NOTICE

AVIS

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

Canada

REGIONAL DEVELOPMENT AND FERTILITY
IN INDONESIA, 1980-1990

JONO SARJONO
Department of Sociology
McGill University
Montreal, QC
CANADA
September 1995

A Thesis
Submitted to the Faculty of Graduate Studies and Research
in Partial Fulfilment of
the Requirements for the Degree of
Doctor of Philosophy

Canada

Abstract

Based on data from the 1990 Indonesian Census and the 1991 Demographic and Health Survey, analyses of fertility, fertility decline, and the use of contraceptive methods in Indonesia are presented. Two levels of analysis are carried out in this thesis: a macro-approach and a micro-approach. The analysis using the macro approach reveals that the family planning program, the status of women's jobs, and infant mortality rates are important determinants of fertility in Indonesia. In addition, the micro analysis shows that there are differences in the average number of children ever-born to couples according to the type of present and childhood residence, educational attainment, religion and occupational status.

Controlling for regional population density reversed the direction of the impact of agriculture sector employment on fertility. Overall in Indonesia, individual couples who worked in the agriculture sector had higher fertility than those who worked in the non agriculture sector. However, in the densely populated areas of the country such as Java and Bali, those who worked in the agriculture sector had lower fertility than those who worked in the non agriculture sector.

The results of this dissertation support the claim that fertility and fertility decline are very complex phenomena. There is no definitive set of variables that strongly and consistently affect them. The most important finding from these analyses is that the fertility rate is influenced both by individual couple's characteristics as well as the place where they live. Further research on fertility and fertility decline should emphasize both of these characteristics.

Resumé

Cette recherche présente des analyses du taux de fertilité et de son déclin ainsi de l'utilisation des moyens de contraception d'après les statistiques recueillies par le recencement Indonésien de 1990 et des sondages portant sur la démographie et la santé de 1991. Deux niveaux d'analyse sont utilisés dans cette thèse. Une approche macro-sociologique ainsi qu'une approche micro-sociologique. L'analyse utilisant l'approche macro-sociologique révèle que le programme de planning familial, la situation de l'emploi chez les femmes et les taux de mortalite infantile sont des variables déterminantes du taux fertilité en Indonésie. De plus, l'analyse micro-sociologique démontre qu'il existe des différences dans le nombre moyen d'enfants mis au monde par ménage selon le type de résidence actuel ou à la naissance, le niveau d'éducation, la confession religieuse ainsi que le statut professionel.

Le contrôle de la densité de la population régionale a modifié l'orientation de l'impact du secteur agricole en matière sur la fertilité. Partout en Indonésie, les ménages ayant travaillé dans le secteur agricole ont accusé un taux de fertilité plus élevé comparativement aux ménages oeuvrant dans les secteurs non-agricoles. Par conséquent, au sein des populations nationales dont la densité est plus élevée telles que celles de Java de Bali, les individus travaillant dans le secteur agricole ont accusé un taux de fertilité moins élevé que ceux travaillant dans les secteurs non-agricoles.

Les résultats de cette thèse confirment que le taux de fertilité et son déclin sont des phénomènes complexes. Il n'existe pas un ensemble définitif de variables les affectant fortement. L'élément le plus important de cette découverte est que le taux de fertilité est à la fois influencé par les particularités des ménages ainsi que leur milieu de vie. Les recherches futures portant sur fertilité devraient se concentrer sur ces deux constatations.

Preface and Acknowledgments

This dissertation presents an analysis of fertility in Indonesia during 1980-1990 based on the 1990 Indonesian Census and the 1991 Demographic and Health Survey. Two broad themes are addressed: the first deals with the effect of regional socioeconomic development on fertility and the use of contraceptive methods, the second examines the effect of individual characteristics, such as type of residence, occupation, religion and education on the average number of children ever born.

The organization of the chapters is as follows. Chapter One provides an overview of demographic and economic development in Indonesia since its independence. Chapter Two reviews theories of fertility that have been widely used by many demographers, such as demographic transition, world-systems and supply and demand theories. Chapter Three discusses the methodology, concepts, operationalization of the concepts, and sources of data used in this dissertation.

Chapter Four presents the statistical evidence of fertility decline in Indonesia by examining indicators of fertility and related indicators, such as total fertility rate, children ever born, and the child-women ratio. I compare data drawn from censuses carried out in several years.

In Chapter Five, fertility rates in all provinces in Indonesia are examined. Socioeconomic indicators such urbanization, GDP, literacy rate, health and the status of women are analyzed. I give a "scale-score" for each province according the level of

socioeconomic index and test the effect of this index on fertility.

Based on the 1991 Demographic and Health Survey, Chapter Six and Chapter Seven examine the effect of individual characteristics, such as type of residence, educational level, religion, and type of occupation, on the number of children ever-born and the ideal number of children. Chapter Seven further presents the socioeconomic fertility differences and the ideal number of children among individual couples, controlling for duration of marriage and age of women.

A summary of the main empirical findings of the dissertation is presented in Chapter Eight. The conclusions are presented in Chapter Nine, which includes a series of suggestions for further research and recommendations for potential population and economic development policies that should be attempted in Indonesia in the near future.

Table of Contents

Chapters

List of Tables

ix

List of Figures

Appendices

CHAPTER 1

INDONESIA: DEMOGRAPHIC AND ECONOMIC BACKGROUND

I.A Introduction

The problems of high fertility and social and economic inequality have been targets for development planning in most less-developed countries (LDCs) over the last thirty to forty years. There have been many discussions as to whether family planning activities or economic development efforts were of greater importance in the reduction of fertility. In the Indonesian case, this debate has become heated over the last two decades, and the Indonesian government has implemented both family planning and socioeconomic development programs.

In the present study, I examine the decline of fertility in Indonesia from 1980 to 1990 in an effort to sort out its principal determinants. Indonesia provides interesting case for the study of fertility for several reasons. First, and apparently contrary to the predictions of some influential version of the theory of demographic transition, Indonesia has undergone fertility decline largely prior to the spread of industrialization and urbanization in that country. As more than seventy percent of Indonesians work in the agricultural sector and live in the rural areas, this kind of study offer an opportunity of the causes of fertility decline in a pre-industrialized society.

Secondly, the pace of fertility decline in Indonesia is one of the most striking demographic "transitions" in modern history. The

1

decline in Total Fertility Rate (TFR) from 1960 to 1980 was 24 percent, and the decline for the following ten years was 23 percent (Central Bureau of Statistics 1989). Some argue that the fertility decline in Indonesia has been a result of the changes in two proximate determinants, namely the use of contraception and the increase in age of marriage (see Adioetomo, Kitting, and Taufik 1990; Hull and Hatmadji 1990). Gertler and Molyneaux (1994) argue that there are three factors combined to reduce Indonesian fertility --family planning program, overall economic development and changes in the status of women. According to the Indonesian Bureau of Statistics, the proportion of women using contraception increased from 27 percent in 1980 to 47 percent in 1987 (BPS 1989). Furthermore, the mean age of marriage rose from 19.3 in 1971 to 21.1 in 1985 (Hull and Hatmadji 1990). Changes in these two proximate determinants can be mainly attributed to (a) a strong commitment, both politically and economically, to limit population growth through family planning programs, and (b) the improvement of the status of women, such as increasing job opportunities and the education for women (Hull and Hatmadji 1990; Hull and Hull 1987; McNicoll and Singarimbun 1982).

Thirdly, the total fertility rate in Indonesia varies from one province to another, as has the pace of fertility decline. In some provinces, fertility rates have declined very rapidly while the others declined very slowly. Such variations in fertility rates and in the pace of their decline among the different provinces in Indonesia offer an excellent opportunity to clarify the impact of

different level of socioeconomic development on fertility.

Fourthly, this study also examines the extent to which individual socioeconomic statuses have differential impacts on fertility. Using micro-analysis, I examine how fertility in Indonesia is determined by the characteristics of individual couples, such as type of occupation, religious affiliation and educational attainment. Furthermore, not only are the actual numbers of children examined, but I also investigate how different socioeconomic characteristics influence the ideal number of children.

Thus, the purpose of this study is to provide answers to several important questions concerning the link between fertility decline, economic development and family planning programs. First, why has fertility declined in Indonesia, and what are the determinants of this decline? Second, why is there variation in the fertility decline among provinces? Finally, how does the regional context affect individual factors?

Before examining these crucial questions, though, I will first briefly review the history of population and economic problems in Indonesia, from the colonial period to the present era. The purpose of this section is to clearly illustrate how population and economic problem are related to each other, and how the Indonesian government implemented policies to overcome problems associated with economic and demographic developments.

1.B Demographic Patterns

With 179.3 million inhabitants in the early 1990s, Indonesia ranks as the fourth most populous country in the world, behind the Republic of China (1,133.7 million), India (849.5 million), USA (250 million) (World Bank 1992:218-219). Indonesia consists of 13,667 islands, and there are more than 350 ethnic groups with different languages, cultures and religions. Furthermore, the population of Indonesia is not distributed equally. Some islands have large populations while others have few people. Java, for example, is a small island but has at the present time a population of more than 100 million. The density of population in Java is more than 735 per km^2.[1] On the other hand, other islands such as Irian Jaya and Maluku have population densities equally around 6 per km^2. Table 1.1 illustrates the percentage of Indonesia's population in Java from 1600-1990. The highest percentage of people residing in Java, that is more than 70 percent, occurred during 1900 and 1920. According to White (1993), during the 1990-1920 period, the population in Java grew from perhaps less than 50 percent to more than 70 percent of the total. Since 1960, the percentage of the Indonesian population residing in Java has been steady at about 60 percent. Two factors might have combined to slow the population

---

[1]Java, however, is not the most densely populated island in the world. Hong Kong has a population density around 5539 inhabitants per km^2 and Singapore has 4761 people per km^2 (World Bank, 1992:136 and 276).

growth rate in Java since 1960: low fertility rate and the
Transmigration Program.[2]

Table 1.1
Percentage of Indonesia's Population on Java, 1600-1990

Date	Total population (million)	In Java (%)
1600	9-11	37-47
1800	14-18	38-55
1900	40	72
1920	48	71
1930	61	69
1961	97	65
1971	119	64
1980	147	62
1990	179	60

Source: White (1993:107).

Java's population density was one of the most contentious
topics during the colonial era, that was from the beginning 1900 to
Indonesian Independence in 1945. Colonial writers such as Cabaton
(cited in Hugo et al., 1987) argue that the density of population
in Java was a beneficial result of the introduction of plantation
agriculture, social order and new systems of transportation.
However, other writers such as Boeke (1957) and Geertz (1963)
contend that the density of Java's population was a result of
specific Indonesian situations and others of the process of
agriculture intensification and involution.

---

[2]The Transmigration Program aims to relocate people, using
government sponsorship, from Java and Bali Island to other islands,
such as Sumatra, Kalimantan and Sulawesi. Since 1950, around
2,320,000 people have been moved to the Outer Island of Java (World
Bank 1990: xxi).

Boeke (1957) for example, argued that the higher density of population in Java, Bali and Lombok (the Inner Islands) is a result of the differences in soil fertility between Java and those areas that are outside of Java. In general, soil in Java is more fertile than that outside Java. Consequently, extensive cultivation took place in Java. However, the type of agriculture cultivation, such as flooded or shifting field, is also a very important factor in determining population density. Geertz (1963) also contrasts Inner (Java and Bali) versus Outer Indonesia. Almost 70 percent of the region in Java is cultivated yearly, which is true only for about 4 percent of the Outer Islands. Most of the agriculture in Outer Indonesia is swidden, shifting cultivation or slash-and-burn farming whereas in the Inner Islands, irrigation have been used intensively. Thus, according to Geertz, the disparity in population distribution between Inner and Outer Indonesia is due to the differences in agriculture methods.

In a similar way, Boserup (1965) argued that increased population pressure was the major force behind the expansion of cultivated areas and the shortening of fallow periods associated with increased production. High population density in Java according Boserup, has caused long fallow to nearly vanish and multiple cropping has become widespread in the most populated parts of the islands.

As noted above, the dominant reality of Indonesia's demography is the contrast between Java's territorial size and its relative share of the Indonesian population. Most Indonesian people reside

in Java, which has an area of only 7 percent of Indonesia's territory but contains more than three fifths of its population. Other islands such as Sumatra, Kalimantan, Sulawesi and Irian Jaya have more land but are less densely populated. Table 1.2 demonstrates how Indonesia's population is distributed unequally among its islands.

Table 1.2
Indonesian Population Density, by Island, in 1985

Region and Province	Population (in 1000s)	% Total per Island	Density (person/sq. km.)
Java	107,573	59.9	813
Sumatra	36,455	20.3	77
Sulawesi	12,521	6.9	66
Kalimantan	9,109	5.1	17
Other Islands	12,019	6.7	74
Indonesia	179,321	100	93

Source: Adapted from Ministry of Population and Environment (1992:17)

Along with unequal population distribution among its islands, the high rate of population growth in Indonesia presents a major problem. The annual population growth rate of Indonesia from 1960 to 1970 was 2.1 percent; from 1971-80 it was 2.32 percent and from 1980-1990 it dropped to 1.97 percent. Indonesian governments over this period have made significant efforts to slow down the growth rate. The figures for total population in Indonesia from 1950 to 1990 are given in Table 1.3

Table 1.3
Indonesian Population, 1950-1990

Year	Total population
1950	78 million
1960	94 million
1970	117.5 million
1980	148.5 million
1985	164.6 million
1990	179.3 million

Source: Adapted from the World Bank (1990:5).

The calculated average annual population growth rate for Indonesia has varied with every census. From 1960 to 1980 the Indonesian population grew at around 2 percent annually.[3] The 1960s was the period of greatest political, social and economic change in Indonesia. The low population growth during 1950-1960 might have been caused by high mortality. It was estimated that during the 1960s, the average death rate for Indonesia was 22 per 1000. Starting in 1990, the annual population growth rate has been less than 2 percent. The annual growth rate is presented in Table 1 4 and graphically in Figure 1.1.

Furthermore, the growth rate of population varies rather widely among provinces. Given different types of economic activities, some provinces have grown more rapidly than the others. The population growth rate among provinces in Indonesia is shown in Table 1.5. Based on this table, all the provinces of Indonesia can be classified according to their rate of population growth as is shown in Table 1.6.

---

[3]The formula used to calculated the annual population growth rate is $P_{t1}=P_{t0}$ $(1+r)^t$.

Table 1.4
Indonesian Population Growth, 1950-1990

Year	Annual Growth rate (percent per year)
1950-1960	1.90
1960-1970	2.24
1970-1980	2.34
1980-1985	2.10
1985-1988	2.01
1980-1990	1.96

Source: Adapted from the World Bank (1990:5).

Table 1.6 shows that the lowest population growth rates between 1980 and 1990 occurred in the provinces in Inner Indonesia (Java and Bali) and one province (South Sulawesi) in Outer Indonesia. On the other hand, very high population growth occurred in the provinces of Riau, Bengkulu and East Kalimantan - all Outer Indonesian provinces. The low growth rates in Inner Indonesia is not a new phenomenon, and certain factors have been associated with low population growth rates in these regions. First of all, fertility rates have been generally lower there than in other provinces. Secondly, as a result of the Government Transmigration Program, migration from these provinces is very high. However, the high population growth rates for the provinces of Bengkulu, Riau and East Kalimantan was are not mainly due to high fertility rates. Instead, the high rates in these provinces are mostly attributable to the fact that these provinces are the area of destination of the transmigration program, and that East Kalimantan and Riau are the major oil producers in Indonesia and also the centres of agro-industry, which become "pull" factor for other people in other
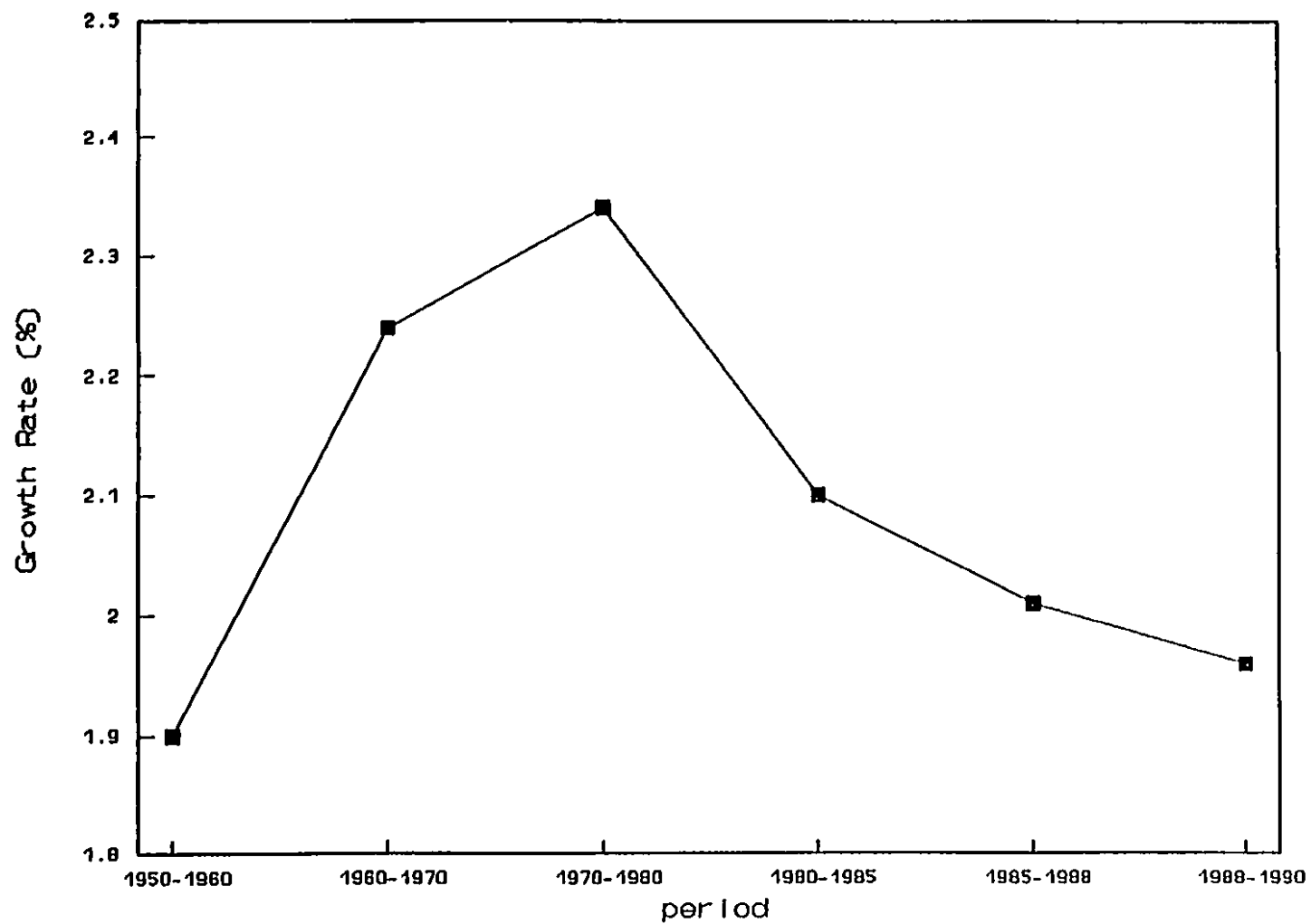
Figure 1.1 Indonesia Population Growth Rate, 1950-1990

Source: As for Table 1.4

regions. Both these factors have caused a major influx of population to these areas.

Table 1.5
Intercensal Growth Rate for Indonesia

	Total Population (1000)				Growth Rate		
	1961	1971	1980	1990	61/71	71/80	80/90
INDONESIA	62,993	119,232	147,383	179,322	1.96	2.33	1.96
SUMATRA	15,739	20,812	27,980	36,555	2.8	3.25	2.67
Aceh	1,629	2,009	2,611	3,416	2.1	2.88	2.69
North Sumatra	4,965	6,623	8,361	10,256	2.9	2.56	2.04
West Sumatra	2,319	2,793	3,407	3,999	1.9	2.18	1.60
Riau	1,235	1,642	2,169	3,306	2.9	3.06	4.21
Jambi	744	1,006	1,446	2,016	3.1	3.99	3.32
South Sumatra	2,773	3,444	4,630	6,377	2.2	3.25	3.20
Bengkulu	406	519	768	1,179	2.5	4.31	4.29
Lampung	1,668	2,777	4,625	6,006	5.2	5.61	2.61
JAVA	62,993	76,102	91.282	100,574	1.9	2.00	1.64
Jakarta	2,907	4,576	6,503	8,254	4.6	3.86	2.38
West Java	17,615	21,633	27,454	35,381	2.1	2.62	2.54
Central Java	18,407	21,877	25,373	28,522	1.7	1.63	1.17
Yogyakarta	2,241	2,490	2,751	2,913	1.1	1.10	0.57
East Java	21,823	25,527	29,189	32.504	1.6	1.47	1.08
KALIMANTAN	4,101	5,152	6,721	9,110	2.3	2.92	3.04
West Kalimantan	1,581	2,020	2,486	3,239	2.5	2.28	2.65
Central Kalimantan	497	700	954	1,396	3.5	3.79	3.81
South Kalimantan	1,473	1,699	2,065	2,598	1.4	1.71	2.30
East Kalimantan	551	734	1,218	1,877	2.9	3.05	4.32
SULAWESI	7,079	8,535	10,378	12,522	1.9	2.15	1.88
North Sulawesi	1,310	1,718	2,115	2,479	2.8	2.28	1.59
Central Sulawesi	693	914	1,290	1,711	2.8	3.79	2.82
South Sulawesi	4,517	5,189	6,062	6,982	1.4	1.71	1.41
Southeast Sulawesi	560	714	942	1,350	2.5	3.05	3.60
NUSA TENGGARA	5,556	6,618	8,469	10,165	1.8	2.71	1.83
Bali	1,783	2,120	2,470	2,778	1.8	1.68	1.18
West Nusa Tenggara	1,808	2,202	2,725	3,370	2.0	2.34	2.12
East Nusa Tenggara	1,967	2,295	2,737	3,269	1.6	1.94	1.78
East Timor	na	na	555	748	na	na	2.98
MALUKU	848	1,089	1,411	1,856	2.5	2.85	2.74
IRIAN JAYA	na	923	1,174	1,641	na	2.64	3.35

Sources: adapted from Hull (1991:140) and Cho, Lee-Jay et al., (1971:10).

Table 1.6
Growth Rates Among Provinces in Indonesia,
1980-1990

Level	Growth Rate	Province
Very low	0 - 1.5	Central Java, DIY, East Java, Bali, South Sulawesi.
Low	1.6 - 2.0	West Sumatra, NTT, North Sulawesi.
Medium	2.1 - 3.0	Aceh, North Sulawesi, Lampung, DKI, West Java,NTB, West Kalimantan, South Kalimantan, Central Sulawesi, Maluku.
High	3.1 - 4.0	Jambi, South Sumatra, East Timor, Central Kalimantan, South-east Sulawesi, Irian Jaya.
Very high	4.0	Riau, Bengkulu, East Kalimantan.

Based on the notion of an "elementary demographic equilibrium," population growth in a given region is a result of the cumulrtive effect of the difference between death and birth rates as well as the difference between in- and out-migration, i.e., net migration. Since net migration in Indonesia is very low,[4] we may conclude that one of the causes of the high population growth rate in Indonesia is high fertility. In 1960-1970, the TFR - roughly, the number of children expected to be born to a woman over her reproductive life if she has children at the prevailing Age-Specific Fertility Rates (ASFR) - for Indonesia was very high (5.605). Since 1976, however, the TFR in Indonesia has decreased

-----

[4]Hugo et al. (1987) noted that the since the independence period, international movements have had only a limited impact on Indonesian population. Furthermore, the 1990 Census (p.42) shows that among 179.3 million people, only 155453 (0.8%) people listed "abroad" as their place of previous residence. This figure, of course, included Indonesian who lived abroad before the 1990 Census.

significantly. Table 1.7, and Figure 1.2 graphically, show the TFRs

and ASFRs in Indonesia.[5]

Table 1.7
Age-Specific Fertility Rate (ASFR) and Total Fertility Rate (TFR),
Indonesia, 1960/1970-1989/1990

Age groups	Period				
	1967-70	1971-75	1976-79	1981-84	1986-89
15 - 19	155	127	116	95	71
20 - 24	286	265	248	220	179
25 - 29	273	256	232	206	171
30 - 34	211	199	177	154	129
35 - 39	124	118	104	89	75
40 - 44	55	57	46	37	31
45 - 49	17	18	13	10	9
TFR	5605	5200	4680	4055	3326
r (%)*	1.65	2.31	2.83	3.89	

* The annual rate of fertility decline (%).
Source: Minister of Population and Environment (1992:86).

---

[5]Both ASFR and TFR require data on the number of live births during the period, according to the age of mother and number of women in the age group. The formulas for those measurements are as follows:

$$ASFR_i = \frac{B_i}{PF_i} \times 1000,$$

$$TFR = 5 \times \sum_{i=15-19}^{i=45-49} \frac{B_i}{PF_i}$$

$$= 5 \times \sum_{i=15-19}^{i=45-49} ASFR_i$$

Where: B=births; P=Population; BF=female births; PF=female population; i=age group index.
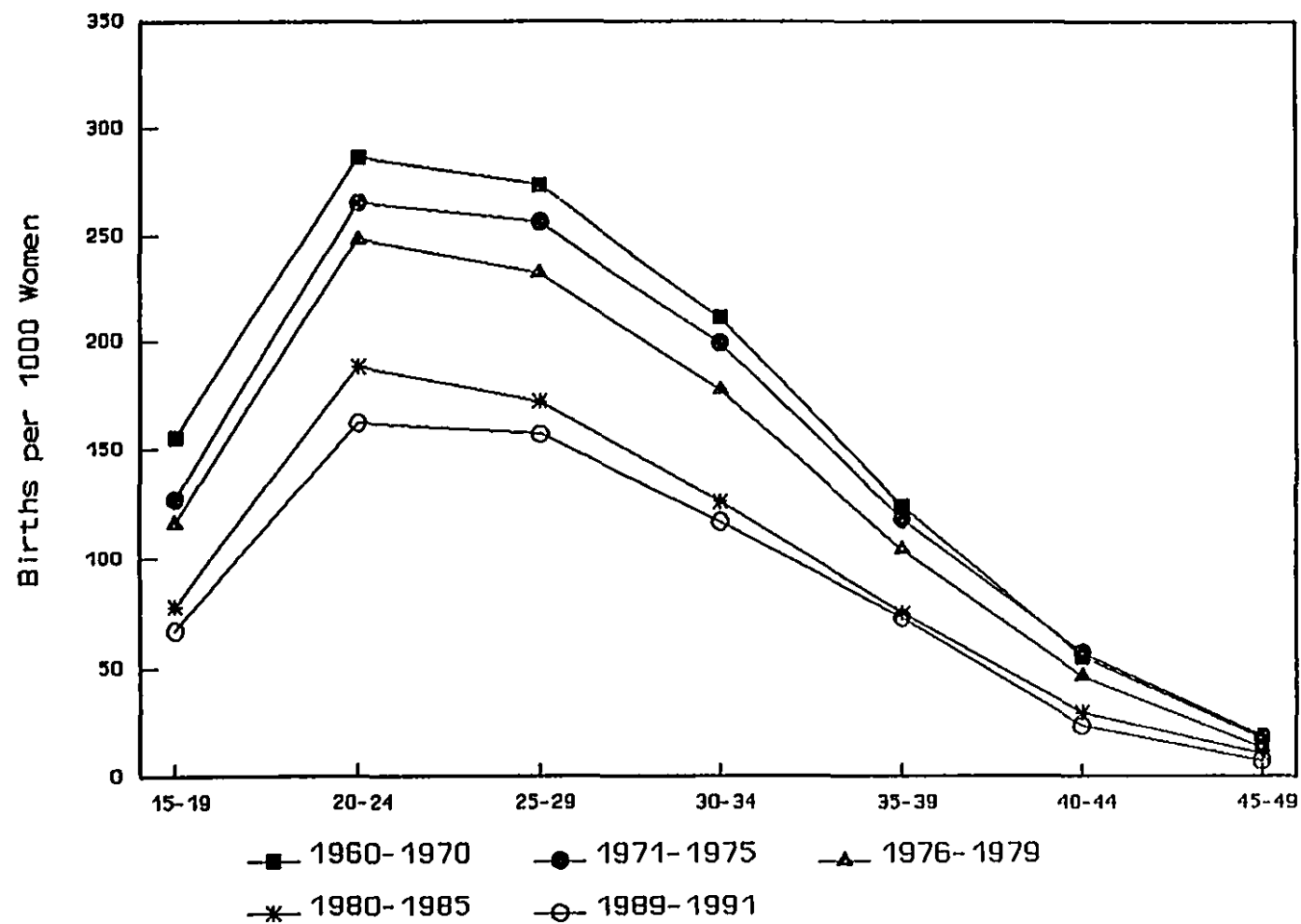
Figure 1.2 Age Specific Fertility Rate in Indonesia, 1967/70-1989/1991

Source: As of Table 1.7

Table 1.8
Total Fertility Rate, Indonesia, 1960-70 and 1989-91

Region/ Province	Total Fertility Rate				
	1960-70	1976-79	1980-85	1983-87	1989-91
Java-Bali	5.4	4.2	3.7	3.1	2.7
DKI Jaya	5.2	4.0	3.3	2.8	2.1
West Java	6.3	5.1	4.3	3.6	3.4
Central Java	5.3	4.4	3.8	3.2	2.9
Yogyakarta	4.8	3.4	2.9	2.3	2.0
East Java	4.7	3.6	3.2	2.7	2.1
Bali	6.0	4.0	3.1	2.6	2.2
Outside Java-Bali I*	6.4	5.5	4.7	3.8	3.5
Outside Java-Bali II**	6.3	5.7	5.0	4.4	3.8
INDONESIA	5.6	4.7	4.1	3.4	3.0

Source: Minister of Population and Environment (1992:88).
Notes: * Outside Java Bali I: Aceh, North Sumatra, Lampung, NTB,
  West and South Kalimantan, North and South Sulawesi.
  ** Outside Java-Bali II: Riau, Jambi, Bengkulu, East Timor,
  East Kalimantan, South-East Sulawesi Maluku and Irian
  Jaya.

In general, all provinces in Java and Bali have lower ASFRs and TFRs than those of all provinces outside Java and Bali. All provinces in Java and Bali are more economically developed than those outside Java and Bali, and so it is not surprising that the TFR in Java is lower than those outside Java. Table 1.8, and Figure 1.3 graphically, show how the TFR in Java is lower than that outside Java.

The Indonesian government realized that notwithstanding the high population growth rates, there were still many other population-related problems, such as unequal distribution of population among urban and rural areas, high mortality and fertility, and low education and health status. To overcome these problems, the Indonesian government began implementing population
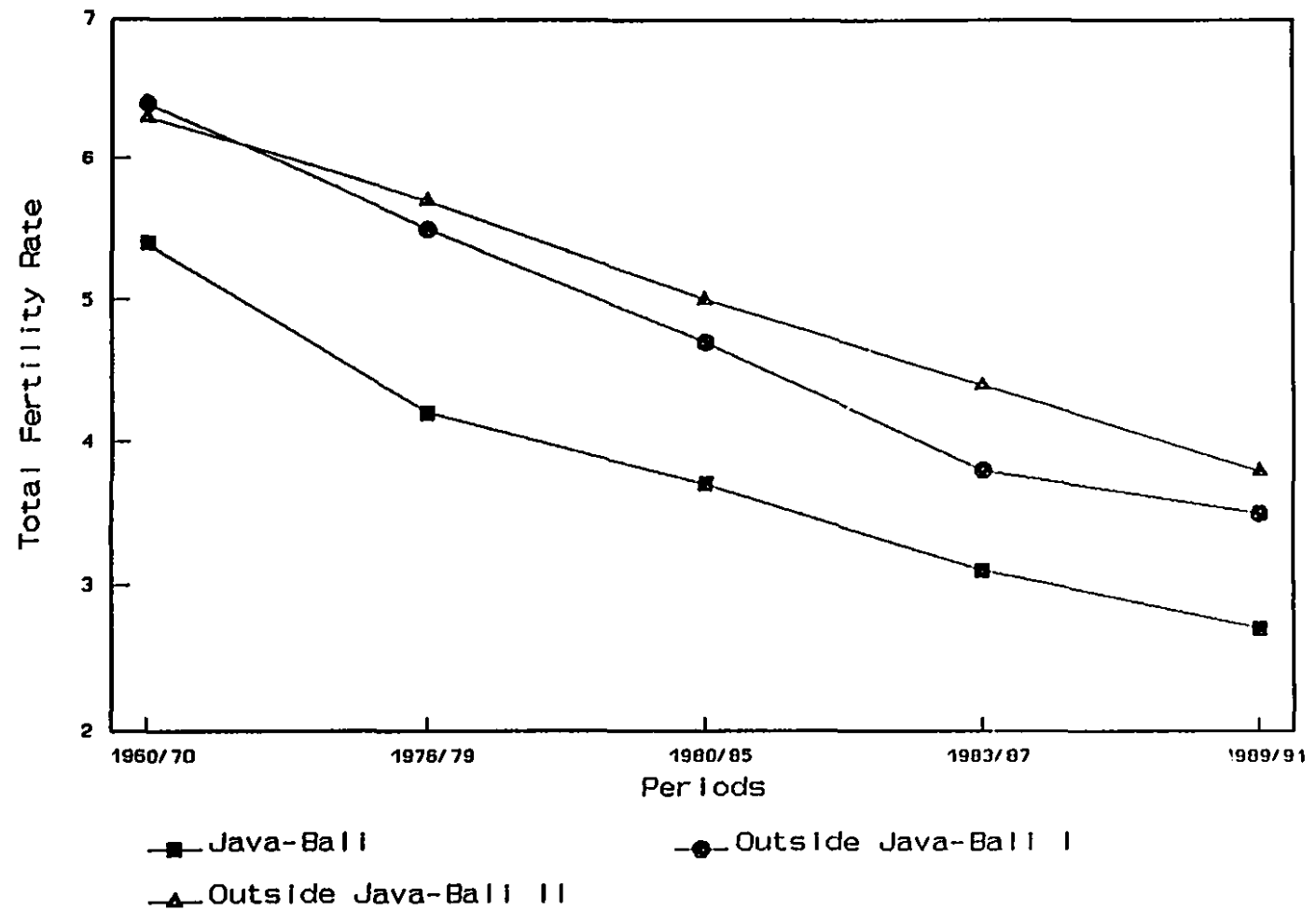
Figure 1.3 Total Fertility Rate in Indonesia, 1967/70 to 1989/91

Source: As for Table 1.8

policies in 1969. Briefly stated, the national population policies in Indonesia have stressed:

(1) Reduction of mortality and increase in life expectancy;

(2) Reduction of fertility so that overall the population growth will decline;

(3) Redistribution of population from densely-settled Java, Bali and Lombok to other unpopulated and unexploited islands through the transmigration program;

(4) Restraining the growth of large cities, especially Jakarta, through rural development programs and other programs, such as those supporting the growth of intermediate and smaller towns;

(5) increasing the productivity of the labour force by improving education systems and improving health and fitness levels.

Most demographers agree that population and economic development are closely related. Further, most of the explanations of the causes, trends and the effect of population growth usually take economic factors into account. As suggested earlier, however, some studies have shown that it is very important to understand the context in which demographic change is occurring. Hence, the remainder of this dissertation is devoted to establishing some of the contextual elements which are most important to understand Indonesia's contemporary demography. In particular, I explore the

extent to which economic development has had, or can be seen to have had, an impact on Indonesia's demography.

It should be noted that all of the government programs aimed at population reduction, however, have been implemented without careful consideration of the socioeconomic characteristics of the various provinces. Reductions in fertility and mortality, for example, are easy to accomplish for provinces where most of the people are literate, and work in the industrial, manufacturing and other modern sectors. On the other hand, in provinces where most of the people are illiterate and work predominantly in the traditional agriculture sectors, it is obviously not as easy to produce similar results.

I.C Economic patterns

Again, the most distinctive aspect of Indonesia's regions is the division between Inner (Java, Madura and Bali) and Outer (Sumatra, Kalimantan, Sulawesi and other islands in Eastern Indonesia). The division between inner and outer islands is based on the characteristics of those islands. Inner islands in general have a larger populations, higher population densities, and are more developed economically than the outer islands.

From an historical perspective, it is possible to analyze the pattern of interregional differences and spatial regularities in contemporary Indonesia. Dutch colonialism in Indonesia, which lasted from 1602 to 1942, especially in Java, had a profound spatial influence on the Indonesian economy. From the beginning,

the Dutch invested heavily in the development of areas and resources that satisfied the needs of the colonial, rather than colonized, populations. For example, development was concentrated mainly in areas suitable for plantations, mining, oil and timber exploitation, rather than in irrigation schemes needed for subsistence food production.

Most Dutch colonial activities and investment were concentrated in Java. According to Fisher (1964:287-288), during the nineteenth century the percentage of population in Java increased from 50 percent in 1815 to over 75 percent in 1900. He noticed that the outstanding feature of production in the Indies by World War II was its extraordinary unevenness. Roughly at the centre of the Archipelago lay the congested island of Java, crowded with people and cultivated to capacity. Outside Java, however, there were only a few areas of intensive development, with the greater part of the outer islands still essentially undeveloped.

After Indonesian independence in 1945, the gap between outer and inner islands was still wide, especially as a result of the economic development policy that was concentrated on Java. In the period 1968-1971, for example, Jakarta, with a total population of less than one twentieth of the national total, received almost 60 percent of foreign investment. West Java, East Java and East Sumatra were also regions that attracted much foreign investment.

Table 1.9
Gross Regional Domestic Products at 1983 Current Prices,
by Province, 1989-1991 (billion rupiahs)[6]

Province	1989	1990	1991
1. Aceh**	1655	1773	1880
2. North Sumatra**	5298	5737	6177
3. West Sumatra	1712	1832	1955
4. Riau**	1515	1653	1825
5. Jambi*	754	812	844
6. South Sumatra**	3708	3741	3997
7. Bengkulu	427	460	498
8. Lampung	1780	1920	2011
9. Jakarta	12586	13665	14709
10. West Java**	14352	15637	16797
11. Central Java**	10297	11043	11773
12. Yogyakarta	1038	1085	1141
13. East Java**	15483	16726	17913
14. West Kalimantan	1470	1575	1679
15. Central Kalimantan	719	773	844
16. South Kalimantan**	1256	1347	1347
17. East Kalimantan**	2204	2339	2509
18. North Sulawesi	873	957	1046
19. Central Sulawesi	535	581	635
20. South Sulawesi	2609	2785	3062
21. Southeast Sulawesi	465	526	598
22. Bali	1473	1604	1737
23. West Nusatenggara	751	819	879
24. East Nusatenggara	668	708	748
25. Maluku**	771	849	907
26. Irian Jaya**	765	1094	921
27. East Timor	125	140	155
Total 27 provinces	85289	91910	98763

Notes: ** Oil, gas and its products have been excluded.
Source: Central Bureau of Statistics (1993:454).

Table 1.9 shows that, even when revenue from oil and gas have been excluded,[7] GDPs for almost all of the provinces in Inner Indonesia are higher than the national average, whereas none of the

---

[6]The exchange rate was approximately 1,770 Indonesian Rupiah to one American dollar in 1989, 1,843 rupiah in 1990, and 1,950 rupiah in 1991.

[7]Oil and gas are excluded because these sectors are controlled by the central government, so excluding oil and gas more accurately depicts the real income of each province.

provinces in Outer Indonesia has its GDP higher than the national average.

Economic structure, in terms of relative contribution to the Gross Domestic Product, also varies greatly by region. There are twenty-seven provinces in Indonesia which, as a result of resource endowment, geographical location, structural effects of colonialism, and the penetration of capitalism (either pre- or post-independence), have resulted in differences in economic structures. In Table 1.10 we see how the economy of the islands differs from the one island to another.

In fact, Titus (1978) argues that it is useful to divide Indonesian provinces into "core" and "periphery", based on the following categories:

1.   The presence of important 'modern sector' activities in mining, plantation agriculture, industry, services, etc.;

2.   The presence of important commercial and transport centres, functioning as a focus of other regions;

3.   The incidence of important private investment activities (foreign and domestic);

4.   The disproportionate allocations of foreign exchange and development funds by the central government;

5.   The functioning of administrative institutions for parts of the country;

6.   The development of a modern infrastructure outside the provincial capital;

Table 1.10
Sectoral Composition of RGDP in 1986, at Current Prices

Province	Percentage of RGDP from									
	Agri	Mini	Manu	Util	Cons	Trad	Tran	Fin.	Adm.	Total
Aceh	15.3	66.2	3.5	0.1	0.8	5.1	4.3	0.8	2.0	100
North Sumatra	33.4	3.5	15.2	1.1	3.5	14.4	10.8	6.2	11.3	100
West Sumatra	33.4	1.1	10.2	1.2	3.3	21.5	10.0	5.3	13.3	100
Riau	6.7	66.6	8.9	7.0	0.1	9.4	2.9	2.4	2.2	100
Jambi	36.3	9.4	11.3	0.7	2.0	17.1	6.7	4.6	11.6	100
South Sumatra	22.0	17.8	21.8	0.4	2.2	24.4	3.3	3.1	5.5	100
Bengkulu	49.9	0.8	16.7	0.6	4.7	14.8	13.7	4.4	10.7	100
Lampung	47.2	0.3	8.1	0.4	2.6	15.5	6.3	6.8	12.6	100
Jakarta	18.9	0	18.9	3.9	7.8	23.0	10.6	22.8	11.0	100
West Java	22.3	9.4	18.8	1.3	6.7	20.1	5.9	3.5	11.3	100
Central Java	33.9	0.5	14.1	0.8	5.1	18.9	4.1	5.2	16.3	100
Yogyakarta	28.7	0.6	8.3	1.0	5.4	18.1	7.0	9.1	21.8	100
East Java	29.8	0.4	17.3	0.9	4.5	21.6	6.7	5.2	13.6	100
Bali	45.9	0.3	4.2	0.9	4.6	16.7	7.8	2.7	16.7	100
West Nusatengg.	52.4	1.3	2.6	0	3.4	15.5	6.8	3.0	14.1	100
East Nusatengg.	53.9	0	2.3	0.6	2.6	12.1	6.8	3.3	17.8	100
East Timor	45.2	0.6	0.9	0.8	10.2	8.9	7.8	4.7	21.0	100
West Kalimantan	31.2	0.3	15.3	0.4	2.9	21.1	9.0	11.1	8.6	100
Central Kaliman.	31.9	0.5	15.7	0.4	7.6	23.9	5.2	2.1	12.7	100
South Kalimantan	30.1	0.6	11.0	1.3	3.5	22.0	10.6	8.4	12.6	100
East Kalimantan	6.4	62.2	16.3	0.2	0.2	8.6	2.1	2.2	1.6	100
North Sulawesi	32.4	0.5	5.4	0.9	5.9	13.5	13.2	4.7	23.5	100
Central Sulawesi	50.0	2.7	5.9	0.3	6.0	13.8	9.3	5.3	15.8	100
South Sulawesi	45.1	0.9	4.4	1.1	3.3	19.7	8.4	6.4	10.7	100
Southeast Sula.	42.6	5.1	1.7	0.6	12.4	1.3	11.7	5.8	16.6	100
Maluku	42.0	3.7	8.6	0.6	2.8	20.6	5.2	3.8	12.8	100
Irian Jaya	22.0	43.2	0.9	0.6	5.0	6.9	7.5	1.1	12.9	100

Source: Central Bureau of Statistic (1988, Table 1-27).

