)	-0.005(-0.91)	0.58(2.48)	-0.007(-1.08)
EH	-0.18(-2.85)		0.10(1.00)	
MORT	0.58(0.93)		0.41(0.15)	
WAM	-0.21(-0.16)	-0.003(-1.71)	0.31(2.29)	-0.002(-0.52)
BSH	-0.040(-0.16)		1.52(1.19)	
DMR	0.15(3.25)	-0.006(-2.08)	0.34(5.56)	0.001(0.24)
EUC	-0.47(-1.86)		-0.69(-1.12)	
PBS		0.026(3.12)		0.041(2.19)
PHDW	-7.10(-0.71)		21.72(0.94)	
CEB		0.017(1.44)		-0.005(0.40)
Intercept	-25.43(-2.51)	-0.095(-0.63)	25.32(1.78)	-0.044(-0.12)
R^2	0.4751	0.1115	0.3129	0.0661
D-W	1.86	1.43	1.82	2.02

Note: Ratios of regression coefficients to standard erros are in parenthesis.

It was found in particular that WPI and EW have much important impacts on fertility of workers than for housewives.

It is also shown that no significant direct causal relationship exists between fertility and FLFP (when PWYW and PHDW are measures of FLFP employed), once economic, attitude and demographic variables are controlled.

CHAPTER V

CHILD-CARE AND FEMALE EMPLOYMENT IN LAGOS

In the previous chapter, I examined the maternal role incompatibility theory as it relates to Lagos married women. It was pointed out that the inverse employment-fertility relationship found in industrialized nations is mainly due to the nature of the work organization which removes work from the home. In most developing countries (especially in their rural areas) female work is mostly centered around the home or in the farms where children are generally welcome. If a mother is working informally around the house or in the agricultural field, she can easily combine child-care activities with her income-earning activities.

The other important factor pointed out in the previous chapter that may aid one in determining the level of conflict between child-rearing and work is the availability of child-care help. The argument is that the compatibility of child-care and market work will considerably depend on whether relatives or older siblings are available to care for pre-school children and whether the household can afford servants.[34] In view of the fact that these conditions are much more likely to be fulfilled in Third World Nations than in industrialized nations, I will explore the role child-care plays on

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[34]Mason, K. D. and V. T. Palan, "Female Employment and Fertility in Peninsular Malaysia: The Maternal Role Incompatibility Hypothesis Reconsidered." Demography, Vol. 18, #4 Nov. 1981 p. 551.

mother's employment in Lagos.

Hypotheses and Questions Posed

In the previous chapter it was pointed out that several factors influence female labor force participation. They include family economic pressure, employability and earning potential, labor market environment and family composition. These factors are more relevant to women in wage employment than those self-employed in their individual economic activities.

A family's economic pressure is often measured by the husband's income. The probability that a woman would want to work decreases if the husband's income is high, implying that the higher the income of the husband, the lower the probability that the wife will engage in formal work.

Employability refers to a woman's ability to perform certain tasks for which there is a demand. A woman with some occupational skills is more likely to be employed. Earning potential is somewhat related to employability. If a woman can earn a high income relatively, she is more likely to work. I will utilized WPI and the number of years of schooling as proxies for earning potential and employability respectively.

Another factor mentioned above that may influence FLFP is the labor market environment. If the job market is such that it is not difficult to find a job, more women may choose to work and if the job market is bad, married women usually fall out of the labor force.

The last factor, family composition, is quite important in influencing mothers' employment rate. Granted that all the already mentioned factors do influence mothers' employment, the effect of family composition may influence the employment prospects of mothers. By family composition I mean whether the mother has young children or not, whether she has a paid baby-sitter or a relative helping her in household activities. If the answers to the last two conditions is a "Yes", then the probability that she will engage in an economic activity increases.

So far, few empirical studies have tried to examine the influence of family composition on the employment of mothers. This section of the present study will try to examine the part played by family composition in influencing female employment.

Two methods will be employed here in analyzing the influence of child-care facilities on female employment: the Multiple Classification Analysis (MCA) and Ordinary Least Square regression (OLS).