7.   The presence of major urban centres (400,000 plus functioning
     on a macro-regional or national level;

8.   The presence of social and cultural institutions of national
     importance (e.g., centres of excellence in education).

Based on these scores, Titus classifies all provinces in Indonesia
into five categories: Centre I, Centre II, and Periphery I, II and
III. The classification of all provinces based on these categories
is as follows:

```
Centre      I: West Java (including Jakarta) and East Java.
Centre     II: North Sumatra.
Periphery   I: Central Java, West Sumatra, South Sumatra, and South
               Sulawesi, and Bali
Periphery  II: Aceh, Riau, Jambi, Bengkulu and Lampung,
Periphery III: All of the rest of the provinces.
```

Although there some are weaknesses in Titus's categorization, such as the rise of Riau and East Kalimantan provinces as the result of oil and plantation development during the past few years, these categories still capture real and deep economic disparities among the provinces.

Titus's categorization is very useful for analyzing the pattern of family planning acceptance and decline of provincial TFRs. Based on his categories, we see that there are variations in terms of the RGDP of each province in Indonesia. Ranking from the highest one such as East Java to the lowest one such as East Timor. Comparing Titus's category with Table 1.9 and Table 1.10, we see that in general, the provinces with high GDP do not depend on the agriculture sector nor on the mining. Whereas those with low GDP most of their income come from agriculture or the mining sector.

Since the purpose of this dissertation is to investigate the impact of regional economic development on the use of family planning methods, fertility rate and its decline, the categorization of Indonesian provinces into core, semi-periphery, and periphery allowing in the study of the impact of these aspects on the Indonesian fertility rates and the use of family planning methods.

I.D Population policy: past and present

Most analyses of fertility decline have overemphasized the role of socioeconomic variables. It is true that modernization such as industrialization, urbanization and increasing participation of women in the labour force may affect fertility rates. However, fertility reduction may come about for reasons other than the effects of modernization. As the experiences of many countries show, the translation of economic development into fertility decline usually takes a long time. Thus, the importance of the population policies such as the Family Planning Program, which has a direct effect on reproduction, should not be ignored. This policy has produced important changes among late modernizing groups, that is, change that almost surely effected the reduction in fertility.

The family planning program in Indonesia was started in 1957. At that time, the program was carried out by a private institution, the Indonesia Family Planning Association. Since then, family planning has become a regular part of Indonesian government and state policy. Beginning in 1970, the family planning program was integrated into the Indonesian development program and the government established the National Centre for Coordination of Family Planning (*Badan Koordinasi Keluarga Berencana National - BKKBN*). This institution reports all its activities directly to the president. The first family planning program based on the BKKBN was implemented mainly in Java and Bali, during the first Five-Year Development Plan (1969-1973). At that time, The Department of Health was responsible for the success of the family planning

program. The BKKBN largely hired some field workers who made house-visits to motivate target users to visit the clinic and obtain contraceptive supplies and services.

During the second Five-Year Development Plan (1974-1979) the family planning program was expanded beyond Java and Bali. One of the main targets of this program during that time was to achieve 50 percent reduction of the birth rate by the year 2000. Furthermore, in 1977 the family planning service was extended to all remaining provinces and village family planning also began to be extended beyond Java and Bali.

The number of family planning acceptors has become the crucial target for every Five-Year Development Plan. For example, during the first Five-Year Development Plan, the goal was to get 3 million acceptors, limited to Java, Bali and Madura. During the second Five-Year Development Plan, the government set goals of 8 million in Java and Bali and 1 million in other areas. Table 1.11 shows the percentages of married couples between the ages 15-49 who have officially used family planning methods since the establishment of the Family Planning Program. The table documents the recent dramatic increase in the use of contraception among Indonesian women. In Java especially, since 1984/85, more than 40 percent of women have used contraceptives.

Table 1.11 also illustrates that, among all the regions in Indonesia, Java and Bali have the highest percentage of married women using contraceptive methods. The most recent data from the Demographic and Health Survey 1991 shows that almost 54 percent of

married women in Java and Bali use contraceptive methods, followed by Outside Java-Bali I (44 percent) and Outside Java-Bali II (43 percent). Since the family planning program was introduced first in Java and Bali, it is not surprising that these regions lead in the number of married women who use contraception. Figure 1.4 graphically shows how family planning programs differ among the region in Indonesia.

E. Summary

This chapter has presented a brief history of population and economic problems in Indonesia since its independence in 1945. In addition, I have discussed the "population problem" during the colonial era. Some of the main points to consider are:

(1) there is unequal distribution of population across Indonesia's territory, with a majority of its people living on the island of Java;

(2) there is a tendency of decreasing population growth rate in Indonesia, with the lowest population growth rate being achieved in 1990;

(3) in terms of the TFRs, there is also a decrease overall rate for Indonesia, with the highest decreases occurring in Inner Indonesia (Java and Bali);

(4) with regard to the family planning (FP) program, there has been wide acceptance by most Indonesians; and

(5) the highest proportion of FP users is found in the regions of Java and Bali.

In the next chapter, I discuss some theoretical frameworks that have been widely used in the study of fertility. Since there are many varieties of population theories, I will categorize them
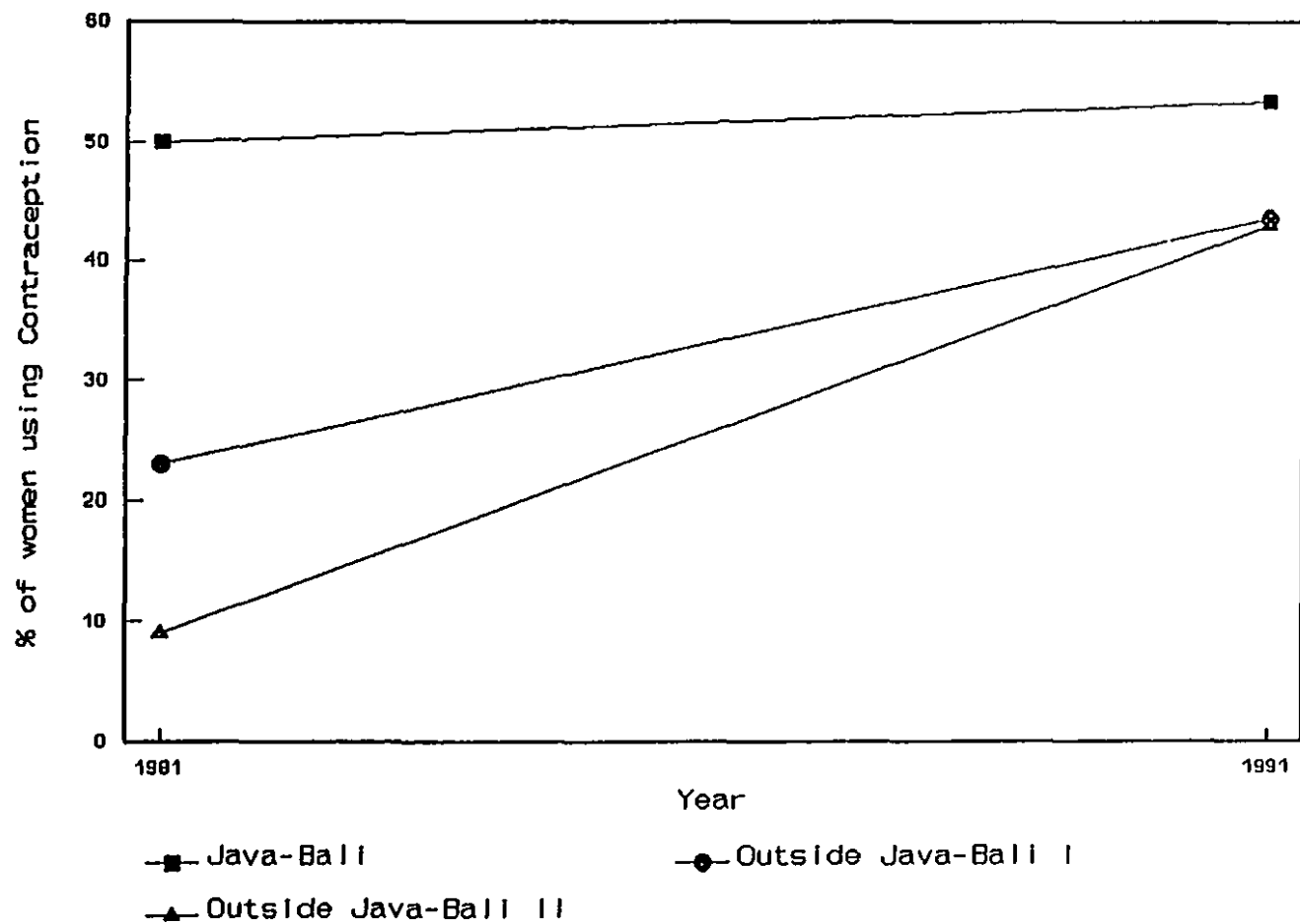
Figure 1.4 Contraceptive Use in Indonesia, 1981 and 1991

Source: Singarimbun (1986,70) and BPS (1991, 57-59)

Table 1.11
Percentage of Married Women of Reproductive Age Using
Contraception, by Province, in Selected Years under Successive
Five-Year Development Plans

Province	1971/2 Repelita I Third Year	1974/5 Repelita II First Year	1979/80 Repelita III First Year	1984/5 Repelita IV July 1985	1991 DHS[*]
INDONESIA	3	13	29	51	53
Stage I Provinces					
Jakarta	4	10	20	46	56
West Java	2	11	21	54	51
Central Java	2	13	43	57	50
Yogyakarta	4	16	57	57	71
East Java	4	27	51	58	55
Bali	7	28	50	75	80
Stage II Provinces					
Aceh		2	7	44	29
North Sumatra		2	14	45	37
West Sumatra		1	15	41	40
South Sumatra		2	8	49	47
Lampung		1	18	41	54
West Nusatenggara		1	13	45	39
West Kalimantan		1	7	42	44
South Kalimantan		2	17	48	52
North Sulawesi		4	32	45	69
South Sulawesi		2	14	41	37
Stage III Provinces					
Riau			1	23	40
Jambi			4	32	48
Bengkulu			9	40	58
East Nusatenggara			1	20	39
Central Kalimantan			4	27	45
East Kalimantan			5	35	58
Central Sulawesi			3	34	50
Southeast Sulawesi			3	31	42
Maluku			2	21	43
Irian Jaya			1	17	21
East Timor				6	25

[*] DHS = Demographic and Health Survey.
Source: Hugo et al. (1987:145) and Central Bureau of Statistics (*Biro Pusat Statistik-BPS*) (1991:59-61).

in three broad groups, namely: (a) demographic transition theories, (b) the proximate determinants theory, and, finally, (c) micro-economic theories. The aim of the next chapter will be to search for some theoretical framework that can explain the causes of fertility decline in Indonesia as outlined in the present chapter.

CHAPTER II

FERTILITY DECLINE HYPOTHESES

This dissertation addresses one of the most remarkable changes in human history, that is, a shift from high and relatively uncontrolled fertility to a low and controlled fertility. This transition occurred first in Western Europe during the early part of the nineteenth century; it was followed later in other European countries, and in the so-called European overseas settlements of the United States, Canada, Australia and New Zealand, and is currently taking place in Asian countries such as South Korea, Taiwan and, now Indonesia.

In the following section, I review a variety of theoretical frameworks applied to fertility, which may be reduced to three basic perspectives. First, I will explain "demographic transition theories", which entail a set of broad empirical generalizations about the timing and phasing of the shift from high fertility and mortality to low fertility and mortality. Even though the demographic transition is sometimes viewed only as a general description, it also may be considered a theory, because it gives an analytical framework for explaining how fertility declines with socioeconomic development. Second, I will explain "proximate determinants approaches". Socioeconomic variables, according to this theoretical framework, do not directly influence fertility but rather they affect fertility through a set of proximate determinants or intermediate variables. Finally, I will provide a

brief discussion of the relatively recent contribution of micro-economic theories to the area of fertility behaviour.

A. Demographic transition theory (DTT)

The demographic transition theory is a set of empirical generalizations used to describe the process of change experienced first in the Western countries from a regime of high fertility and mortality to one characterized by low fertility and mortality. Although this argument is hotly debated among demographers, it is commonly used as a framework for analyzing current demographic levels and trends in the LDCs. One proponent of the DTT holds that:

> The demographic transition ranks among the most sweeping and best documented historical trends of modern times. All nations in the modern era which have moved from a traditional agrarian-based economy system to a largely industrial, urbanized based have also moved from a condition of high mortality and fertility to low mortality and fertility (Stolnitz 1964:30).

Demographic transition theory provides both description and explanation of historical change in population growth. According to this theory, a population goes through three major stages in its transition to a modern pattern. Stage one, or "pre-transition," is characterized by high fertility and high mortality. As a result of famines, epidemics and so forth - what Malthus called "positive checks" on population growth - the death rate fluctuates around a high average level. In this stage, population grows slowly. Stage two, or "transitional growth" consists of two substages. In the first, the birth rate is still high but the death rate starts to fall, consequently, the population grows rapidly. In the second

substage, the birth rate begins to decline and the death rate continues to decrease. Since mortality decline has had a head start, the birth rate is still higher than the death rate so that at this stage, a high rate of population growth still occurs. With the arrival of stage three, the "final transition" to low birth and death rates is completed.

In general, DTT emphasizes the effect of socioeconomic change on demographic aspects. In particular, DTT holds that all societies undergoing the shift from a predominantly agrarian economic structure to an industrial one will experience a shift in demographic pattern similar to that which occurred in Western societies over the course of the last two centuries - that is, a shift from high fertility and mortality rate to low fertility and mortality rate.

However, Teitelbaum (1975) has identified four important differences between LDCs and the 19th-century European countries in terms of economic growth and its potential impact on population growth. First, in Europe, the decline of mortality was gradual and generally related to the social and economic development that was occurring whereas in the LDCs decline in the mortality rates have been much more dramatic and a result of imported technology. Second, fertility levels in most LDCs have been much higher than in early 19th-century Europe. Third, population in Western Europe was able to migrate to the Americas and other parts of the world when the rapid population growth occurred. Fourth, all of these differences cause population growth in the LDCs to be much higher

than that in the European countries. Consequently, the higher number of people in the LDCs can hinder social and economic development, and can prevent the fertility decline that transition theory maintains such development should bring.

Fertility transition is an interesting phenomenon because of the maintenance of high levels of fertility in most LDCs since World War II. While fertility declined significantly in some countries during this time, most have had levels consistently higher than those ever experienced in Europe. There are many opinions regarding the contributing factors to fertility decline, but the importance of socioeconomic development is rarely disputed. Indeed, the World Population Plan of Action, elaborated at the 1974 Bucharest Conference, stated that, "The basis for effective solution... is above all socioeconomic transformation" (Mauldin et al. 1974:381). Socioeconomic development, they argue, will create a social context conducive to fertility reduction. Consequently, family planning programs will be more effective where socioeconomic development is high (Mauldin et al. 1978).

The complex relationship between economic development and demographic change is, of course, a much-disputed topic, on both empirical and theoretical grounds. Most versions of DTTs associate population change with economic development. Notestein (1953), who introduced "demographic transition theory", clearly tried to illustrate how demographic change is associated with economic development. The decline of fertility in Western Europe according to Notestein was caused by economic development. Similarly,

Zelinsky (1971) integrated the third basic demographic process of population movement into the traditional DTT, arguing that "there are definite patterned regularities in the growth of personal mobility through space-time during recent history, and these regularities comprise an essential component of the modernization process" (1971:221-222). The DTT can be summarized as follows:

```
┌─────────────────┐                    ┌──────────────┐
│ Socioeconomic   ├──────────────────> │ Fertility    │
│ Development     │                    │ Decline      │
└─────────────────┘                    └──────────────┘
```
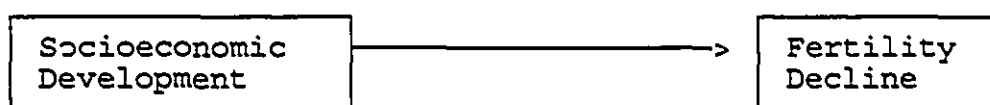
Some empirical research

The demographic transition theory focuses on the impact of the wider social and economic environment such as industrialization, urbanization, education, increasing female labour force participation, and technological advance on fertility and mortality. As a result of these arguments, most of the subsequent research on demographic change has tended to focus the analysis on socioeconomic factors. A considerable amount of research has been carried out using the demographic transition as the frame of reference. Some of that research, specifically focusing on the aspects of the development and fertility, are examined below.

One of the crucial factors supporting the transition is improvement in the status of women. Since women give birth and are those who are principally responsible for child-rearing, one would expect that if women get more education, have better jobs outside the home and engage in other activities, then this would limit the

time they can devote to the family. For instance, Handwerker's (1992) analysis of West Indian development has shown that socioeconomic developments that create job opportunities for women have caused fertility to decline significantly. A recent survey in Tamil Nadu, India, also suggests that the improving status of women has had a negative impact on fertility over the course of the demographic transition. Although the relationship between the status of women and fertility is weak at early stages of the fertility transition, at later stages social status has been shown to be negatively related to fertility (Jejeebhoy 1991). Crafts (1989), in his historical study in England and Wales, also suggests that the spacing of births appears to have been more widespread in districts where women's employment opportunities were comparatively high (quantitatively and qualitatively).

This evidence suggests that reductions in fertility in developing countries could be achieved relatively rapidly by improving women's status. In fact, this was emphasized in the World Population Plan of Action adopted by the 1974 World Population Conference, where the integration of women into the development process was recommended as an effective way to reduce fertility rates. The World Population Plan of Action discussed the status of women in terms of opportunity for education, access to jobs outside the household, and decision-making authority within the family. Thus, improving the status of women has been a priority item for policy makers in the developing countries.

Specifically, the education of women has received a great deal of attention from many governments. The effectiveness of educational factors has been supported by empirical research showing that providing higher education for women results in low fertility. However, the strength and specific form of this relationship varies widely (for example, Meekers 1994; Ahn and Shariff 1994).

The educational levels attained by women influences fertility through various mechanisms: by increasing the opportunity cost of women's time, by exposing them to Western ideas concerning family size, by raising the age at marriage and, finally, by disseminating information concerning contraception. The United Nations (1987:214) found that, on average, women with seven or more years of education give birth to three fewer children than women with no schooling. Moreover, in about 40 percent of the countries studied, the negative relationship between education and fertility remained significant even after controlling for duration of marriage, urban/rural residence, wife's occupation and husband's level of education. Similarly, in a study of Indians living in South Africa, it was found that higher levels of education leads to smaller families (Lotter 1976). As in other countries, increasing use of contraception among Indians was caused by the presence of a favourable attitude toward birth control and limiting family size.

The increasing participation of women in the labour force[1]

----

[1]Labor force participation is an elusive concept, that is difficult to measure in the context of most third world countries. However, there are some measures that usually been used in

outside of the household also has been strongly argued for as a cause of fertility decline. As with the case of education, female labour force participation influences fertility through various mechanisms: increased opportunity cost of women's time upon entering the labour force, incompatibility between child-care and job, greater access to information, particularly concerning family planning, and the delaying of time-of-marriage. In the developed countries, even though the causal mechanism is not well understood, it is generally accepted that the relationship between fertility and female labour force participation is negative. Rodriguez and Cleland (1981) in a review of the World Fertility Survey (WFS) data, categorized female work status as "non-work", "work for self or family", or "work for non-relatives" and found a negative relationship between work status and fertility in 19 of 27 populations, after controlling for socioeconomic and demographic factors.

Increasing opportunities for women outside the home seems also to have played a major role of fertility transition in Ghana. According to Oheneba (1989), in Ghana, increasing women's opportunities to work outside the home, especially for the younger generation, the changing social meaning of marriage, and the prevalence of family planning limitation measures appear to have brought about the recent changes in the fertility behaviour of Ghanian women. Caldwell and Ruzicka (1978) also supported the

---

empirical research including hours worked, wage rates, occupational categories, place of work, and whether the work was paid or unpaid.

argument that socioeconomic development influences fertility when, and only when, this development also alters the roles of women.

Some real weaknesses

There are many debates about the significance of the contribution of economic development to fertility decline. For example, it has been argued that fertility decline does not always result from economic development. According to Friedlander et al (1991), however, fertility decline in England can be best explained by socioeconomic variables. Urbanization, industrialization, and the increasing education of women are some of the characteristics of modernization. Increasing economic development followed by changes in opportunity structure, increasingly reward to educationally acquired skills and perspectives sharply limit or eliminate the expected child-to-parent income flow (Handwerker 1986). Moreover, according to the Princeton analyses, fertility decline in Western Europe is best explained by the diffusion of family planning which took place within cultural geographic boundaries (Friedlander, Schellekens and Ben-Moshe 1991).

Economic development in the LDCs is sometimes difficult to achieve. One main reason for this is that economic development in most of these countries is characterized by "dependent development" (Evans 1979). This type of development is guided by the state, in alliance with elements of domestic and foreign capital, and all of these parties are mainly interested in using capital-intensive techniques to achieve economic development. Consequently, much of

the population has been left out of the labour force, and is unable
to enjoy the fruits of development. A related effect of dependency
noted above is the skewing of income distribution towards higher
income groups. As a result of applying only capital investment
projects, the demand for low skilled/low paid service sector labour
increases. Consequently, such dependency leads to increased
unemployment and also exaggerated income inequality.

Another reason why socioeconomic development in the third
world has not brought about the anticipated fertility declines is
that socioeconomic development itself did not reach the whole
population. Dependent development mainly benefits only a small
elite, and, consequently, the fertility decline that would be
expected as the result of economic growth and development fails to
materialize. A number of authors have drawn the implication that
development strategies which promote the participation of the
largest possible fraction of the people in the process of
development will best accomplish the goal of a rapid reduction in
fertility (see Rich 1973; Kocher 1974; Bhattacharyya 1975; Repeto
1978; Karush 1978). Rich (1973:9) has succinctly stated this idea.

> The shift in attitude toward reduced births is, rather, a
> function of a combination of environmental changes that affect
> the orientation of families enough to alter fertility
> decisions. In a developing country, this appears to occur when
> families begin to participate significantly in the modern
> social, political, and economic systems. Thus nations in which
> only a small elite constitutes the modern sectors while the
> majority of the population continues to live at the
> subsistence level and to maintain its traditional way of life
> are not likely to experience reduced national fertility as
> readily those as those countries which bring about mass
> participation in the development process.

In a similar way, Todaro (1985:168), who studied the relationship between income level, GNP growth rate, income distribution and birth rate concluded:

> Countries that strive to lessen inequality in their distribution of income, or alternatively, attempt to spread the benefit of their economic growth to a wider segment of the population may be better able to lower their birth rate than countries where the benefit of growth are more unequally shared.

Thus, all the above arguments point to a single very important factor in lower fertility rates - not economic growth rate per se, but the distribution of economic development in the population. In other words, policies which are aimed at eliminating poverty and raising overall standard of living are probably more important than those which aim simply to increase GNP. Economic development can accelerate fertility reduction if the majority of the people share the benefits of development. The reduction of fertility might likely occur when development motivates families to limit their size.

All of these arguments have shown that economic development did not always produce low growth rates. Modernization, industrialization, and urbanization, which are assumed as the crucial factors in reducing high growth rate, do not always occur. The most important factor, then, would appear not to be a high income growth rate, but rather a development strategy that benefits a large portion of the population. There have been some experiences that a high growth rate of economic development did not cause reduction in the population growth rate. Brazil and Venezuela, for example, are countries that enjoyed high growth rates in their GNP

in the period 1950 to 1973, that is, 3.7 and 2.7 per year respectively. However, since incomes were unequal, high population growth rates in those countries continued. During 1950 to 1973, the annual population growth rate in Brazil was 2.9 and in Venezuela was 3.1. During that time, the annual growth rate in Indonesia was 2.5 (Morawetz 1975:19,21,92).

Fiala and Ramirez (1984:409), nicely summarize these aspects of the effects of dependency on service sector growth:

1. Economic dependency generates employment in low skilled personal and informal services.

2. Inequality increases employment in low skilled personal and informal services.

3   Weak state structure leads to an increase in employment in personal and informal services.

It has been argued that dependence is the chief obstacle to achieving fertility decline. There are many reasons why dependency could be related to continuing high fertility. First, dependency, while not necessary hindering overall economic growth, seems to foster income inequality and to encourage the growth of the informal service sector (Bornschier and Chase-Dunn 1985, Evans and Timberlake 1980). Secondly, the status of women and children as sources of marginal labour does not change with dependent development. Ward (1984), for example, argues that dependency restricts women's economic possibilities in a number of ways. For example, women are concentrated only in the informal sectors and low-wage segment of the labour market. Thus, income inequality, low status of women, low wages act to maintain high fertility levels.

Still other researchers have argued that high fertility rates in developing countries have remained high during development because children are needed in certain sectors, especially agriculture. In this connection, Caldwell (1972) has noted that the crucial difference between fertility in developed and developing countries has been the influence cash flow between children and parents. In developed nations, social and economic transformations resulted in flow of cash from parents to children while in developing nations, the flow of cash from child to parents, so that there is little incentive to limit fertility. In the economic dependence situation, where economic improvements only benefit the core, we can anticipate that fertility will remain high in the periphery. Nolan and White (1984:84), support this argument by noting that, "[T]he core may benefit from a continuing supply of cheap labour and accordingly, core-periphery interaction may counteract development forces conducive to fertility decline." Finally, Hout (1980:84) says, "[E]mpirical support for the argument that fertility reducing effect of socioeconomic development is strongest when dependence is low, it weakens as dependence increases."

In some areas of certain countries, however, less-developed regions did not always have high fertility. For example, in some regions in Indonesia, Sri Lanka and in India which are overwhelmingly poor and rural, fertility has already begun to decline. According to Freedman (1979:4), there are four factors that have been shown to be associated with low birth rates:

1. Better health and longer life, which means fewer births are necessary for the survival of any desired number and encourages investment in the future.

2. Higher education for both boys and girls, which increases the cost and decreases the benefits while children are in school. Fewer, better educated children may provide greater satisfaction than many but poorly educated ones.

3. Welfare institutions, providing minimum subsistence for the masses, at least in food, which may decrease dependency on children.

4. Communication and transportation facilities, capable of providing the information, services and goods which have produced the other changes.

The explanation of fertility decline in strictly economic deterministic terms of economic development may miss still other factors. According to Jones (1984:3)

> Social and economic forces impinge on fertility through changes in age of marriage, family structure, value of children, interspousal relationship, practice of contraception and abortion and other variables which differ widely among different cultures and can be expected to alter differently when exposed to the same kind of social and economic changes. Moreover, diffusion of ideas might be just as important as changes in the underlying social economic condition in ushering in fertility decline.

Thus, the relationship between economic development and demographic change may be much more complex than has generally been assumed, particularly in so far as the causal linkages between them are not always one-way.

Economic dependency, however, does not always allow for the maintenance of high fertility rates. There are regions that remain economically dependent but achieve low fertility rates. For instance, strong family planning program can mitigate the effect of dependency on fertility. Family planning programs that have been

adopted by many third world countries such as Thailand, Indonesia, and the Philippines have facilitated the transition to low fertility rates even though the level of economic development in those countries is still low. Another example of how family planning, and especially the distribution of contraception, could affect the birth rate is given by Freedman (1979:10) in a study in Taiwan where it was found that

> ... contraception has spread and fertility declined in all major population strata in a number of LDCs far exceeds European experience.... something I never anticipated when I began my research collaboration with the Taiwanese 17 years ago. The rapid change has affected all strata of the population - rich and poor, urban and rural, illiterates and college graduates. Between 1965 and 1976 - just 11 years - among illiterate Taiwanese wives of childbearing ages, the proportion of ever using contraception increased from 19 to 78 per cent.

Other evidence indicates that where family planning programs are intensively implemented, they will affects fertility rates more than economic development levels. Mauldin and Berelson (cited in Freedman 1979:10) found that both family planning and development programs have strong joint and independent effects on fertility. Indeed, China and Indonesia, which implemented major family planning programs, have experienced significant fertility rate declines in recent years.

Caldwell has criticized demographic transition theory by arguing that Westernization, not socioeconomic development, is the crucial factor to influence fertility decline in the Third World countries. Caldwell (1976:358) concludes that

> ... fertility decline in the third world is not dependent on the spread of industrialization or even on the rate of

economic development. It will of course be affected by
such development in that modernization produces more
money for schools, for newspapers, and soon; indeed, the
whole question of family nucleation can not arise in the
non-monetized economy. But fertility decline is more
likely to precede industrialization and to help bring it
about than to follow it.

The most significant implication of the foregoing discussion
is that the explanation of fertility decline as the result of the
economic development is far from perfect. As has been mentioned
before, there are certain variables that directly influence human
reproduction and can not be categorized as the economic variables.
Family planning has accelerated the fertility decline in some of
the less developed countries. In the next discussion, we will
review another theory that is more specific on how human
reproduction is directly influenced by certain factors.

B. Proximate determinants of fertility

The weakness of the demographic transition theory is that it
does not explain the mechanisms by which economic development
influences fertility. It only asserts that modernization such as
industrialization, urbanization and other economic development will
ultimately result in fertility decline.

Bongaarts (1978) has developed a simple but comprehensive
model of the relationship between the variables intervening in the
socioeconomic development/ fertility decline relation. According to
Bongaarts, social, cultural, and economic variables influence
fertility via proximate determinants:

```
┌─────────────────┐      ┌──────────────┐      ┌──────────────┐
│ Social, cultural│ ───> │ Change in    │ ───> │ Fertility    │
│ and economic    │      │ proximate    │      │ decline      │
│ development     │      │ variables    │      │              │
└─────────────────┘      └──────────────┘      └──────────────┘
```
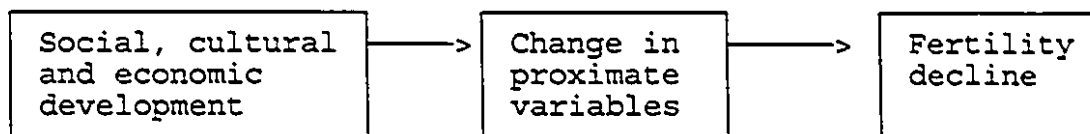
This figure illustrates that the proximate determinants can be thought of as providing the link between socio, economic, and cultural factors which influence fertility. In other words, only through these intermediate variables can social, economic and cultural factors affect fertility.

Originally, this model was developed by Davis and Blake (1956:212) who identified eleven intervening variables that directly influence fertility:

1. Age of entry into sexual union.
2. Permanent celibacy: Proportion of women never entering sexual union.
3. Amount of reproductive period spent after or between union.
   a. When unions are broken by divorce, separation, or desertion.
   b. When union are broken by death of husband.
4. Voluntary abstinence.
5. Involuntary abstinence (from impotence, illness, unavoidable but temporary separation).
6. Coital frequency (excluding periods of abstinence).
7. Fecundity or infecundity, as affected by involuntary causes.
8. Use or non-use of contraception.
   a. By mechanical and chemical means.
   b. By other means.
9. Fecundity or infecundity, as affected by voluntary causes (sterilization, subincision, medical treatment, etc.).
10. Foetal mortality from involuntary causes.
11. Foetal mortality from voluntary causes.

Bongaarts (1978) has reduced these eleven variables to eight, classified into three broad factors: (1) exposure factors, that is, proportion married, (2) deliberate marital fertility control factors consist of contraception and induced abortion, and (3)

natural marital fertility factors, consist of lactational
infecundability, frequency of intercourse, sterility, spontaneous
intrauterine mortality and duration of the fertile period.

Bonga rts's proximate determinants model (1978, 1982) suggests
that fertility differences among countries or population is
determined both by the extent to which the particular variable
differ across population, and by the extent to which fertility in
a given population responds to changes in the variable. Bongaarts
identified four variables as the most important determinants of the
fertility level: (1) proportion married, (2) contraception use, (3)
induced abortion (4) postpartum infecundability. Bongaarts' 1982
study of 41 present-day and historical populations, found that 96
per cent of the variation in fertility was explained by these four
variables. The overall results of Bongaarts' research are
summarized in Table 2.1.

Table 2.1
Ratings of Proximate Determinants with Respect to the Sensitivity
of Fertility and Variability Among Populations

Intermediate Fertility Variables	Sensitivity of Fertility to Intermediate Variables	Variability among Populations	Overall rating
Proportion married	***	***	***
Contraceptive use	***	***	***
Prevalence of abortion	**	***	***
Postpartum infecundability	**	***	***
Fecundability	**	**	**
Spontaneous intrauterine mortality	*	*	*
Permanent sterility	**	*	*

Notes: *** High   ** Medium   * Low or Absent
Source: Bongaarts (1982:180).

In summary, the proximate variables give us a valuable tools for examining the fertility decline. The use of this model clarifies the general arguments of how socioeconomic variables influence fertility, while allowing in specific country-level factors to be considered.

The proximate variables approach has been widely used in the other studies of fertility. Some research has found that the basic, socioeconomic determinants play a crucial factor in fertility transition, while other studies have found that proximate determinants are the most important. Further, some argue that reducing the cost of fertility regulation should be considered first, since this will encourage families to use contraceptive methods. Many studies have shown that fertility transition can be achieved by emphasizing more on the socio-cultural factors and family planning programs, rather than on the economic factors alone (see Robinson 1992; Fawcett and Khoo 1980; Larsen 1990; Quanhe 1987). Overall, this research suggests that to predict fertility transition mainly in terms of socioeconomic development could be, and may already be, very misleading.

If a fertility transition is determined by socioeconomic development, the question that can be raised is how long it will take for a country to achieve this transition? Two ways to reduce fertility rate is to introduce family planning programs or to improve health conditions in the population. Strong government support for implementing family planning programs - such as easy access to clinics, or a free supply of contraceptives - have been

found to significantly accelerate the fertility decline. For example, Caldwell et al. (1982) found that improving levels of infant and child mortality, substantial extension in female secondary education, an ample supply of contraceptives, and strong governmental support from the government could reduce the fertility rate in Nigeria. Other study also suggests that attitudes toward birth control as it is broadly defined play a crucial role in fertility transition, and not socioeconomic changes (Cleland and Wilson 1987). The following arguments will review how each of the proximate determinant variables is supposed to influence fertility.

Some empirical research

As has been discussed in previous sections of this chapter, there is no fully developed theory of the intermediate variables that can be tested through empirical investigation. However, many of these proximate factors have been used in studies and are regarded by these perspectives as the most important variables influencing fertility. Therefore, in the following sections, I examine critically the status they have attained in empirical demographic research.

Marital status. One of the proximate variables that directly influences fertility is marital status. There are three dimensions of marital status: (1) the proportion of population ever-married, (2) the age of marriage or age of entry into sexual union, and (3) the prevalence of widowhood, divorce and remarriage and other

temporary separations. These aspects of marital status are very useful in explaining the fertility rate of a population. For example, Kumar (1971) argues that the relatively low fertility of eighteenth and nineteenth century Europe is better explained by the high proportion of never-married women and the relatively late age of marriage than by the level of marital fertility per se. Furthermore, the United Nations' (1987) World Fertility Survey (WFS) found a significant zero-order correlation between the Total Fertility Rate (TFR) and the reproductive life span women spend in marriage. In general, a low age at marriage means a higher number of children will be born. Based on this fact, one of the policies to reduce the fertility rate is to limit the age at marriage, especially for women. Many countries such as China and Indonesia have legislated a minimum marriage age. The minimum age of marriage for women in Indonesia according to the 1974 Marriage Law is 16.

Post-partum infecundability. The length and intensity of breast-feeding has been widely accepted as the crucial factor influencing the length of the period of infecundity after childbirth. Breast-feeding is a common practice for women in LDCs, whereas in developed countries there appears to be a greater use of bottle-feeding and formulas. Women in LDCs generally breast-feed 2.5 times longer than do women in more advanced developing countries (Farooq and DeGraff 1988). The average differences between the least developed and the most developed countries, would be even greater. Cleland and Scott (1986) estimate that if breast-feeding practices

in Bangladesh were to change to match those of the industrialized world, the level of fertility would increase by over 50 per cent.

Contraception: Contraception has become the central issue of fertility regulation. The major goal of family planning programs is to reduce the fertility rate by providing contraceptive methods and other birth control services. The use of contraception is often found to be negatively associated with fertility, that is the higher the proportion of women in their reproductive years use contraceptive methods, the lower the fertility rate.

Strong evidence of the effectiveness of family planning programs in reducing the birth rate can be found in Kenya, one of the least developed countries in Africa. Data from the 1989 Kenya community survey of 260 rural communities show that easy access to family planning services and other institutions related to health service attract many women in that country to family planning methods. Hammerslough (1992) and Robinson (1992) concludes that increasing the proportion of users who rely on highly effective clinical methods has accelerated the fertility transition in Kenya.

The innovation-diffusion model has become an interesting factor to support family planning programs. Indeed, Knodel (1977) argues that the diffusion process, with family limitation being viewed as innovative behaviour, may not only diffuse rapidly through a population but, further, also serve itself as a catalyst for changing fertility desires. Knodel concludes that the modern fertility transition results from the spread of innovative

behaviour and can not be viewed simply as an adjustment to new socioeconomic circumstances based on previously established behavioral mechanisms. Evidence on the fertility transition in Taiwan supports the innovation-diffusion model. According to Sun and Ting (1989), innovation-diffusion was more important in the early years, while structural adjustment became more important in the latter years. Studies in Europe and in third world countries also show that lower levels of fertility are largely due to the adoption of innovative behaviour within marriage (Watkins 1987).

In terms of the type of contraceptive technology or specific technique used, family planning programs, should not put the emphasis mainly on sterilization, since other factors - such as the age of marriage, literacy, infant mortality and spacing between children (Antony 1992) - can also effectively influence fertility. In some areas of China where traditional son preference is unlikely to decline, and socioeconomic conditions in rural areas are unlikely to change, strong government policy will ensure the maintenance of a low birth rate. This policy was well-known as the one-child policy (Larsen 1990), that has lead to a low birth rate and a consequent decline in population growth in China. Most women in China use contraceptive tools and induced abortion is common and fairly widespread.

The conclusion that can be drawn from the Taiwanese and Chinese experiences is that both socioeconomic development and policy influence the proximate determinants of fertility and therefore fertility decline. Family planning programs, in other

words, are very important in reducing fertility rates. A problem that usually arises involves the choice of program to be given priority. On the one hand, relying on economic development for bringing about a fertility decline is hampered by the fact that this is undoubtedly a slow process. On the other hand, implementing family planning program when a majority of people still live in poverty, and the level of education is still low, presents many practical difficulties, some of which could only be effectively overcome by promoting other aspects of social development.

Perhaps the best solution is to pursue both strategies at the same time, as has been the case in Thailand. According to Knodel et al.; (1984) four factors explain fertility decline in Thailand: (1) socioeconomic change which causes parents to view large families as a burden, (2) conduciveness of the cultural setting to the acceptance of fertility regulation, (3) the presence of a latent demand for effective contraceptive techniques, and (4) an increased awareness of family planning, as a result of governmental family planning programs. Of course, this begs to the questions of where the "latent demand" and culture conduciveness come from and why if development has already taken place in the presence of high fertility should large families to be seen as a burden or obstacle?

C. Individual Fertility Decision-Making Models

Although both the demographic transition and the proximate determinants theories are conceptualized largely in terms of aggregate level variables, fertility behaviour is obviously

determined by the decisions of individual couples, as micro-economic theory argues. Becker (1960), for example, argues that since children contribute "utility" and since they have a "price", then fertility behaviour can be compared to other consumer behaviour. According to this view, it is important to recognize not only the financial cost of raising children, but also the opportunity costs of the time devoted to child-care, especially for the mother. Consequently, according to Mincer (1963), the value of time is an important determinant influencing fertility behaviour. The negative relationship between women's wages and fertility in most of the developed countries is a result of women's choice to pursue careers rather than the mother's role.

Easterlin (1969, 1975, 1978) has developed and elaborated a theory of fertility based on the "taste" and "supply" variables. Easterlin's synthetic framework can be summarized as saying that the determinants of marital fertility and completed family size are mediated by family preferences for consumption, children, and fertility regulation, as well as by the following four constraints:

1. A "budget constraint" that reflects the limitations implied by the market prices of goods and services, the wage rates of family members, any non-labour income, and the time at the disposal of household members.

2. The constraint of household technology, which enables the household to convert market goods and time of family members into the basic commodities that are part of its utility function.

3. A "birth function" or "fertility reproduction function", expressing the number of live birth as a function of frequency of intercourse, reproductive span of the household, fertility regulation practices, and the commodities, goods and practices that govern the probability of conception and nonsusceptible period of the wife.

4. An "infant" mortality function, that expresses infant and
    child mortality through adulthood, as a function of other
    variables such as health and nutrition. (Subtracting mortality
    from fertility gives completed family size.)

Maximizing the utility function subject to budget constraint, the
household's technology, the birth function, and the infant
mortality function yields the optimal solution values for the
household's decision variables (Easterlin 1980:81-81).

In their present approach, Easterlin and Crimmins have
developed a new model of the study of fertility. They propose three
general variables - namely supply, demand, and regulation cost -as
those which indirectly influence fertility, as illustrated in the
following figure:

Proximate Determinants

Regulation Cost Rc

Demand Cd

Supply Cn

Basic Determinants

Deliberate Fertility Control Variables

Other Proximate Determinants

Children Ever Born
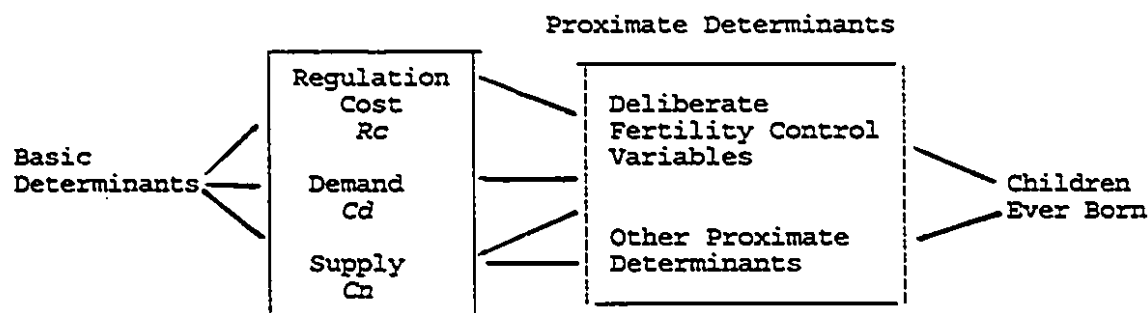
Source: Easterlin and Crimmins (1985:13).

Easterlin (1978), defines "demand" as the number of surviving
children that parents would want if fertility regulations were
without cost, and "supply" as the number of surviving children if
parents made no deliberate attempt to limit family size. Further,
according to Bongaarts and Menken (1983), the supply of children is
influenced bv: (1) postpartum infecundability, (2) the waiting time

to consumption, (3) intrauterine mortality, (4) onset of permanent sterility and (5) exposure to the cost. Finally, cost of fertility regulation includes both subjective disadvantages of regulation such as distaste for the general notion of family planning and the drawbacks of specific techniques like abortion, and the economic cost of control, such as time or money required to procure family planning services.

Easterlin's supply and demand theory is very useful for analyzing the fertility transition in both developed and less-developed countries. In the LDCs, for example, demand for children is usually high. As discussed above, there are many reasons to have large families; for example, children become the source of labour, especially in agriculture, they can get a job so that they will contribute to the family's income, they provide a place to live when parents are getting old. Thus, high demand for children might result in high fertility.

Caldwell (1976, 1978, 1982) asserts that the key to the fertility transition depends on the direction and magnitude of inter-generational wealth flows at the individual couples. Raising a child according to Caldwell, involves both benefits and the cost. The direct cost of children includes food, education, clothing, dowry and medical care. On the benefit side are productive activities in the household, support in old age and the consumption and utility derived from children. On the basis of the costs and benefits of children we can predict that if parents judge the costs

of having children to be higher than the benefits, they will reduce their fertility, and vice versa.

The economic motivations which affect fertility can be grouped into two categories; cost associated with raising of children, and benefits derived from them. Cost of bringing up children can direct such as food, education, clothing, housing, and medical care. Indirect cost includes opportunities for wife to work outside home, make investment in farm or business or raise consumption standards. Following Leibenstein's (1963) suggestions, the economic benefits of raising children may be divided into two categories: first, children as the source financial security such as take care of parents financially in old age or in emergencies. Secondly, children can contribute directly to the family since the young age such as work on family farm or in a family business. As economic development progresses, cost of children are increase and the benefits from them decreases. All of these factors change people's thinking, because in the modernization process, children need more education and consequently start working at a later age. Thus, the perceive the economic benefits of raising children become diminish. Most parents in modern societies provide for their own old age security or the state does so for them, so that a small family enhances the parents ability to save money for their future.

All three theories have been widely used in explaining fertility transition in several countries. Although these three approaches are different in many ways, they share a common characteristic - a focus on a single level of analysis, either the

individual or the group level. Studies on fertility transition in Western Europe, for example, focus on change across geographic units, rather than on individual couples. In other words, the European Fertility Project has surprisingly little to say about changes in family systems and the roles of men and women in its conclusion. Conversely, other studies tend to concentrate on decision-making at the individual or couple level. Such non-recursive models are bound to be unsatisfactory, because they concentrate on the demographic-economic relationship and individual characteristics. In the remainder of this dissertation, I apply both individual and group approaches to study the fertility transition in Indonesia, using provinces as a macro-level unit of analysis and individual couple characteristics as the micro-level one. The general model to be used here can be summarized as follows:
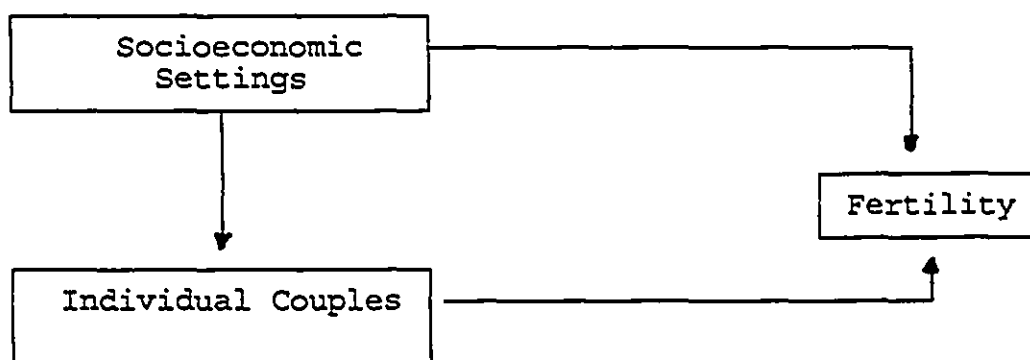
The macro analysis emphasizes the effect of socioeconomic setting, such as provincial income, urbanization, literacy rate, infant mortality rate and life expectancy on fertility, while the

micro level emphasizes the direct effects of individual characteristics such as religion, type of residence, education, type of occupation. I argue that socioeconomic setting directly influence individual couples because it encompasses the transportation, communication, and other facilities that enhance individual couples' access to fertility control.

D. Summary

Even though this literature review can not claim to be exhaustive, I have identified a number of theoretical and substantive issues worth pursuing: demographic transition theories, proximate determinants approach and micro-economic theory. Further as almost all fertility studies have focused on either micro or macro level, the approach being pursued here, namely to mix them, would seem to be more interesting.

At the macro level, I shall examine the impact of socioeconomic development variables such as level of urbanization, the literacy rate, GDP per capita, contribution of each economic sector on the GDP, infant mortality rate, and life expectancy on the TFR. At the micro or individual level, these include type of occupation, religion, and education of individual couples. In the next chapter, I outline the methodology, concepts, operationalization of the concepts and source of data that used in this study.

CHAPTER III

DESCRIPTION OF DATA

In recent years, there have been many studies on inequality and poverty in less-developed countries (LDCs). A common characteristic of these studies is that they have concentrated on national levels of growth. An aggregate study is appropriate in the case of a small and relatively homogenous country such as Taiwan or South Korea, but it is unlikely to be adequate in the case of large and regionally diverse countries such as Indonesia, India or Brazil. In such cases, research needs to focus on and account for the imbalance between regional and national economic growth within national borders. This is a very important gap to be filled by research.

One of the best and most widely-used measures of economic development is Gross Domestic Product (GDP) per capita. However, this measurement contains many weaknesses. Most importantly, it tells us nothing about how equally income is distributed. A high average GDP does not guarantee that everyone receives the same income. In particular, Indonesia has undergone spectacular economic development over the past twenty years. In the 1960s, Indonesia's per capita annual GDP was very low, at $50, lagging well-behind figures for Nigeria or Bangladesh during the same period. By the late 1980s, however, Indonesia's per capita GDP had increased to almost $500, 30 percent higher than Nigeria's and 150 percent higher than Bangladesh's during the same period (World Bank 1990:27). In spite of many obstacles, the Indonesian economy has

59

grown rapidly during recent years, the growth rate in 1993 was 6.7 percent and in 1994 was 7 percent (Far Eastern Economic Review 1994). Indonesia's increasing GDP correlates with the ascent to power of the "New Order" government's implementation of a series of Five-Year Development Plans, REPELITA. The new order government, which took power in 1965, has established a number of development policies aimed at increasing the welfare of the Indonesian people.

As a result of the increasing Indonesian GDP, poverty has decreased markedly. For example, in 1970 about 60 percent of Indonesians lived below the poverty line, but data from the World Bank in 1990 estimated that the number had dropped to 15 percent. As another indication of declining poverty, during the 1980s' period of structural adjustment and austerity, poverty declined from 22 percent in 1984 to 17 percent in 1987 (World Bank 1990:38). Expressed in absolute terms, the number of Indonesians living below the poverty line fell from 70 million in 1970 to 30 million in 1987.

In Indonesia, the disparity between regional and national economic growth is an interesting and important issue. Indonesia's economic policies have emphasized increases in GDP, which have not automatically improved the overall living standards of the people. Further, policy makers were sometimes criticized for concentrating too much on the overall national economic growth rate and too little on the large and growing differences between various regions (as well as between urban and rural areas, and between social classes). After 25 years of development initiatives, the Indonesian

government now seems set to review its policies and to examine their impact on regional as well as national development. Indeed, since the second five-year plan in 1974 Indonesia has adopted specific policies to address the regional distribution of economic development, policies favouring the dispersion of growth throughout various islands (though Jakarta and Java still continue to grow at disproportionate rates).

The choice between policies that promote national economic and those which deal with equal distribution of such growth across regions is not an easy one to make. For example, Williamson (1965) argues that economic inequality among regions is perhaps necessary for a period of time, in order to increase the national rate of economic growth. An equity perspective, however generally recommends a more equal distribution of economic growth among regions rather than a more concentrated distribution of economic growth. If Williamson's hypothesis is correct, however, then, for the sake of national economic growth, it may be preferable to allow some regions of a nation to grow more rapidly than the others.

The major objective of this dissertation is to integrate micro- and macro-level analyses of economic development and fertility levels and changes. Specifically, I am interested in the extent to which fertility rates and transitions can be explained in terms of macro-level factors, such as provincial or regional income, versus household-level factors, such as the husband's and wife's education and occupation. I consider that macro-level

determinants of fertility and fertility change must be examined because as Ryder (1980:201-202) has said:

> Fertility is a collective property and therefore calls for explanation at the microanalytic level in terms of other properties of the collectivity. The task of explaining why fertility is higher in one population than in another, and why fertility decline more in one population than in another require sociological analysis at the system level.

Thus, in this research, I investigate the effect of the regional economic development on fertility decline; the impact of different socioeconomic status on the average number of children ever-born and, finally, the extent to which regional context affects individual couples' fertility behaviour.

Regional economic development variables

In the macro-level analysis I examine the influence of socioeconomic development indicators of each province on its fertility rate and the pace of fertility decline. In this, I follow other social scientists (e.g., Sofranko and Bealer 1972) in using multiple economic and education indicators to measure such development.

The indicators of structural economic development include:

(1) Urbanization.

One commonly used indicator of regional economic development is urbanization, that is the number of people and/or the proportion of population living in urban areas. The experience of developed countries suggests, the higher the level of economic development,

the higher the number of people reside in urban areas. Consequently, in Indonesia, we would expect that the more developed region, the higher the people live in urban areas. Further, in many studies, urbanization has been found significantly related to the fertility rate, usually in an inverse fashion.

(2) The literacy rate.

Literacy rate is included as an indicator of socioeconomic development because it is one of the best indicators of the socioeconomic development. Education can influence an individual's life by improving knowledge of contraception use, improving the standard of living, and improving an individual's occupational situation, which might be incompatible with raising a child. Thus, I argue that the more developed the region, the lower the illiteracy rate and, in turn, the lower the fertility rate and/or the faster the rates of decline.

(3) The proportion of the population employed in agriculture.

Another indicator of socioeconomic development is the proportion of people who work in the agriculture sector. Almost by definition, the more modernized the society, the lower the proportion of agricultural workers. Further, and as discussed earlier, agriculture is one of the economic sectors that usually associated with high fertility. The high demand for children in this sector particularly when practised in a "traditional" form is

easy to understand and has been generally integrated into "intergenerational cash-flow arguments."

(4) The proportion of the population living in poverty.

As dependency theory argues, the main cause of the high fertility in LDCs is that the income in dependent countries or regions within them is not distributed equally. Many studies have found that, on average, lower-income families have higher numbers of children than higher-income groups.

(5) GDP Indicators consist of three measures:

(a) The per capita GDP (non-oil)

Non-oil GDP per capita is taken because it is the best approximation of provincial average income. Since oil and gas are exploited by the central government, excluding oil and gas better reveals the "real income" of each province.

(b) The GDP per capita growth rate

As in the case of per capita GDP, the growth rate of per capita GDP is another measure of provincial economic growth. Excluding oil and gas in this measurement may also reflect the real economic growth of each province.

(c) The respective share of Regional Gross Domestic Product (RGDP) from the economic sectors: agricultural, trade, mining, transportation, manufacturing, finance, utilities, administration, and construction.

These different kinds of GDP data are taken to be the core indicators of economic development. The most developed regions are predicted to have large proportion of people working in the non-agricultural sectors, have high GDP growth rate, and high GDP per capita (non-oil). Following the demographic transition argument, I argue that increasing the number of people work in the industrial sector and other non-agricultural sectors lead to the decline of fertility.

The health indicators include:

(1)   Infant mortality rates.

Infant mortality rate (IMR), the number of infant deaths per 1000 births, is a very important variable in the study of fertility. Among countries in the contemporary world, those with low mortality always have low fertility whereas those with high morality are also usually characterized by high fertility. Thus, as a policy issue, reducing infant mortality level is usually universally given high priority as an important social objective.

(2)   Life expectancy at birth.

Life expectancy is a general measure of the living conditions of the mass of the population. Consequently, I argue that high life expectancy at birth is strongly related to improvements in socio-economic conditions of the masses. Based on this argument, life expectancy at birth is chosen as one of the variables that may have effect on fertility.

Female status indicators include:

(1) Female literacy rate.

As Lotter (1976) suggest, level of female education is typically associated with relatively low levels of fertility, a relationship which has been shown by both national and cross-national research.

(2) Women's employment status.

For purposes of the present research, female employment statuses are categorized into the following groups: the self-employed, those temporarily employed, employers, full-time employed, and family workers. The type of women's occupation is a very important factor determining fertility rate, as some types of jobs outside the home may conflict with child-bearing and child-rearing roles, which is often called "role incompatibility" theory.

Independent variables at the level of the household

As with micro-level case studies, we will examine the influence of each household's characteristics on the average number children ever born (CEB) and the ideal number of children. These indicators are:

(1) Women's type of residence.

Women's residence can be defined as the place where individual couple live when the survey was being carried out. Type of women's

residence is classified into three categories: (a) big city, (b) small city, (c) village.

(2) Women's type of childhood residence.

While the type of women's residences ask about current residence, the childhood residence question asks about the place where women lived until age 12. In this survey, classification of childhood residence is the same as for current residence, that is (a) big city, (b) small city, and finally (c) village.

(3) Women's level of education.

Level of women's education has four categories: elementary school (6 years), junior high school (3 years), senior high school (3 years) and, finally, university or college.

(4) Women's type of occupation.

Type of occupation is obtained directly from respondents. In this survey, type of occupations are classified into nine categories: (a) Professional/technical, (b) Manager and administrators, (c) Clerical, (d) Sales, (e) Service, (f) Agriculture, (g) Industrial, (h) Other, (i) Military.

(5) Women's religion.

There are many religions in Indonesia, such as Islam, Catholicism, Protestantism, Hinduism, and Buddhism. In this survey

used in this dissertation, women's religion was asked directly of the respondent.

(6) Husband's level of education.

Classification of husband's level of education is the same as those women's level of education, that is elementary school (6 years), junior high school (3 years), senior high school (3 years) and, finally, university or college.

(7) Type of husband's occupation.

Classification of husband's occupation is the same as those in women's occupation, that is (a) Professional/technical, (b) Manager and administrators, (c) Clerical, (d) Sales, (e) Service, (f) Agriculture, (g) Industrial, (h) Other, (i) Military.

The dependent variables:

In examining the impact of regional economic development on fertility rate and the pace of its decline as well as the use of contraceptive methods, I use the following indicators:

(1) Age at first marriage

Age at first marriage determines the length of time a woman is exposed to the risk of pregnancy. In general, the younger a woman is when she marries, the longer her reproductive years in a consensual sexual union and the higher the expected fertility. As noted earlier, one of the major factors in the onset of the

Indonesian fertility transition was a dramatic change in marriage behaviour. The most common feature of women in Indonesia is that almost all women eventually marry but there are substantial variations in marriage patterns among the different regions of the country.

(2) Use of contraception

Use of contraception either with modern-advance contraceptive methods such as IUD, norplant, or modern ones such as the pill or condom, is common among Indonesian women. Since using contraceptive methods has direct a effect on fertility rates, it is necessary to investigate what factors influence the use of these methods.

(3) Total Fertility Rate

Total Fertility Rate (TFR) is derived from the Age-Specific Fertility Rate (ASFR), that is, the number of births to a women within a certain age group, with each age group covering one to five years. TFR, then, is simply the sum of ASFRs, multiplied by the number of years covered by the interval of the age groups (usually 5 years). TFR represents the completed fertility of a synthetic cohort, that is, the total number of children expected to be born by each woman, assuming that at each age the fertility experiences will be represented by the current period ASFR for that group. Thus, TFR can be seen as an approximation of average completed family size. The advantages of using TFR to measure fertility are (a) it assumes that women do not die during

childbearing years, and thus it is unaffected by a mortality differential, and (b) it is independent of the effect of the age- and sex-composition of the population, and thus isolates changes in actual fertility.

(4) The average number children ever born

Children ever born (CEB), also known as "parity", is another measurement of fertility, and measures the cumulative number of live births a female has had. One problem involved in using the CEB measure is that it is greatly affected by the age structure of a population. For example, high natality groups with a large proportion of women just entering childbearing years are likely to have a lower number of children ever born than those with the same natality but consisting of women at later stages in their childbearing periods.

(5) The ideal number of children

Another measure of fertility used in this analysis is the "ideal" number of children, as reported in the 1991 Indonesia Demographic and Health Survey. The survey asked respondents who were married how many total children they expected to have (expected family size), how many children they considered "ideal" (ideal family size) how many children they desired (desired family size) and finally how many children they actually had at the time of the survey (current or actual family size). Expected or desired family size as measures of fertility have many weaknesses, however.

Some researchers have found that if a family member were asked about their family desires, they tended to say that their desired family size either is determined by God, or that they were unable to give a numerical response.

Sources of Data and Methodology

In this dissertation, I also explore whether and by how much population policies, such as family planning programs and development plans, reduce rates of population growth in Indonesia. Data for the analyses come from the 1990 Indonesia Indonesian Census and from the Indonesian Demographic Health Survey (SDKI) 1991, which was carried out from May to July 1991. In this survey, more than 27000 households were visited and around 22909 women in the reproductive age groups were interviewed.

A variety of techniques are used in the statistical analyses: simple correlation among the variables, multiple regression to analyze the effect of economic development on fertility and contraceptive prevalence, and a variety of graphic and tabular presentations.

For the purpose of a macro-level analysis, I present regional data on contraceptive use, all indicators of the socio-economic development and the provincial TFRs. There have been many studies that used regional approaches in family planning and fertility studies such as Mauldin et al. (1978) or Lapham and Mauldin (1984). One of the weaknesses of such a macro approach is that we are not sure what regional aspects explain the outcome. To overcome this

weakness, we will also use micro level analyses on family planning and fertility behaviour for every province, including individual characteristics, such as education, religion, type of jobs, type of residences, with the data for these analyses coming from the Demographic and Health Survey.

Table 3.1 summarizes the measurement of all types of independent variables, both macro-and micro-level as well as the dependent variables. The data sources of each variable is also noted.

Summary

I have developed the argument that study of fertility should emphasize both regional level or "macro approach" and individual characteristics at the "micro level." The reason for this is that fertility behaviour is not only determined by the individual couple alone but is also affected by the surroundings in which they live. Both of these sets of factors are assumed to affect fertility behaviour. A combination of census materials, official statistics and a demographic and health survey will allow me to explore the complex relationship between economic development and fertility change.

Both micro- and macro-level analysis are the subject of the next chapters. In the following chapter, however, I present data on the Indonesia fertility rates and the pace of their decline from 1970 to the end of 1990. Other fertility measurements, such as children ever-born, children-to-women ratios, and the use of

contraceptive methods are also presented. Finally, I also discuss provincial differences in fertility rates and their socio-economic characteristics. The purpose of next chapter is to investigate how different groups and different province influence their fertility in Indonesia, following variables I have outlined above.

Table 3.1
Summary of Variables, Measurements and Data Sources

Variables	Measurement	Source of data
Independent: Regional economic development	Percent urban	1990 Census
	Literacy rate	1990 Census
	Proportion of population working in agriculture	1990 Census
	Proportion of population living below poverty line	Pangestu and Azis (1994)
	GDP per capita (non-oil)	Soegijoko (1994)
	GDP growth rate (non-oil)	Soegijoko (1994)
	Percentage of GDP from:	Provincial Income (1988)
	- agriculture	
	- manufacture	
	- utilities	
	- construction	
	- trade	
	- transportation	
	- financial/banking	
	- other services	
Health status	Infant mortality rate	Kasto (1992)
	Life expectancy at birth	Kasto (1992)
Female status	Female literacy rate	1990 Census
	Female employment status	1990 Census
	- self employee	
	- temporary employee	
	- employer	
	- employee	
	- family worker	
	Type of women's residence	Demographic and Health Survey (DHS, 1991)
	Type of childhood resid.	
	Women's educ. level	
	Women's occup. type	
	Women's relig.	
	Husband's educ. level	
	Husband's occup.	
Dependent: Age at marriage	Age at first marriage	DHS 1991
Use of contraception	Use of contraception	DHS 1991
Fertility	Total fertility rate	1990 Census
	Average children ever-born	DHS 1991
	Ideal number of children	DHS 1991

CHAPTER IV

FERTILITY DECLINE IN INDONESIA: THE STATISTICAL EVIDENCE

There are two proximate determinants that have been cited as the main factors influencing fertility: a woman's age at first marriage and the use of contraception. Both of these variables are highly correlated with fertility; that is, the higher the average age of women at their first marriage and the higher the proportion of them using contraceptive methods, the lower the fertility rate in a given country. In this chapter, I first examine changes in the institution of marriage and, second, I explore the innovations in fertility control introduced by family planning programme. Finally, I present fertility measurements such as age specific fertility rates (ASFR), total fertility rates (TFR), crude birth rates (CBR), and the number of children ever born (CEB) or parity. Some of the related measures that are usually associated with fertility such as the child-woman ratio are also presented.

A. Age at first marriage

One of the main factors that causes fertility decline is an increase in the average age at which women first marry. The higher this average, the shorter the reproductive years spent in marriage (a consensual sexual union). There is a tendency for Indonesian women today to marry at older ages than women of previous generations. Those who marry later are likely to have fewer children than those who marry at a younger age. Almost 80 per cent

of the women aged 45-49 married when they were less than 17 years old, while women 20-24 on average married when they were a little less than 20 years old. Thus, there has been a rise in the average age at which women first marry in Indonesia.

This increasing age at marriage for Indonesian women has been caused by many factors. The most significant factor is the change from marriages usually arranged by their parents to those where couples find their own partners (Hull and Hatmadji 1990). Increasing education and the role of women in the labour force are also the crucial factors that change the marriage pattern. There are, however, regional differences in the age at marriage for Indonesian women. Not every region has the same pattern.

Table 4.1 shows that the mean age at first marriage rose in the provinces of Indonesia during the period 1971-1985. There is one contrary case, the age of marriage among Javanese women. Java, which has the lowest fertility in Indonesia, does not have a particularly high age at first marriage, thus other factors must also be at play here in its fertility decline. Indeed, women in Java tend to marry younger than those from the rest of the country. The most recent survey on the topic still showed the age at first marriage in Java was the lowest in Indonesia. Figure 4.1 shows that even though there has been an increase in the age at first marriage, the lowest age at marriage still occurred in Java.

In addition to the overall increasing age of women at first marriage, the percentage of unmarried women in certain age groups

Table 4.1
Trends in the Singulate Mean Age at Marriage
of Women in Indonesia, by Province, 1971-1985

Region and province	Mean age at first marriage		
	1971	1980	1985
Sumatra	19.9	20.6	21.7
D.I. Aceh	19.5	20.8	21.6
North Sumatra	20.8	21.7	22.6
West Sumatra	20.3	20.8	22.0
Riau	20.0	20.7	21.9
Jambi	18.4	19.2	20.8
South Sumatra	20.0	20.7	22.0
Bengkulu	19.7	19.6	20.8
Lampung	18.0	18.9	20.4
Java	18.7	19.5	20.7
Jakarta	20.0	21.7	23.4
West Java	17.8	18.5	19.8
Central Java	19.0	19.8	21.0
Yogyakarta	21.8	22.5	23.4
East Java	18.7	19.4	20.3
Nusa Tenggara	20.8	21.6	22.1
Bali	20.8	21.2	22.3
W. Nusa Tenggara	19.2	20.3	20.2
E. Nusa Tenggara	22.4	23.1	23.6
East Timor	-	-	22.4
Kalimantan	20.0	20.2	21.2
West Kalimantan	20.9	20.9	21.5
Central Kalimantan	19.7	19.8	20.5
South Kalimantan	19.2	19.6	20.9
East Kalimantan	19.6	20.5	21.2
Sulawesi	20.7	21.6	22.3
North Sulawesi	21.6	21.7	21.3
Central Sulawesi	20.6	20.7	21.8
South Sulawesi	20.5	21.8	22.9
S-East Sulawesi	22.0	20.6	20.8
Maluku	22.0	21.6	22.2
Irian Jaya	-	19.8	18.8
Indonesia	19.3	20.0	21.1

Source: Leete and Alam (1994:167).

has also increased. Table 4.2 displays the percentage of females never married in 1971 and 1991. Among women aged 20-21 in 1971, 18.5 per cent of them had never married. In 1991, however, this figure increased to 35.6 per cent. It means that in twenty years
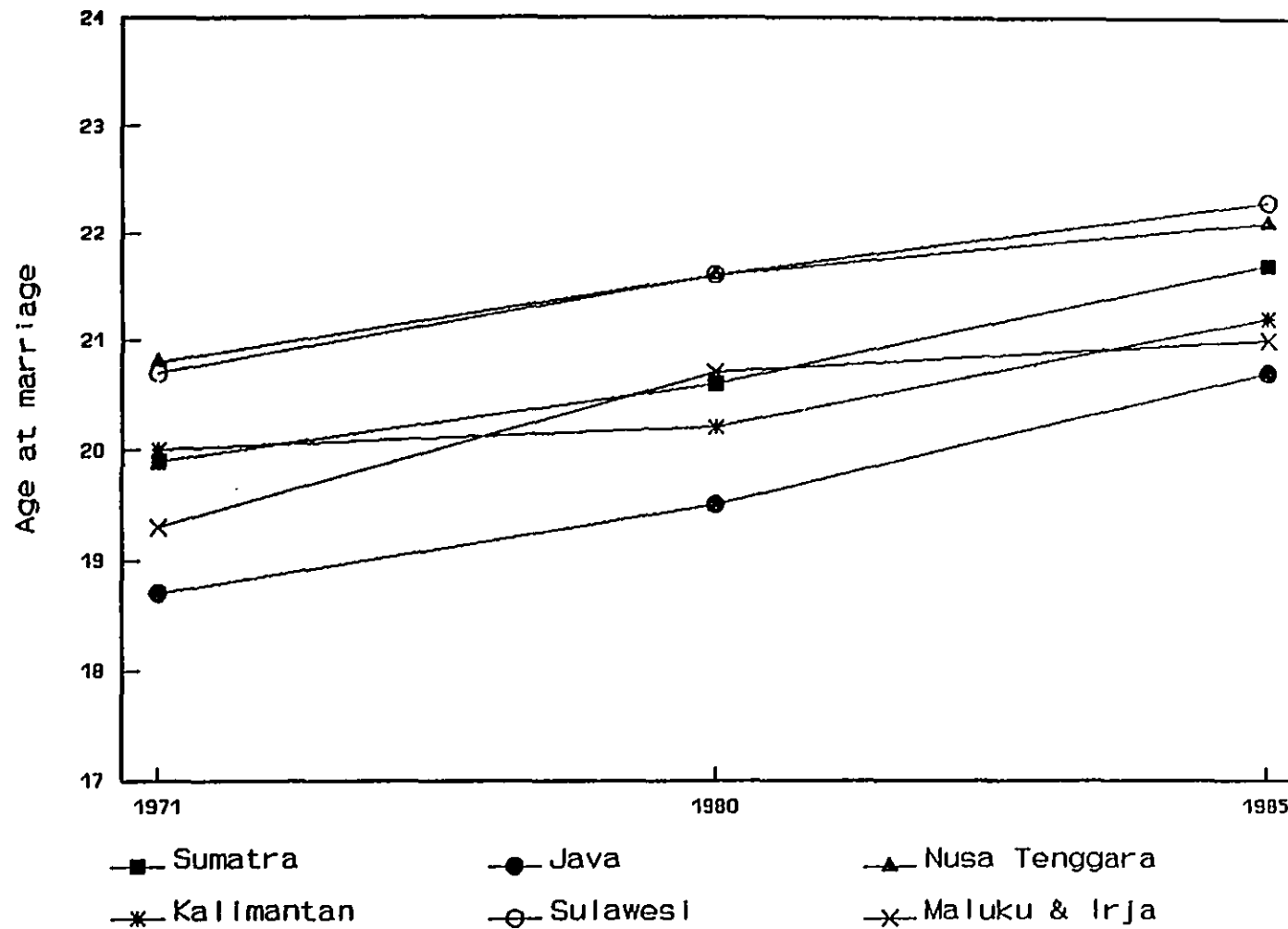
Figure 4.1 Age at First Marriage by Region, 1971-1985

Source: As for Table 4.1

the number of females never married in this age group increased almost two fold.

The highest increase of females never married is found among women aged 15-19 while the lowest is among women aged 25-29. This number also suggests that women's age at first marriage has increased, with the highest number being among women aged 15-19. Some of the factors that cause women to delay their marriage are the increase in women's educational levels, the lesser influence of parents in arranging their child's marriage, and more jobs being available for women.

Table 4.2 shows that among women aged 30-34, only one woman in twenty has never married, and further that among women aged 45-49, nearly 99 per cent of them have married. This suggests that in Indonesia, most women eventually marry, but some only after ages 35 years.

Table 4.2
Percentage of Females Never Married, 1971 and 1991

Age group	1971	1991	% Increase
15 - 19	62.6	80.2	17.6
20 - 24	18.5	35.6	17.1
25 - 29	10.5	11.5	1
30 - 34	na	4.7	na
35 - 39	na	2.3	na
40 - 44	na	2.4	na
45 - 49	na	1.4	na

Sources: Cho et al. (1976:40), BPS (1991:95).

Estimates of the median age at first marriage of Indonesian women by region are presented in Table 4.3. As expected, women in Java married at significantly younger ages than women in other

regions. Furthermore, among women in Java, the highest median age at first marriage in Jakarta was 22.2, followed by 22.1 in Yogyakarta; finally, in Bali, median age at marriage was 20.2. The median age at first marriage for women in Outside Java I was 19.3 and in Outside Java-Bali II was 19.5. If we look at the median age at first marriage by the level of education, we find that the level of education has a strong upward influence on age at marriage. Also, increased educational levels also raise the likelihood of the free choice of partner rather than arranged marriages, together with other attitudinal changes that come with education.

Table 4.3
Median Age at First Marriage, by Place of Residence
and Province, Indonesia 1991

Background Characteristics	Age					
	25-29	30-34	35-39	40-44	45-49	25-49
Place of residence						
Urban	20.6	19.1	18.9	18.1	17.7	19.1
Rural	17.6	17.3	16.9	16.3	16.5	17.1
Province						
Java & Bali	18.1	17.2	16.9	16.1	16.1	17.1
Jakarta	22.2	20.1	19.9	19.0	18.1	20.1
West Java	16.9	16.2	15.6	15.5	15.5	15.9
Central Java	18.4	17.8	17.6	16.2	16.3	17.5
Yogyakarta	21.1	20.7	20.0	18.6	18.5	20.0
East Java	17.9	16.8	16.8	15.9	16.0	16.9
Bali	20.7	19.6	20.0	20.4	20.1	20.2
Outside Java-Bali I	19.3	18.7	18.3	17.9	18.0	18.6
II	19.5	19.2	18.7	18.7	19.2	19.1

Source: Central Bureau of Statistic (1991:98).

B. Family Planning Program

The Indonesian family planning program has been one of the major programmatic successes of the government. When the program

was introduced in 1976, it was estimated to have reached 26 per cent of the eligible couples (15 to 49 years old). Since then, the family planning program has become the subject of a strong official commitment and vigorous sustained effort at all levels of government to achieve ambitious targets.

The basic strategy of family planning program in Indonesia was set at the beginning of 1970s. Services which were formerly limited only to clinical settings were to be brought directly to village homes. Consequently, this program was not only carried out by the employees of the National Coordinating Family Planning Board (BKKBN) but also by involvement of the other bureaucracies, the heads of the village and by other politicians.

In the areas of Java and Bali for example, as a result of a relatively large numbers of clinics per unit of population as well as highly committed official, the number of acceptors has risen rapidly. In West Java, however, as a result of the less effectiveness of the clinic coverage, numerous problems of leadership and local resistance to the program, caused low rates of acceptance of family planning in the beginning of this program, that was only 21 per cent in 1978/80 while other provinces in Java the rates of acceptance was more than 40 per cent (see Table 4.4).

Table 4.4 illustrates how the family planning program was remarkably successful during the period 1985-1991. In 1991, more than 50 per cent of Indonesian married women between the ages 15-49 years used contraceptive methods. The highest increase of married

women who used contraceptive methods was in the provinces outside Java and Bali.

It is not surprising that those provinces achieved high increases in the number of acceptors because, in the provinces of Java and Bali, the number of women who use contraceptive methods

Table 4.4
Indonesia: Estimated Proportion of Married Women of Reproductive Age Using Contraception, by Province, 1985 and 1991

Province	1985 Supas*	1991 DHS**	Differences 1991-1985
Indonesia	38	50	12
Jakarta	44	56	12
West Java	44	51	7
Central Java	39	50	11
Yogyakarta	53	71	18
East Java	40	55	15
Bali	60	72	12
D.I. Aceh	22	29	7
North Sumatra	30	37	7
West Sumatra	26	40	14
Riau	21	40	19
Jambi	38	48	10
South Sumatra	26	47	21
Bengkulu	38	58	20
Lampung	29	54	25
West Nusa Tenggara	25	39	14
East Nusa Tenggara	29	39	10
East Timor	10	25	15
West Kalimantan	22	44	22
Central Kalimantan	29	45	16
South Kalimantan	39	52	13
East Kalimantan	37	58	21
North Sulawesi	60	69	9
Central Sulawesi	38	50	12
South Sulawesi	23	37	14
South-east Sulawesi	24	42	18
Maluku	17	43	26
Irian Jaya	17	21	4

Notes:
* Supas = Survey Penduduk Antar Sensus (Intercensal Survey)
** DHS = Demographic and Health Survey
Sources: Adapted from Hugo, et al. (1987:145), BPS, (1991)

has been very high since 1985, so that in those areas the increase could not be expected to be as high as in the areas outside Java and Bali. A few provinces, such as Maluku, Lampung and West Kalimantan, stand out as having exceptionally high prevalence during the 1990s.

Table 4.5 presents the increase of contraceptive use from 48 per cent to 50 per cent. Thus, during the period 1987-1991, there was a 2 per cent increase. Most of that increase has occurred among currently married women outside Java-Bali II. This expansion might have been caused by a combination of economic development that has begun to expand outside Java and Bali, followed by improvements in women's education, and also the implementation of a strong family planning program.

The level of education of women seems to have a strong effect on contraceptive use. The highest number of married women who use contraceptive methods is among the women who have secondary education or more. This figure decreases by 5 per cent, however, compared with that reported by the 1987 survey. This group already had high contraceptive prevalence rates in 1987 (64 per cent), a level at which increases become difficult for any group, since most of the motivated women are already using contraceptive methods. Women with no education have the lowest frequency of contraceptive use. However, compared to the 1987 survey, the highest increase of contraceptive users was found among women with no education.

Table 4.5
Contraceptive Prevalence Rates of Women in Various Age,
Residential, Education, and Parity Groups

Characteristic	CPR		Change
	1976	1991	
Age			
15-19	26	30	4
20-24	47	51	4
25-29	54	57	3
30-34	59	57	2
35-39	56	58	2
40-44	43	48	5
45-49	24	27	3
Residence			
Urban	54	56	2
Rural	46	47	1
Province/Region			
Jakarta	54	56	2
West Java	46	51	5
Central Java	54	50	-4
Yogyakarta	68	71	3
East Java	50	55	5
Bali	69	72	3
Outer Java-Bali I	42	44	2
Outer Java-Bali II	40	59	19
Education			
None	33	37	4
Some primary	47	47	0
Primary completed	54	54	0
Secondary or more	64	59	-5
Number of living children			
None	8	8	0
One	43	48	5
Two	57	60	3
Three	60	59	-1
Four or more	50	52	2
Total	48	50	2

Source: Adapted from BPS., (1978,46-47); BPS., (1991:58).

Trends in contraceptive use in Java-Bali

Java and Bali were the regions with the highest contraceptive prevalence rates. This was not only the case in 1976 but also in

1991. During this period of 15 years, the use of contraceptives in Java and Bali doubled, that is, from went 26 per cent to 53 per cent. In other words, during 1991, more than half of married women of childbearing age used contraceptive methods. A clear picture of the increase of prevalence rates in Java and Bali is presented in Figure 4.2.

Table 4.5 shows that in Inner Indonesia (Java and Bali) the use of contraceptive methods has increased dramatically over the last fifteen years. The use of contraceptive methods in these provinces has doubled since 1976. The highest increase occurred between 1976 and 1987 and then only increased slightly during the next four years, that is from 51 per cent to 53 per cent. West Java and East Java are two provinces with the highest increased during the last four years.

C. Trends in total fertility rate (TFR)

Data collected in the 1970, 1980, and 1990 censuses showed that fertility in Indonesia has decreased. The greatest declines were recorded in parts of the provinces in Java and Bali. Using the total fertility rate (TFR), Table 4.6 shows the magnitude of the decline for the major provinces and regions of Indonesia. It will be recalled that the total fertility rate can be defined as the average number of children that would be born to a cohort group of women if they maintained the current period age-specific fertility levels throughout their reproductive lives.

The Total Fertility Rate in Indonesia in 1980 was 4.27 while in 1961-70 it was 5.61. In 1980, highest fertility rates in
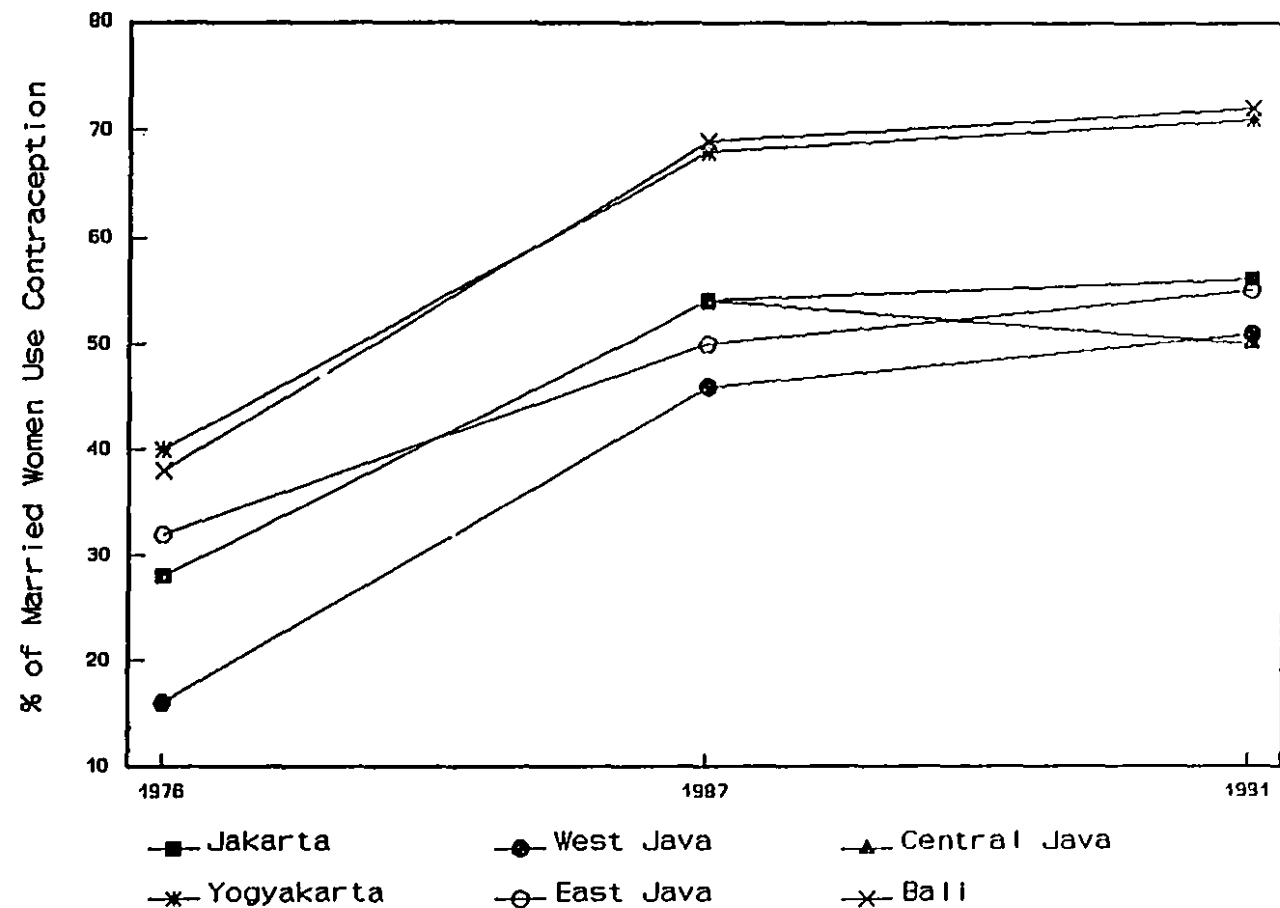
Figure 4.2 Contraceptive Prevalence Rate in Java-Bali, 1976-1991

Source: BPS (1991,61).