Results from the Analysis: Tables 5.1 to 5.4 are various results of the MCA that were done. Two dependent variables were employed in this analysis: PWYW--the percentage of years worked since marriage and HDW--the hours spent daily in any form of income earning activity that is outside the home. Four explanatory variables were employed: baby sitting help from a relative (BSH), paid baby-sitter (PBS), wife's educational level measured in years (EW) and wife's earned income (YW). BSH and PBS are dummy variables in which values of "0" were assigned if the respondents do not have a

Table 5.1 Multiple Classification Analysis of Effects of Four Independent Variables on PWYW. (For All Respondents).

Variables + Categories	N	Mean	Adjusted Mean
PBS			
No	422	0.48	0.51
Yes	136	0.61	0.52
BSH			
No	194	0.53	0.53
Yes	364	0.51	0.51
EW			
< 9	166	0.28	0.42
9-14	263	0.55	0.53
15+	129	0.72	0.58
YW			
< 125	158	0.14	0.20
125-240	144	0.60	0.59
241-360	118	0.66	0.63
360+	138	0.71	0.68

Grand Mean: 0.51

R^2 : 0.386

Table 5.2 Multiple Classification Analysis of Effects of Four Independent Variables on HDW. (For All Respondents).

Variables + Categories	N	Mean	Adjusted Mean
PBS			
No	422	5.45	5.69
Yes	136	7.16	6.43
BSH			
No	194	5.97	5.86
Yes	364	5.82	5.87
EW			
< 9	166	3.97	5.63
9-14	263	6.47	6.20
15+	129	7.09	5.51
YW			
< 125	158	1.85	1.98
125-240	144	7.05	6.93
241-360	118	7.24	7.22
360+	138	8.08	8.07

Grand Mean: 5.87

R^2 : 0.512

Table 5.3 Multiple Classification Analysis of Effects of Two Independent Variables on PWYW For Civil Servants and Businesswomen.

Variables + Categories	N	Mean	Adjusted Mean
	Civil Servants		
PBS			
No	203	0.70	0.71
Yes	82	0.77	0.74
BSH			
No	113	0.75	0.73
Yes	172	0.70	0.71
	Businesswomen		
PBS			
No	102	0.57	0.57
Yes	37	0.53	0.54
BSH			
No	34	0.55	0.57
Yes	105	0.56	0.56

Table 5.4 Multiple Classification Analysis of Effects of Two Independent Variables on HDW For Civil Servants and Businesswomen.

Variables + Categories	N	Mean	Adjusted Mean
	Civil Servants		
PBS			
No	203	7.10	7.14
Yes	82	7.69	7.60
BSH			
No	113	7.40	7.26
Yes	172	7.18	7.27
	Businesswomen		
PBS			
No	102	8.39	8.46
Yes	37	9.30	9.11
BSH			
No	34	9.50	9.37
Yes	105	8.35	8.39

baby-sitting help from either a relative or a paid baby-sitter, and the value of "1" is assigned otherwise respectively.

The results of the analysis shown in tables 5.1 to 5.4, reveal that the impact of PBS on the two measures of FLFP employed is consistently positive both for the adjusted and the unadjusted means. From table 5.1, about 136 respondents have a paid baby-sitter, and they have spent more than half of their married life in income earning activities. Table 5.2 also shows that respondents with a paid baby-sitter on the average day worked longer than those without paid baby-sitter. Similar results were observed for the civil servants in tables 5.3 and 5.4. PBS in each case showed to influence either PWYW or HDW in a positive direction.

For the BSH, there seems to be lack of a substantial impact in all the cases as illustrated on tables 5.1 to 5.4, coupled with a lack of consistency. In most of the results, respondents with some baby-sitting help from a relative worked fewer hours daily or worked a lesser percentage of their married life than respondents with no baby-sitting help from a relative. This is rather a surprising result, because one will expect that mothers that enjoy the privilege of having a relative helping them in baby-sitting activities will be more willing to engage in income earning activities outside her home. The reason for this rather surprising finding may be due to the nature of baby-sitting helps from relatives; they are in most situations very unreliable. There is no guarantee that a relative helping in baby-sitting activities will stay for the required period of time.

These tables of MCA results (i.e., 5.1 to 5.4) give useful information about FLFP differences among categories of the explanatory variables, but the analysis technique does not provide one with the summary measure for the net effects of an explanatory variable. Thus, OLS regression was utilized also.

Tables 5.5 to 5.7 show the regression results for the impacts of PBS and BSH on PWYW and PHDW. The model utilized for these regression can be written as;

$$FLFP = \alpha_o + \alpha_1 PBS + \alpha_2 BSH + \sum_{i=1}^{m} \beta_i x_i + \varepsilon$$

where FLFP represents either PWYW or PHDW;

x_i are control variables (which include wife's education, wife's potential income, wife's age and the log of husband's income).

The regression results on table 5.5 indicate that PBS has a positive, significant effect on PWYW and PHDW when all respondents were regressed together. When the respondents were all grouped according to their age groups[35], a slightly different result occurs. For the respondents aged 35 or less PBS showed a positive impact on

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[35]Some studies (Adewuyi, 1980) that have been done on the influence of child-care on female employment have centered their analysis on the employment rates of mothers by age of the youngest child. This study lacks adequate information on the age of the youngest child, as such, I grouped mothers by their age. This would help show if difference in employment rate exist between younger mothers and older mothers. The theory does tend to show that younger mothers are the ones mostly likely to have younger children, and as such, a baby-sitting help may be needed greatly.

Table 5.5 OLS Regression Coefficient of Two Explanatory Variables for Two FLFP Measures (For All Respondents)

	Explanatory Variables	Dependent Variables PWYW		PHDW	
	For All Respondents				
1)	PBS	0.090	(2.44)	0.058	(3.90)
	BSH	0.002	(0.07)	0.008	(0.57)
	R^2	0.2613		0.1687	
	All Respondents Aged 35 or Less. N = 374.				
2)	PBS	0.078	(1.67)	0.066	(3.65)
	BSH	-0.001	(-0.02)	0.001	(0.07)
	R^2	0.2417		0.1752	
	All Respondents Aged 36 or Above. N = 184.				
3)	PBS	0.111	(1.87)	0.052	(2.00)
	BSH	-0.005	(-0.09)	0.017	(0.72)
	R^2	0.3135		0.2199	

Note: Ratios of regression coefficients to standard errors in parentheses.

both PWYW and PHDW; but the significance level is higher in the later case. For the respondents aged 36 or above, PBS showed a positive and significant influence on both PWYW and PHDW.

A different picture is observed with the results of the regression analysis of the impact of BSH on both PWYW and PHDW as shown in table 5.5. Mixed results were observed; a positive effect occurred in most cases. Only in two situations did BSH have a negative influence on PHDW. In any case, all the influences were highly insignificant.

These results are quite consistent with the MCA results shown earlier in tables 5.1 to 5.4. PBS showed a strong positive influence on both PWYW and PHDW while an inconsistent and insignificant results

were observed with the case of BSH's influence of PWYW and PHDW. These findings further help in showing that mothers with paid baby-sitters are usually more able to engage in some form of income earning activities.

Table 5.6 shows the regression results for civil servants. The same model employed in the previous analysis was utilized here. For all the sub-groups, PBS showed a consistent positive influence

Table 5.6 OLS Regression Coefficient of Two Explanatory Variables for Two FLFP Measures (For Civil Servants Only)

	Explanatory Variables	Dependent Variables PWYW		PHDW	
	For All Civil Servants.				
1)	PBS	0.061	(1.56)	0.021	(2.88)
	BSH	-0.029	(-0.81)	-0.004	(-0.57)
	R^2	0.2058		0.1320	
	Civil Servants Aged 35 or Less. N = 207.				
2)	PBS	0.013	(0.27)	0.020	(2.27)
	BSH	-0.039	(-0.90)	-0.013	(-1.55)
	R^2	0.1981		0.1519	
	Civil Servants Aged 36 or Above. N = 78.				
3)	PBS	0.172	(2.49)	0.026	(1.99)
	BSH	-0.011	(-0.17)	0.018	(1.36)
	R^2	0.2925		0.1978	