Indonesia were found in the provinces of Bengkulu (5.76), Central Sulawesi (5.76), Southeast Sulawesi (5.70) and West Nusatenggara (5.55). All of these provinces have total fertility rates much higher than the national level (4.27). In 1990, still provinces of West Nusatenggara, Southeast Sulawesi are among the provinces with high total fertility rates. Furthermore, as reported by the 1980 census, the 1990 census also showed that, in general, the highest decrease in the TFR still occurred in the provinces in the Java and Bali regions with the average decline being 25 per cent. Both the 1980 and 1990 censuses show that Sumatra is the region with the highest fertility rate.

The Republic of Indonesia, which gained independence in August 1945, did not immediately and directly formulate policies to affect population growth. In the early 1960s, or during what is commonly referred as the "old order government," Indonesia had high fertility, but the government was ideologically opposed to fertility control. The old order government argued that high birth rates were good for economic development. As President Soekarno said:

> My solution is to exploit more land-because if you exploit all the land in Indonesia, you can feed 250 million and I have only 103 million.... In my country, the more children the better (Quoted ii Hull and Hull 1977, 26).

Toward the end of 1960, however, the situation changed dramatically. In 1969 the "new order government" started formulating and implementing its first five-year development plans, which included a strong national family planning program in order

to a achieve substantial decline in fertility. Table 4.6, and graphically Figure 4.3, show the trend of fertility decline since 1967-70 to 1990. During the period 1960 to 1980, the total fertility decline in Indonesia was almost 24 per cent and from 1980 to 1990 the total decline was an additional 23 per cent.

Table 4.6
Total Fertility Rate (TFR), Indonesia, by Province,
Based on the 1961/1971, 1980 and 1990 Censuses

Region	TFR during Reference Period		
	1967-1970	1980	1990
INDONESIA	5.61	4.27	3.32
Aceh	6.27	4.19	4.36
North Sumatra	7.20	5.40	4.28
West Sumatra	6.18	5.05	3.89
Riau	5.94	5.30	4.08
Jambi	6.39	5.11	3.75
South Sumatra	6.33	4.24	4.22
Bengkulu	6.72	5.76	3.96
Lampung	6.36	5.40	4.05
DKI Jakarta	5.18	3.94	2.32
West Java	5.94	4.47	3.46
Central Java	5.33	4.08	3.04
DI Yogyakarta	4.76	3.25	2.08
East Java	4.72	3.27	2.45
Bali	5.96	3.50	2.27
West Nusa Tenggara	6.66	5.55	4.97
East Nusa Tenggara	5.96	5.15	4.60
West Kalimantan	6.27	5.00	4.43
Central Kalimantan	6.83	5.20	4.02
South Kalimantan	5.43	3.99	3.23
East Kalimantan	5.41	4.51	3.27
North Sulawesi	6.79	3.89	2.68
Central Sulawesi	6.53	5.76	3.85
South Sulawesi	5.71	4.43	3.53
Southeast Sulawesi	6.45	5.70	4.90
Maluku	6.89	6.08	4.59
Irian Jaya	7.20	4.11	4.70

Sources: adapted from Hugo et al. (1987:153), BPS (1990)
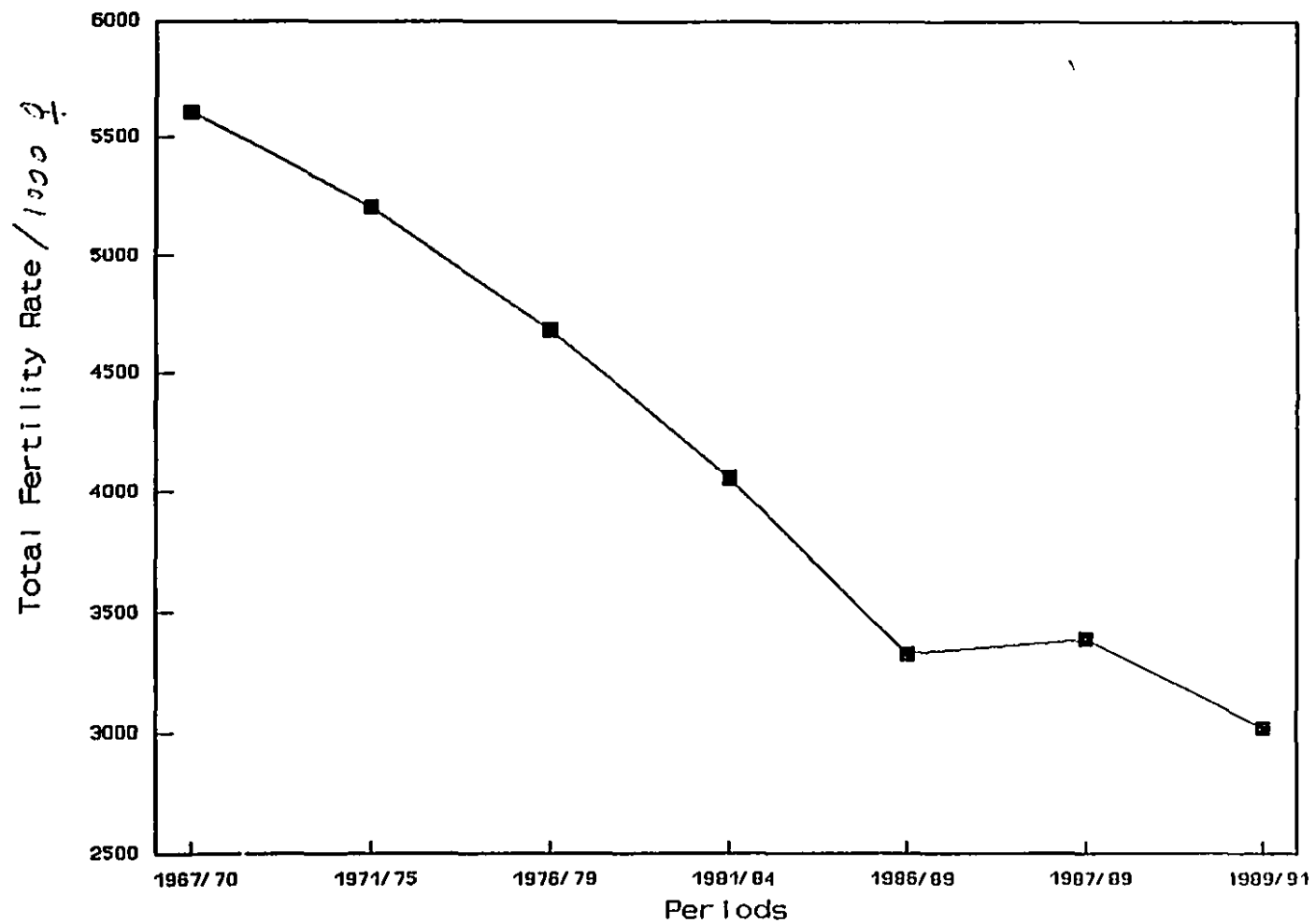
Figure 4.3 TFR in Indonesia, 1967/70 -1989/91

Source: As for Table 1.7

According to census data collected in 1990, the total fertility rate in Indonesia during the period 1986 through 1989 was 3.3; this represented the lowest fertility ever recorded for Indonesia since colonial times. In the period 1971-1975 the TFR was 5.2, from 1976 to 1979 the TFR was 4.8 and from 1981-1984 it was 4.1. These numbers clearly support the argument that a fertility transition was underway in Indonesia. Notwithstanding the magnitude of the decline in its total fertility rate, the pace of that decline has actually tended to increase during subsequent periods. For example, from the 1967/1970 to 1971/75 periods, the overall decline of total fertility rate was 1.65 per cent yearly. During the following years, this figure increased to 2.31 per cent. Finally during the most recent years, the pace of fertility decline has been about 3.89 per cent yearly. Thus, we can see that from year to year there appears to be a sharp and accelerating fertility decline in Indonesia.

D. Differential fertility among regions

Because of regional differences in economics and geography, and also because of culture diversity, it is not surprising that there is substantial regional variation in fertility rates across Indonesia. Java, for example, is a region which is densely populated and under extreme pressure for agriculture land. It is more urbanized and more developed than other regions and has about a 2.60 children per woman. In other words, it had the lowest TFR than other regions. The highest total fertility rate was found in

the provinces of West Nusa Tenggara, East Nusatenggara, Maluku, East Timor and Irian Jaya. These are among the least developed regions in Indonesia, and so it is not surprising that their fertility rates were high. The second highest fertility is in Sumatra, a prosperous region, still far from fully exploited in terms of its land-use and other natural resources. The fertility rate in this region is 4.07, very much higher than the national average of 3.3. Kalimantan and Sulawesi occupy intermediate positions.

During the past twenty years, there have been changes in the comparative position of the total fertility rates among Indonesian provinces. During the period 1971-1975, the lowest total fertility was in East Java (4.7); in 1976/1979, however, the lowest total fertility was Yogyakarta (3.25). The province with the highest total fertility rate, on the other hand, has also changed; during the period 1967-1970 North Sumatra and Irian Jaya were the provinces with the highest total fertility rate (each TFR was 7.1). On the other hand, during the period 1971-1975, the highest total fertility rate was Southeast Sulawesi (5.70). During the period 1976-1979, West Nusa Tenggara was the province with the highest fertility rate (4.97), and beginning 1986-90, East Timor became the province with the highest TFR.

B. Urban and rural fertility

The fertility differences among urban and rural areas are presented in Table 4.7 and Table 4.8. The difference in total

fertility between urban and rural areas are almost one child, that is, 2.69 in urban areas and 3.64 in rural areas. Furthermore, the data also reveal that, for the most part, even urban fertility outside Java is higher than rural fertility in Java.

Table 4.7
Age-Specific Fertility Rates (x 1000) and Total Fertility Rates'
in Urban Areas, Average, 1986-1989

Province	Age Groups (in Years)							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	TFR
Aceh	38	173	209	148	71	26	12	3.37
North Sumatra	31	168	210	156	79	24	6	3.36
West Sumatra	16	128	191	151	90	22	3	3.00
Riau	34	169	197	141	71	24	6	3.21
Jambi	37	156	176	124	69	25	6	2.96
South Sumatra	46	177	196	139	72	28	7	3.31
Bengkulu	41	180	212	141	77	20	7	3.37
Lampung	·48	162	189	146	81	26	10	3.30
Jakarta	36	121	138	100	49	16	5	2.36
West Java	56	?.54	163	119	67	23	6	2.93
Central Java	42	146	152	106	57	20	4	2.63
Yogyakarta	17	95	131	86	37	11	2	1.89
East Java	38	126	125	82	38	13	4	2.12
Bali	22	120	132	77	30	14	3	1.99
West Nusatenggara	54	198	214	171	113	46	14	4.04
East Nusatenggara	24	142	222	190	101	40	13	3.65
East Timor	62	221	262	204	137	60	15	4.79
West Kalimantan	39	159	191	139	80	33	7	3.24
Central Kalimantan	47	168	158	114	48	17	3	2.78
South Kalimantan	45	148	146	107	59	18	6	2.64
East Kalimantan	49	160	163	115	64	20	9	2.89
North Sulawesi	36	128	126	83	38	11	3	2.12
Central Sulawesi	41	165	188	124	65	19	4	3.03
South Sulawesi	36	135	178	141	74	27	6	2.98
Southeast Sulawesi	47	204	232	167	91	33	8	3.90
Maluku	33	142	170	126	62	27	8	2.83
Irian Jaya	58	182	204	155	93	47	16	3.77
INDONESIA	41	143	158	113	59	20	5	2.69

Source: BPS., 1990 Indonesia Census
Notes: Total Fertility Rate (TFR) is obtained by multiplying ASFR by 5.

Table 4.7 shows that as of 1989, Yogyakarta and East Java had the lowest total fertility rates, that is, 1.89 and 1.99,

respectively. If we look at all provinces on the island of Java and Bali, we find that the TFRs of each and every one of these provinces were below the national level. On the other hand, regions that were significantly less developed than Java/Bali, such as the provinces of East Timor and Irian Jaya, have very high fertility rates, that is, 4.79 and 3.77, respectively. Thus, we may conclude that in urban areas in Indonesia, the most developed regions have lower fertility rates than those of the less developed regions.

Table 4.8
Age-Specific Fertility Rates (x 1000) and Total Fertility Rates
in Rural Areas, Average, 1986-1989

Province	Age Groups (in Years)							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	TFR
Aceh	83	237	238	183	111	49	15	4.56
North Sumatra	59	243	261	210	131	55	15	4.86
West Sumatra	62	214	222	180	111	38	7	4.17
Riau	92	238	229	185	106	46	13	4.54
Jambi	117	223	186	145	84	33	11	3.99
South Sumatra	105	246	229	178	109	46	14	4.63
Bengkulu	108	234	202	147	89	38	11	4.14
Lampung	96	226	198	156	98	48	14	4.17
Jakarta	0	0	0	0	0	0	0	0
West Java	117	198	173	138	82	38	11	3.78
Central Java	87	188	154	113	68	27	7	3.21
Yogyakarta	44	143	124	79	43	12	4	2.29
East Java	85	157	121	84	48	20	6	2.60
Bali	58	165	125	74	37	16	7	2.40
West Nusatenggara	88	256	245	205	141	72	28	4.72
East Nusatenggara	46	202	244	212	147	72	23	4.72
East Timor	67	251	289	253	168	93	39	5.80
West Kalimantan	114	247	230	180	113	51	17	4.76
Central Kalimantan	110	229	158	114	48	17	3	2.78
South Kalimantan	90	188	170	134	72	31	11	3.47
East Kalimantan	96	203	178	134	76	38	10	3.67
North Sulawesi	63	176	148	100	56	26	8	2.88
Central Sulawesi	98	226	201	143	89	40	11	4.04
South Sulawesi	63	182	191	150	96	48	19	3.74
Southeast Sulawesi	91	273	260	206	126	52	17	5.12
Maluku	79	237	248	214	142	65	27	5.06
Irian Jaya	123	239	223	177	122	80	37	5.00
INDONESIA	90	198	177	136	82	35	11	3.64

Source: BPS (1990, unpublished).

Table 4.8 illustrates the different total fertility rates among provinces in rural areas in Indonesia. It shows that almost all provinces on the islands of Java and Bali have lower f rtility rates than those of the other islands. This table suggests that, in Indonesia, the more developed the region, the less its fertility.

Most theoretical perspectives expect that fertility in urban areas to be lower than in rural ones. Fertility in Indonesia also shows the same pattern, that is, the more urban an area the lower the fertility rates and the more rural an area the higher the rates of reproduction. Table 4.8 shows that the highest fertility rates are found in rural areas in the provinces of West and East Nusatenggara, East Timor, Maluku and Irian Jaya (mentioned as "other" provinces). On the other hand, the lowest fertility rate is in the urban areas in the provinces of Java.

That the total fertility rates in urban areas is lower than that in rural areas has become a general phenomenon. TFRs in urban areas in Indonesia also show that from all census data the TFR in urban areas is always lower than that in rural areas. Not only is TFR in urban areas low, but the decrease of the TFR in urban areas is faster than that in rural areas.

Table 4.9 shows that the total fertility rate in urban areas from the periods 1967-70 to 1971-75 declined by 1.65 per cent yearly, while in rural areas, during the same periods, the decline was 1.61, so the fertility decrease was higher in urban than in rural areas. Furthermore, from the periods 1985-89 to 1985-1989, the average decrease of fertility rates in urban areas was 5.31 per

cent while in rural areas it was 3.12. Thus, from these data we can draw the conclusion that during these periods the more urban the areas, the faster the decrease in their fertility rates.

Table 4.9
TFR (per 1000 women), by Residence, 1967/70-1986/89

Period	Urban		Rural	
	TFR	r(%)	TFR	r(%)
1967-1970	5160	-	5745	-
1971-1975	4715	1.98	5340	1.61
1976-1979	4130	2.90	4850	2.12
1981-1984	3535	3.06	4270	2.52
1985-1989	2691	5.31	3644	3.12

Source: BPS (1990, unpublished).

F. Trend in crude birth rate

The crude birth rate (CBR) is the number of births per 1000 population. There are advantages and disadvantages to using the CBR. The advantage of this measurement is that it can be related directly to the rate of population growth and is simple to calculate and to use. However, CBR as an indicator of fertility has disadvantages, because it depends not only on the level of childbearing but also on the age and sex structure of the population. There is no exact figure of the CBR in Indonesia before the year 1970 since there was no census held before 1971. However, some writers have made several estimations of the Indonesian CBR based on data from 1961, 1971 and 1980 (see, for example, Nitisasatro, 1970 and Hugo, et al., 1987).

The highest CBR appears to have occurred during the 1950s; this was a period of economic chaos for most Indonesians because the government paid more attention to political issues rather than to economic ones. During this period people from all sectors began to suffer a real decline in their standard of living. During this time the nation was suffering from a large debt; most of the money was used to construct heroic monuments and in the campaign against the Dutch in West Irian (later Irian Jaya). As irrigation systems fell into disrepair, agriculture went into decline. Times of misery also increase the desire to prevent birth, but most people did not have any access to safe and effective methods. Furthermore, during the first half of 1960, the Indonesian government did not support family planning programs; on the contrary, they pursued a pronatalist policy. Starting in the 1970s CBR decreased and the lowest level was estimated to have occurred in the year 1990 (see Table 4.10 and Figure 4.4).

Table 4.10
Crude Birth Rate in Indonesia, 1900-1995

Period	Crude Birth Rate
1900-1930	46
1930-1935	45
1935-1940	45
1940-1945	39
1945-1950	41
1950-1955	47
1955-1960	47
1961-1970	43
1971-1980	38
1985-1990	29
1990-1995	25

Source: Adapted from KLH (1991:78 and 83).
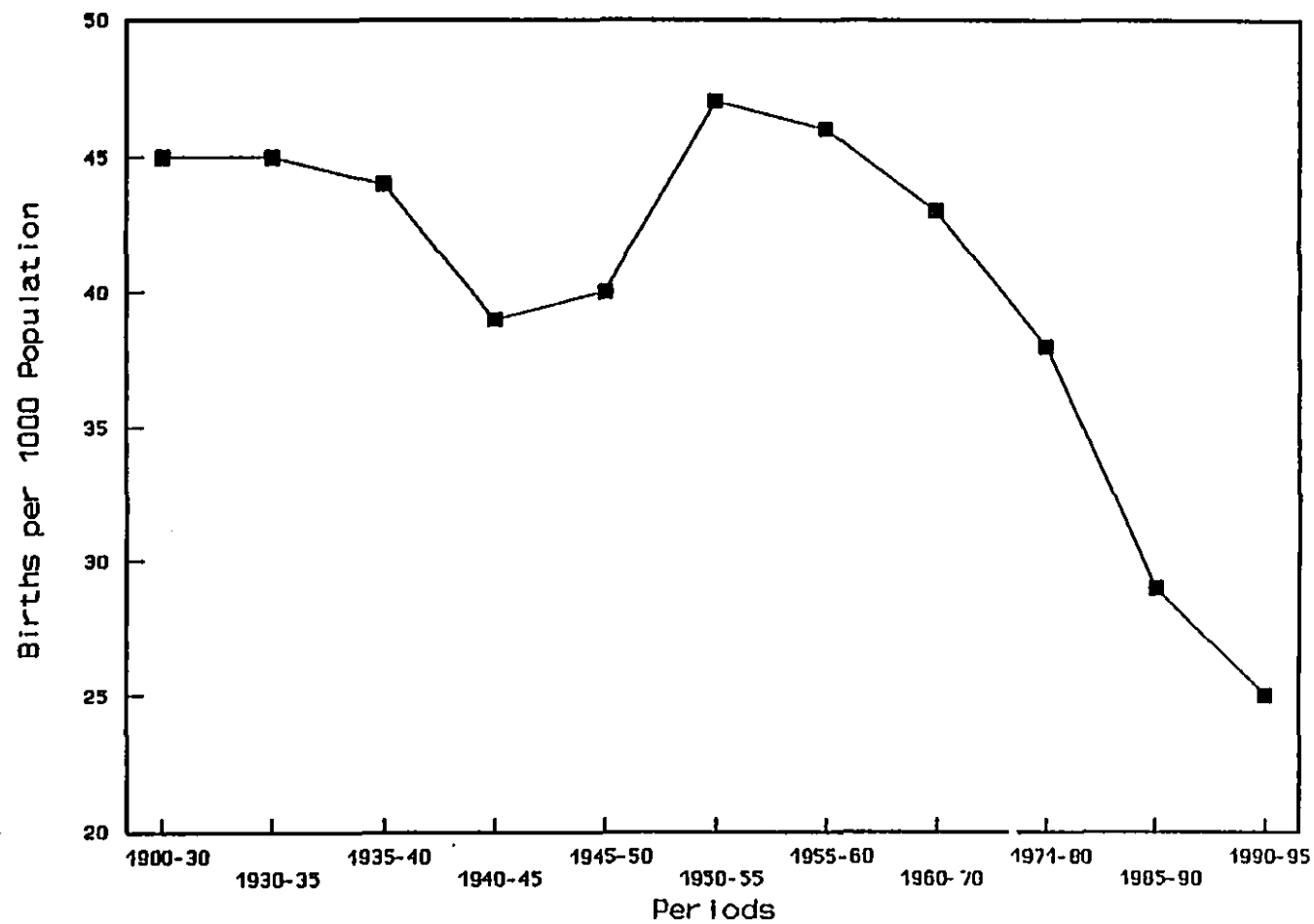
Figure 4.4 Crude Birth Rate in Indonesia, 1900-1995

Source: As for Table 4.10

G. Children Ever-Born

The total number of children ever born (CEB) to married women represents cumulative fertility, so it is difficult to use as a measurement of the growth rate. However, CEB is often used in fertility analysis since it can be found in every census and most surveys. The question of children ever born is ordinarily asked only of those who are or have been married. In the 1985 intercensal survey, it was found that the average CEB among married women of ages 20-24 was 1.35, whereas in 1991 it is 1.34. Thus, during the six year period this figure did not change significantly. In general, the older the women, the higher the number of children ever born.

Table 4.11 and Figure 4.5 graphically show that the average children ever born in Indonesia does not differ significantly from year to year. Between 1985 and 1991 the average CEB among women 15 to 24 and 35 to 44 points to similar figures. If we compare the CEB for women age 30 to 34 during the period 1985 and 1991, we find that the number of CEB in 1991 is lower than that in 1985.

Table 4.11
Average Number of Children Ever Born per Woman,
1985 and 1991

Age of mother	1985	1991
15-19	0.53	0.60
20-24	1.35	1.34
25-29	2.42	2.30
30-34	3.45	3.29
35-39	4.30	4.14
40-44	4.75	4.80

Source: Ministry of Population and Environment (1991:82)
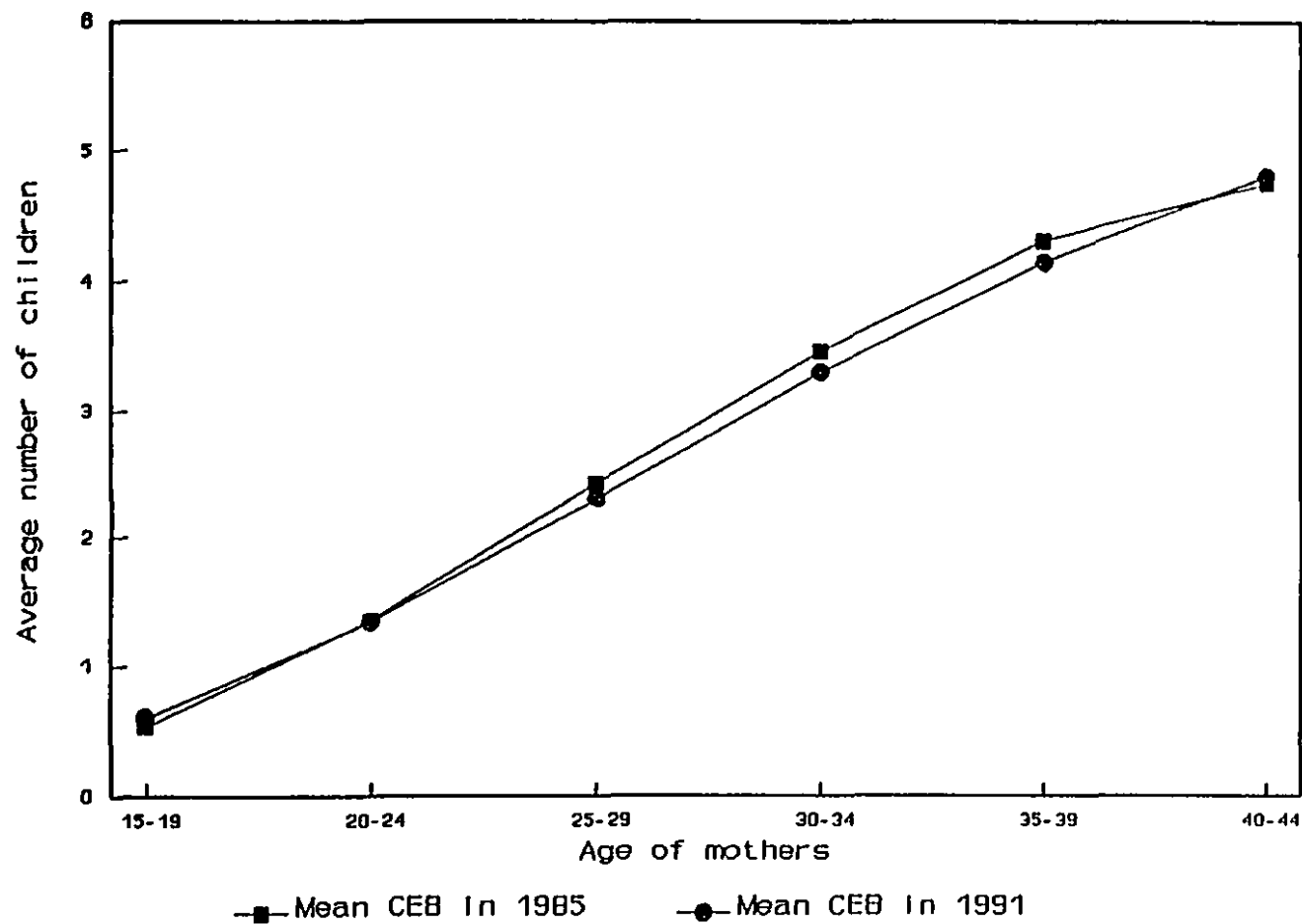
Figure 4.5 Average Number of Children Ever Born, 1985-1991

Source: As for Table 4.11

H. Child Women Ratio (CWR)

The child women-ratio represents the ratio between children under five years old to women at childbearing ages (15-49 years) or the "ratio of children to women." The child women ratio data is easy to get because it does not require a special question in the census. CWR indicates the flow of fertility rates from time to time. CWR also represents the fertility rate during the five year period of data collection.

Like the total fertility rate, the child-women ratio also differs from one region to the others. For example, in 1990 Java had the lowest ratio (480) while Sulawesi, which had a high TFR, also had a high CWR (603). Based on Figure 4.6, we may conclude that high fertility rates usually result in high child-women ratios.

Table 4.12
Child Women Ratio (CWR) in Indonesia by Region
1971 to 1990

Region	1971	1980	1985	1990
Sumatra	752	705	635	657
Java	627	528	460	480
Kalimantan	691	667	595	598
Sulawesi	747	668	590	603
Others	632	545	523	586

Source: KLH (1992, 78)

Fertility decline in Indonesia: a conclusion

Fertility in Indonesia has fallen dramatically since the end of 1980 and according to all indications appear to have continued to decline into the 1990s. There are important regional differences
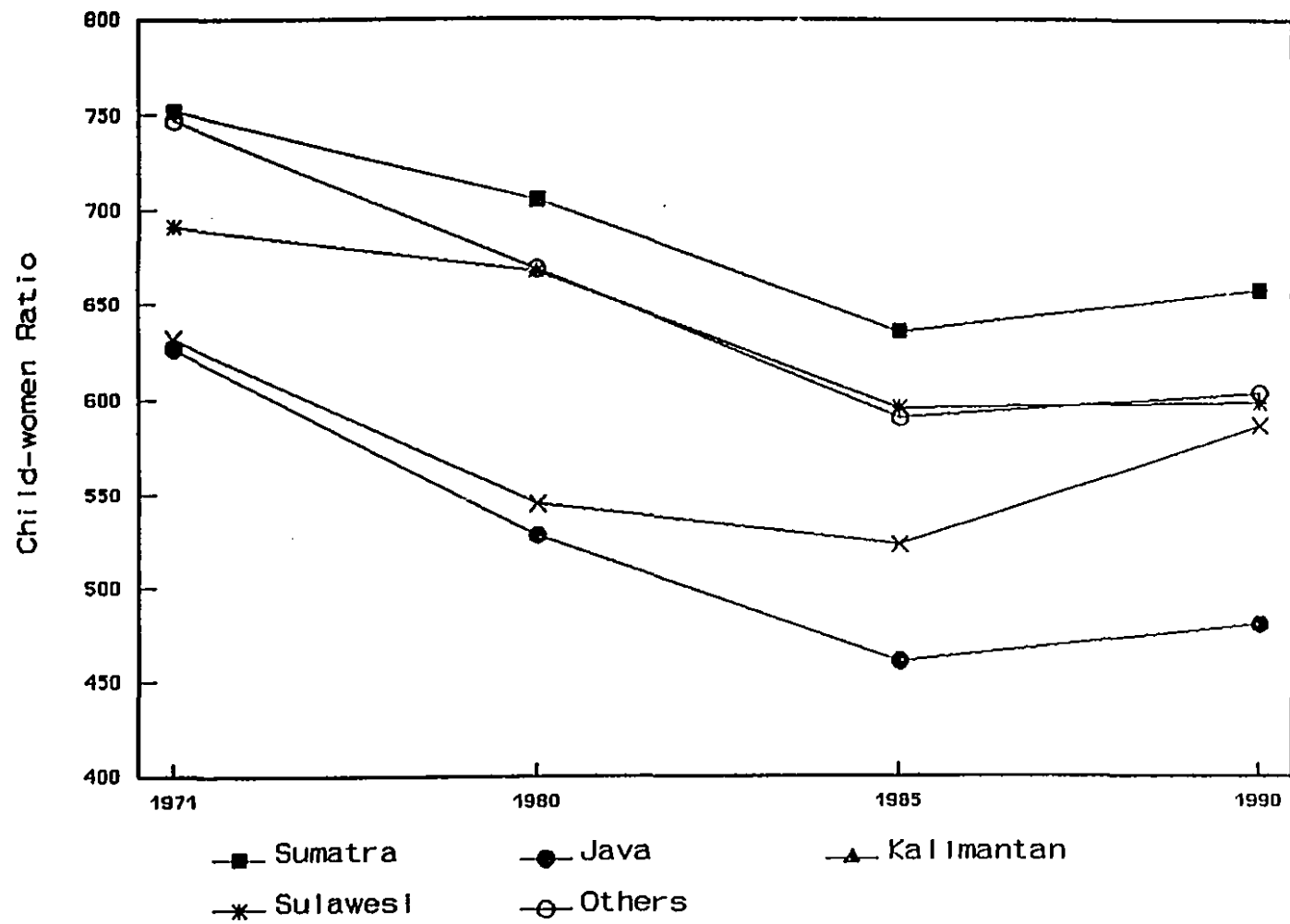
Figure 4.6 Child Women Ratio by Region, 1971-1990

Source: As for Table 4.12

in the pace of the decline and in the changes in the relative level of fertility among provinces. The fertility decline in Indonesia is the result of many factors such as the success of the family planning program and the increase in the age at which women marry, as well as the result of economic development which was accomplished with significant reduction in poverty.

In addition to the family planning program, the pace of fertility decline in Indonesia is also affected by the economic development programs that were established in 1969, known as the Five-Year Development Plan. Since 1969, many social and economic infrastructures such as schools and health facilities, a transportation network has been built, and there has been a growth in the number of industries and in the use of scientific agriculture. All these developments directly or indirectly influence the population growth rate.

Both family planning and economic development programs have been associated with the Indonesian fertility decline. The decrease of Indonesian fertility is shown in many fertility indicators such as the crude birth rate (CBR), the average children ever born (CEB), child women ratio (CWR), and total fertility rate (TFR).

The fertility decline in Indonesia, however, did not occur equally among regions, provinces, and other socioeconomic groups. Some regions have maintained a low fertility rate, but other regions have not. Moreover, provinces on the same islands have manifested different levels of fertility and different rates of decline in it. There is, however, a general phenomenon where less

developed regions or provinces have higher fertility rates that those that are more developed. Furthermore, low fertility in Indonesia is most likely occurs among women who (1) have high education, (2) are involved in the labour force, (3) live in urban areas. With regard to education, as a result of mandatory education for all children between 7 and 12 years old, thereby creating a derivative increase in demand for secondary education, and there has been a high increase of enrolment in elementary education. Increasing education has caused fertility decline through the following mechanisms: (1) an improved access to information such as family planning, (2) a more egalitarian relationship between husband and wife in determining the number of children, (3) an increased age at marriage.

One conclusion that can be drawn from this chapter is that the fertility rate, the pace of its decline, and the success of the family planning program, are related to characteristics of regions as well as to characteristics of individuals and households. In general, I found that the most developed regions produced low fertility rates and a high use of contraceptive methods. In order to extend this finding, in the next chapter I investigate in more detail the impact of the level of regional economic development on fertility rates and the use of contraceptive methods.

CHAPTER V

EXPLAINING FERTILITY DECLINE: MACRO LEVEL ANALYSIS

As assessed in previous chapters, no matter which approach to measuring fertility is taken, children ever born, child-women ratio, total fertility rate, a consistent result is obtained: a major fertility decline has been underway in Indonesia since 1980. This reduction in fertility, however, does vary considerably among provinces and regions. Java, Sumatra, Kalimantan and Sulawesi recorded a high reduction of fertility rates. On the other hand, poor regions such as the Eastern Islands of Nusa Tenggara and East Timor and also the relatively backward area of Southeast Sulawesi showed low rates of reduction. We can not, however, state categorically that the highly developed regions produce the largest reductions in fertility rates. There has been much variation in the reduction of fertility in Indonesia's provinces. Some have had a high reduction in fertility, while others have had a lower reduction. West Sumatra, for example, is relatively well-endowed and has been part of the national family planning program for over a decade, and yet it had only a 24 per cent reduction in the TFR, so that this province stood as having the second highest fertility rate in 1985.

That demographic behaviour varies across countries is not a new phenomenon. Studies of the European countries, for example, found that the pace of fertility decline was related to the geographic pattern and aligned with cultural and linguistic

boundaries (Coale and Watkins 1986). All fertility differences among regions appear to have been caused by the social and economic institutions that underpin fertility behaviour and that were, and still are, unevenly spread within countries.

Socioeconomic development and fertility change

Researchers have often attempted to establish the existence of a statistically significant relationship between fertility and income (Mueler and Short 1983). It is a frequently reported finding that affluent countries have lower fertility than less developed ones. In spite of this overall pattern, on the other hand, empirical studies that correlate per capita income and other standard of living measures such as household wages to fertility indicates have not consistently produced the expected correlation. In rural areas particularly, some studies show a positive income effect on fertility (Hull and Hull 1977). Mueler and Short (1983:628) also noted that the relationship is apparently not monotonic, and that there is a fair amount of evidence of a positive relationship over some lower income ranges and negative at higher ones.

Demographic transition analyses states often argue that over the longer-run time span, average growth rates in per capita GDP should have a negative impact upon fertility rates. In order to test this argument, data on the GDP growth rate and the pace of fertility decline are presented and then plotted. Table 5.1 and

Figure 5.1 graphically present the relationship between these two variables in Indonesia's 27 provinces.

Table 5.1 shows that a high growth of GDP per capita has taken place in the provinces of Inner Indonesia with an average of 6 per cent per year. On the other hand, most provinces in Outer Indonesia show a yearly growth of only about 3 per cent.

Table 5.1
Changes in Total Fertility Rates and GDP per Capita

Province	Annual change in GDP per capita 1983/1987[a]	Total fertili- ty rate		% Reduction in TFR 1982-1987
		1982	1987	
Inner Indonesia				
Jakarta	2.54	3.25	2.32	27.3
West Java	6.68	4.30	3.46	19.5
Central Java	4.79	3.82	3.04	20.4
Yogyakarta	3.22	2.93	2.08	29.0
East Java	4.19	3.20	2.45	23.4
Bali	6.91	3.09	2.27	26.5
Outer Indonesia				
Aceh	1.56	4.79	4.36	8.9
North Sumatra	4.20	5.12	4.28	16.4
West Sumatra	3.49	4.80	3.89	18.9
Riau	2.46	4.70	4.08	13.1
Jambi	3.17	4.62	3.75	18.8
South Sumatra	2.66	4.78	4.22	11.7
Bengkulu	3.71	5.13	3.96	22.8
Lampung	4.31	4.79	4.05	15.4
West Nusa Tenggara	3.30	5.73	4.97	13.2
East Nusa Tenggara	2.28	5.12	4.60	10.1
West Kalimantan	4.99	4.98	4.43	11.0
Central Kalimantan	2.55	4.76	4.02	15.5
South Kalimantan	3.63	3.74	3.23	13.6
East Kalimantan	3.19	4.16	3.27	21.3
North Sulawesi	1.64	3.58	2.68	25.1
Central Sulawesi	1.76	4.85	3.85	20.6
South Sulawesi	3.98	4.12	3.53	14.3
Southeast Sulawesi	3.15	5.66	4.90	13.4
Maluku	5.19	5.61	4.59	18.1
Irian Jaya	1.89	4.83	4.70	2.6

[a] This data is adapted from Soegijoko (1992:75)

30

■ Yogyakarta

■ Jakarta

■ Bali

■ N. Sulawesi

■ E. Java

■ Bengkulu

■ E. Kalimantan

■ C. Sulawesi

Jambi

■ C. Java

20

■ W. Sumatera

■ W. Java

■ Maluku

■ N. Sumatera

■ C. Kalimantan

■ Lampung

SE. Sulawesi

■ S. Sulawesi

■ S. Kalimantan

■ Riau

■ W. Nusatenggara

■ S. Sumatera

■ W. Kalimantan

10

■ E. Nusatenggara

■ Aceh

■ Irian Jaya

0

1.5   3.5   5.5   7.5

% Change in TFR, 1982-1987

Annual GDP Growth Rate (%)
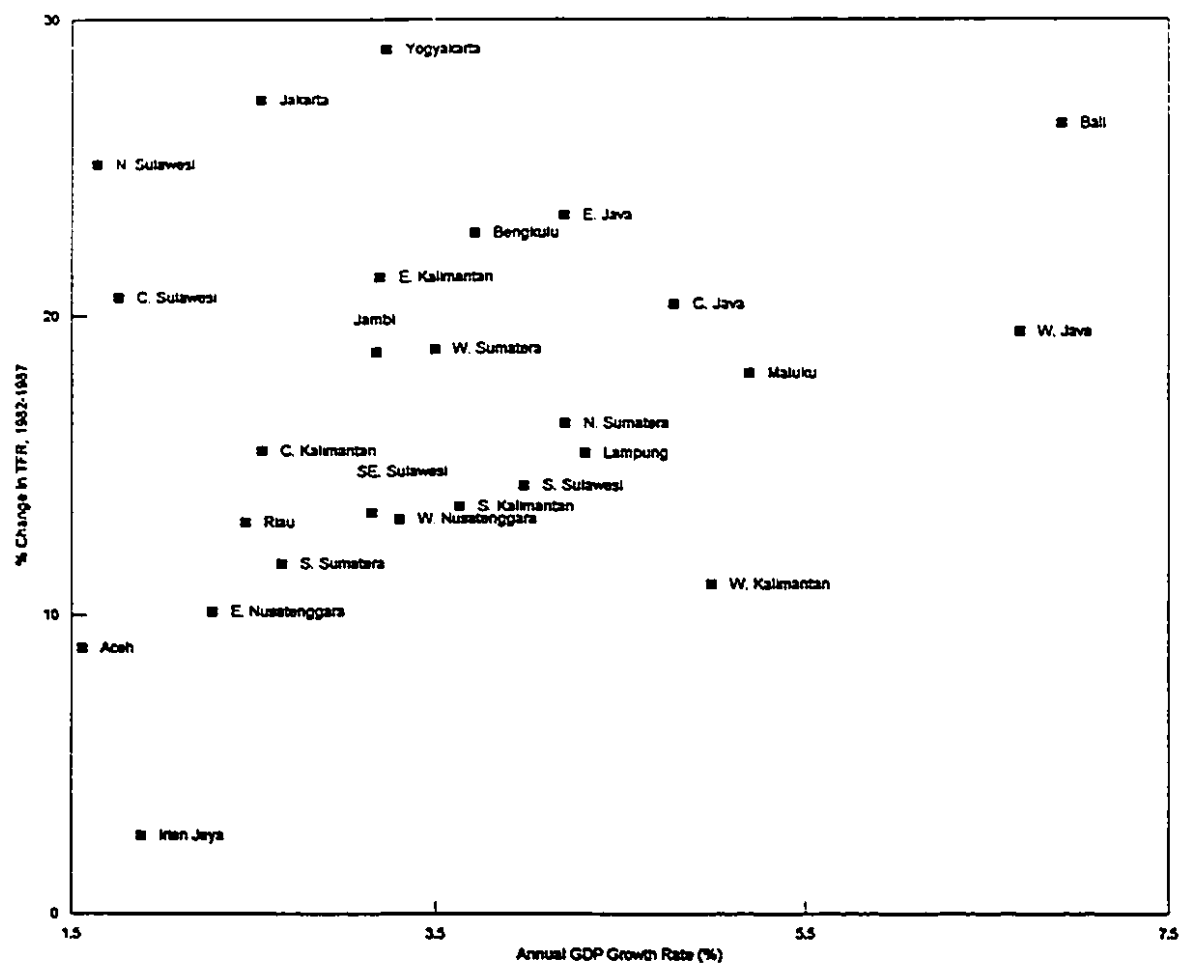
Figure 5.1 GDP per Capiata Growth rate and the Percentage of TFR Decline 1982-1987

Source: Calculated from Soegijoko (1992,75) and BPS, 1990 Census

Based on the core-periphery argument, a high economic growth rate should be associated with a low fertility rate. On the other hand, areas which show low economic growth are supposed to have a high fertility rate. There are twenty-seven provinces in Indonesia, with a variation of economic growth rate, measured by GDP. Figure 5.1 graphically shows the GDP growth rate from 1982 to 1987 and also the percentage of fertility change during the same period.