Note: Ratios of regression coefficients to standard errors in parentheses.

on both PWYW and PHDW. PBS showed a significant positive influence on PHDW when all the respondents that are civil servants were analyzed together. But when the civil servants were grouped according to their age-groups, PBS was insignificantly related to PWYW and highly significantly related to PHDW for civil servants aged 35

or less. For much older civil servants (36 years old or more), PBS was positively related to PWYW at a one per cent significance level, also PBS's impact on PHDW was positively significant at a five per cent level.

The regression results indicate that among the older women who are engaged in civil service jobs, PBS do have a greater impact on PWYW than on PHDW. And finally, the results show that BSH lacks a clear-cut consistent influence on either PWYW or PHDW for all respondents that are civil servants.

Table 5.7 shows the regression results of respondents that are businesswomen. The model employed in the analysis shown in table 5.7 is similar to the one utilized in two previous cases. The regression results give no clearly defined pattern that can help in

Table 5.7 OLS Regression Coefficient of Two Explanatory Variables for Two FLFP Measures (For Businesswomen Only)

	Explanatory Variables	Dependent Variables PWYW		PHDW	
	For All Businesswomen.				
1)	PBS	-0.029	(-0.45)	0.027	(1.47)
	BSH	-0.006	(-0.09)	-0.042	(-2.27)
	R^2	0.0522		0.0923	
	Businesswomen Aged 35 or Less. N = 83.				
2)	PBS	0.061	(0.65)	0.040	(1.47)
	BSH	0.111	(1.10)	-0.021	(-0.71)
	R^2	0.0786		0.0985	
	Businesswomen Aged 36 or Above. N = 56.				
3)	PBS	-0.058	(-0.59)	0.040	(1.65)
	BSH	-0.054	(-0.54)	-0.053	(-2.20)
	R^2	0.1280		0.1619	

explaining the influence of either PBS or BSH on the two FLFP measures employed.

Conclusion: The question addressed in this chapter is what influence, if any, does child-care have on female employment. It is generally believed that the compatibility of child-care and mother's market work will greatly depend on the availability of child-care help in the household. Subsequently, mothers with child-care help, will be more willing to engage in market work outside the home.

The results from this study do indicate that mothers with paid baby-sitters spend a greater part of their married life in income generating activities; they also spend on the average more hours daily in income generating activities that are performed outside the home. This result is quite pronounced for the civil servants. The results indicate that PBS has a significant and positive influence on both PWYW and PHDW when the civil servants data was analyzed. The results from the analysis of businesswomen do not show any clearly defined pattern.

It was also observed that BSH does not have a significant impact on the work participation rate of mothers in the labor force. This rather surprising finding may be due to the nature of such baby-sitting help from relatives. First, there is always the possibility that a relative helping in baby-sitting care can easily terminate such activity without the necessary quit notices that are required if the baby-sitter is paid. Second, in most cases nowadays, when a relative is helping in baby-sitting duties, it is usually agreed upon (especially if the babysitter is a teenager) that

he/she be put through high school education. This actually cuts down on the number of hours he/she spends on actual baby-sitting duties.

In view of these findings, the influence of child-care on female employment in Lagos will greatly depend on the nature of such help.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Conclusions

The model utilized in this study is somehow similar to the Chicago model because it is a comparative statics model that puts fertility and female labor force participation within the framework of family decision-making process with income and time constraints. The model examined the incompatibility of working and caring for children. This was included to take account of the fact that in LDC's some types of work can be carried out simultaneously with child-care activities while some other types of work cannot be carried out simultaneously with child-care activities. The model also recognized two types of relationship between FLFP and fertility. One in which they are jointly determined but not causally related and one in which they may be casually related over time. Finally, the model recognized the important role of child-care help in influencing mother's participation rate in the labor force.