Even though there is a statistically significant relationship between the GDP per capita growth rate and fertility decline, this relationship is not very strong (the regression correlation has an R^2 of .18 and $p<0.05$). This finding suggests that in Indonesia, the annual GDP per capita growth rate exhibited, at best, a moderate positive relationship with the pace of fertility decline.

Since GDP per capita growth rate only has small effect on the pace of fertility decline, this finding does support the demographic transition theory position that a large fertility decline should be expected in nations that have undergone rapid social change toward a modern society.

One of the major concerns of this dissertation is the relationship between the level of economic development and fertility decline in Indonesia. At the sub-national level, I have argued earlier that the components of economic development should be negatively related to fertility. In addition to improving general health, increasing levels of urbanization or increasing the percentage of people involved in industrial sectors, economic

development should improve the status of women and decrease the infant and childhood mortality levels.

Table 5.2 presents the zero-order correlation coefficients between indicators a series of economic development and the level of fertility, age at first marriage and use of contraception. The result of these correlations suggests that some of them support the argument of an inverse relationship and some fail to do so. Among variables of the structural economic development index, the percentage of people who work in the agricultural sector has the strongest positive correlation with the total fertility rate variable, that is, +0.67; the next variable that strongly influences the fertility rate is the percentage of people living below the poverty line, that is +0.64. The other two variables that have correlation coefficients of more than 0.50 are the percentage of people living in urban areas and GDP per capita. However, both urbanization and GDP per capita have negative correlation with the TFR.

Among the indicators of health conditions, both infant mortality and life expectancy are significantly related to TFR. The relationship between the infant mortality rate and total fertility rate is +0.56. This number clearly lends support to the hypothesis that infant mortality rate has an impact on the fertility rate. In a society where the infant mortality rate is high, each married couple will have to produce a large number of children in order to ensure the survival of the desired number of children to adulthood. Decline in the infant mortality rate, according to Freedman (1963)

for an earlier analysis of this phenomenon, would reduce the gap between the number of births produced and the number of children desired. Moreover, if the infant mortality rate can be brought to a low level, couples will perceive excess births to be undesirable because of the required extra cost of supporting their children. Again, according to demographic transition theory, a typical response to lowered infant mortality is the regulation of fertility, thus suggesting a positive relationship between the infant mortality rate and total fertility rate. Finally, the infant mortality rate increases the TFR by of shortening the lactation period for a population in which a substantial proportion of mothers breast-feed their children (see Heer, 1963 and Preston, 1978). In addition to the infant mortality rate, life expectancy is also found to be negatively correlated with fertility. Increasing life expectancy probably causes fertility to decline because substantial gains in life expectancy mean that improvements in living conditions have been experienced by a large proportion of the population, rather than having been restricted to elites within the population (Cutright and Welly, 1978; Cutright, 1983).

Women's age at first marriage in general is not influenced by structural economic variables, since the coefficient of correlation among these variables is only 0.04. One of the variables that strongly influence women's age at first marriage is the type of jobs women hold. The percentage of women who are self employed, temporarily employed and who are themselves employer are negatively related with age at first marriage. Being a family worker is

positively related with age at first marriage, but also with the TFR. That is, the higher number of women who work as family workers, the higher the age at first marriage, but also the higher the fertility. All these figures indicate that not all kinds of women's jobs influence age at marriage. Only those jobs that cause conflict between the mother role and career appear influence the timing of marriage and/or the number of children.

The findings reported here indicate that the structure of economic development not only influences fertility rates but also has an impact on the use of contraceptive methods. The proportion of the population living in urban areas, the percentage of people working in the agriculture sector, and the number of families living below the poverty line are variables that significantly affect the TFR and the use of contraceptive methods.

Women's employment status also influences the use of contraception. Being a family worker is the strongest variable that influences the use of contraceptive method. In this case, the more people work as family workers, the less they use contraceptive methods. Only women who are self-employed seem to strongly support the use of contraceptive methods.

Indicators of health conditions such as life expectancy or infant mortality also have a relationship with the use of contraception. Low infant mortality and high life expectancy will increase the use of contraceptives. These indicators, as has been mentioned before, are the best measurement of how socioeconomic development is distributed equally among the population.

Table 5.2
Zero-Order Correlation Coefficients among Indicators of Development
on Fertility, Age at First Marriage and Use of Contraception*

Indicators of Structural Economic Development	TFR	Age at first marriage	Use of contraception
Percent urban	-.58**	-.00	.35
Literacy	.40	-.05	.43
% Labour force in Agriculture	.67**	.03	-.46*
% of people living below the pov.	.64**	.17	-.53
GDP per capita (non Oil)	-.46*	-.07	.25
% share of GDP from:			
Agriculture	.33	.31	-.09
Mining	.13	-.23	-.27
Manufacture	-.38	-.38	.37
Utilities	-.30	.12	-.01
Construction	-.15	.21	.05
Trade	-.45*	-.10	.39
Transportation	-.03	.23	.03
Financial/Banking	.36	.13	.25
Other Services	-.12	.43	.22
Structural economic index	-.44	.04	.38
Indicators of Health Conditions			
Infant Mortality Rate	.56**	-.12	-.38
Life expectancy	-.58**	.15	.41
Health condition index	-.67	.11	.54*
Female status			
Literacy rate	-.12	.19	.21
Employment Status			
Self Employed	-.43	-.14	.36
Temporary Employed	.18	-.45*	-.13
Employer	-.24	-.33	-.04
Employee	-.61**	.06	.39
Family Worker	.72**	.13	-.46*
Female status index	-.60	.11	.38

Notes: 1-tailed Signif: * .01 ** -.001.
* See Table 3.1 for summary of the concepts, measurements and indicators
of variables used in this dissertation.
Source: BPS (Biro Pusat Statistik [Central Bureau of Statistics] 1988,
1990, 1991).

Structural economic development, health conditions, and female
status are multi-dimensional concepts. We know that each of these
measurements has a relationship with TFR, with the age of women age
at first marriage and with the use of contraception. As well as
testing the relationship between these measurements of fertility,
Table 5.2 also shows the relationship between the structural
economic index, health index, and female status index of fertility.

The relationship between structural economic index and fertility is -.44, between the health index and fertility is -.67, and between female status and fertility is -.60. Thus, all three of these indicators are negatively related to fertility.

Regional variations in total fertility rates (TFR) and the pace of their decline can be influenced by a number of factors. Each of these factors represents a complex notion that can not be captured by a single variable. In order to examine the effect of each factors on the TFR, I apply a stepwise regression model to the data to identify variables that have a strong effect as well as those that have no effect at all.

In this section, I examine regional variations in the TFR and their decrease by introducing all of the regional socioeconomic variables which rooted in the demographic theory and the use of family planning methods. All of these variables are hypothesized to influence fertility rates. These variables (except family planning) can be grouped into three categories:

1. *Socioeconomic development variables*, which include the literacy rate for the whole population, the percentage of people working in agriculture, the percentage of people living below the poverty line, Gross Domestic produce (GDP) and the contribution of individual sectors to GDP;

2. *Health development variables* consisting of infant mortality rate and life expectancy at birth; and

3. *Women's development variables* consist of woman literacy rate, and employment status (self employed, temporary employed, employee, and family worker).

As noted above, the fertility rate was regressed on all these variables, the use of contraception and the pace of fertility

decline using a stepwise regression procedure. This is one of the most commonly used approaches for deciding how and whether independent variables should be entered into the equation. In this method, each variable is entered according to the magnitude of its contribution to R^2 and any variables failing to meet the predetermined statistical criteria for inclusion in the analysis are eliminated. The result of this procedure for current set of variables shows that only a few of them add significant contributions to the explained variance in the regional TFRs and their decrease (see Table 5.3).

As far as the TFR is concerned, there are four statistically significant explanatory variables: family planning, family worker, and the infant mortality rate, and the female literacy rate. According to the categorization employed here, family worker and the female literacy rate are included under the broad heading variables related to the status of women, while infant mortality rate is considered an indicator of health development. None of the economic development variables reached the 0.05 level of significance.

The percentage of couples using contraceptive methods has R^2 value of 66 per cent, so by itself and was the single most important variable in accounting for the variance in the TFR. All of the variables together explained 90 per cent of the TFR variance. The female literacy rate was significant at 0.05 while the rest of these variables were significant at 0.0000.

The positive relationship between family worker and fertility rate supports the argument that the type of job that a woman has plays a crucial role in determining fertility. A likely explanation is that the labour force participation of women competes with their interest in bearing and rearing children. Consequently, as that participation increases, there will be further pressure to decrease their fertility. This is well-known as role incompatibility.

Table 5.3
Stepwise Regression Model Explaining Regional Variations
in the Total Fertility Rate (TFR), Current Users of FP Methods
in 1991 and the Percentage Decrease of TFR

Step	Incl. variable	Multiple regression coefficient with TFR			
		Multiple R	R Square	R² change	Beta coefficient.
1	Family planning	.81	.66	.66	-.55***
2	Family worker	.90	.81	.15	.43***
3	IMR	.93	.87	.06	.30**
4	Female lit. rate	.94	.90	.03	.20*
	Multiple regression coefficient with FP				
1	Poverty rate	.53	.29		-.53**
	Multiple regression with the TFR decrease				
1	Family planning	.78	.61	.61	.66***
2	Family worker.	.83	.68	.07	-.30*

Note: * significant at .05   ** significant at .01   *** significant at .001

Another variable that influences the Indonesian TFR is the infant mortality rate (IMR). This variable is positively related to fertility. The relationship between the decline of mortality and the subsequent reduction of fertility are an important issue in the literature of "demographic transition." Several possible mechanisms that relate IMR and fertility were presented and examined earlier.

The results reported here suggest that the positive relationship between IMR and fertility is most likely caused by replacement and insurance effects, that is, the tendency of individual couple in a society with high IMR to produce more children in order to replace the death of their children.

Surprisingly, the relationship between female literacy rate and the fertility rate is positive, it means the higher the number of women who are literate, the higher the fertility rate. However, since literacy rate does not mention the level of education among Indonesian women, it is difficult to interpret this finding. It is true that most Indonesian women are literate but according to the 1990 census, most of them graduated only from the elementary school. In other words, at the aggregate level, it also does not mean that the most literate women are having the largest number of children.

The only variable that is significantly related to the use of family planning methods is the poverty rates, that is the number of people live below the poverty line. This analysis suggest that the more people live in poverty, the fewer number of people use family planning methods. The negative relationship between poverty and the contraceptive prevalence is not surprising, since the family planning programs entail costs, and thus may not affordable for the poor people.

In the present analysis, there are only two variables that significantly influence TFR decrease: use of family planning and being family worker. The rate of TFR decline is also influenced by

the proportion of contraceptive users. The higher the number of contraceptive users, the faster the fertility decline. The second variable that influences the pace of fertility decline is the number of women working as family workers. The higher the number of women work as the family workers, the slower the fertility decrease. This is, of course, not a new phenomenon. As we have discussed before, if a woman's economic activity is within the family, her fertility level is not lowered, whereas those who work outside home have significantly lower TFRs.

After discussing the impact of socioeconomic variables and the family planning users on fertility and its decline, it is appropriate to look at the effect of the level of socioeconomic development of each province and the FP users on fertility. The purpose of this analysis is to examine what happened if these two variables are put together in a single analysis. The level of socioeconomic development index is calculated by summing up all of the data on IMR, life expectancy, literacy rate, GDP per capita. Then, I standardized each indicators and sum up the items for each province. The higher the score a province receives, the higher its level of socioeconomic development. Regressing fertility on the socioeconomic development index and FP user produces results that are presented in Table 5.4

Regressing fertility on socioeconomic development and the use of family planning methods, using stepwise method, we found that FP users is the best predictor of the TFR in Indonesia. The respective

contributions to R^2 were 0.67 and 0.08, summing to the R^2 value of 0.75.

Table 5.4
Stepwise Regression Model Explaining Total Fertility Rate
by Socioeconomic Development and Current Users of FP Methods

Step	Incl. variable	Multiple Regression Coefficient with TFR			
		Multiple R	R Square	R^2 change	Beta Coefficient
1	F P	.82	.67	.67	-.66**
2	Socioeconomic	.86	.75	.08	-.33*

Note: * significant at .05   ** significant at .001

At least in Indonesia, a solution to the debate about which variables have "caused" fertility decline seems to emerge from these findings. The success of family planning, rather than socioeconomic development per se, has a more significant impact in fertility rates in Indonesia's regions. However, the success of the Indonesian family planning program can not be separated from the strong effort of the central government in this regard.

This analysis supports the argument that something can be done to lower fertility rates. Socioeconomic development, which according to the demographic transition theory brings about fertility decline, does not always have a great effect on individual couples. In a pre-industrialized country such as Indonesia, the direct intervention of the government through its support for family planning programs has proved to significantly lower the fertility rates.

In the next section, I examine the effect of socioeconomic index on fertility, fertility decline, and the use of contraception methods, in order to establish the degree of association among variables and examine possible explanations for regional deviations from the general patterns.

Regional variations in family planning and fertility rates

The relationship between family planning and fertility is usually negative, that is, the higher the proportion of people that use contraceptive methods, the lower the fertility rate. However, the increase of contraceptive use does not always cause a large decrease in the fertility rate. To explore this argument, I examine how family planning has affected fertility decline in Indonesia.

In analyzing regional patterns of family planning acceptance and fertility decline I have organized all provinces according to their level of family planning acceptance and increases in it over a certain time period. Table 5.5 and Figure 5.2 graphically illustrate a classification of all provinces in Indonesia according to the level of contraceptive acceptance use in 1985 and their increase in prevalence through 1991.

Table 5.5 demonstrates that there are six types of regions that can be distinguished on the basis of family planning acceptance patterns and the current increase during this period:

Table 5.5
Classification of Provinces According to the Level
of FP Acceptance and Current Increase. 1985-1991[*]

% Current-user increase	Level of Acceptance		
	Low (<20%)	Medium (20-30%)	High (>40%)
High (>14.1%)	E. Timor (15.1) Maluku (26.2)	W. Sumatra (14.3) Riau (18.8) S. Sumatra (21.1) Bengkulu (20.3) Lampung (24.8) W. Nusatenggara (14.0) W. Kalimantan (22.4) E. Kalimantan (20.9) C. Kalimantan (15.6) S. Sulawesi (14.1) SE. Sulawesi (17.9)	Yogyakarta (18.3) E. Java (15.4)
Low (<14.1%)	I. Jaya (3.6)	C. Java (10.7) Aceh (6.9) N. Sumatra (7.2) Jambi (9.9) E. Nusa Tengg. (2.1) S. Kalimantan (12.9) C. Sulawesi (12.4)	Jakarta (12.0) West Java (7.0) Bali (11.9) N. Sulawesi (8.5)

Notes:
Figures in parentheses represent percentage increase of current-users.
[*] Categorization of current user increases into "low" and "high" is based on the median increase in contraceptive use over the six year period. Categorization of level of FP acceptance is obtained by subtracting the highest level of FP acceptance with the lowest one and dividing by 3:

{ (high score - low score) /3) }

This formula is applied in all matrix analyses in this chapter.
Source: Author's calculations from Hugo et al. (1975, 145) and BPS (1991).

I.   High initial level and low increase (H-L) provinces. Among these provinces, three of them are provinces in Inner Indonesia (Jakarta, West Java and Bali) and one province in Outer Indonesia (North Sulawesi). As a result of strong family planning programs in the provinces of Java/Bali in the 1970s, it is not surprising that the three provinces in Java/Bali have had low increase in family planning acceptance. A high
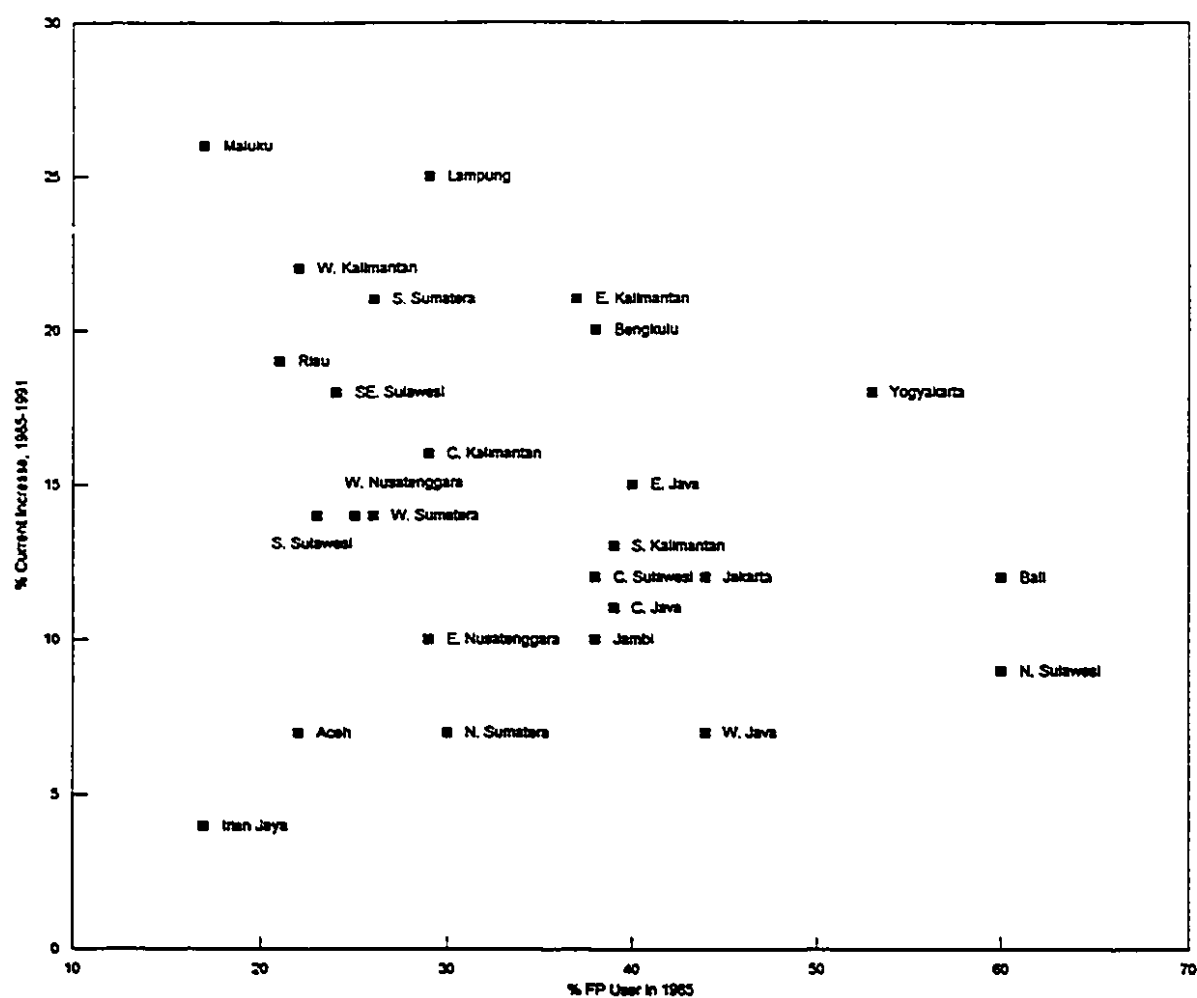
Figure 5.2 Level of Family Planning Acceptance and Current Increase, 1985-1991

Source: As for table 5.5

initial level with low increase suggests that the use of contraception in these provinces has reached a plateau.

II. <u>Medium initial and low increase (M-L)</u>. There are seven provinces in this category: one in Java (Central Java), three in Sumatra (Aceh, North Sumatra, and Jambi), one province in Kalimantan (South Kalimantan), East Nusatenggara, and finally one province in Sulawesi (Central Sulawesi). Medium level and low increase suggests that these provinces, in spite of being relatively densely populated (such as Central Java and North Sumatra), are close to level IV (M-H).

III. <u>Low initial level and low increase (L-L)</u>. There is only one province in this category, Irian Jaya. Low initial level and also low increase show that this province needs special attention from the central government. Irian Jaya is the most isolated as well as the farthest province from the central government. The family planning program in this region is weak and came late, compared to other provinces in the western parts of Indonesia.

IV. <u>High initial level and high increase (H-H)</u>. Both of the provinces in this category are in Java. They are the most densely populated provinces in Indonesia. Almost half of all Indonesian people reside in these provinces. High initial level and high increase in these provinces is mainly caused by

two factors: first, the family planning program was started in these regions and these two regions are more developed compared to the other provinces in Indonesia.

V.   Medium initial level and high increase (M-H). There are many characteristics of provinces that fall under in this category: first of all, all of them are provinces in Outer Indonesia; and secondly, some of them are relatively densely populated and also relatively more developed; and, finally, most of these provinces have strong family planning programs.

VI. Low initial level and high increase (L-H). There are two provinces in this category: East Timor and Maluku. Both of these provinces are less densely populated and the family planning program came late to these provinces. The high increase of family planning acceptances might be caused by the strong commitment of the local government to implement the family planning program.

A similar method is used to analyze how fertility decline differs from one province to the other with the exception of East Timor Province.[1] The main argument behind this is that a high level of fertility decrease should go hand in hand with the rise of

---

[1]East Timor became the twenty-seventh province of Indonesia on 17 July, 1976, after Portugal left this colony. Data on TFR was not available before 1986/1989.

family planning acceptance. Table 5.6 and Figure 5.3 graphically

show the relationship between these two variables.

Table 5.6
Classification of Provinces According to the Level
of Total Fertility Rate and Current Decreases. 1981/84-1986/89

% TFR Decline	Level of Total Fertility Rate		
	Low (<3.86)	Medium (3.86-4.79)	High (>4.80)
High (>16.4)	Jakarta (27.4) West Java (19.5) C. Java (20.4) Yogyakarta (29.0) East Java (23.4) Bali (26.5) S.Kalimantannn (13.6) N.Sulawesi (21.5)	Jambi (18.8) E. Kalimantan (21.3)	N. Sumatra (16.4) W. Sumatra (18.9) Bengkulu (22.8) C. Sulawesi (20.6) Maluku (18.1)
Low (<16.4)		Aceh (8.97) Riau (13.1) S. Sumatra (11.7) W. Kalimantan (11.0) Lampung (15.4) C. Kalimantan (15.5) S. Sulawesi (14.3)	W. Nusateng. (13.2) E. Nusateng. (10.1) S.E. Sulawesi (13.4) I Jaya (2.7)

Notes: Figures in parentheses indicate percentage decrease in TFR.
Source: Author's calculation from Central Bureau of Statistic (1990, unpublished).

Table 5.6 shows that there are five categories of provinces

according to the level of TFR and current TFR decrease:

I. <u>High initial level and low decline (H-L)</u>. All of the provinces

in this category are in Outer Indonesia or, more specifically,

they are all in eastern Indonesia. There are certain

characteristics of some provinces in this category: first of

Pagination Error

Text Complete

Erreur de pagination

Le texte est complet

all, in spite of being rich in natural resources, Irian Jaya is far from being exploited and in general is less developed than other provinces in western Indonesia. Secondly, West and East Nusatenggara are also relatively less developed and have poor natural resources, and some of their regions are relatively isolated.

II. <u>Medium level and low decline (M-L)</u>. There are seven provinces in this category: four of them are on Sumatra (Aceh, Riau, Lampung, and South Sumatra) and two provinces in Kalimantan (West Kalimantan and Central Kalimantan) and only one province in Sulawesi (South Sulawesi). In terms of natural endowment, Aceh and Riau are two provinces with rich natural resources such as oil and gas. These natural resources, however, are exploited by the central government, so that their impact on these societies is very limited.

III. <u>High initial level and high decrease (H-H)</u>. Three provinces in this category are provinces on the island of Sumatra (North Sumatra, West Sumatra and Bengkulu), one province on from Sulawesi island (Central Sulawesi) and Maluku. There are different characteristics for provinces in this category: North and West Sumatra are relatively developed provinces in Sumatra despite being relatively densely populated. Maluku and Central Sulawesi, on the other hand, are relatively backward regions.

IV. <u>Medium initial level and high decrease (M-H)</u>. There are only two provinces in this category, one of them (Jambi) in Sumatra and another one in Kalimantan (East Kalimantan). Both these two provinces are raw material exporter provinces (oil or wood).

V. <u>Low initial level and high decrease (L-H)</u>. There are eight provinces in this category: six of them are in Inner Indonesia and one of them (South Kalimantan) is on the island of Kalimantan, and another one (North Sulawesi) is on the island of Sulawesi. Inner Indonesia is the most densely populated region but it has a strong family planning program. South Kalimantan is a province where economic development has taken place rapidly because of its natural resources. North Sulawesi is a province where the majority of its people have a high level of education attributed to the effect of Dutch Colonialism.

Low initial level and high decrease is the best figure among these five categories. A low fertility rate and high level of decrease is an interesting phenomenon. All of the provinces in this category are on the island of Java/Bali. These are the most developed regions in Indonesia, and the family planning program started there.

Table 5.7 combines two classification systems into one, and we find various provinces grouped according to the patterns of family planning acceptance and fertility decline:

1. All provinces in Inner Indonesia have low initial levels of fertility and a high pattern of fertility decline. The family planning acceptance in these provinces, however, does not have the same pattern. The most interesting pattern is for the province of Yogyakarta and East Java. From the beginning, the level of family planning acceptance was high in these provinces, but the increase of family planning acceptance was also high. Fertility rates have decreased rapidly in the province of Jakarta, West Java, Bali and North Sulawesi even though the family planning acceptance only slowly increased. The other two provinces that have low initial levels but a high decrease of fertility rate are Central Java and South Kalimantan. A high decrease of fertility but a slow increase of family planning acceptance in Inner Indonesia might be caused by having a strong family planning program since the beginning and also by rapid socioeconomic development in these areas.

2. Generally, provinces that have medium initial but high decrease of fertility also display a high increase of family planning acceptance. All of the provinces in this category are in Outer Indonesia. Jambi is the only province that has a medium initial level of family planning acceptance and low increase but that has demonstrated high fertility decline.

3. Provinces with a high initial fertility level and a high decline of fertility usually display a high increase in family planning acceptance (North Sumatra, Bengkulu and Maluku). There are, however, two provinces that display slow increases in family planning acceptance in spite of a high decrease in fertility. These two provinces are North Sumatra and Central Sulawesi.

4. Riau, South Sumatra and West Kalimantan are provinces that have strongly increasing levels of family planning acceptance, but all of them display a slow decline in fertility. A lagging fertility response to the increasing level of family planning acceptance might be caused by counterfeit reports on family planning acceptance by local government.

5. Irian Jaya is the only province in Indonesia with a low initial level of family planning acceptance and slow fertility decline in spite of high initial level. This position may be due to high illiteracy rates in this province and late adoption of the family planning program.

In conclusion, the relationship between the adoption of family planning and marital fertility decline in Indonesia is far from perfect. A high increase of family planning acceptance does not guarantee a high decrease in fertility. According to Hull (1977), almost everywhere in Indonesia, couples use contraceptive methods in older age groups and high parity figures. Furthermore, most couple are likely to use modern methods such as pills or condoms.

Contraceptive use in Indonesia varies among provinces, some provinces have a high percentage of couples who use modern and advanced methods such as the IUD, norplant or sterilization while others show a high percentage of people using pills or condoms which are difficult to check.

Table 5.7
Pattern of FP Acceptance and Fertility Decline

Pattern of fertility decline	Pattern of Family Planning Acceptance				
	H - L	H - H	M - L	M - H	L -L/H
L - H	Jakarta West Java Bali N.Sulawesi	Yogyakarta E. Java	C. Java S.Kalimantan		
L - L					
M - H			Jambi	Lampung C. Kalimantan E. Kalimantan S. Sulawesi	
H - H			N. Sumatra C. Sulawesi	W. Sumatra Bengkulu	Maluku
L - L					
M - L			Aceh	Riau S. Sumatra W. Kalimantan	
H - L			E.Nusateng-gara	W. Nusateng-gara SE. Sulawesi	Irian Jaya

Source: Author's calculation based on Table 5.5 and Table 5.2

Table 5.8 shows that even though there is some increase in the use of contraception, most of it involves methods such as pills or condoms. There are only five provinces where the majority of the acceptors use modern advanced methods such as female/male

sterilization, Norplant or IUDs. Three of these provinces are in Inner Indonesia and two of them (North Sulawesi and East Nusatenggara) in Outer Indonesia. The case of East Nusatenggara is interesting. This province shows a high percentage of modern advanced methods, but the initial level of fertility in this province is high and shows a low fertility decline. The rest of the provinces in Indonesia display a high percentage of acceptors who use only modern methods, including two provinces in Inner Indonesia, Jakarta and West Java.

The pattern of family planning acceptance and the level of fertility decline in each province are summarized and graphically illustrated in Figure 5.4, which shows four major types of areas:

(1) low increase of family planning acceptance but high fertility decline;

(2) high increase of family planning acceptance but low decrease in fertility rate;

(3) low increase of family planning acceptance and low decrease in fertility rate;

(4) high increase of family planning acceptance and high decrease of fertility decline.

There is a small coefficient of correlation (r) between the percentage of TFR decline and family planning current users increase, that is, 0.14. One can say, therefore, that the increase in family planning users has had only a small impact on the TFR decline in Indonesia. This gives us a clear picture of all provinces in these four categories. East Nusatenggara, Irian Jaya and Aceh are all provinces that have low fertility decline and low increase of family planning acceptance. This category suggests that

Pagination Error

Text Complete

Erreur de pagination

Le texte est complet

these provinces need special attention from the central government
to catch up with other provinces in fertility reduction or increase
in the use of family planning.

Table 5.8
Classification of Provinces According to the Type of
Contraceptive Use and Pattern of FP Acceptance

Pattern of FP acceptance	Type of Contraceptive Use*	
	Modern Advanced	Modern
H - L	Bali N. Sulawesi	Jakarta West Java
H - H	Yogyakarta East Java	
M - L	East Nusatenggara	Central Java Aceh North Sumatra Jambi South Kalimantan Central Sulawesi
M - H		West Sumatra Riau South Sumatra Bengkulu Lampung West Nusatenggara West Kalimantan East Kalimantan Central Kalimantan South Sulawesi SE. Sulawesi
L - L		Irian Jaya
L - H		E. Timor Maluku

Notes: * The division of contraceptive methods into "modern advanced" and
"modern" is based on the sequence of time when these methods were
introduced in Indonesia. IUD, Sterilization, and injectable are
relatively new compare to birth control pills or condoms.
Source: Author's calculation based on Table 5.7 and BPS (1991).

All of the provinces in Inner Indonesia have undergone a high
decrease of fertility, but some of them have only a small
percentage of family planning current users. Since most provinces
in Inner Indonesia have a high percentage of family planning

acceptance, it is not surprising that most of these provinces show only a small increase. Figure 5.4 suggests that all provinces in Inner Indonesia have reached a "plateau".

Level of Socioeconomic Development Index and Fertility

GDP per capita is the most frequently used indicator to measure development. Cutright (1983) notes that between 1962 and 1981, there were at least 28 articles that used GDP per capita as an economic development indicator. There is, however, some weakness in using GDP per capita as an indicator of economic development. The most crucial factor that is not explained by GDP per capita is how this income is distributed among the population. High GDP per capita income does not always benefit the entire population. Thus, it is not sufficient to determine fertility rates based on economic factors alone. Urbanization and rural-urban labour forces are two other determinants of fertility that have frequently been used. Developed societies are usually more urbanized and more industrialized than developing societies. Cutright reports that these two measurements were used in 16 and 10 articles, respectively in the time frame he considered.

In addition to economic development, social development has also been used to address fertility differences among nations. The literacy rate, infant mortality rate, life expectancy are some potential and used indicators of social development. Indeed, the infant mortality has long been argued to be the major determinant of the fertility rate. According to Preston (1978), there are three

mechanisms by which the infant mortality influences fertility. First, a child's death, especially in a society where contraception is rare and fertility is high, would tend to shorten the period of lactation and the interval between births. Second, in a country where infant mortality is high, parents tend to bear "surplus" children as "insurance" against likely losses. Finally, parents may also tend to replace dead children with additional children.

Life expectancy, another indicator of social development also plays a crucial factor in determining the fertility rate of nations. Life expectancy is a general measure of the living conditions of the mass population. Cutright and Kelly (1978) argue that substantial gains in life expectancy indicate that improvements in living conditions have been experienced by large proportions of the population, rather than having been restricted to elites within a population.

The literacy rate is the last indicator of social development that is frequently used. Freedman (1979), who has studied fertility rates in developing countries, has found that even though the level of economic development might still be low, real improvements in education and also in the health system could provide a basic change from traditional parent-child roles to new roles that are compatible with smaller families.

Recent evidence also supports the argument of the importance of the effect of social development on fertility. Some demographers have demonstrated the importance of adult literacy and health and education over economic development on fertility decline (for

example Caldwell 1980, 1981; Mauldin and Barelson 1978; McNicoll and Nag 1982). Based on these arguments, data on the infant mortality rate, life expectancy, literacy rate, GDP per capita of each province are collected. We then standardize each indicator and sum up the standardized items for each province. The higher the score a province receives, the higher its level of social economic development. Then, we cross these indices with the total fertility rate, the decrease of fertility rate and contraceptive-user rate.

Table 5.9 presents the relationship between the social economic index and the total fertility rate in Indonesian provinces. This table clearly demonstrates that economic development alone is not the best predictor of fertility rate. As in the cases of Sri Lanka and Kerala in India, high literacy rates, high life expectancy, and low infant mortality rates in Indonesian provinces resulted in lower fertility rates even though their level of economic development was still low. Fertility rates in Indonesia presents a picture similar to those in some states in India or in Sri Lanka. The main conclusion from this table is that the higher the level of social economic development, the lower the fertility rate. There are, however, certain provinces that do not fit this category. Central Sulawesi and South Sulawesi are two provinces with low indices of socioeconomic development but medium fertility rates. On the other hand, some provinces in Inner Indonesia generally have low fertility rates even though their socioeconomic indices are medium. Among the provinces with a low index of social

economic development, most have high fertility rates in general. All provinces in this category are in eastern Indonesia.

Table 5.9
Classification of Provinces According to Socioeconomic
Index and Current Total Fertility Rate. 1991

TFR	Socioeconomic Index		
	High (> 79.5)	Medium (62.58-79.5)	Low (<62.58)
Low (<3.17)	Jakarta (2.3)	Central Java (3.0) Yogyakarta (2.1) East Java (2.5) Bali (2.3) N. Sulawesi (2.7)	
Medium (3.17-4.07)	E. Kalimantan (3.3)	S. Kalimantan (3.2) West Sumatra (3.9) Jambi (3.8) S. Sumatra (4.2) Bengkulu (3.9) Lampung (4.0) West Java (3.5) C. Kalimantan (4.0) Riau (4.0)	C. Sulawesi (3.9) S. Sulawesi (3.5)
High (>4.07)		Aceh (4.4) North Sumatra (4.3) Maluku (4.6)	W. Nusa Tengg. (4.9) E. Nusa Tengg. (4.6) E. Timor (5.7) W. Kalimantan (4.4) SE. Sulawesi (4.9) Irian Jaya (4.7)

Notes: Figures in parentheses indicate current total fertility rate.
Source: Author's calculation based on Table 5.2 and BPS (1990. unpublished)

Figure 5.5 graphically illustrates the relationship between the socioeconomic index and the current total fertility rate. The correlation coefficient for this relationship is relatively high,
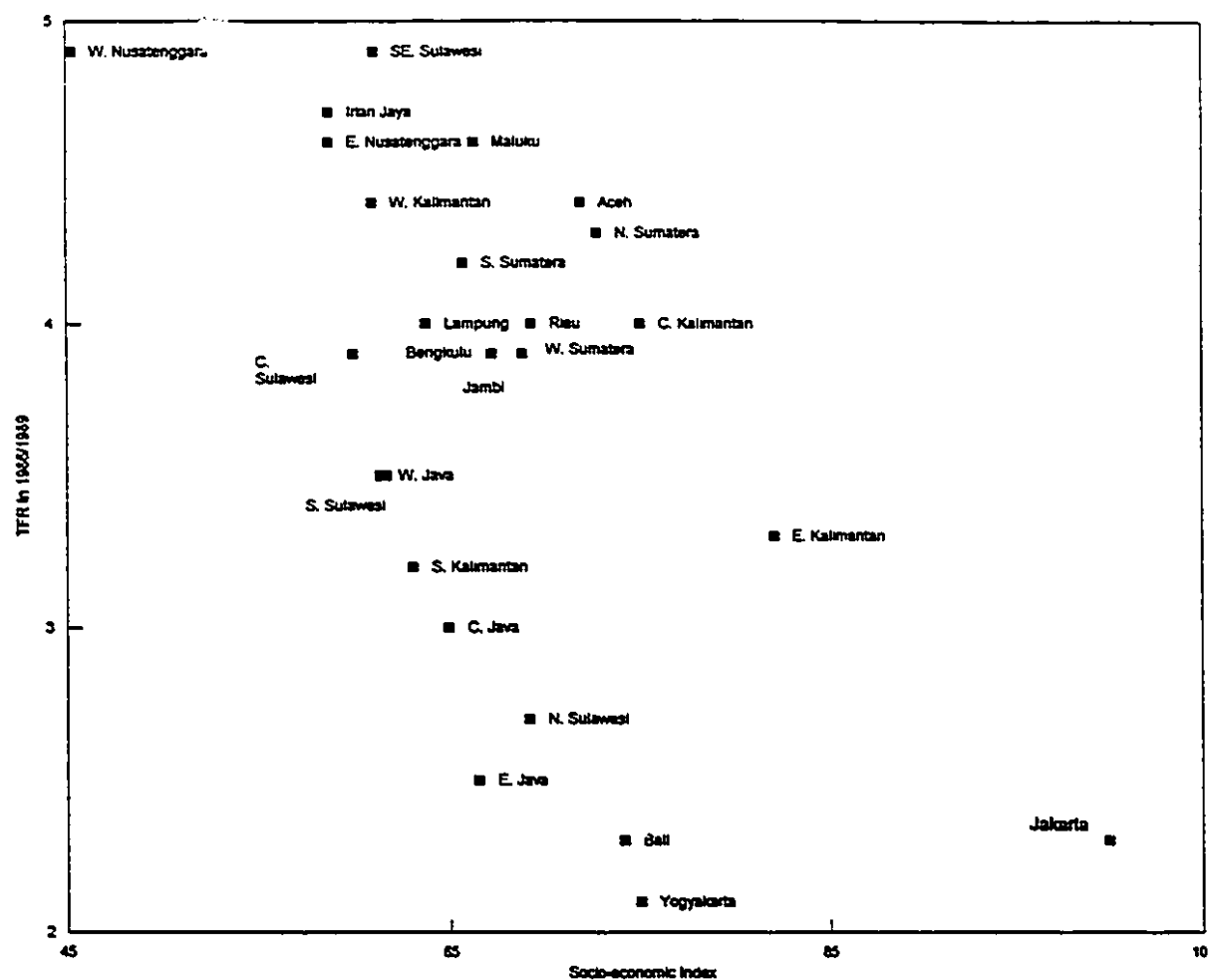
Figure 5.5 Level of Socioeconomic Index and Current Total Fertility Rate

Source: As for Table 5.9

(-0.64), indicating the relationship between the socioeconomic index and TFR is also relatively high. Thus, we may say that socioeconomic development programs are very important factor influencing fertility rates in Indonesia.

Socioeconomic index and fertility decline

The socioeconomic index not only influences fertility rates but also has an effect on the pace of fertility decline. The general argument is that a high level in the socioeconomic index should accelerate fertility decline because improvements in child mortality, increased life expectancy, education and income should support low fertility. Table 5.10 presents how levels of social economic development influence fertility decline.

Table 5.10 and Figure 5.6 graphically demonstrate that the highest fertility decline takes place in the provinces with a high socioeconomic index. Both Jakarta and East Kalimantan are two provinces with the highest socioeconomic index and a high rate of fertility decline. Moreover, some provinces especially in Inner Indonesia, also have a high fertility decline even though their socioeconomic development index is medium. Other provinces that have a medium index of socioeconomic development usually have a moderate fertility decline. Finally, the lowest fertility decline takes place in the provinces that show a low socioeconomic index. Again, most of these provinces are in Eastern Indonesia. Thus, this data supports the hypothesis that development in general, not only economic development, plays a major role in reducing fertility.

Table 5.10
Classification of Province According to Socioeconomic
Index and Current TFR Decreases, 1981/84-1986/89

% TFR Decline	Socioeconomic index		
	High (>79.5)	Medium (62.58-79.5)	Low (< 62.58)
High (>20.21)	Jakarta (27.4) E.Kalimantan (21.3)	Bengkulu (22.8) C. Java (20.4) Yogyakarta (29.0) E. Java (23.4) Bali (26.5) N. Sulawesi (21.5)	C. Sulawesi (20.6)
Medium (11.46-20.21)		N. Sumatra (16.4) W. Sumatra (18.9) Riau (13.1) Jambi (18.8) S. Sumatra (11.7) Lampung (15.4) W. Java (19.5) C.Kalimantan (15.5) S. Kalimantan (13.6) Maluku (18.2)	W. Nusa Tengg (13.2) S. Sulawesi (14.4) SE. Sulawesi (13.4)
Low (<11.4)		Aceh (8.9)	E. Nusa Tengg (10.1) W. Kalimantan (11.0) Irian Jaya (2.7)

Notes: Figures in parentheses indicate percentage decrease of TFR.
Source: Author's calculation based on Table 5.2 and BPS (1990, unpublished).

Socioeconomic index and use of contraception

In this section, I consider how the socioeconomic index also influences the use of contraception. People use contraception for several reasons. The most common reasons for using it are that they do not want any children or they want to arrange the birth of their children. The major hypothesis is that the higher the level of the socioeconomic index, the higher the use of contraceptive methods. The relationship between these two variables is presented in Table 5.11 and Figure 5.7.
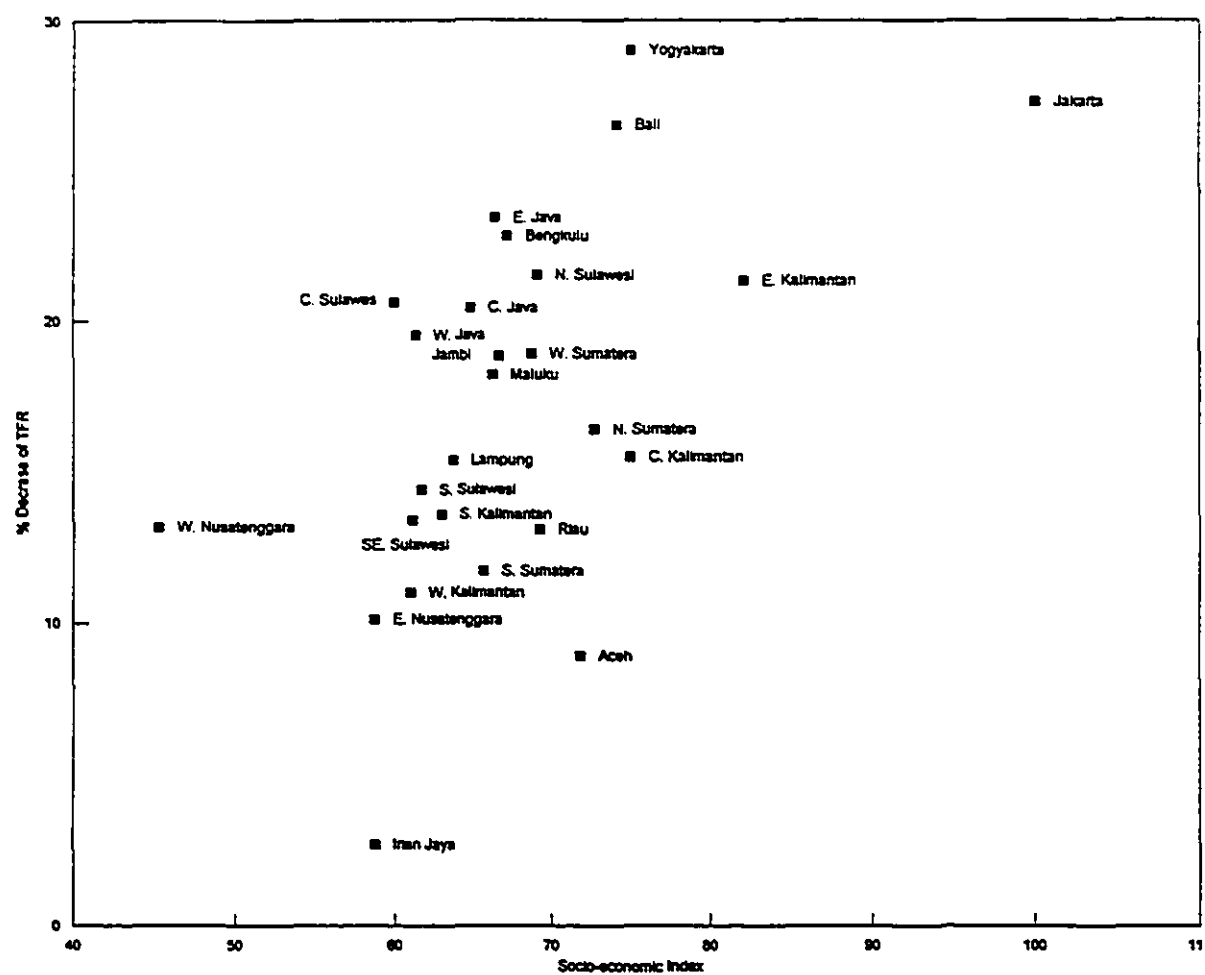
Figure 5.6 Level of Socioeconomic Index and Current TFR Decrease

Source: As for Table 5.10

Table 5.11
Classification of Province According to Socioeconomic
Development Index and Current Contraceptive Users

Contracep-tive use	Socioeconomic index		
	High (>79.5)	Medium (62.58-79.5)	Low (< 62.58)
High (>55)	Jakarta (56) E.Kalimantan (59.9)	Yogyakarta (71.3) E. Java (55.4) Bali (79.9) N. Sulawesi (68.5) Bengkulu (58.3)	
Medium (38-55)		C. Java (49.7) W. Sumatra (40.3) Riau (39.5) Jambi (47.9) S. Sumatra (47.1) Lampung (53.8) W. Java (51) C.Kalimantan (44.6) S. Kalimantan (51.9) Maluku (43.2)	W. Nusa Tengg(39.0) E. Nusa Tengg(39.2) W. Kalimantan(44.4) C. Sulawesi (50.4) SE. Sulawesi (41.9)
Low (< 38)		Aceh (28.9) N. Sumatra (37.2)	East Timor (25.1) S. Sulawesi (37.1) Irian Jaya (20.6)

Notes: Figure between brackets indicate percentage of current contraceptive
users.
Source: Author's calculation based on Table 5.1 and Table 5.5.

Like the fertility rate or the decrease in fertility rate, the use of contraception in Indonesia is likely influenced by the socioeconomic index. The highest proportion of those using contraceptive methods is found in provinces with a high socioeconomic development index. These provinces are East Kalimantan and Jakarta.

The eastern Indonesian provinces are among the provinces with a small proportion of contraceptive users. This is related to their
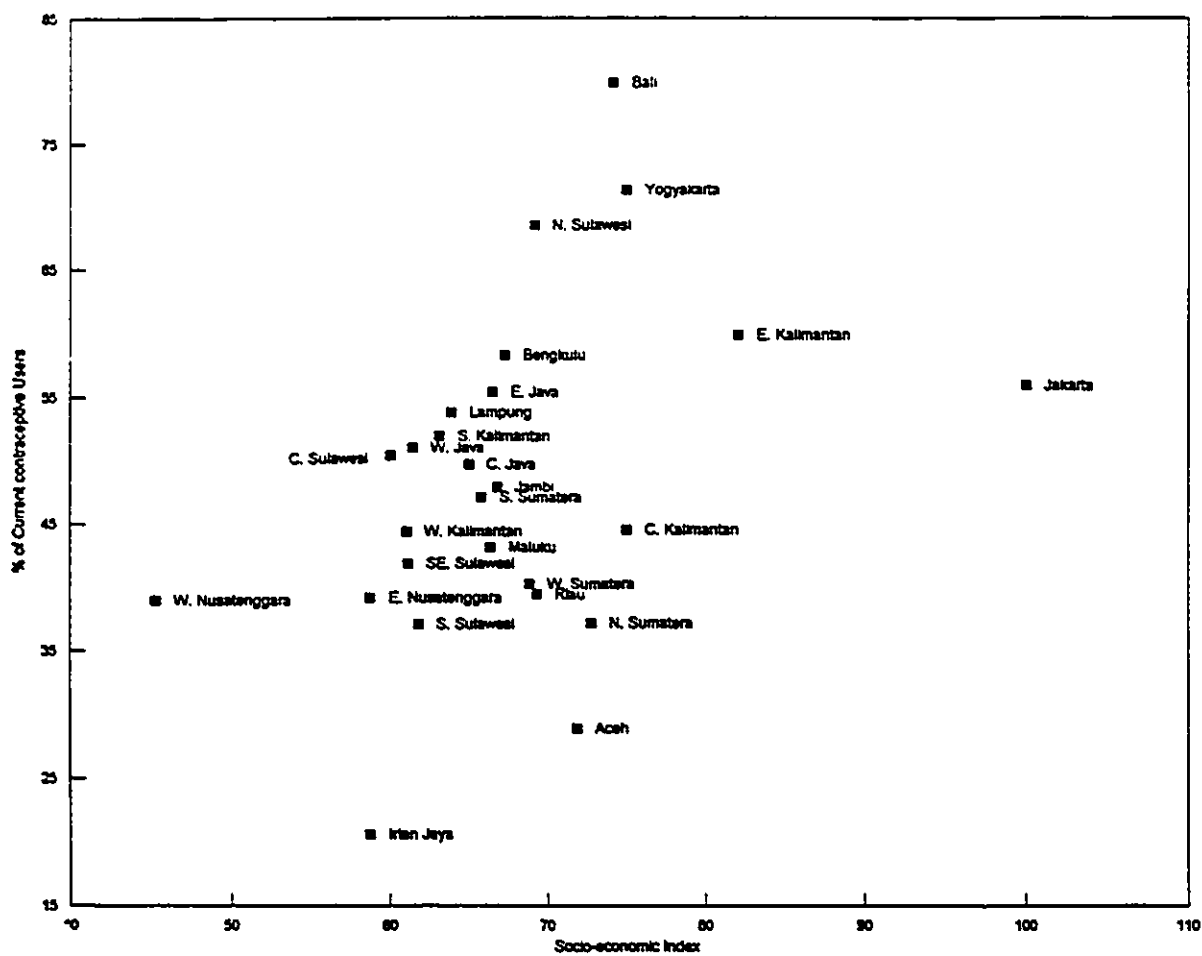
Figure 5.7 Level of Socio-economic Development Index and Current Contraceptive Users

Source: As for Table 5.11

low level of socioeconomic development index. There are many provinces, however, with a relatively low index of socioeconomic development but where the large majority of their people use contraceptive methods. A low socioeconomic development index with medium level contraceptive use suggests that these provinces have strong family planning programs. A large majority of provinces with a medium level of socioeconomic development usually have medium levels of contraceptive use. The exceptions are the provinces in Inner Indonesia. The use of contraceptive methods in these areas is very high even though their level of socioeconomic development is medium. This is not a new phenomenon because the first and the strongest family planning programs in Indonesia have taken place in these provinces, so that the adoption of the family planning program in these provinces is very high.

Summary

The experience of all provinces in Indonesia suggests that in the period 1980-1990, there are four factors combined influenced Indonesian fertility - the family planning program, the types of jobs held by women, the infant mortality rate and the female literacy rate. Further, there are two factors that strongly influenced the fertility decline - family planning practice and being a family worker.

Since the regression analysis alone could not present which provinces fell in which categories, this chapter also applied matrix analysis. In spite of economic development, social economic

development also plays a major role in decreasing the fertility rate. The improvement in health conditions followed by a more equal distribution of income affects the infant mortality rate and increase life expectancy. All of these factors collectively decrease fertility rates. Thus, economic development alone did not produce the major effects. It had to be accompanied by a general development of all social aspects.

Fertility, however, is not determined only by the macroeconomic conditions. Individual couples can decide the number of children they want based on their estimation of the costs and benefits of children. Religion, farm background, type of occupation are some of prominent characteristics that are important.

In the next chapter, I discuss the influence of these individual characteristics on fertility. The main argument of this approach is that fertility is a product of the decision-making process of individual couples. Different levels of education, the type of job, religion, and other socioeconomic characteristics are assumed to influence the fertility decision making. In addition, I also explore the extent to which these socioeconomic characteristics determine the ideal number of children.

CHAPTER VI

EXPLAINING FERTILITY DECLINE: MICRO-LEVEL ANALYSIS

Evidence from micro-level case studies on fertility and family planning have been published since 1970. All these studies offer insights into the structural factors underlying fertility decisions at the micro levels (for example, Singarimbun and Mannings 1976; Hull and Hull 1977 and Pffenberger 1983). Some of these studies point to a different set of conclusions. For example, in certain rural areas, those of low socioeconomic status have fewer births than those of high socioeconomic status. This happened not only in some of the third world countries but the historical European transition also showed this patterned (Hainess 1992). The major causes of low birth for the lower status groups are a higher incidence of sub-fecundity, longer breastfeeding and abstinence periods, long separation because of labour mobility. On the other hand, some studies have showed that improving socioeconomic status reduces fertility rates (Kirk 1971; Hwan 1992).

One study found that commercialization and changing the mode of production both play major roles in the adoption of family planning methods. In rural Bali, Pffenberger (1983) found that family planning has been much more advanced in wet-rice areas of South Bali where tourism and the Green Revolution have thoroughly commercialized and transformed the village economy, as compared to the upland areas, where subsistence farming is still predominant.

Based on the above arguments, this chapter describes and compares various fertility rates among different socioeconomic strata as well as measuring the degree to which differences in fertility are related to variation in age. Data from the 1991 Demographic and Health Survey will be examined to test this micro-level approach.

Residence and fertility

The Demographic and Health Survey in 1991 classified place of residence into four categories: (1) Large city, (2) Small city, (3) Town and, finally, (4) Country side. The expected pattern of fertility rate in Indonesia, as has been expected by many researchers working with demographic transition theory, seems to follow the place of residence; that is, those who live in a large city tend to have a smaller number of children ever born than those who live in a small city. Finally, the highest fertility rate can be found among couples who reside in rural areas. Table 6.1 shows the average children ever born based on the woman's current place of residence.

Classification of the average number of children ever born by women's place of residence clearly shows the argument that the more urbanized areas have lower fertility rates. The average Children Ever Born (CEB) in Indonesia in 1991 was 3.24. However, for respondents who lived in small towns or rural areas, there was a higher number of births than the national level, 3.42 and 3.46, respectively. On the other hand, respondents who lived in large or

small cities, tended to have a smaller number of children, that is,

3.14 and 3.19, respectively .

Table 6.1
Percentage Distribution of Number of Children Ever Born to Women,
Classified by Residence

Number of Children Ever born	Large city (3310)	Small city (1511)	Town (1631)	village (14731)	Total (21183)
None	32.9	32.7	29.3	28.1	29.5
1-2	28.4	27.0	27.5	26.9	28.6
3-4	22.1	22.8	22.4	23.0	22.1
5-6	10.5	11.3	11.8	13.0	11.9
7 or more	6.2	6.2	8.9	9.0	7.9
Total	100.0	100.0	100.0	100.0	100.0
(mean CEB)	(3.14)	(3.19)	(3.42)	(3.46)	(3.24)

Source: BPS [(*Biro Pusat Statistik*) Central Bureau of Statistic,
survey data, 1991)].

Controlling for the age of women as shown in Table 6.2, the average children ever born for women who reside in rural and small areas is still higher than those who live in large and small cities. Thus, one can conclude that the general pattern of fertility rates in Indonesia are influenced by the couple's place of residence: the more urban they are, the fewer children they have.

The 1991 Demographic and Health Survey also classified place of residence into two categories: urban and rural areas. Both Table 6.1 and Table 6.2 tend to support to the argument that place of residence is an important determinant of fertility rates. In order to give a clear picture of how differences in fertility was influenced by place of residence, see Table 6.3, which classifies

place of residence into two categories: urban and rural.[1]

Table 6.2
Mean Number of Children Ever Born to Women
Classified by Residence and Age

Age of wife (in year)	Large city (3310)	Small city (1511)	Town (1631)	village (14731)	Total (21183)
Under 25	1.19	1.14	1.36	1.32	1.17
25 - 34	2.52	2.63	2.89	2.92	2.77
35 - 44	3.99	4.00	4.57	4.58	4.41
45 +	5.22	5.01	5.89	5.42	5.35
All ages	3.14	3.19	3.47	3.46	3.46

Source: BPS (1991, survey data).

Table 6.3
Percentage Distribution of Number of Children Ever Born to Women,
Classified by Residence

Number of CEB	Urban (6347)	Rural (14809)	Total (21156)
None	33.3	27.6	29.5
1-2	27.5	27.0	28.6
3-4	22.2	23.1	22.1
5-6	10.8	13.1	11.9
7 or more	6.5	9.1	7.9
Total	100.0	100.0	100.0
(Mean CEB)	(3.21)	(3.47)	(3.24)

Source: BPS (1991, survey data).

Classification of place of residence into only two categories produces the same result as the four fold classification: rural fertility was higher than urban fertility, 3.21 and 3.47 in rural

---

[1]Defining a region as a "rural" or "urban" is based on a set of objective criteria: as population density of more than 5000 people per km^2 is categorized as urban; less than 25 per cent proportion of households in agriculture for urban; and possession of "urban" facilities and services such as school, hospital or clinic (KLH 1992:135-136).

areas, respectively. Even if the age of women is controlled, as shown in Table 6.4, the data still show that urban fertility is lower than rural fertility, overall and in every age group.

Table 6.4
Mean Number of Children Ever Born to Women
Classified by Residence and Age

Age of wife (in year)	Urban (8911)	Rural (19230)	Total (21183)
Under 25	1.22	1.32	1.17
25 - 34	2.64	2.92	2.77
35 - 44	4.06	4.61	4.41
45 +	5.24	5.45	5.35
All ages	3.21	3.47	3.24

Source: BPS (1991, survey data).

Table 6.5 displays the results of a multiple classification analysis between the average number of children ever born by type of residence. It shows that there is a significant difference (0.26) in the number of children ever born between the two types of residence, even though the latter does not explain much of the variance in the former.

Childhood residence and fertility

Childhood residence is the place where a woman grew up and spent her life until the age of 12. It is necessary to look at the childhood residence because in most areas in Indonesia, especially in rural areas, many marriages are still arranged by parents and also because age of marriage in rural areas is still lower than that in urban areas. Consequently, it may be argued that the fertility rates of women whose childhood residence were in rural

areas will be higher than that of comparable women who spent their childhoods instead in urban areas.

Table 6.5
Multiple Classification Analysis (MCA) of Children Ever Born (CEB)
by Type of Residence

Variable + category	Unadjusted dev'n
Grand Mean 3.39	
Urban area	-0.18
Rural area	0.08
Multiple R^2	0.003

Source: BPS (1991, survey data).

Table 6.6
Percentage Distribution of Number of Children Ever Born to Women,
Classified by Childhood Residence

Number of children Ever Born	City (2511)	Town (2714)	Village (17479)	Total (22704)
None	8.4	7.8	8.0	8.0
1-2	41.1	39.1	36.5	37.3
3-4	29.7	30.4	28.4	28.8
5-6	12.7	14.3	16.2	16.1
7 or more	8.1	8.4	11.0	10.2
Total	100.0	100.0	100.0	100.0
(mean fertility)	(3.00)	(3.09)	(3.30)	(3.24)

Source: BPS (1991, survey data).

When differences in the present age of women are controlled, as shown in Table 6.6, the relationship between childhood residence and fertility, however, does not appear to be so strong. Except for women at the aged 45 and older, childhood residence seems to have

an effect on fertility rates, that is those who were raised in rural areas have larger numbers of children than those who were raised in urban areas.

In order to demonstrates that differences in type of childhood residence results in a different numbers of children ever born in Indonesia, Table 6.8 presents the result of a MCA for different childhood residences and CEB. As in the case of current residence, different type of childhood residence also influence the current fertility.

Table 6.7
Mean Number of Children Ever Born to Women,
Classified by Childhood Residence and Age

Age of wife (in year)	city (2511)	Town (2714)	village (17479)	Total (22704)
Under 25	1.10	1.11	1.18	1.17
25 - 34	2.52	2.62	2.83	2.77
35 - 44	3.96	5.22	4.53	4.41
45 +	5.39	5.22	5.36	5.35
All ages	3.00	3.09	3.30	3.24

Source: BPS (1991, data survey data).

Table 6.8
Multiple Classification Analysis (MCA) of Children Ever Born (CEB)
by Childhood residence

Variable + category	Unadjusted dev'n
Grand Mean 3.24	
City	-.24
Town	-.15
Village	.06
Multiple R^2	.002

Source: BPS (1991, survey data).

Women's education and fertility

The level of educational attainment of women in the survey is classified in the following categories: (1) No schooling, (2) Elementary school or grade 1 to 6, (3) junior high school or grade 7 to 9, (4) Senior high school or grade 10 to 12 and finally (5) University or Academy. Fertility differences by education of women are presented in Table 6.9.

Table 6.9
Mean Number of Children Ever Born to Women.
Classified by Education

Number of CEB	No ed. (4479)	Primary (12985)	Junior (2475)	Senior (2505)	University (466)	Total (22909)
None	6.5	7.5	10.7	10.2	12.9	8.0
1-2	1.4	35.8	43.2	55.2	57.7	37.3
3-4	30.3	29.3	27.8	25.2	25.3	28.8
5-6	20.7	16.5	12.5	6.7	3.0	15.5
7 or more	16.4	11.0	5.8	2.7	1.1	10.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
(mean CEB)	(3.96)	(3.34)	(2.70)	(2.20)	(1.93)	(3.24)

Source: BPS (1991. survey data).

When women are classified on the basis of their educational achievement, considerable variation in fertility is clear, that is, the higher the educational attainment of women, the lower the fertility. Education and age, however, are inversely related to each other, that is, the younger generation tends to have higher education than the older ones. Table 6.10 presents the effect of educational attainment of women on fertility controlled by age of women. This table clearly support the argument that education of

women is a strong variable that support low fertility.

To compare the mean number of children of the five levels of education, I present Table 6.11, which displays the result of the analysis of variance. This table demonstrates that, indeed, there is a statistically significant relational between the level of education and the mean number of children ever born to Indonesian women, and that it is negative.

Table 6.10
Mean Number of Children Ever Born to a Woman Classified by
Women's Education and Age

Age of wife (in years)	No edu. (4479)	Primary (12985)	Junior (2475)	Senior (2505)	University (466)	total (22909)
Under 25	1.46	1.23	1.04	.89	.64	1.17
25 - 34	3.14	2.94	2.60	1.95	1.49	2.77
35 - 44	4.55	4.62	4.03	3.47	2.76	4.41
45 +	5.15	5.64	5.35	4.57	3.50	5.35
All ages	3.96	3.34	2.70	2.20	1.93	3.24

Source: BPS (1991, survey data).

Table 6.11
Multiple Classification Analysis (MCA) of Children
Ever Born (CEB) by Level of Education

Variable + category	Unadjusted dev'n
Grand Mean 3.24	
No education	0.72
Primary	0.10
Junior High School	-0.53
Senior High School	-1.04
Academy/University	-1.30
Multiple R^2	0.05

Source: BPS (1991, survey data).

Religion and fertility

From the European demographic transition, it is clear that religion was an important factor in that continent's fertility decline. During the demographic transition in Europe, the first religious group to undergo a significant fertility decline was the Jews, followed by Protestants, and finally Catholics. All of these phenomena suggest that cultural resistance to change was probably related to certain religious beliefs and practices.

In Indonesia, there is a considerable variation among religious groups in fertility. Table 6.12 shows that the mean number of children ever born to Muslim women is 3.27; for Protestants, is 2.99, Catholics, 3.55, Hindus, 2.87, Buddhists, 2.99 and finally "other religions" is 3.16. If the average of children ever born in 1991 is 3.24 children per woman, then the religious groups that have higher than the national rate are Catholics and Muslims. More than 85 percent of Indonesians are

Table 6.12
Percentage Distribution of Number of Children Ever Born to Women
Classified by Religion

Number of CEB	Muslim (18374)	Protestant (1960)	Catholic (1155)	Hindu (1084)	Buddhist (269)	Other (90)	Total (22909)
None	8.2	8.5	7.3	5.9	4.8	10.0	8.0
1-2	36.8	40.5	32.5	44.4	37.9	35.6	37.3
3-4	28.3	29.4	28.9	32.3	41.6	30.0	28.8
5-6	15.8	14.0	18.9	12.2	10.8	13.3	15.5
7 or more	10.9	7.6	12.5	5.3	4.8	11.1	10.3
All ages (mean CEB)	100.0 (3.27)	100.0 (2.99)	100.0 (3.55)	100.0 (2.87)	100.0 (2.99)	100.0 (3.16)	100.0 (3.24)

Source: BPS (1991, survey data).

Muslim, while Catholics consist of less than 10 percent of the Indonesian people (BPS, 1990:24).

Even when controlling for age of mothers, as shown in Table 6.13, Catholic and Muslim women still raise more children than those from other religious groups. Catholic women under the age of 34 have more children than Muslim women in the same age groups. Between 35 to 45, however, Muslim women have more children than Catholic women. Since both Catholic and Muslim women are two religious groups that still have high fertility, it is very important for family planning programs to target these two religious groups.

Table 6.13
Mean Number of Children Ever Born to Women
Classified by Women's Religion and Age

Age of wife (in years)	Muslim (18374)	Christian (1960)	Catholic (1155)	Hindu (1084)	Buddhist (269)	Other (90)	Total (22909)
Under 25	1.15	1.21	1.40	1.08	1.25	1.07	1.17
25 - 34	2.79	2.54	3.19	2.35	2.45	2.86	2.77
35 - 44	4.54	3.91	4.45	3.68	3.39	4.08	4.41
45 +	5.49	4.63	5.33	4.83	3.93	3.75	5.35
All ages	3.27	2.99	3.55	2.87	2.99	3.16	3.24

Source: BPS (1991, survey data).

Table 6.14 displays the relationship between religion and the number of children. This analysis suggests that the number of children ever born is different among religious groups in Indonesia. In other words, the average number of children ever born in Indonesia is influenced by their religion.

Table 6.14
Multiple Classification Analysis (MCA) of Children
Ever Born (CEB) by Religion

Variable + category	Unadjusted dev'n
Grand Mean 3.24	
Muslim	0.03
Protestant/Christian	-0.25
Catholic	0.31
Hindu	-0.37
Buddhist	-0.25
Other	-0.08
Multiple R^2	0.003

Source: BPS (1991, survey data).

Occupation and fertility

Women's occupations are classified into 9 categories: (1) technical and professional, (2) manager and administrators, (3) clerical, (4) sales, (5) service, (6) agricultural worker, (7) industrial worker, (8) other and (9) military services. Table 6.15 shows that the highest number of children ever born is found among women who work in the agricultural sector followed by those who work in sales. These two sectors include the major jobs for the majority of women who live both in urban and rural areas. Sales and the agricultural sectors are examples of work that do not cause conflict between the mother's role and job. In other words, women who work in the sales or agricultural sectors can raise their children at the same time. For women who do not work, their fertility rate is almost as high as those who work in the agricultural or sales sectors. Even if we control for the age of women, as shown in Table 6.16, women who do not work or work in the

sales or agricultural sector still have high fertility rates.

Table 6.15
Percentage Distribution of Number of Children Ever Born to Women
Classified by Women's Occupation

Number of CEB	Never (3963)	Tech. (635)	Manager (26)	Clerical (412)	Sales (2071)	Service (596)	Agric. (5783)	Ind. (883)	Military (9)	Total (14378)
None	7.7	8.3	3.8	13.8	6.3	16.8	7.0	8.8	22.2	7.9
1-2	42.0	51.2	50.0	58.0	32.4	43.0	31.6	40.8	33.3	37.3
3-4	27.5	28.8	30.8	22.3	33.0	22.7	29.2	29.2	22.2	28.8
5-6	13.6	8.8	3.8	4.1	16.8	11.9	18.8	13.4	22.2	15.5
7 or more	9.1	2.8	11.5	1.7	11.5	5.7	13.4	7.8	0	10.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(Mean CEB)	(3.03)	(2.51)	(2.58)	(2.06)	(3.42)	(2.54)	(3.55)	(2.87)	(2.70)	(3.24)

Source: BPS (1991, survey data).

Table 6.16
Mean Number of Children Ever Born to a Woman Classified by
Women's Occupation and Age

Age of wife (in year)	Never (3963)	Tech. (779)	Manager (34)	Clerical (627)	Sales (2689)	Service (1055)	Agric. (7558)	Ind. (1601)	Military (10)	Total (18326)
Under 25	1.18	0.78	.66	.82	1.08	.94	1.28	1.05	-	1.15
25 - 34	2.66	1.89	1.83	1.58	2.73	2.26	2.96	2.70	1.83	2.67
35 - 44	4.42	3.42	2.92	2.92	4.19	3.79	4.59	4.21	4.33	4.29
45 +	5.25	4.53	4.33	4.66	5.38	4.51	5.41	5.47	3.00	5.30
All ages	3.03	2.51	2.58	2.06	3.42	2.54	3.55	2.87	2.70	3.25

Source: BPS (1991, survey data).

One can propose the hypothesis that the mean number of children ever born is equal for all nine groups. That is, there is no difference in the average number of children among different types of occupations. But, Table 6.17 shows that there is a difference between types of occupation and their average number of children.

Table 6.17
Multiple Classification Analysis (MCA) of Children Ever Born (CEB)
by Type of Occupation

Variable + category	Unadjusted dev'n
Grand Mean 3.25	
No job	-0.21
Professional/Technical	-0.79
Manager/Administrators	-0.41
Clerical	-1.29
Sales	0.26
Services	-0.78
Agriculture	0.37
Industry	-0.30
Other	-0.34
Military	-0.59
Multiple R²	0.033

Source: BPS (1991, survey data).

Partners's education and fertility

In addition to the woman's education, the level of education of the partner is another important factor in determining fertility. The fertility rate for a husband with a higher education is clearly different from that of a husband with a lower education. Table 6.18 shows that like the wife's education, the husband's education also has a strong effect on fertility. The higher the partner's education, the lower the fertility rate. The highest number of children ever born is found among husbands with no education at all. On the other hand, respondents whose husbands received a higher education have a smaller number of children.

Table 6.18
Percentage Distribution of Number of Children Ever Born to Women
Classified by Partner's Education

Number of CEB	No edu. (2762)	Primary (12504)	Junior (2850)	Senior (3687)	University (1028)	total (22831)
None	7.2	7.2	8.8	10.5	9.2	8.0
1-2	30.6	34.7	39.8	45.7	50.4	37.3
3-4	28.6	29.5	27.5	27.2	29.5	28.8
5-6	19.7	16.7	14.9	11.3	7.6	15.5
7 or more	13.9	11.9	8.9	5.3	4.5	10.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
(mean CEB)	(3.69)	(3.43)	(3.05)	(2.62)	(2.43)	(3.24)

Source: BPS (1991, survey data).

Even if one classifies women's age into two categories, women at ages over 35 and those under 35, those with husbands who have no education still have higher fertility. Thus, all of this data supports the hypothesis that in addition to woman's education, the husband's education also has a strong effect on the fertility rate.

Table 6.19
Mean Number of Children Ever Born to Women
Classified by Partner's Education and Woman's Age

Age of wife (in year)	No edu. (2762)	Primary (12504)	Junior (2850)	Senior (3687)	University (1028)	total (22909)
Under 25	1.38	1.24	1.12	0.95	0.95	1.17
25 - 34	2.92	2.99	2.69	2.34	1.86	2.77
35 - 44	4.36	4.62	4.39	4.00	3.43	4.41
45 +	4.98	5.53	5.63	5.22	4.46	5.35
All ages	3.69	3.43	3.05	2.62	2.43	3.24

Source: BPS (1991, survey data).

Table 6.20 supports the hypothesis that the average number of children changes according to the different levels of a husband's education, or at least in this survey, as the level of the

husband's education increases the number of children ever born decreases.

Table 6.20
Multiple Classification Analysis (MCA) of Children Ever Born (CEB)
by Partner's Level of Education

Variable + category	Unadjusted dev'n
Grand Mean 3.24	
No education	0.45
Primary	0.19
Junior High School	-0.19
Senior High School	-0.62
Academy/University	-0.81
Multiple R²	0.025

Source: BPS (1991, survey data).

Partners's occupation and fertility

One useful indicator of a family's socioeconomic status is husband's occupation. Classification of partner's occupation is the same as that for the woman's classification (see above). Table 6.21 presents the patterns of fertility classified according to partner's occupation. The mean number of children ever born is 3.47 for the agricultural group, 3.13 for sales and 2.53 for those who do not have any job. Like the woman's occupation, the husband's occupation also influences the woman's fertility rates. The agricultural and sales sectors are the most fertile groups in Indonesia.

Table 6.21
Percentage Distribution of Number of Children Ever Born to Women
Classified by Partner's Occupation

Number of CEB	Never (159)	Tech. (1037)	Manager (363)	Clerical (1726)	Sales (2404)	Service (1327)	Agric. (11528)	Ind. (1199)	Military (324)	Total (20103)
None	23.9	7.0	5.2	7.8	8.8	7.9	7.5	9.7	4.6	8.0
1-2	39.0	43.8	35.3	41.8	38.4	39.2	33.9	43.7	34.9	37.3
3-4	16.4	30.0	33.9	29.2	29.0	30.5	28.7	27.8	31.8	28.8
5-6	13.2	12.3	16.8	12.7	15.0	13.5	17.5	11.6	18.5	15.5
7 or more	7.5	6.9	8.8	8.4	8.9	8.9	12.3	7.3	10.2	10.3
Total	100	100	100	100	100	100	100	100	100	100
(Mean CEB)	(2.53)	(2.89)	(2.33)	(2.99)	(3.13)	(3.11)	(3.47)	(2.79)	(3.40)	(3.24)

Source: BPS (1991, survey data).

Table 6.22 demonstrates that after controlling for the ages of the woman, the number of children is correlated with the occupations of the husbands. The highest number of children ever born is found among couples in which the husband works in the agriculture sector. Even if we compare this statistic with that of the unemployed husbands, those whose husbands work in the agriculture sector still bear a larger number of children. Thus one may say that work in the agriculture sector is the kind of job that leads to higher fertility.

Table 6.22
Mean Number of Children Ever Born to a Woman
Classified by Partner's Occupation and Age

Age of wife (in years)	Never (159)	Tech. (1037)	Manager (363)	Clerical (1726)	Sales (2404)	Serv. (1327)	Agric. (11528)	Ind. (1199)	Mil. (324)	Total (20103)
Under 25	0.62	1.10	1.32	1.01	1.08	1.18	1.23	1.07	1.14	1.17
25 - 34	1.68	2.37	2.37	2.32	2.78	2.75	2.98	2.57	2.48	2.77
35 - 44	3.67	3.87	3.92	3.98	4.21	4.31	4.63	4.38	4.09	4.41
45 +	5.90	5.59	4.84	3.35	5.28	5.83	5.32	5.53	4.87	5.35
All ages	2.53	2.89	3.33	2.99	3.13	3.11	3.47	2.79	3.40	3.24

Source: BPS (1991, survey data).

Table 6.23 displays the result of the analysis of variance of the mean number of children according to the spouse's type of occupation. The observed significance level as is shown in this table suggests that different types of husbands' occupations do not result in the same number of children.

Table 6.23
Multiple Classification Analysis (MCA) of
Children Ever Born (CEB)
by Partner's Occupation

Variable + category	Unadjusted dev'n
Grand Mean 3.24	
No job	-0.71
Professional/Technical	-0.35
Manager/Administrators	0.09
Clerical	-0.25
Sales	-0.11
Services	-0.13
Agriculture	0.23
Industry	-0.45
Other	-0.29
Military	0.16
Multiple R^2	0.012

Source: BPS (1991, survey data).

Women's age at first marriage

One of the proximate determinants of fertility is the woman's age at first marriage. In Indonesia, the birth of a child usually occurs within such a union. However, not all of the women in reproductive years spend their time in marriage. Some never marry; some marriages end in divorce, separation or death. Marriage is, of course, universal in all regions in Indonesia, and reproduction is seen as the primary role of a married woman. There is strong

pressure to have a child soon after marriage. In certain areas, especially in urban ones, this situation is changing, even though the majority of couples still prefer to have a child as soon as possible. Therefore the woman's age at first marriage becomes an important factor that influences the rate of population growth. The following data present how various socioeconomic characteristics of women influence the timing of their marriage.

Childhood residence and age at first marriage

When women are differentiated by childhood residence, we find variation in age at first marriage. On the average, women who spent their childhood in the big city married at 19.6 years of age, whereas those in the towns and villages marry at 19.0 and 17.7 years of age, respectively. The total age at first marriage for Indonesian women in 1991 is 18.1.

Comparison between women over 35 years of age with those under 35 years of age reveals a rise in age at first marriage in all town and village areas. However, for women who spent their childhood in the city the average age at first marriage did not change between the two age groups.

Table 6.24
Age at Marriage of Women, by Childhood Residence

Childhood Residence	Mean	Number of Women
City	19.6	2511
Town	19.0	2714
Village	17.7	17479
Total	18.1	22704

Source: BPS (1991, survey data).

Table 6.25
Mean Age at Marriage of Women over- and under-35 Years of Age
by Residence

| Childhood Residence | Number | | Mean age at marriage | | increase in mean |
	Over 35	Under 35	Over 35	Under 35	
City	995	1630	19.7	19.7	0
Town	1083	1761	18.9	19.2	0.3
Village	7112	11317	17.7	17.8	0.1
Total	9190	14708	18.0	18.8	0.8

Source: BPS (1991, survey data).

In order to test the hypothesis that different types of childhood residence result in different ages at first marriage, we present Table 6.26, which shows the result of MCA in different childhood residences and the age at first marriage. Table 6.26 shows that women who used to live in cities, towns or villages have different age at first marriage.

Table 6.26
Multiple Classification Analysis (MCA) of Age at First Marriage,
by Childhood Residence

Variable + category	Unadjusted dev'n
Grand Mean 18.12	
City	1.56
Town	0.93
Village	-0.37
Multiple R^2	0.023

Source: BPS (1991, survey data).

Education and age at marriage

Table 6.27 classifies age at first marriage by women's educational attainment. We can observe that education and age at first marriage are significantly associated. The mean age at first marriage is 17.3 for non-educated women, 17.4 for primary educated women, 18.8 for junior high school, and the highest mean age at first marriage is found among women with academy or university education with the average age at first marriage being around 24. Thus, from this figure we see that education of women is a strong determinant of age at first marriage.

Comparing women over 35 years of age with those under 35 years of age, we find that the age of women at first marriage increased only slightly. Almost all levels of education increased by less than 1 percent. The highest increase in age at first marriage was achieved by women who finished junior high school. While those who obtained the highest education (academy or university) increased only slightly. The slow increase of age at marriage for women with the highest level of education is not surprising since this group usually married at old ages.

To compare the mean number of children of the five levels of education, we present Table 6.29 which displays the result of the MCA. This table demonstrates that, indeed, there is a statistically significant relationship between the level of education and the mean age at first marriage.

Table 6.27
Age at Marriage of Women, by Level of Education

Level of education	Mean	Number of Women
No Education	17.3	4479
Primary	17.4	12985
Junior	18.8	2475
Senior	21.2	2504
University	24.0	466
Total	18.1	22909

Source: BPS (1991, survey data).

Table 6.28
Mean Age at Marriage of Women over- and under-35 Years of Age,
by Level of Education

Level of Education	Number		Mean age at marriage		increase in mean
	Over 35	Under 35	Over 35	Under 35	
No Educ.	2603	2165	17.1	17.5	0.4
Primary	4971	8745	17.3	17.6	0.3
Junior	806	1747	18.6	19.4	0.8
Senior	725	1855	21.1	21.7	0.6
Univ.	162	331	24.0	24.3	0.3
Total	9267	14843			

Source: BPS (1991, survey data).

Table 6.29
Multiple Classification Analysis (MCA) of Age at First Marriage,
by Level of Education

Variable + category	Unadjusted dev'n
Grand Mean 18.12	
No education	-.77
Primary	-.69
Junior High School	.73
Senior High School	3.12
Academy/University	5.97
Multiple R^2	.105

Source: BPS (1991, survey data).

Occupation and age at first marriage

When age at first marriage is classified according to women's occupation, we find that the mean age at first marriage ranges from 17.5 years in the agricultural sector group to 24 years in the professional group. This figure also clearly supports the hypothesis that the occupation of a woman is associated with her age at first marriage. Those with "white collar" jobs tend to have a high age at first marriage since women in this group take jobs as their priority instead of raising children. On the other hand, the agriculture sector tends to support a lower age at marriage.

Table 6.31 shows that age at marriage has increased for all occupational strata. On the other hand, comparing women at the ages above 35 and those under 35 produces an interesting result. The average age at marriage in some occupational sectors, such as the sales, service and industrial sector, has decreased 0.2 to 0.3.

Table 6.30
Age at First Marriage, by Women's Occupation

Occupation	Mean	Number of women
Never worked	18.3	3963
Professional, techn.	22.7	635
Managers and admin.	24.0	26
Clerical	23.0	412
Sales	18.0	2071
Service	18.2	596
Agricultural worker	17.5	5783
Industrial worker	18.4	883
Other	18.1	80
Military members	22.7	9

Source: BPS (1991, survey data).

Table 6.31
Age at First Marriage, by Women's Occupation

Kind of Occupation	Number		Mean age at marriage		Change in mean
	Over 35	Under 35	Over 35	Under 35	
Never	1404	2559	18.4	18.2	- 0.2
Profess.	255	380	22.4	23.0	0.6
Manager	18	8	24.0	24.1	0.1
Clerical	127	285	22.8	23.3	0.5
Sales	1080	991	18.0	17.9	- 0.1
Service	229	367	18.3	18.0	- 0.3
Agric.	2732	3051	17.3	17.8	0.5
Indus.	334	549	18.4	18.3	- 0.1
Other	38	42	18.0	18.1	0.1
Military	3	6	23.6	21.0	- 1.4
Total	6220	8238	18.3	18.3	0

Source: BPS (1991, survey data).

Table 6.32 shows how much the average age at first marriage varies between different occupational types.

Table 6.32
Multiple Classification Analysis (MCA) of Age at First Marriage,
by Type of Occupation

Variable + category	Unadjusted dev'n
Grand Mean 18.33	
No job	.02
Professional/Technical	4.40
Manager/Administrators	5.74
Clerical	4.71
Sales	- .32
Services	- .10
Agriculture	- .75
Industry	.07
Other	- .23
Military	4.45
Multiple R^2	.079

Source: BPS (1991, survey data).

Religion and Age at First Marriage

There is also considerable variation among religious groups in their age at first marriage. The lowest age (17.6 years) at first marriage is found among Muslim women with (17.6 years) while the highest mean at first marriage occurs among Buddhist women (22.4 years). But, since Buddhism is the minority religion in Indonesia, the lower fertility rate of this group does not have much of an effect on the national rate. The groups that can most effectively change the national fertility rate should be Muslim women since Islam is the majority religion in Indonesia. Other religions, such as Christianity and "other" religious groups, have almost the same mean, that is, around 19 years old of age.

Table 6.33
Age at Marriage of Women, by Religion

Religion	Mean	Number of Women
Muslim	17.6	18347
Protestant	19.7	1960
Catholic	19.6	1155
Hindu	19.1	1084
Buddha	22.4	269
Other	19.5	90
Total	18.1	22905

Source: BPS (1991, survey data).

Table 6.34 shows that the mean age at first marriage has increased for all religious groups but the Muslim group. The highest rise is among "other" religious groups, which constitute less that 5 percent of the Indonesian people. Catholic women rank number two in the rise of the age at first marriage while among

Muslim women, the average age at first marriage has decreased by 0.2 years.