The model used has a couple of implications for fertility and FLFP. First and foremost, a negative relationship between FLFP and fertility will only depend on the degree that they are competing uses of time. If FLFP and fertility are not competing uses of time, one will expect no relationship, or even a positive one should be expected. Second, a number of economic and demographic variables affect both fertility and FLFP. The economic variables

are the ones of most interest in this study. The model implied that husband's actual income is expected to have a negative influence on FLFP; the higher the husband's actual income, the lower should be the wife's labor force participation. On the effect of husband's actual income on fertility, one would expect a positive effect. As for the wife's potential income, the model implies that it will both raise FLFP and fertility, but a negative influence on fertility would not be inconsistent with economic theory. Finally, two separate causal relationships exist between FLFP and fertility. One is the case in which they affect each other indirectly through the common explanatory variables, and the other in which they may affect each other directly over time. These mentioned implications form the basis of the empirical investigations carried out.

Variations in the relationship between FLFP and fertility have been explained by the role incompatibility hypothesis; which states that an inverse relationship between women's work and fertility occurs only when the role of workers conflict with that of mothers. One basic question which this study tried to answer is concerned with the relationship one expects to exist between FLFP and fertility. It was noted after reviewing the literature on the subject that most studies on industrialized nations usually find that the amount of wife's work is inversely related to the number of children they bear. Studies on LDC's find no such consistent results: some studies find a negative FLFP-fertility relationship, some find a positive relationship and some no relationship at all. However, these studies employed a variety of measures to estimate FLFP and some do not take into account the differences in types of work.

Two most common ways used in measuring role incompatibility is the use of the urban-rural dichotomy and the job location (i.e., whether the job is performed at home or away from home). These two ways in which role incompatibility are most usually measured have their shortcomings. The urban-rural dichotomy is not a good measure of role incompatibility because residence may likely be associated with a variety of economic activities. Within both the rural and urban sectors, there are compatible and incompatible types of work. The classification of work by location also has some shortcomings. Work-away-from-home will be less compatible with childcare than work-at-home if the away-from-home work is itself incompatible.

The questionnaire utilized in this study categorized work performed by women into three groups: women employed in the civil service sector, those that are self-employed and women that are housewives. Several aspects of fertility attitudes were observed in this study. The most important observation is that the fertility level of civil servants is lower than that of businesswomen and housewives. Also, not much difference exist between the fertility level of businesswomen and that of housewives. The lower fertility level of civil servants is quite as expected if one considers the nature of their work organization which is much more incompatible with childrearing. It was also observed that a much greater percentage of the respondents that are civil servants have knowledge of some birth control devices, than the rest of the respondents who are either housewives or businesswomen.

When the respondents were grouped according to their intensity of work, an interesting observation emerged. It was observed that

the part-time workers have about half a child more than the full-time workers. Also for the respondents that have been in gainful employment for the majority of their married life had on the average a lower mean CEB than otherwise.

Results from the regression analysis do support the above findings of the uncontrolled analysis as illustrated in table 4.15. First, a negative and significant relationship was observed between the FLFP measures (PWYW and PHDW) and fertility when all respondents were regressed together. Second, when the respondents were grouped into work classification that may show degrees of incompatibility between working and caring for children, different results became apparent. Although the relationship was still negative for both the civil servants and businesswomen, the coefficients and the significance levels were quite different. For the civil servants, PWYW was highly significant while PHDW was only significant at .20 level.

For the businesswomen, although PWYW was negatively related to fertility, it was highly insignificant.

The results do show that as the respondents were grouped according to the economic activities they performed and the level of intensity such activities are performed, some measures of incompatibility become better than others. The findings do support the hypothesis that a negative relationship will exist between FLFP and fertility only to the extent that fertility and work are competing time use.

Another basic question which this study tried to address itself is concerned with the effects of economic and some demographic

variables have on fertility. The results for wife's potential income show that increases in WPI tend to significantly raise fertility and FLFP measures employed. Furthermore, WPI of younger women is positively related to fertility. As women get older, WPI gradually ceases to play any significant influence on fertility. Mortality rate, which is a very important demographic variable especially in the less developed countries showed an interesting pattern of effects on fertility. It showed a very strong positive effect on fertility when all the observations were analyzed together. When the observations were grouped according to their age-groups, the positive effect of mortaility rate on fertility for the younger women was highly significant. As the respondents get older, the effect of mortality increases up to some point and thereafter starts to play an insignificant effect on fertility. For the respondents aged 40 and over, mortality has an insignificant effect on fertility. The probable explanation to this may be that the older respondents might have reached their desired number of children and as such, mortality ceases to play an important part in their fertility decisions. Also women over forty are less fecund, so nothing will influence their fertility very much. Whereas for the younger mothers, they probably have not reached their desired fertility level or that their children are still young and more prone to infectious illnesses; as such mortality should play an important role in their fertility decisions as observed in this study.

The next important question addressed here is whether FLFP and fertility have a direct causal relationship to each other over

time. 2SLS regression analysis was used to determine whether such a relationship exists. Two FLFP measures (PWYW or PHDW) and one fertility measure (CEB) were employed, and it was found that none of the FLFP measures had a significant impact on fertility after the effects of other several economic, demographic and background variables were accounted for. The same results were observed when CEB was used as an explanatory variable. It was observed that CEB has an insignificant negative effect on PWYW and PHDW (both for the civil servants and businesswomen). Thus, the results do indicate that FLFP and fertility do not have a direct relationship on each other.

Another question addressed in this study is concerned with what influences, if any, will child-care have on female employment. The compatibility of child-care and mother's market work will greatly depend on the availability of child-care help in the household. The results indicate that mothers with paid baby-sitters spend a greater part of their married life in income generating activities; they also spend on the average more hours daily in income generating activities that are performed outside the home. These results were found to be quite pronounced for the civil servants. The results from the analysis of the influence of BSH on female employment do indicate an insignificant influence. These findings imply that the influence of child-care on female employment in Lagos will depend on the nature of such help.

This study does show some interesting findings. First, just raising the rate of FLFP may have no effect on fertility. The important issues are what types of jobs are involved, how FLFP is

raised, and most importantly what influence childcare facilities have on the mother's labor force participation. The study also does indicate that a wider availability of birth control information and effective contraceptives might have a substantial effect on fertility. This is more pronounced among the highly educated women.

The causes of the FLFP and fertility relationship is far from finished, much remains to be done. There is a need for some time series data that will measure fertility and labor force participation behavior and expectations at several points in time. Such data would help in observing changes in wages, prices and aid in determining how these changes may affect the FLFP and fertility plans made earlier in life.

Second, there is a need for data that provide variables more relevant to the economic theory of household decision-making. These include most time use variables like market work time, housework time, childcare facilities and leisure time. Detailed surveys work are required in most LDC's to provide such information since such data are quite deficient more in LDC's. And finally, more studies are needed in most rural areas of the LDCs. An acute deficiency of fertility information has plagued researchers for some time. It is a very difficult task for one to undertake a survey work, but the accomplishments would add a great deal to the understanding of the nature and causes of the fertility issues. Apart from the data information obtained from such surveys, the researcher acquires more information about the society which may be more valuable than the statistics obtained.

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APPENDIX A

FERTILITY QUESTIONNAIRE SAMPLE

1. How old are you? Are you between 15 - 21 ___,
   22 - 28 ___,
   29 - 35 ___,
   36 - 42 ___,
   or 43 - 49 ___.

2. Are you a Civil Servant ___, a Businesswoman ___, or a Housewife ___.

3. Roughly, how much do you earn monthly? _____

4. Roughly, how much do your husband earn monthly? _____

5. How many years have you been working outside the home? _____

6. Roughly, how many hours do you work daily? _____

7. What is your educational level? _____

8. How many years have you spent in schooling? _____

9. What is the educational level of your husband? _____

10. What was your age at marriage? _____

11. How many live births have you given that were fathered by the head of the household? _____

12. Did they all survive? Yes ___, or No ___; if they did not all survive, how many died? _____

13. What do you think is the best number of children to have?
    1 - 3 Children ____,
    4 " ____,
    5 " ____,
    6 " ____,
    7 " ____,
    8 " ____,
    or up God to decide ____.