Table 6.34
Mean Age at Marriage of Women over- and under-35 Years of Age, by Religion

Religion	Number Over 35	Under 35	Mean age at marriage Over 35	Under 35	Change in mean
Muslim	7269	12078	17.7	17.5	- 0.2
Protest.	844	1188	19.5	20.7	0.8
Catholic	488	721	19.3	20.3	1.0
Hindu	468	677	19.1	19.3	0.2
Buddha	150	131	21.2	23.1	1.9
Other	46	48	18.2	21.1	2.9
Total	9267	14841	18.1	18.0	0.1

Source: BPS (1991, survey data).

To test the hypothesis that there is no differences in the age at first marriage among religious women in Indonesia, I produced Table 6.35. This table suggests that the average ages at first marriage among different religious groups is not the same, or different religions have different mean age at first marriage.

Table 6.35
Multiple Classification Analysis (MCA) of Age at First Marriage, by Religion

Variable + category	Unadjusted dev'n
Grand Mean 18.12	
Moslem	-0.43
Protestant/Christian	1.85
Catholic	1.55
Hindu	1.06
Buddhist	4.34
Other	1.46
Multiple R^2	0.040

Source: BPS (1991, survey data).

Summary

In this chapter, I have analyzed differences in the number of children ever born and women's age at first marriage according to several different socioeconomic statuses. The result of these analyses consistently support demographic transition theory: the more urbanized areas and higher socioeconomic statuses for women both lead to lower fertility. Moreover, it was also found that the mean of women's age at first marriage has also increased.

This analysis, is, however, far from perfect. It only presented data Indonesian as a whole. As noted above, there is considerable variability in characteristics among Indonesian provinces, including but not limited to such factors as level of socioeconomic development and the density of the population. In the next chapter, I examine the average number of children ever born according to several socioeconomic status, but controlling for regions if the country. Moreover, the ideal number of children according to the different socioeconomic status is also explored, in order to introduce a potential "motivational" variable.

Chapter VII

SOCIOECONOMIC GROUP DIFFERENCES OF FERTILITY AND

IDEAL NUMBER OF CHILDREN

I have presented the average number of children ever born according to the socioeconomic characteristics of respondents. In this chapter, I will examine the effect of respondents' characteristics on the average number of children and the desired number of children, but with duration of marriage and the current age of women as covariates. The purpose of bringing in covariates is to explore whether the relationship between socioeconomic variables and fertility is influenced by other variables.

I chose the duration of marriage and age of women as covariates because of arguments that these two factors are strongly related to fertility. Both duration of marriage and age of women are usually positively related to fertility, that is the longer duration of marriage and the older the age of women, the higher the cumulative fertility rate. Indeed, in the multiple classification analysis presented in this chapter, I find that socioeconomic characteristics affect fertility both before and after controlling duration of marriage and the age of women.

There is some evidence of fertility differences among provinces (see Chapter V) as well as the pace of their fertility declines. To study whether fertility differentials among provinces are caused by socioeconomic or other factors, four separate analyses of covariance are computed on criterion variables:

173

Provinces of Java-Bali, Outside Java-Bali I, Outside Java-Bali II
and all Indonesia provinces,[1] using type of residence, women's
level of education and religion as the main factors.

The results of four analyses of covariance suggest that in
Indonesia, except in the provinces Outside Java-Bali II, education
is the strongest variable that influences fertility, even
controlling for other factors and covariates. Table 7.1 displays
the values of eta, beta and adjusted beta. The value of eta is
roughly equivalent to the slope of the regression variable with
only one independent variable. The values of beta and adjusted beta
are equivalent to standardized partial regression coefficients in
multiple regression equations (Nie 1970:409). In all provinces in
Indonesia, the woman's level of education has a strong effect on
fertility. In all provinces in Java and Bali, the type of residence
is the second strongest variable influencing fertility. On the
other hand, in all provinces in Outer Indonesia, religion is the
second strongest factor that influences fertility. This figure
suggests that religion in Outer Indonesia still plays a major role
in determining the number of children a couple has.

The average number of children ever born in Indonesia
according to the 1991 Demographic and Health Survey is 3.39 (see
Table 7.2). The average number of children ever born in Java and
Bali is 3.03; Outside Java-Bali I, it is 3.67; and Outside Java-
Bali II it is 4.42. Thus, the average of children ever born in Java

---

[1]This criterion is based on the phasing of FPPs in Indonesia.
Java-Bali were the first areas in which FPPs were carried out,
followed by Outside Java-Bali I and finally Outside Java-Bali II.

Table 7.1
Multiple Classification Analysis of Fertility by type of Residence,
Education Level, and Religion, Indonesia 1991

Predictors	Java-Bali			Outside Java-Bali I			Outside Java-Bali II			Indonesia		
	Unadjust. (Eta)	Adjusted for Independents (Beta)	Adjusted for independents and Cov. (Bet.)	Unadjust. (Eta)	Adjusted for Independents (Beta)	Adjusted for independents and Cov. (Beta)	Unadjus. (Eta)	Adjusted for Independents (Beta)	Adjusted for independents and Cov (Beta)	Unadj. (Eta)	Adju. for Independ. (Beta)	Adjust. for Ind & Cov (Beta)
Main Effects												
Type Residence	.05	.12	.09	.06	.04	.01	.07	.04	.04	.05	.05	.05
Education	.20	.25	.10	.23	.25	.07	.23	.24	.03	.22	.24	.08
Religion	.05	.04	.05	.04	.03	.04	.13	.13	.11	.07	.07	.06
Covariates												
Respondent's age												
Marriage Duration												
Multiple R²	.05	.41		.05	.42		.07	.44		.05	.41	

a) Java-Bali consists of Jakarta, West Java, Central Java, Yogyakarta, East Java and Bali;
b) Outside Java-Bali II consists of Aceh, North Sumatra, W. Sumatra, S. Sumatra, Lampung, West Nusa
   Tengg., West Kalimantan, S.Kalimantan, North Sulawesi, S. Sulawesi; and
c) Outside Java-Bali II are the rest of all remaining provinces.

Table 7.2
Deviations from the Mean in Multiple Classification Analysis of Fertility by type of Residence, ,
Education Level and Religion of Women, Indonesia 1991

Predictors	Java-Bali			Outside Java-Bali I			Outside Java-Bali II			Indonesia		
	Unadjust.	Adjustad for Indepen- dents	Adjusted for Indepen- dents and Cov.	Unadjust.	Adjustad for Indepen- dents	Adjusted for Indepen- dents and Cov.	Unadjust.	Adjustad for Indepen- dents	Adjusted for Indepen- dents and Cov.	Unadj.	Adju. for In- dep.	Adjust. for Ind & Cov
Type Residence												
Big City	.01	.34	.20	- .28	- .19	-.02	- .52	.03	-.07	-.25	.15	-.07
Small City	- .17	.03	-.08	- .25	.14	-.11	- .28	.11	-.29	-.20	.13	-.08
Town	.33	.37	.41	- .10	.08	.01	.07	.24	.00	.08	.20	.16
Village	- .04	- .20	-.14	.07	- .05	.01	.08	- .05	.05	.07	-.07	.01
Education												
No Education	.69	.81	.06	.73	.77	.10	.49	.58	-.06	.65	.71	.05
Elementary School	.03	.06	.12	.12	.13	.09	.16	.13	.06	.10	.11	.10
Secondary School	- .30	- .42	-.15	- .57	- .60	-.15	- .74	- .77	-.11	-.51	-.55	-.14
High School	- .72	- .92	-.37	-1.19	-1.26	-.44	-1.21	-1.22	-.06	-1.03	-1.10	-.36
Academy/Univ.	-1.08	-1.35	-.73	-1.54	-1.67	-.58	-1.39	-1.43	-.05	-1.37	-1.49	-.67
Religion												
Islam	.05	.03	.03	.02	.01	.01	.09	.14	.03	.05	.05	.02
Protestant	- .21	.16	-.21	- .23	-.01	-.06	- .58	- .58	-.46	-.30	-.15	-.13
Catholic	- .44	.05	-.34	.29	.16	.36	.18	.18	.42	.27	.19	.39
Hindu	- .12	- .20	-.01	- .20	-.44	-.24	- .90	- .90	-.31	-.44	-.59	-.39
Buddha	- .53	- .42	-.66	- .31	-.31	-.49	.05	- .23	.31	-.34	-.27	-.34
Others	-1.43	-1.27	-.87	- .19	-.60	-.46	- .21	- .71	-.58	-.07	-.41	-.32
Grand Mean	3.03			3.67			3.42			3.39		

and Bali is lower than that of the national level. Furthermore, even though provinces in Outside Java-Bali I implemented family planning earlier than provinces in Outside Java Bali II, their average number of children ever born is higher than that in the provinces of Outside Java-Bali II.

Type of residence, level of education and religion influence the number of children a couple have. In Indonesia, people who live in urban areas have lower fertility than those who live in rural areas. Both provinces in Outside Java-Bali I and II support these arguments. In the Provinces of Java and Bali, however, it is interesting that women in urban areas have a larger number of children ever born than those in rural areas after controlling for the effects of other factors and covariates.

Table 7.2 shows that there is a relationship between religion and the fertility. In Java and Bali, only Muslim women have higher fertility than other religion groups. However, in Indonesia in general, both Muslim and Catholic women have higher fertility than those from other religious groups. The lowest fertility is found among Hindus. Most Indonesian Hindus live in Bali; thus, lending support the argument that high population density and high poverty cause people to limit their fertility. So, in this case, the area where individual couple live, not their religion, influences their fertility behaviour.

There is also some concentration among religion in Indonesia. For example, most Christians live in urban areas and, since Dutch Colonial times, Christians characteristically have high levels of

education. Catholicism is the religion of most people in Eastern Indonesia, such as Timor and East Nusatenggara. These areas, as discussed above, are usually less developed than other regions in Western Indonesia. Again, as in the case of Hinduism, the relationship between Christianity and fertility might have been influenced by other factors such as education level or place of residence.

Table 7.3 shows that, in Java-Bali and Outside Java Bali I, husband's education is the strongest determinant of fertility. In all of Indonesia, on the other hand, husband's occupation has the strongest effect on the number of children ever born while wife's occupation has the second strongest effect on it. Net of other factors, women's job experiences do not seem to have a strong effect on the number of children ever born in Indonesia.

If we look at the deviation from the grand mean (Table 7.4), all regions in Indonesia show the same figure, that is, husbands who received higher education have fewer children that those with less education. So besides wife's education, husband's education also strongly influences the number of children a couple has. Husbands with no education at all, however, have fewer children than those with some elementary school. Husbands with only elementary school education constitute the only group that produces the highest fertility.

The average number of children a couple has also differs among occupational groups, the woman's job before marriage and the woman's occupation. Both in Indonesia and in Outside Java-Bali I,

Table 7.3
Multiple Classification Analysis of Fertility by Couple's
Socio-economic Status, Indonesia 1991

Predictors	Java-Bali			Outside Java-Bali I			Outside Java-Bali II			Indonesia		
	Unadjust. (Eta)	Adjusted for Independents (Beta)	Adjusted for Independents and Cov. (Beta)	Unadjust. (Eta)	Adjusted for Independents (Beta)	Adjusted for Independents and Cov. (Beta)	Unadjus. (Eta)	Adjusted for Indenpendents (Beta)	Adjusted for Independents and Cov (Beta)	Unadj. (Eta)	Adju. for Indep. (Beta)	Adjust. for Ind & Cov (Beta)
Main Effects												
Husband's Education	.05	.12	.09	.06	.04	.01	.07	.04	.04	.05	.05	.02
Husband's Occupation	.20	.25	.10	.23	.25	.07	.23	.24	.03	.22	.24	.08
Women's Job bef. Mar	.06	.05	.01	.04	.03	.02	.00	.01	.04	.06	.05	.01
Wife's Occupation	.05	.04	.05	.04	.03	.03	.13	.13	.11	.07	.07	.06
Covariates												
Respondent's age												
Marriage Duration												
Multiple R²		.06	.41		.06	.42		.07	.44		.05	.41

Table 7.4
Deviations from the Mean in Multiple Classification Analysis of Fertility by Couple's Socio-economic
Status, Indonesia 1991

Predictors	Java-Bali			Outside Java-Bali I			Outside Java-Bali II			Indonesia		
	Unadjust.	Adjusted for Independents	Adjusted for Independents and Cov.	Unadjust.	Adjusted for Independents	Adjusted for Independents and Cov.	Unadjust.	Adjusted for Independents	Adjusted for Independents and Cov.	Unadj.	Adju. for Indep.	Adjust. for Ind. Cov
Husband's education												
No Education	.57	.52	-.07	.51	.46	-.10	.13	.04	-.42	.45	.33	-.21
Elementary School	.14	.11	.09	.19	.14	.03	.32	.28	.16	.20	.14	.06
Secondary School	-.14	-.14	-.02	-.21	-.19	.14	-.29	-.27	.03	-.19	-.16	.08
High School	-.53	-.45	-.16	-.18	-.64	-.07	-.83	-.66	.03	-.71	-.52	-.05
Academy/Univ.	-.63	-.45	-.21	-1.17	-.86	-.31	-.96	-.67	-.15	-.94	-.59	-.19
Husband's Occup.												
No Job	-.23	-.24	-.12	.95	1.00	.70	-1.46	-.88	-.91	-.46	-.25	-.21
Employee	-.14	-.01	.07	-.35	-.02	-.02	-.34	.05	.07	-.32	-.07	-.02
Agriculture	.21	.01	-.10	.20	.01	.01	.17	-.01	-.02	.28	.06	.02
Job before marriage												
Yes	-.12	-.10	-.01	-.07	-.04	.03	.00	.02	.05	-.09	-.07	.01
No	.38	.31	.02	.18	.11	-.08	-.01	-.04	-.14	.25	.19	-.03
Women's job												
No Job	-.06	-.01	.18	-.27	-.25	-.03	-.26	-.25	.03	-.21	-.16	.05
Employee	-.53	-.40	-.29	-.68	-.37	-.16	-.81	-.46	-.23	-.69	-.44	-.30
Sales	.48	.45	.07	.20	.21	-.13	.13	.17	-.15	.26	.28	-.10
Agriculture	.19	.04	-.03	.34	.22	.11	.26	.17	.07	.37	.21	.14
Grand Mean	2.80			3.69			3.33			3.25		

husbands who work in the agriculture sector have higher fertility than those who work in the non agricultural sectors, while in Java-Bali and Java Bali II, husbands who work in the agriculture sector have a lower number of children. In terms of the average number of children ever born, the wife's job share the same figure with the husband's occupation.

As has been discussed in the macro analysis, the relationship between fertility decrease and the percentage of people working in the agriculture sector is negative, i.e., the higher the proportion of people live in the agriculture sector, the slower the fertility decrease. However, at the micro analysis, a contrast phenomenon is found in Java and Bali: both respondents and their husbands who work in the agriculture sector have fewer children than those who work in the non-agriculture sector.

Based on this finding, we can argue once again that what the conventional theories on population such as demographic transition theory, dependency theory and wealth-flow theory do not fit for the population who work at the agricultural sector and live at the densely populated areas such as Java and Bali. Our findings suggest that, in the study of fertility, it is very important to examine the regional context in which individual couples live.

In terms of the size of the land, there is a great differences between Java and outside Java. People in Java usually have small size of land and concentrated mainly on paddy whereas those who live outside Java and Bali usually have large size of land and more variations in the use of land. This condition has different effect

on their fertility behaviour.

The conventional arguments of the demographic transition, dependency or cost-benefits of children may be suitable in the region outside Java and Bali. Living in a less densely populated region, children outside Java-Bali still can contribute directly to their family. Children can work from very early ages, and can must provide a place where parents can stay during old age. All the arguments of conventional theories should fit in these regions. However, as has been demonstrated in the macro-level studies, the economic conditions of Java-Bali do not provide empirical validation for them.

Based on this fact, one may say that fertility decline in at least some parts of Indonesia does not follow the model of the demographic transition which argues that socioeconomic development is associated with a declining fertility. The Indonesian case suggests that deepening poverty and a high portion of agricultural workers also limits their fertility.

Demographic transition theory, wealth-flow theory, supply-and-demand theory and dependency theory have similar arguments: declining infant mortality means parents do not have to over-reproduce to ensure survival; the urbanization process causes breakdown of the extended family; and child labour declines when women have more opportunities outside the home. These theories are in general plausible, but they do not fit all societies. In particular, they do not help to account for fertility decline in poor countries such as Indonesia, especially in their poorer

regions.

Poverty and the proportion of people in the agricultural sector are strongly related in Indonesia. Most poor people live in rural areas, and those who work in the agricultural sector are usually poor. Most Indonesian peasants have less than 0.5 hectares of land and some are even landlessness. Thus, we need to reformulate existing theories to account for the fast fertility decline in the poorer and densely populated regions, such as in Indonesia, especially some of its regions.

Not all of the arguments discussed by current theoretical approaches discussed are seen to hold empirically in Indonesia. The statement that rural poor always support high fertility because of the need for children to work in the agriculture sector or to obtain additional income from outside is not totally applicable in Indonesia. As a result of the small amount of land available to them, some peasants apparently do not need extra sons because they can work their plots by themselves; still others are landless. More and more, these peasants appear to realize that having children is less advantageous, because hiring from outside is usually cheaper than hiring family workers, including children. Thus, the small size of available land, the limited jobs and low wages in rural areas seem to lead to declining fertility.

Indeed, there is a tendency for Indonesian peasants to have less and less land. As a result of the equal inheritance, the average size of holdings tends to decrease from generation to generation. Consequently, most of the land is now below the size

needed for self-efficiency, the size of plot one person can easily work alone.

Fragmentation of the land from generation to generation and landlessness are two crucial problems occurring in the rural areas in Indonesia. Under these conditions, having many children in this situation does not make sense. The cost is higher than the benefits, and Caldwell's "flow of wealth" does not exist in this society. In most areas, the supply of labour has exploded, creating an army of work-seekers. Children could not contribute to their families.

Furthermore, agricultural development introduced in the country in the 1970s has increased the output, but has also limited the need for labour input. Increasing use of tractors and the factory-processing agricultural product has reduced the amount of workers required in this sector. Consequently, demand for labour has grown more slowly than supply. As a result of the over-supply of labour, the price of labour has decreased, as has the amount of work offered to a given worker. All these factors have caused the incomes of the landless and near-landless to drop.

In rural Indonesia, village-based industries disappeared a long time ago. Many predominantly female jobs, such as hand-pounding rice, have been replaced by small rice mills. Unemployment, low wages and other economic difficulties faced by rural peoples motivate them to have small families. Hardly anyone needs extra sons as cheap labour.

The above descriptions stand in contrast to conventional

arguments offered by demographic transition, dependency, supply-and-demand, and wealth-flow analyses. A cost-benefits approach may be more to the point but, at least in the Indonesian case, the direction is wrong. Cost and benefits are not only influenced by economic development but also by economic underdevelopment. With mass poverty, agriculture sectors do not always motivate people to have large families, except perhaps in the pressure of high infant mortality. On the contrary, poverty, and related problems such unemployment, mean people can afford fewer children.

Since economic development does not appear to have any significant effects on the fertility decrease in Indonesia, new theoretical directions are clearly required to account for the demographic processes in these poor and densely populated areas such as in Indonesia and elsewhere in the developing world. According to some demographic theories such as wealth-flow arguments, poor people are seen as being driven to have many children for economic reasons, such as working in fields or outside the home and bring home to bring additional income. In the Indonesian cases, however, the opposite seems to be the case.

I propose a new argument that the regional context of socioeconomic development has strong effect on the individual couple's behaviours. Conditions such as extreme underemployment, shrinking land size, oversupply of labour have strong effect on individual couple's fertility. In other words, the relationship between individual socioeconomic characteristics and fertility so far reported may be spurious, that is influenced by 'other'

variables, most importantly by the regional context where individual couples live. This would explain why high fertility in the agriculture sector, which according to most demographic theories it should occur, does not always materialize in Indonesian regions.

Socioeconomic groups: differences of the ideal number of children

In order to investigate the ideal number of children among Indonesian couples, I present data according to the regions, socioeconomic levels and respondents' characteristics. Table 7.5 shows that the strongest variable influencing the ideal number of children is the education of a woman. That is exactly the same as the actual fertility (CEB) where education is the strongest variable. In all regions, there is evidence that increasing the education of women is the most crucial factor in reducing the fertility rate. Even after adjustment for the factors and covariates, education still exerts a strong influence on the ideal number of children. Religion and the type of residence have the second and the third largest effect on the ideal number of children.

The average ideal number of children in Java-Bali as of 1991 was 3.50, Outside Java-Bali I, 4.77. Outside Java-Bali II was 4.39 and finally in overall Indonesia was 4.24. It is surprising to note that in Java-Bali, women who live in the big city have a slightly larger ideal number of children than those who live in smaller areas.

Table 7.5
Multiple Classification Analysis of Ideal Number of Children by type of Residence,
Education Level, and Religion, Indonesia 1991

Predictors	Java-Ball			Outside Java-Ball I			Outside Java-Ball II			Indonesia		
	Unadjust. (Eta)	Adjusted for Indepen- dents (Beta)	Adjusted for indepen- dents and Cov. (Beta)	Unadjust. (Eta)	Adjusted for Indepen- dents (Beta)	Adjusted for indepen- dents and Cov. (Beta)	Unadjus. (Eta)	Adjusted for Indenpen- dents (Beta)	Adjusted for indepen- dents and Cov (Beta)	Unadj. (Eta)	Adju. for In- dep. (Beta)	Adjust. for Ind & Cov (Beta)
Main Effects												
Type Residence	.03	.05	.02	.15	.06	.08	.14	.04	.05	.13	.05	.07
Education	.21	.24	.14	.28	.26	.14	.30	.27	.17	.26	.25	.14
Religion	.12	.12	.11	.10	.08	.08	.16	.11	.09	.13	.14	.11
Covariates												
Respondent's age												
Marriage Duration												
Multiple R²		.06	.20		.09	.27		.10	.28		.09	.26

Table 7.6
Deviations from the Mean in Multiple Classification Analysis of Ideal Number of Children
by Type of Residence, Education Level and Religion of Women, Indonesia 1991

Predictors	Java-Bali			Outside Java-Bali I			Outside Java-Bali II			Indonesia		
	Unadjust.	Adjusted for Independents	Adjusted for independents and Cov.	Unadjust.	Adjusted for Independents	Adjusted for independents and Cov.	Unadjust	Adjusted for independents	Adjusted for independents & Cov	Unadj.	Adju. for Indep.	Adjust. for Ind & Cov
Type Residence												
Big City	- .08	.19	.06	- .80	- .34	-.44	- .84	-.25	-.26	-.63	-.26	-.35
Small City	- .25	.02	-.01	- .71	- .31	-.40	- .56	-201	-.25	-.15	-.13	-.20
Town	.00	.05	-.06	- .20	- .04	-.08	- .15	.10	.00	-.18	-.03	-.12
Village	.05	.09	-.02	.21	.09	.11	.17	.04	.06	.21	.08	.11
Education												
No Education	.84	.94	.55	1.05	.99	.60	.98	.90	.64	.97	.95	.61
Elementary School	.00	.00	.00	.10	.07	.01	- .07	-.06	-.12	.04	.02	-.02
Secondary School	-.48	-.57	-.40	- .83	- .75	-.45	- .71	- .67	-.33	-.68	-.66	-.40
High School	-.73	-.81	-.43	-1.38	-1.22	-.61	-1.24	-1.13	-.58	-1.13	-1.05	-.54
Academy/Univ.	-.90	-.91	-.39	-1.50	-1.25	-.44	-1.38	-1.16	-.51	-1.32	-1.18	-.51
Religion												
Islam	.13	.12	.11	.07	.05	.05	- .16	-.05	-.12	.06	.07	.05
Protestant	-.49	.11	-.23	- .67	-.45	-.45	- .13	- .18	.07	-.21	-.09	-.03
Catholic	-.81	- .33	-.34	.31	.09	.05	.83	.49	.43	.59	.39	.33
Hindu	-.59	-.74	-.65	-1.18	-1.42	-1.23	- .47	- .74	-.35	-1.22	-1.44	-.19
Buddha	-.31	-.01	.06	-.27	.09	.20	.56	.45	.58	-.14	.24	.34
Others	-1.50	-1.14	-.68	1.04	.53	.78	-1.04	-1.47	-1.15	.93	.51	.68
Grand Mean	3.50			4.77			4.39			4.24		

There appears to be a negative relationship between the wife's education and the ideal number of children. The lower the education of the wife, the higher the ideal family size. All the regions in Indonesia show the same patterns where education is negatively related to the ideal number of children.

As in the case of actual fertility, religion in general has the same influence on the ideal family size; that is, Muslim women tend to have a higher ideal number of children than those of other religions. In Java-Bali especially, Muslim women as a group ideal a larger family than other religious groups do. After controlling for the effect of other factors and covariates, "other" religion groups show up as below the sample average. This is the case not only in Java-Bali but also in other regions.

Table 7.7 presents the effect of the husband's education, occupation and also the wife's occupation on the ideal family size. Covariates are women's age, duration of marriage and children ever born. Among the three variables, the husband's education has the strongest effect on ideal family size, even after adjusting other variables and covariates. In all region in Indonesia, the effect of the husband's education on the ideal family size is very strong compared to other variables.

When the husband's education, occupation and woman's job are used as main factors, still the level of the husband's education has the strongest effect on the ideal family size. The higher the husband's education, the smaller the ideal number of children. In all regions, husbands with no education always idealize a large

Table 7.7
Multiple Classification Analysis of Ideal Number of Children by Couple's
Socio-economic Status, Indonesia 1991

Predictors	Java-Bali			Outside Java-Bali I			Outside Java-Bali II			Indonesia		
	Unadjust. (Eta)	Adjusted for Indepen- dents (Beta)	Adjusted for Indepen- dents and Cov. (Beta)	Unadjust. (Eta)	Adjusted for Indepen- dents (Beta)	Adjusted for indepen- dents and Cov. (Beta)	Unadjus. (Eta)	Adjusted for Indenpen- dents (Beta)	Adjusted for indepen- dents and Cov (Beta)	Unadj. (Eta)	Adju. for In- dep. (Beta)	Adjust. for Ind & Cov (Beta)
Main Effects												
Husband's Education	.19	.18	.12	.24	.19	.01	.28	.04	.04	.24	.17	.12
Husband's Occupation	.09	.02	.01	.17	.04	.07	.20	.24	.03	.19	.07	.06
Wife's Occupation	.09	.06	.02	.19	.11	.02	.23	.01	.04	.20	.10	.061
Covariates												
Respondent's age												
Marriage Duration		.										
Multiple R²		.04	.17		.07	.27		.09	.26		.07	.25

Table 7.8
Deviations from the Mean in Multiple Classification Analysis of Ideal Number of Children
by Couple's Socio-economic Status, Indonesia 1991

Predictors	Java-Bali			Outside Java-Bali I			Outside Java-Bali II			Indonesia		
	Unadjust.	Adjustad for Indepen- dents	Adjusted for indepen- dents and Cov.	Unadjust.	Adjustad for Indepen- dents	Adjusted for indepen- dents and Cov.	Unadjust.	Adjustad for Inoepen- dents	Adjusted for indepen- dents and Cov.	Unadj.	Adju. for In- dep.	Adjust. for Ind & Cov
Husband's education												
No Education	-.87	.86	.57	1.08	.97	.70	.97	.79	.76	1.05	.84	.66
Elementary School	.12	.11	.07	.17	.09	.01	.12	.04	-.07	.15	.07	.00
Secondary School	-.27	-.27	-.20	-.37	-.32	-.19	-.50	-.44	-.32	-.34	-.25	-.16
High School	-.59	-.57	-.36	-1.03	-.75	-.41	-1.09	-.76	-.48	-.89	-.61	-.35
Academy/Univ.	-.61	-.56	-.36	-1.38	-.90	-.46	-1.16	-.63	-.36	-1.10	-.67	-.39
Husband's Occup.												
No Job	-.16	-.20	-.10	.75	.85	.42	- .54	.21	.57	-.26	-.05	.06
Employee	-.16	-.03	-.01	-.55	-.13	-.12	- .69	-.10	-.12	-.52	-.17	-.16
Agriculture	.24	.04	.01	.33	.07	.07	.32	.04	.05	.44	.06	.13
Women's job												
No job	-.09	-.06	.00	-.26	-.24	-.10	-.21	-.11	-.01	-.26	-.13	.03
Employee	-.27	-.08	.06	-.90	-.47	-.29	-1.18	-.69	-.51	.74	-.35	-.16
Sales	.22	.27	.02	-.02	.11	-.04	-.34	-.13	-.20	.09	.07	-.11
Agriculture	.19	-.05	-.07	.47	.27	.17	.42	.23	.16	.55	.37	.16
Grand Mean	3.37			4.83			4.49			4.15		

family size, even after controlling for other factors and covariates.

The ideal number of children differs according to the different types of occupation. Those families whose jobs are in the agriculture sector tend to idealize a large number of children. On the other hand, husbands who work as employees tend to idealize a small number of children. The type of woman's occupation produces the same phenomenon as the husband's occupation. Except in Java and Bali, those who work in the agriculture sector usually idealize a large number of children.

Summary

The most interesting finding in this chapter is that different type of population density and different level of socioeconomic development of the regions appears reverse the direction of the impact of agriculture sector in fertility. Even though agriculture sector in overall Indonesia has positive effect on fertility, but in the densely populated regions such as Java and Bali the effect of this sector is instead negative. Based on this finding, it was concluded the impact of socioeconomic variables on fertility may not always be negative. The direction of the relationship seems to depend on the characteristics of the place where individual couple live.

So far, I have discussed the cause of fertility decline in Indonesia using both macro-level and micro-level approaches. Both these approaches suggest that regional economic development and

socioeconomic characteristics of individual households could contribute to fertility decline. The strongest factor that affects fertility decrease, however, lies in family planning program, the status of women, infant mortality rate, and the female literacy rate. In addition to these factors, social and health development, composed of life expectancy of the whole population and low infant mortality rate could accelerate fertility reduction.

CHAPTER VIII

SUMMARY OF FINDINGS

With more than 178 million people, Indonesia is the third most populous developing country, after China and India. However, over the past twenty years, fertility in Indonesia has falling significantly. In the 1960s, the total fertility rate (TFR) was 5.61, whereas by 1980 it was 4.27, a decline of 24 percent, and by 1990 it had fallen further to 3.32, a further decline of 23 percent.

Of the more than 13 thousand Indonesian islands, the most densely populated is Java, where two-thirds of the country's population reside. However, Java has also shown the highest regional rate of fertility decline. Since 1967-70, the TFR in Java-Bali or Inner Indonesia as I have labelled it in the purpose of this dissertation has always been lower than in Outer Indonesia, and the overall average TFR decline for Java-Bali has been faster than that for Outer Indonesia.

One of the main causes of the fertility decline in Indonesia appears to be the success of its family planning programs (FPP). Compared to other developing countries, family planning came relatively late to Indonesia However, because of the strong commitment of the central government and other formal and informal leaders such as religious leaders, the FPP was accepted by almost every group. The dramatic increase in the use of modern contraceptive methods use over the past twenty years nicely

194

illustrates the striking change that have taken place in Indonesian demographic behaviour.

The macro level analysis reported here supports arguments that the fertility rate in Indonesia has been strongly influenced by the FPP effort, although infant mortality rates, the family worker rate (the proportion of women who work as family workers), and the female literacy rate have also played important roles. The success of the FPP, in conjunction with several other factors, also affected the pace of fertility decline. Except in the islands of Java and Bali, the FPP was found to be weak, was related to the poverty rate; that is, the higher the poverty rate, the smaller the number of FP users.

On the one hand, the macro analysis revealed many regional (provincial) differences in fertility and in the pace of fertility decline, that can be attributed to various characteristics of the regions. For example, in Java and Bali, the agricultural economic sector was associated with a low fertility, rather than a high fertility rate as might be predicted by demographic transition theory (DTT). In general, this economic sector was associated with high fertility rates in Indonesia in 1991. In order to account for this discrepancy, it is necessary to recognize the exceptional conditions in the Javanese agricultural sector, Java, such as its small land and the increasing fragmentation of the land into ever-smaller plots, landlessness, and high population density. These conditions encourage people living in these sectors to limit their

family size, since the costs of having children outweigh their benefits.

On the other hand, the micro-analysis has found that the fertility level in urban areas was consistently lower than those in rural areas, although this was least true for Java. In Java, the fertility differences between urban and rural areas was very small, less than half a child, whereas on other islands, the TFR in rural areas is much higher than that in urban areas. Fertility differentials between socioeconomic groups in Indonesia were also illustrated to be distinctive. The highest fertility rate was found among uneducated married women with the TFR of 3.96, as compared to 3.34 for those with only elementary school education. The lowest fertility rate was found among women with a college education. The type of women's employment was also found to be an important predictor of the TFR. In Indonesia, jobs in agriculture, sales and other domestic sectors tend to support high fertility; only in Java and Bali does the agricultural sector tend to support low fertility. Religious differences also exist, with Muslim women tending to have more children than women of other religious groups.

Detailed Analysis of Fertility Decline

The fertility decline in Indonesia has varied by region, socioeconomic level and other socio-demographic characteristics. Macro-analysis showed that the overall average decline of TFR in Java, Bali and some provinces in Outer Indonesia was more than 24 percent, whereas in other provinces it was less than that. One of

the main reasons for the high fertility decline in these provinces seems to be the rapid increase in contraceptive use, in the 1970s for Java-Bali and the late 1970s for the other provinces.

There are 27 provinces in Indonesia, with different natural resources, levels of economic development, population densities and other demographic characteristics. The first step in analyzing how the fertility decline varied from one province to the other was to present a classification of provinces according to the level of family planning acceptance and current use increase.

The matrix analysis showed that, among all Indonesian provinces, the highest level of family planning acceptance is in the Inner Indonesian provinces. The high level of family planning acceptance in these provinces is not surprising, since it was here that the FPP was started. More than 40 percent of couples in their reproductive years (aged 15-49) in Java and Bali use modern contraceptive methods. The lowest level of family planning acceptance was in the Eastern Indonesian provinces in such as Irian Jaya, Maluku and East Timor, where less than 20 percent of the couples of reproductive age in those areas use contraceptive methods.

As a result of high levels of FPP acceptance in Java and Bali occurring relatively earlier in the program, there was only a slow increase in contraceptive use in recent years, except in Yogyakarta and East Java provinces, which continue to show high levels of FPP acceptance and large increases in contraceptive use.

The above analyses suggested that different factors make the FPP more successful in specific regions. One such factor is that the FPP effort in Inner Indonesia has more intensive than in other regions; consequently, the knowledge of FPP is higher in Java-Bali than it is in other regions. In 1976, for example, more than 76 percent of married people in Java-Bali had "ever heard" about fertility regulation, as compared to only 51 percent for other regions. Second, as Java-Bali is more developed and has more social and health facilities than is the case with other regions. Two thousand Family Planning Clinics were in operation in Java and Bali by early 1970 and, by 1977, each administrative village had a contraceptive distribution centre. Any problems of access was countered by an increasing stock within each hamlet (Hull and Hull 1977).

The same method (matrix analysis) may also used to explain the fertility decline in twenty seven provinces. The results of this analysis showed that high fertility decline and low levels of TFR took place in all Inner Indonesian provinces in and in some provinces of Outer Indonesia.

The next step in testing the impact of the FPP on fertility was to combine two classification systems - the levels and patterns of family planning acceptance and the level of fertility decline - into one single matrix. The results of matrix analysis showed that there is indeed a strong correlation between family planning acceptance and the level of fertility decline. Almost all provinces in Indonesia with high levels of FPP acceptance showed a

significant decrease in their fertility rates, again supporting the argument that FPP is one of the primary causes of fertility decline in Indonesia. All of the provinces in Inner Indonesia showed this pattern, that is, high levels of family planning acceptance and high decreases in fertility rates. On the other hand, provinces with low levels of family planning acceptance showed a low decrease of fertility decline.

Because each province had a different level of fertility decline and also a different level of FPP acceptance, it was necessary determine what characteristics of these provinces could be influencing their fertility rate and declines in it. Analysis of structural economic development, health condition and female status indicators for each province found that each of these conditions was related to the provincial TFR.

The analysis also found that the family worker rate was positively related to TFR and negatively related to fertility decline. The positive relationship between family worker and the TFR may simply reflect a "compatibility" between the role of mother and working. The positive relationship between female literacy rate and fertility rate found in the analysis should not be considered very surprising, because the literacy rate need not be strongly associated with the level of education. The infant mortality rate taken as an indicator of health status variable, also showed a strong relationship to fertility, and is one case where the effect of socioeconomic development was distributed equally across the population. This suggests that, in spite of the success of the

FPPs, some aspects of the socioeconomic development, as well as health and female status factors, remain strongly connected to the in Indonesia and its provinces.

The macro-analysis involved both regressing each socioeconomic development indicator with both TFR and TFR decline and presenting the matrix analysis of the socioeconomic index and current TFR decrease. From the matrix analysis, I concluded that the relationship between socioeconomic factors and fertility decline in Indonesia in the time period under consideration was not very strong. Of the 27 provinces in Indonesia Jakarta and East Kalimantan show the highest socioeconomic index values and are also the provinces with the highest fertility decline. On the other hand, of six provinces with a low socioeconomic index, five show low decreases of fertility decline, and only one has a medium level of TFR decline.

Regarding the micro-analysis of fertility differentials among different groups of people. Using "children ever born" (CEB) as a measurement of fertility, I found the average CEB to be influenced by several respondent characteristics. An analysis of variance and a multiple classification technique, suggest that both actual fertility rates and the desired number of children differed among socioeconomic groups. As with the macro-analysis, type of residence, level of education and women's religion have significant impacts on fertility. The data revealed that the average CEB for rural women was higher than that for urban women. Generally, the more urban the area, the lower the CEB. The desired number of

children also showed the same pattern: that is, those who live in rural areas seem to desire a greater number of children than those who live in urban areas.

The level of education was also shown to be significantly and negatively related to the level of fertility. Of all socioeconomic factors, education showed the strongest fertility effect, and this relationship held for both women and men. Women at higher levels education had fewer children than those at lower levels. Husbands' level of education was also found to strongly and negatively affect their fertility. Husbands with a higher level of education tend to have a fewer children than those with less education.

Notable religious differences also emerged in the analysis, with Catholic women having the highest number of children ever born, followed by Muslim women. Buddhist and Hindu women, members of two minority religions in Indonesia, have a smaller number of children ever born. I argued that different levels of education and different types of residence affected these two variables.

The type of employment was also found to be related to fertility behaviour, and similar results were again found to hold for women and men. In Indonesia as a whole, women working in agricultural sectors tend to have a higher number of children than those who work in non-agricultural ones. Much the same result was found for male/husband respondents. However, the opposite was the case in Java-Bali, with agricultural workers having fewer children than non-agricultural ones. This is true for both men and women. In terms of ideal number of children, women working in the

agricultural sector also tend to report higher numbers than women working in other jobs, but in Java and Bali, they idealize fewer number of children.

Discussion

This dissertation has investigated the relationship between socioeconomic development and fertility decline in all 27 provinces in Indonesia. Socioeconomic development was conceptualized as comprising three distinct elements: structural economic development, health conditions, and the status of women. I expected a negative relationship between each of the elements of socioeconomic development and fertility rate. Economic development could either directly or indirectly influence fertility. The causal process that I have argued links fertility decline to economic development has not been clearly specified in the previous demographic and development literature. In general, though, it has been hypothesized that economic development that produces better living standards will therefore encourage the enhancement of those improvements through fertility control (Teitelbaum 1975). In other words, the styles of development are more important the growth of economic development. Economic development which produces egalitarian of income, increase women level of education and labour force participation, decrease the infant mortality are some of the crucial factors that support low fertility.

Fertility has declined in Indonesia since the end of the 1970s. The cause of the fertility decline can be attributed either

to the actions of FPPs or to the process of economic development. But, as later data have indicated, the demographic transition in Indonesia has in part been caused and reinforced by the success of FPP and the decrease of infant mortality rate. Especially in Java and Bali, part of fertility decrease is caused by low demand for children. Small land ownership, landlessness, low wages are some of the crucial factors that cause family in Java and Bali to limit their fertility.

The relationship between economic development factors and fertility is very complex, a point reinforced by the present study. Among the macro level factors there are education, the relative contribution of economic sectors to GDP, and indicators of health and the status of women. At the micro level, discussions have centred on women's jobs, education, religion, place of current and childhood residence, and husbands' education and the occupational type. As has been shown here, the contributions of these factors are not always consistent across regions, in terms of both magnitude and the direction of the effects.

The most consistent factor influencing Indonesian fertility is women's job type. Labour force participation is usually treated as a dichotomous variable treating a person as economically active or inactive, but this practice is of highly questionable validity in studying Indonesian development. Data from the 1990 census show that more than eighty percent of women of working age are economically active. Some of these jobs are, however, only temporary and some consist of work done only at home. It was found

that fertility rates vary from one job to the other. In general, it was shown that family jobs, sales and agriculture support high fertility while wage-jobs such as those of employees, managers and other professions support low fertility.

Use of contraception has a more direct effect on human fertility than other determinants, though its use is affected by still other factors. In the micro-analysis, I found that the use of contraception is influenced by wives' and husbands' education and occupational type. Higher levels of education for both men and women and non-traditional jobs for women (such as in the civil service, salaried position and other modern occupations) support a positive attitude toward contraceptive methods. In all regions in Indonesia, I found women's level of education to be the strongest variable contributing the contraceptive use. In other words, the lower the education of women, the lower the proportion who use contraceptive methods (Soeradji and Harijati 1981).

In contrast to proximate variable models, development approaches argue that high fertility is caused by a high demand for children. As Becker (1991:143) states:

> The major changes (in fertility) have been caused by primarily other (than birth control) changes in the demand for children, and improvement in birth control methods are mainly an induced response to other decreases in the demand for children, rather than an important cause of the decrease in demand.

Thus, according to Becker and according to the development approach, women's fertility choice is primarily a function of social, educational, cultural and economic conditions. Furthermore, policies that improve objective conditions for women such as

raising their income, increasing their education, and otherwise empowering them are probably the most important voluntary and sustainable ways to achieve the reduction in fertility necessary to slow population growth.

Since the 1970s, there have been many debates about the causes of fertility decline. Some demographers argue that economic development improves the standard of living, education, health and communication which bring about fertility decline. On the other hand, others argue that economic development itself is threatened by rapid population growth and that overpopulated areas will be unable, or less able, to develop at all, if there is no effort to slow this growth. This latter argument is a crucial basis for those advocate FPP instead of economic development. Thus, economic development influences fertility in two different ways: first, economic development affects the parental demand, desire or need for children and, second, it affects the willingness of a parent to translate these desires into appropriate forms of reproductive control.