14. Is child bearing the most improtant thing a woman can do? Agree ___, or Disagree ____ (check one).

15. A husband and wife have 5 daughters and no sons, and wonder if that is enough children. If you are in such a position, will you have more children? Yes ____, or No ____.

16. Do you have knowledge of any birth-control device? No ____, or Yes ____; if yes, have you used any? Yes ____, or No ____.

17. Do you have a relative staying with you that is helping you in housework/childcare duties? Yes ____, or No ____. (check one)

18. Or, do you have a paid baby-sitter? Yes ____, or No ____. (check one)

APPENDIX B

THE DERIVATION OF THE FIRST AND SECOND ORDER CONDITIONS OF THE PRODUCTION FUNCTION.

The production function of the household for G-goods and services was expressed in equation 12 of chapter three as;

$$G = G_o h_g^{\lambda} X_g^{(1-\lambda)} \qquad o < \lambda < 1,\ G_o > o.$$

The first order condition was expressed as,

$$\frac{\partial G}{\partial h_g} = \lambda G_o h_g^{(\lambda-1)} X_g^{(1-\lambda)}$$

$$\frac{\partial G}{\partial X_g} = (1-\lambda) G_o h_g^{\lambda} X_g^{-\lambda}$$

Second order condition is expressed as;

$$\frac{\partial G^2}{(\partial h_g)^2} = (\lambda-1)\lambda G_o h_g^{(\lambda-2)} X_g^{(1-\lambda)} \qquad B1$$

$$\frac{\partial G^2}{\partial h_g \partial X_g} = (1-\lambda)\lambda G_o h_g^{(\lambda-1)} X_g^{-\lambda} \qquad B2$$

$$\frac{\partial G^2}{(\partial X_g)^2} = (1-\lambda)-\lambda G_o h_g^{\lambda} X_g^{-(\lambda+1)} \qquad B3$$

$$\frac{\partial G^2}{\partial X_g \partial h_g} = (1-\lambda)\lambda G_o h_g^{(\lambda-1)} X_g^{-\lambda} \qquad B4$$

From B1, $(\lambda-1) < 0$ since $\lambda < 1$ and $\lambda > 0$. $G > 0$ as given and h_g and X_g are all positive. Therefore $\partial G^2/(\partial h_g)^2 < 0$. Also in equation B3, $(1-\lambda) > 0$ and λ has a negative sign besides it; as

such, $\partial G^2/(\partial X_g)^2 < 0$.

VITA

Amon Okechukwu Okpala was born on November 25, 1950 in Makurdi, Nigeria. He entered Community High School, Nnobi, Nigeria in 1964. After spending four years in high school, he entered the military service and spent two years fighting in the Nigerian civil war. After the war, he went back to Community High School and graduated in June of 1971. The next four years of his life were spent working for the Nigerian government: first, as a clerk with the Customs and Excise Department, and secondly, as an exchange control clerk with the Central Bank of Nigeria. In 1975 he was given admission to study Economics in Western Kentucky University. He completed the requirements for a Bachelor of Arts degree in Economics in August of 1978, and completed also all the requirements for a Master of Arts degree in Economics a year later from the same university. In August of 1979, he enrolled in the Graduate School at Louisiana State University. He is now a candidate for the degree of Doctor of Philosophy in Economics.

EXAMINATION AND THESIS REPORT

Candidate: Amon Okechukwu Okpala

Major Field: Economics

Title of Thesis: Female Labor Force Participation and Fertility in Nigeria: A Study of Lagos

Approved:

Herman E Daly
Major Professor and Chairman

William Tyler
Dean of the Graduate School

EXAMINING COMMITTEE:

R A Hamming

G M Heyler

William R. Dane

W. P. Culbertson

Adrienne M McElwain

Robert Summa

Date of Examination:

July 6, 1984