Improvement in the status of women in Indonesia certainly has been one of the principal causes of the rapid decline in fertility in Indonesia. Economic development that provides the full integration of women within the development process, and the elimination of discrimination in employment and education, are among the crucial factors that can moderate fertility levels. The International Conference in Mexico City recommended improvement in the status of women as an important goal that should be pursued

both as an end in itself as well as a means, among others, to fertility level decline.

The relationship between women's work and fertility, however, depends upon the overall level of economic development. Not all types of jobs that females hold influence their fertility behaviour in the same way. In the majority of the least-developed countries, the relationship between these two variables is weaker than for more-developed LDCs or for developed countries. This especially true in the case of women working in traditional sectors, because women's occupations appear to influence fertility more if there is a conflict between employment and childbearing, which is less true for traditional female work roles. Advanced economic development usually increases women's level of education, urbanization, industrialization and other related factors, which related to a shift in female employment from traditional to non-traditional work roles.

The effect of socioeconomic development upon the reduction of fertility can be reinforced and sustained by family planning facilities. There are many questions whether socioeconomic development alone can suffice to reduce fertility rates. On the other hand, FPPs are unlikely to bring about major fertility reduction by themselves; they require other, structural changes in the society to work most effectively. FPP will not reduce fertility rates unless other programs such as enforcing school attendance, promoting forms of security against illness and discouraging child labour are instituted. Neither socioeconomic development nor family

planning measures can address the problem of fertility reduction on their own.

This dissertation has addressed two fundamental questions regarding causes of fertility decline; first, was fertility decline intentional? Second, what caused this change? In order to answer these questions, I have used both micro and macro levels of analysis. From the micro perspective, fertility is seen as an individual decision, whereas from the macro one, the context in which individuals live may not remain fixed. Thus, the individual alone may not appropriate as a source of information, and macro analysis was deemed desirable and necessary. Based on these two approaches, I have found that both individual characteristics and the regional context constitute important factors in the determination of individual fertility behaviour.

CHAPTER IX

CONCLUSION

The aim of this dissertation has been to investigate relationships between some important aspects of development and fertility change in Indonesia from 1980 to 1990. Indonesia is a large country divided into twenty-seven provinces. In terms of its fertility, there are considerable variations among its provinces. Some provinces, especially in "Inner Indonesia" usually have a lower fertility rate and a faster pace of fertility decline than provinces in "Outer Indonesia."

There have been various explanations for the decline of fertility in Indonesia, though they can be divided into two basic categories: (1) those that see fertility as a consequences of the socioeconomic changes during the last decades, and (2) those that view this decline as a result of FPPs distributing contraceptives. I have reviewed the evidence of decline, giving particular attention to regional differences in the timing and pace of fertility decline. All twenty-seven provinces were included in the statistical analysis. Because I chose to study all provinces in the county, this thesis requires explicit, overall consideration of social, culture and economic issues in historical perspective.

To explain the immediate mechanisms responsible for fertility decline, I have examined provincial data changes in the TFR and the use of contraception. Finally, I speculate on the implications of

the institutional changes to date for future levels and trends of fertility in Indonesia.

The study of fertility differences among nations has become a topic of interest for many demographers. Such a field of study began in Western Europe when countries there underwent a fertility transition from high to low rates of births and deaths. The main purpose of those earlier studies was to investigate the cause of fertility transition in these areas.

Various explanations were offered for the transition. The first explanation emphasizes on the macro-level or an explanation based on the geographic areas. The second explanation, a micro-approach referring to the individual couple level, based on sample surveys of populations. Like the first approach, this micro-level research also concludes that socioeconomic characteristics, such as education level, type of occupation, religion and other socioeconomic characteristics correlate with fertility.

There are weaknesses with both the macro- and the micro-level approaches. Macro-approaches that heavily emphasize the geographic areas rather than individual levels cannot determine which parts of the population support high fertility and which support low fertility. In other words, they are too general to capture such specific differences. In these approaches, fertility is considered as a system-level product, rather than an individual-level one. A serious, complete study of fertility should also emphasize on the areas of individual lives.

By focusing on the individual couple level, the micro-approach addresses this need, but it faces other problems. Although an individual's command over resources depends in part on choices which he or she can make, these "choices" depend considerably on local and national economic circumstances, which are taken as given at the individual level. Thus, individuals alone cannot determine fertility behaviour. Thus, when focusing on micro-level one might miss larger patterns of individual choices; individuals do not determine fertility behaviour in a structural vacuum. The cause and the pace of fertility decline vary greatly from one country to the other and even from region to region within a single country.

One of the weaknesses of micro-level approaches is that they do not explain fertility decline in terms of broader social and economic change. These approaches are interested only in investigating how different groups of population have different fertility rates. For example, the micro-approach tends to focus only on the characteristics of individuals such as education, religion, type of job and then, based on these categories researchers draw conclusions that these individual characteristics have significant effects on fertility. Consequently, this approach tends to forget that fertility is part and parcel of the process of social and economic change.

Urbanization, industrialization, and the increasing literacy rate are among the most important macro developments influencing fertility. All of these changes cause a shift from dependence on family and other local institutions to the wider social, economic

and political institutions which provide many of the functions that were formerly carried out by the family.

Economic development not only increases the cost of children but also affects other related factors such as an improved standards of living, increased education (especially for women), new occupational opportunities, and rising aspirations. Consequently, economic development can reduce demand for children decreases as parents desire more for themselves and additional children conflict with increased aspirations.

In this dissertation I have examined the cause of fertility declines in all provinces of Indonesia. The reason for this is that the study of fertility determinants in large samples of nations can make an important contribution to the body of empirical evidence about the cause of fertility decline. Many of studies of the causes of fertility decline have been done, but most are based on single cases, cross-sectional data, or longitudinal data from small samples. These micro-level studies can contribute to our knowledge of fertility decline, but their findings may not be generalizable across sub-populations, such as different regions within a country, let alone across countries. Some postulated determinants of fertility in some areas do not always predict fertility change in other areas.

Thus, I included a macro-level analysis in the present study, examining all the Indonesian provinces, in order to determine the causes and pace of fertility decline. I have examined macro-level

determinants of fertility because this perspective is consistent with Ryder's (1980:201-202) views that

> fertility is a collective property and therefore calls for explanation at the macroanalytic level in terms of other properties of the collectivity. The task of explaining why fertility is higher in one population than in another, and why fertility has declined more in one population than in another, requires sociological analysis at the system level.

In a similar way, Freedman (1985:29) argues that the rationale for expecting the effect of macro-level factors on the micro-level behaviour flows from the assumption that "social context or social normative variables must affect fertility". Thus, all development projects influence the social context within which decisions about family size are made by individual couples.

However, the limitations of an exclusively macro approach was revealed by our micro-level analyses, which results than conflict with some most macro-analyses. Specifically, in Java and Bali, the agricultural sector did not support high fertility; on the contrary, people working in the agricultural sectors in these regions have lower fertility rates than those working in non-agricultural ones. Many major difficulties experienced by people who work in agriculture sector of these regions - extreme poverty, very high population density, increasing fragmentation of land and landlessness, etc. - have caused them to limit their fertility rate. This finding suggests that the study of fertility should consider both micro and macro approach, and clearly conflicts with demographic transition and dependency theories.

Implications for further research

The level of analysis used in this study can be referred as macro and micro level. That is, analysis based on data from the 1990 Census, which provides information at the provincial level, and data from the 1991 Demographic and Health Survey, which provides information at the individual level.

As this dissertation has shown, the question is not so much whether economic development will reduce fertility in most developing countries, as it is what types of development will reduce fertility, by how much, and in what time span. I also explores what the government can do to accelerate the process of change by focusing on FPPs and their implementation.

Some of our results support demographic transition and dependency theories, but others do not. Specifically, although these theories were consistent with our overall analysis of Indonesia, they were not always supported by regional analyses.

These conclusions are neither definitive nor final, and a number of questions still remain. It is possible that more precise measures of concepts, more elaborate statistical models, a wider range of cases and a longer time span would arrive at different results. More specifically, future research should develop better measurements of socioeconomic development and test more complete models of fertility decline.

Implications for Population Policy

A number of implications for population policy can be drawn from this study.

First, my analyses have demonstrated that FPPs can reduce the fertility rate. Indeed, they have done so in Indonesia and its provinces.

Second, economic development must be accomplished by other social and health developments, because socioeconomic development not only directly affects fertility rates but also exerts indirect influences in the adoption of family planning methods.

Third, given the findings that female employment outside the home contributes to fertility decline, attention also should be given to the type of female employment generated by economic development. Policy directed at increasing female employment outside the agricultural and domestics areas appears to increase the use of contraceptives and thus to decrease fertility.

Fourth, as the infant mortality rate is significantly and negatively related to fertility, it is necessary to formulate policies that directly influence it - establishing health facilities and or indirectly by improving the status of women.

Finally, increasing the level of women is education is necessary to fertility reduction, because as the data for Indonesia show, while low education does not support low fertility, high education is significantly related with fertility decline.

REFERENCES

Adioetomo, S.M., A.S. Kitting, and S. Taifik. 1990. "Fertility Transition in Indonesia: Trends in Proximate Determinants of Fertility." pp. 43-75 in *Population Studies in Sri Lanka and Indonesia*, New York: Population Council.

Agyei, Willam K.A. 1978. "Modernization and the Theory of Demographic Transition in the Developing Countries: The Case of Jamaica." *Social and Economic Studies* 27:44-68.

Ahn, Namkee and Abusaleh Shariff. 1994. "A Comparative Study of Socioeconomic and Demographic Determinants of Fertility in Togo and Uganda." *International Family Planning Perspectives* 20:14-22.

Antony, T.V. 1992. "The Family Planning Program, Lessons from Tamil Nadu's Experience." *Indian Journal of Social Science* 5: 319-328.

Beaver, S.E. 1975. *Demographic Transition Reinterpreted*. Lexington, Mass.: Lexington Books.

Becker, Gary S. 1960. "An Economic Analysis of Fertility," in Ansley J. Coale (ed.), *Demographic and Economic Change in Developed Countries*. Princeton: Princeton University Press.

Becker G. 1981. *A Treatise on the Family*. Cambridge: Harvard University Press.

Bhattacharyya, Amit Kumar. 1975. "Income Inequality and Fertility: A Comparative View." *Population Studies*, 29:5-19.

Boeke, J.H. 1957. *Economics and Economic Policy of Dual Societies*. H.D. Tjeenk Willik, Harlem.

Bongaarts, John. 1978. "A Framework for Analyzing Proximate Determinants of Fertility." *Population and Development Review* 4:105-132.

Bongaarts, John. 1982. "The Fertility Inhibiting Effects of the Intermediate Fertility Variables." *Studies in Family Planning*, Vol. 13; No.6/7.

Bornschier, Volker and Christopher Chase-Dunn. 1985. *Transnational Corporation and Underdevelopment*. New York: Praeger.

Boserup, E. 1965. *The Condition of Agriculture Growth*. London: Allen and Unwin.

Caldwell, John. 1972. *Theory of Fertility Decline*. New York: Academic Press.

Caldwell, John. C. 1976. "Toward a Restatement of Demographic Transition Theory." *Population and Development Review* 3:321-366.

Caldwell, John. C. 1980. "Mass Education as the Determinants of the Timing of Fertility Decline." *Population and Development Review,* 8 (Supplement):159-173;

Caldwell, John. C. 1981 "The Mechanism of Demographic Change in Historical Perspective." *Population Studies* 35:5-27;

Caldwell, John. C. 1982. *Theory of Fertility Decline*. London: Academic Press.

Caldwell, John C., Orubuloye, I.O. and Pat Caldwell. 1992. "Fertility Decline in Africa: A New Type of Transition?" *Population and Development Review* 18:211-242.

Caldwell, John C., Reddy, P.H. and Pat Caldwell. 1982 "The Causes of Demographic Change in Rural India: A Micro Approach." *Population and Development Review* 8:689-727.

Caldwell, John C. and Lado T. Ruzzicka. 1978. "The Australian Fertility: An Analysis." *Population and Development Review* 4:81-103.

Central Bureau of Statistics. 1988. *Provincial Income in Indonesia 1983-1986, Parts I and II*. Jakarta.

Central Bureau of Statistics. 1989. *National Indonesia Contraceptive Prevalence Survey 1987*. Columbia, MD: Institute for Resource Development.

Central Bureau of Statistics. 1991. *Survey Demography dan Kesehatan Indonesia (Demographic and Health Survey in Indonesia)*. Jakarta: Central Bureau of Statistics, National Family Planning Coordinating Board, Ministry of Health and Macro International Inc. USA.

Central Bureau of Statistics. 1992. *Population of Indonesia: Results of the 1990 Population Census, Series S No. 2*. Jakarta: BPS.

Central Bureau of Statistics, 1993. *Statistical Pocketbook of Indonesia*. Jakarta: BPS.

Cho, Lee-Jay. 1971. *Population Growth of Indonesia: An Analysis of Fertility and Mortality Based on the 1971 Population Census*. Honolulu: The University of Hawaii Press.

Cleland, John and Christopher Wilson. 1987. "Demand Theories of the Fertility Transition: An Iconoclastic View." *Population Studies* 41:5-30.

Cleland, J.G. and Chris Scott (eds.) 1987. *World Fertility Survey: An Assessment of Its Contribution*. London: Oxford University Press.

Coale, A.J. 1973. "The Demographic Transition," in *International Population Conference* (Vol. 1). Hiège, Belgium: International Union for Scientific Study of Population.

Coale, A.J. and S.C. Watkins. 1986. *The Decline of Fertility in Europe*. Princeton: Princeton University Press.

Crafts, N.F.R. 1989. "Duration of Marriage, Fertility and Women's Employment Opportunities in England and Wales in 1911." *Population Studies* 43:325-335.

Cutright, Philips and William R. Kelly. 1978. "Modernization and Other Determinants of National Birth, Death, and Growth Rate: 1958-72," in R. Thomasson. (ed.) *Comparative Studies in Sociology* (Vol 1). Greenwich: JAI Press.

Cutright, Philips. 1983. "The Ingredients of Recent Fertility Decline in Developing Countries." *International Family Planning Perspectives* 9:101-09.

Cutright, Philips. 1983. *Statistical Models of Interrelationship between Socio-economic Development and Fertility among Less Developed Areas*. Bloomington: Fertility Determinants Project, Indiana University.

Davis, Kingsley and Judith Blake. 1956. "Social Structure and Fertility." *Economic Development and Culture Change* 4:211-235.

Easterlin, Richard A. 1969. "Towards a Socioeconomic Theory of Fertility: A Survey of Recent Research on Economic Factors in American Fertility," in S.J. Behrman (ed.) *Fertility and Family Planning: A World Review*. Ann Arbor: University of Michigan Press.

Easterlin, Richard A. 1975. "An Economic Framework for Fertility Analysis." *Studies in Family Planning* 6:54-63.

Easterlin, Richard A. and Eilen M. Crimmin. 1985. *The Fertility Revolution: A Supply-Demand Analysis*. Chicago: University of Chicago Press.

Easterlin, Richard A., Pollak, Robert A. and Michael L. Wachter. 1980. "Toward a more General Economic Model of Fertility Determinants: Endogenous Preferences and Natural Fertility,"

in Richard Easterlin (ed.) *Population and Economic Change in Developing Countries*. (Universities-National Bureau of Economic Research, Committee for Economic Research, Conference Report No. 30.) Chicago: University of Chicago Press.

Evans, Peter B. 1979. *Dependent Development*. Princeton, NJ. Princeton University Press.

Evans, Peter B. and Michael Timberlake. 1980. "Dependency, Inequality, and the Growth of Tertiary: A Comparative Analysis of Less Developed Countries. *American Sociological Review* 45:531-52.

Farooq, G.M., and D.S. DeGraff. 1988. *Fertility and Development: An Introduction to Theory, Empirical Research and Policy Issues*. Geneva: International Labor Office.

Fawcett, James T and Siew Khoo Ean. 1980. "Singapore: Rapid Fertility Transition." *Population and Development Review* 6:549-579.

Feldman, H. 1967. *The Ghanian Family in Transition*. Cornell University Press.

Fisher, C.A. 1964. *Southeast Asia*. Methuen, London.

Fiala, Robert and F. Ramirez. 1984. "Dependency, Service Sector Growth and Economic Development in Lesser Developed Countries, 1960-1975. *Comparative Social Research* 7:399-424.

Freedman, Ronald. 1985. "Summary Observations on the WFS Seminar on Collection and Analysis of Data on Community and Institutional Factors," in J. Casterline (ed.) 1985. *The Collection and Analysis of Community Data*. Voorburg, Netherlands: International Statistical Institute.

Freedman, Ronald. 1979. "Theories of Fertility Decline: A Reappraisal." *Social Forces* 58:1-17.

Freedman, Ronald. 1963. "Norms for Family Size in Underdeveloped Areas." *Proceedings of the Royal Society* 159.

Friendlander, Dov., J. Schellekens and Elia Ben-Moshe. 1991. "The Transition from High to Low Marital Fertility: Cultural or Socioeconomic Determinants?" *Economic Development and Cultural Change* 39:331-351.

Geertz, H. 1963. Agriculture Involution: *The Process of Ecological Change in Indonesia*. Berkeley: University of California Press.

Gertler J. Paul and John W. Molyneaux. 1994. "How Economic

Development and Family Planning Programs Combined to Reduce Indonesian Fertility." *Demography* 31:33-63.

Hainess, Michael R. 1992. "Occupation and Social Class During Fertility Decline: Historical Perspective," in *The European Experience of Declining Fertility 1895-1970: The Quite Revolution*. New York: Blackwell.

Hammerslough, Charles R. 1992. "Proximity to Contraceptive Services and Fertility Transition in Rural Kenya." *International Family Planning Perspective* 18:54-58.

Handwerker, W. Penn, 1986. "The Modern Demographic Transition: An Analysis of Subsistence Choices and Reproductive Consequences." *American Anthropologist* 88:400-417.

Handwerker, W. Penn. 1992. "West Indian Gender Relation, Family Planning Programs and Fertility Decline." *Social Science and Medicine* 35:1245-1257.

Hatmadji, S.H. and S. Achmad. 1984. *Analisa Fertilitas di Indonesia Berdasarkan data Sensus Penduduk 1980* [Fertility Analysis in Indonesia, Based on the 1980 Population Census Data]. Jakarta: BPS and the Demographic Institute.

Heer, David M. 1966. "Economic Development and Fertility." *Demography* 3.

Hout, Michael. 1980. "Trade Dependency and Fertility in Hispanic America: 1900-1975," in A. Bergesen (ed.), *Studies of the Modern World System*. New York: Academic Press.

Hugo, J. Graeme, Hull, Terence H., Hull, Valerie J. and Gavin W. Jones (eds.). 1987. *The Demographic Dimension in Indonesian Development*. Singapore: Oxford University Press.

Hull, Terence H. 1977. "Fertility Decline in Indonesia: An Institutionalist Interpretation." *International Family Planning Perspective* 13:90-94.

Hull Terence. H and Valerie J. Hull. 1977. "The Relation of Economic Class on Fertility; An Analysis of Some Indonesian Data." *Population Studies* 31:43-57.

Hull, Terence H. and Valerie J. Hull. 1977. "Indonesia Family Planning Stories: Success and Challenge." *Population Bulletin* 32(6), Population Reference Bureau, Washington D.C.

Hull, Terence H. 1991. "Population Growth Falling in Indonesia: Preliminary Results of the 1990 Census." *Bulletin of Indonesia Economic Studies* 27.

Hull, Terence H. and Hatmadji, Sri Harijati. 1990. *Regional Fertility Differentials in Indonesia: Cause and Trends*. Canberra: Australian National University.

Hwan, Thai Kwon. 1992. "Exploring the Socio-Cultural Explanation of Fertility Transition in South Korea" in Richard Leete and Iqbal Alam (Eds.) *The Revolution of Asian Fertility: Dimension, Causes and Implication*. Oxford: Clarendon Press.

Jejeebhoy, Shireen J. 1991. "Women's Status and Fertility: Successive Cross-Sectional Evidence from Tamil Nadu, India, 1970-1980." *Studies in Family Planning* 22:217-230.

Jones, G.W. 1984. *Demographic Transition in Asia*. Singapore: Maruzen Asia.

Karush, Gerald D. 1978. "Plantation, Population, and Poverty: The Roots of the Demographic Crisis in El Salvador." *Studies in Comparative International Development* 13:59-75.

Kasto, 1992. "Variasi Tingkat kematian bayi dan harapan Hidup di Indonesia menurut Propinsi: hasil sensus penduduk 1990." *Populasi* 2:13-23.

Kependudukan dan Lingkungan Hidup [Ministry of Population and Environment]. 1992. *Kependudukan Indonesia: Laporan Kepada Konperensi Kependudukan Asia Pacific IV*. [Indonesian Population: A Report to the Asia-Pacific Population Conference IV]. Jakarta.

Kependudukan dan Lingkungan Hidup [Ministry of Population and Environment]. 1992. *Penduduk Indonesia Selama Pembangunan Jangka Panjang I* [The Indonesian Population During the Long First Stage of Development]. Jakarta.

Kirk, Dudley. 1971. " A New Demographic Transition?" Pages 123-147 in *Rapid Population Growth*. Vol 2, Baltimore, MD: John Hopkins University Press.

Knodel, J. 1977. "Age Pattern of Fertility and Fertility Transition: Evidence for Europe and Asia." *Population Studies* 31:210-50.

Knodel, John, Havanon, Napaporn and Anthony Pramual Ratana. 1984. "Fertility Transition in Thailand: A Qualitative Analysis." *Population and Development Review* 10:297-328.

Kumar, J. 1971. "A Comparison Between Indian Fertility and Late Nineteenth Century Swedish and Finnish Fertility." *Population Studies* 25:269-283.

Lapham, R.J. and W.P. Mauldin. 1984. "Family Planning Program

Effort and Birth-rate Decline in Developing Countries." *International Family Planning Perspectives* 4:109-118.

Larsen, Ulla. 1990. "An Assessment of the One-Child Policy in China from 1980-1985." *European Journal of Population* 6:257-284.

Leibenstein, Harvey. 1963. *Economic Backwardness and Economic Growth.* New York.

Leibenstein, H. 1975. "The Economic Theory of Fertility Decline." *The Quarterly Journal of Economics* 89:1-31.

Li, Li, John A. Baleg. 1992. "Development, Urbanization and Fertility in China." *Sociology and Social Research* 76:111-117.

Lotter, J.M. 1976. "Some Aspects of Indian Fertility in South Africa." *Humanities* 3:49-426.

Mauldin, W.P., Choucri, Nazli, Notestein, Frank W. and Michael Teitelbaum. 1974. "A Report on Bucharest." *Studies in Family Planning* 5:357-395.

McNicoll, G. and M. Singarimbun. 1982. "Fertility Decline In Indonesia." *Population Council Center for Policy Studies Working Papers.* No. 92 and 93, (Vol. 1 & 2), New York: Population Council.

McNicoll, G. and Moni Nag. 1982. "Population Growth: Current Issues and Strategies." *Population and Development Review* 8:121-139.

Meekers, Dominique. 1994. "Education and Adolescent Fertility in Sub-Saharan Africa." *International Review of Modern Sociology* 24:1-43.

Mincer, Jacob. 1963. "Market Prices, Opportunity Cost, and Income Effect," in Carl, Crist et al. (eds.), *Measurement in Economics and Econometrics in Memory of Yehuda Grunfeld.* Standford: Stanford University Press.

Morawetz, David. 1977. *Twenty-Five Years of Economic Development: 1950 to 1975.* Washington, DC: World Bank.

Mueler and Short. 1983. "Effect of Income and the wealth on Demand for Children," in R.A. Bulatao and R.D. Lee, 1983 (eds.) *Determinants of Fertility in Developing Countries* (Vol. 1). New York: Academic Press.

Nie, Norman H. 1970. *Statistical Package for the Social Sciences.* New York: McGraw Hill.

Nitisastro, Widjojo. 1970. *Population Trend in Indonesia.* London: Cornell University Press.

Nolan, Patrick D. and Ralph B. White. 1984. "Structural
    Explanations of Fertility Change: The Demographic Transition,
    Economic Status of Women, and the World System." *Comparative
    Social Research* 7:81-109.

Notestein, F.W. 1945. "Population: The Long View," in T.W. Schultz
    (ed.) *Food for the World*. University of Chicago Press,
    Chicago.

Oheneba, Sakyi Y. 1989. "Cohort Shifts in the Timing of Births in
    Ghana." *Sociological Perspectives* 32:485-500.

Pangestu, Mari and Iwan Jaya Azis. 1994. "Survey of Recent
    Developments." *Bulletin of Indonesian Economic Studies* 30(2).

Mauldin, Parker W. and Bernard Barelson, Zenasykes. 1978.
    "Conditions of Fertility Decline in Developing Countries."
    Studies in Family Planning 9:89-147.

Pffenberger, M. 1983. "Toward a New Understanding of Population
    Change in Bali." *Population Studies* 37:43-59.

Preston, H. Samuel (ed.). 1978. *The Effect of Infant and Child
    Mortality on Fertility*. New York: Academic Press.

Quanhe, Yang. 1987. "Fertility and Some Determinants of Fertility
    Decline in Huaibei Olain, Anhui Province, China." *Journal of
    Bio-Social Science* 19:323-344.

Repetto, Robert. 1978. "The Interaction of Fertility and the
    Distribution of Income." *Journal of Development Studies*
    14:22-39.

Rich, William. 1973. *Small Families through Social and Economic
    Progress*. Washington D.C.: Overseas Development Council.

Robinson, Warren C. 1992. "Kenya Enters the Fertility Transition."
    Population Studies 46:445-457.

Rodriguez, G. and John Cleland. 1981. "Socioeconomic Determinants
    of Marital Fertility in Twenty Countries: A Multivariate
    Analysis," in *World Fertility Survey Conference 1980: Record
    of Proceedings* (Vol. 2). Voorbourg, Netherlands: International
    Statistics Institute.

Rossen, Bernard C. and Alan B. Summons. 1971. "Industrialization,
    Family and Fertility: A Structure-Psychological Analysis of
    the Brazilian Case." *Demography* 8:49-70.

Rossen, Bernard C. and Anita K. Raia. 1972. "Modernity and Women:
    An Index of Social Change in Brazil. *Journal of Marriage and
    the Family* 34:353-360.

Ryder, Norman B. 1980. "Where Do Babies Come From?" in Hubert M. Blalock, Jr. (ed). *Sociological Theory and Research: A Critical Appraisal.* New York: Free Press.

Singarimbun, Masri and Chris Manning. 1976. *Fertility and Family Planning in Mojolama.* Yogyakarta: Population Institute UGM.

Soegijoko, Sugijanto. 1992 " Spatial Development: Future and Prospects," in Kim, John Tschangko, Gerrit Knapp and I. Jaya Azis (eds.) *Spatial Development in Indonesia: Review and Prospects.* London: Avebury.

Soeradji, Budi and Sri Harijati Hatmadji. 1981. "Contraceptive Use in Java-Bali: Multivariate Analysis on the Determinants of Contraceptive use." *Asian Population Studies, Series No. 49, Economic and Social Commission for Asia and the Pacific.* Thailand, Bangkok.

Sofranko, A.J. and Robert C. Bealer. 1972. *Unbalanced Modernization and Domestic Instability: A Comparative Analysis.* Newbury Park, California: Sage.

Stolnitz, George J. 1964. "The Demographic Transition," in Ronald Freedman (ed.) *Population: The Vital Revolution.* New York: Doubleday.

Sun, Te-Hsiung and Y.L. Soon. 1979. "On Its Way to Zero Population Growth: Fertility Transition in Taiwan, Republic of China," in *Fertility Transition of the East Asian Population.* Honolulu: Hawaii University Press.

Sun, Te-Hsiung and Tin-Yu Ting. 1989. "Innovation-Diffusion or Adjustment: The Case of Taiwanese Fertility Transition." *Population Studies* 12:67-89.

Teitelbaum, Michael S. 1975. "Relevance of Demographic Transition Theory for Developing Countries." *Science* 188:420-425.

Titus, Milan J. 1982. *Migrasi Antar Daerah Sebagai Cerminan Ketimpangan regional dan Sosial* [Migration Among regions as a Reflection of Regional and Social Imbalance]. Yogyakarta: Population Study Center.

Todaro, P. Michael P. 1985. *Economic Development in the Third World.* New York: Longman.

United Nations. 1987. *Fertility Behaviour in the Context of Development: Evidence from the World Fertility Survey.* New York: United Nations.

van de Walle, E. 1987. "[Review of] *La transition demographique:*

étapes, formers, implications enconomiques." Population and Development Review 13:547-549.

Ward, Kathryn B.1984. *Women in The World System: Its Impact on Status and Fertility.* New York: Prager.

Warren, C. Robinson. 1992. "Kenya Enters the Family Transition." *Population Studies* 46:445-457.

Watkins, Susan C. 1987. "The Fertility Transition: Europe and the Third World Compared." *Sociological Forum* 2:645-673.

Watkins, S.C. 1986. "Conclusion," in A.J. Coale and S.C. Watkins (eds.) *The Decline of Fertility in Europe.* Princeton: Princeton University Press.

White, Benjamin. 1993. "Indonesia's Population Problems and Policies," in Paul Dirkse, Jan Frans Husken and M. Rutten (eds.) *Indonesia's Experience Under the New Order.* Leiden: KITLV.

Williamson. J.G. 1965. "Regional Inequality and the Process of National Development: A Description of the Pattern." *Economic Development and Cultural Change* 13:3-45.

Widjojo Nitisastro. 1970. *Population Trends in Indonesia.* London: Cornell University Press.

World Bank. 1990. *Indonesia: Strategy for a Sustained Reduction in Poverty.* Washington D.C.: World Bank.

World Bank, 1992. *World Development Report: Development and the Environment.* Washington D.C. Oxford University Press.

Zelinsky, W. 1971. "The Hypothesis of the Mobility Transition." *Geographical Review* 61:219-249.

APPENDICES
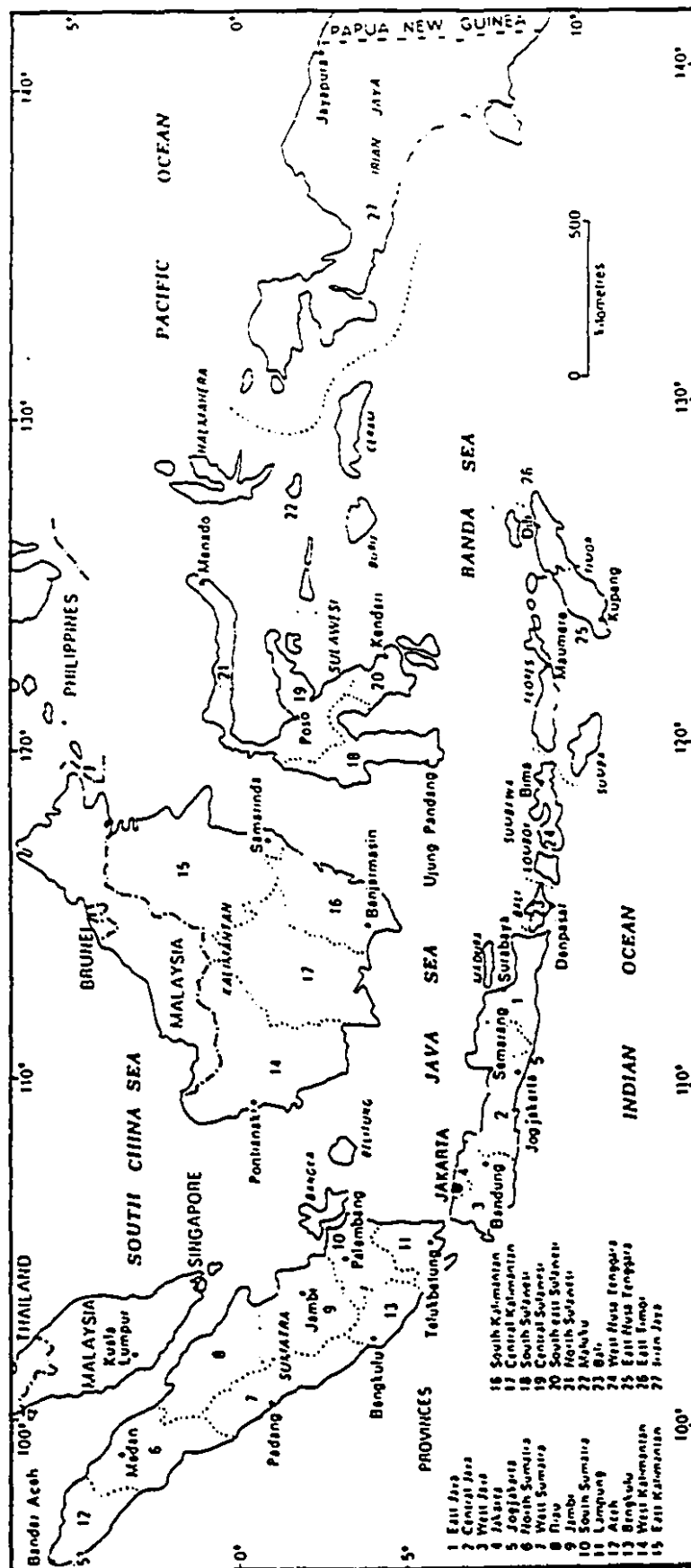
Map of Indonesia

1991 INDONESIA DEMOGRAPHIC AND HEALTH SURVEY
INDIVIDUAL WOMAN'S QUESTIONNAIRE

Confidential

IDENTIFICATION	CODE
1. PROVINCE	.... ☐☐
2. REGENCY/MUNICIPALITY *)..............................	.... ☐☐
3. SUB-DISTRICT _____	
4. VILLAGE _____	
5. AREA ....URBAN - 1.....RURAL - 2 **)	☐
6. LARGE CITY/SMALL CITY/TOWN/COUNTRYSIDE.............. (Large city=1, Small City=2, Town=3, Countryside=4)	☐
7. ENUMERATION AREA NUMBER _____	
8. SP90 SAMPLE CODE....................................	.... ☐☐☐
9. IDHS91 SAMPLE CODE	.... ☐☐☐
10. HOUSEHOLD NUMBER....................................	.... ☐☐☐
11. NAME OF HOUSEHOLD HEAD _____	
12. LINE NUMBER OF WOMAN FROM HOUSEHOLD SCHEDULE.......	.... ☐☐
13. NAME OF WOMAN _____	

INTERVIEWER VISITS

	1	2	3	FINAL VISIT	
DATE	___	___	___	MONTH	☐☐
				YEAR	☐☐
INTERVIEWER'S NAME....	___	___	___	INTERV.	☐☐
RESULT ***)..........	___	___	___	FINAL RESULT	☐
NEXT VISIT: DATE	___	___	___		
TIME	___	___	___	TOTAL NUMBER OF VISITS	☐

***) RESULT CODES:
1 COMPLETED   4 REFUSED
2 NOT AT HOME   5 PARTLY COMPLETED
3 POSTPONED   6 OTHER _____

	FIELD EDITED BY	OFFICE EDITED BY	KEYED BY	KEYED BY
NAME	_____	_____	_____	☐☐
DATE	_____	_____	_____	

*) Cross out category not used
**) Circle selected category
***) Choose suitable result

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP TO
101	RECORD THE TIME.	HOUR........................ ☐☐ MINUTES..................... ☐☐	
102	First I would like to ask some questions about you. For most of the time until you were 12 years old, did you live in a village, in a town, or in a city?	CITY.............................1 TOWN.............................2 VILLAGE..........................3	
103	In what month and year were you born? IF MONTH NOT IN WESTERN CALENDAR, WRITE NAME: _____	MONTH...................... ☐☐ DK MONTH........................98 YEAR....................... ☐☐ DK YEAR.........................98	
104	How old were you at your last birthday? COMPARE AND CORRECT 103 AND/OR 104 IF INCONSISTENT. IF AGE LESS THAN 15 OR 50+, END INTERVIEW.	AGE IN COMPLETED YEARS...... ☐☐	
104A	Are you now married, widowed, or divorced?	MARRIED..........................1 DIVORCED.........................2 WIDOWED..........................3	
105	Have you ever attended school?	YES..............................1 NO...............................2 ⟶109	
106	What is the highest level of school you attended: primary, junior high, senior high, academy, or university?	PRIMARY..........................1 JUNIOR HIGH SCHOOL...............2 SENIOR HIGH SCHOOL...............3 ACADEMY/UNIVERSITY...............4	
107	What is the highest (GRADE, FORM, YEAR) you completed at that level?	GRADE....................... ☐	
108	CHECK 106: PRIMARY ☐ JUNIOR HIGH OR HIGHER ☐		⟶110
109	Can you read and understand a letter or newspaper easily, with difficulty, or not at all?	EASILY...........................1 WITH DIFFICULTY..................2 NOT AT ALL.......................3 ⟶111	
110	Do you usually read a newspaper or magazine at least once a week?	YES..............................1 NO...............................2	
111	Do you usually listen to the radio every day?	YES..............................1 NO...............................2	
112	Do you usually watch television at least once a week?	YES..............................1 NO...............................2	
113	What religion are you?	MUSLIM...........................1 PROTESTANT/CHRISTIAN.............2 CATHOLIC.........................3 HINDU............................4 BUDDHIST.........................5 OTHER_____6 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP TO
201	Now I would like to ask about all the births you have had during your life. Have you ever given birth?	YES.............................1 NO..............................2——▶206	
202	Do you have any sons or daughters to whom you have given birth who are now living with you?	YES.............................1 NO..............................2——▶204	
203	How many sons live with you? And how many daughters live with you? IF NONE ENTER '00'.	SONS AT HOME............... ☐☐ DAUGHTERS AT HOME.......... ☐☐	
204	Do you have any sons or daughters to whom you have given birth who are alive but do not live with you?	YES.............................1 NO..............................2——▶206	
205	How many sons are alive but do not live with you? And how many daughters are alive but do not live with you? IF NONE ENTER '00'.	SONS ELSEWHERE............. ☐☐ DAUGHTERS ELSEWHERE........ ☐☐	
206	Have you ever given birth to a boy or a girl who was born alive but later died? IF NO, PROBE: Any (other) baby who cried or showed any sign of life but only survived a few hours or days?	YES.............................1 NO..............................2——▶208	
207	In all, how many boys have died? And how many girls have died? IF NONE ENTER '00'.	BOYS DEAD................. ☐☐ GIRLS DEAD................ ☐☐	
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL. IF NONE ENTER '00'.	TOTAL...................... ☐☐	
209	CHECK 208: Just to make sure that I have this right: you have had in TOTAL _____ live births during your life. Is that correct? YES ☐ NO ☐ ——▶ PROBE AND CORRECT 201-209 AS NECESSARY		
210	CHECK 208: ONE OR MORE ☐ NO BIRTHS ☐ ——————————————————————————————▶225		

3

229

301	Now I would like to talk about family planning - the various ways or methods that a couple can use to delay or avoid a pregnancy. Which of these ways or methods have you heard about?
	CIRCLE CODE 1 IN 302 FOR EACH METHOD MENTIONED SPONTANEOUSLY.
	THEN PROCEED DOWN THE COLUMN, READING THE NAME AND DESCRIPTION OF EACH METHOD NOT MENTIONED SPONTANEOUSLY. CIRCLE CODE 2 IF METHOD IS RECOGNIZED, AND CODE 3 IF NOT RECOGNIZED.
	THEN, FOR EACH METHOD WITH CODE 1 OR 2 CIRCLED IN 302, ASK 303-304 BEFORE PROCEEDING TO THE NEXT METHOD.

	302 Have you ever heard of (METHOD)? READ DESCRIPTION OF EACH METHOD.	303 Have you ever used (METHOD)?	304 Where would someone go if he/she wanted to use (METHOD)? (USE CODES BELOW)**
01 PILL "Women can take a pill every day".	YES/SPONT.....................1 YES/PROBED....................2 NO...........................3	YES...............1 NO................2	☐☐ OTHER_____
02 IUD "Women can have a loop or coil placed inside them by a doctor or a nurse".	YES/SPONT.....................1 YES/PROBED....................2 NO...........................3	YES...............1 NO................2	☐☐ OTHER_____
03 INJECTIONS "Women can have an injection by a doctor or nurse which stops them from becoming pregnant for several months".	YES/SPONT.....................1 YES/PROBED....................2 NO...........................3	YES...............1 NO................2	☐☐ OTHER_____
04 INTRAVAG "Women can place a tissue inside them before intercourse".	YES/SPONT.....................1 YES/PROBED....................2 NO...........................3	YES...............1 NO................2	☐☐ OTHER_____
05 CONDOM "Men can use a rubber sheath during sexual inter- course".	YES/SPONT.....................1 YES/PROBED....................2 NO...........................3	YES...............1 NO................2	☐☐ OTHER_____
06 NORPLANT/IMPLANT "Women can have small rods put in the arm to prevent pregnancy".	YES/SPONT.....................1 YES/PROBED....................2 NO...........................3	YES...............1 NO................2	☐☐ OTHER_____
07 FEMALE STERILIZATION "Women can have an operation to avoid having any more children".	YES/SPONT.....................1 YES/PROBED....................2 NO...........................3	Have you ever had an operation to avoid having any more children? YES...............1 NO................2	☐☐ OTHER_____
08 MALE STERILIZATION "Men can have an operation to avoid having any more children".	YES/SPONT.....................1 YES/PROBED....................2 NO...........................3	YES...............1 NO................2	☐☐ OTHER_____
09 PERIODIC ABSTINENCE/CALENDAR "Couples can avoid having sexual intercourse on certain days of the month when the woman is more likely to become pregnant".	YES/SPONT.....................1 YES/PROBED....................2 NO...........................3	YES...............1 NO................2	Do you know where a person can obtain advice on how to use periodic abstinence? ☐☐ OTHER_____
10 WITHDRAWAL "Men can be careful and pull out before climax".	YES/SPONT.....................1 YES/PROBED....................2 NO...........................3	YES...............1 NO................2	
11 ABORTION/MENSTRUAL REGULATION "Women can do something to end a pregnancy".	YES/SPONT.....................1 YES/PROBED....................2 NO...........................3	YES...............1 NO................2	☐☐ OTHER_____
12 ANY OTHER METHODS? "Have you heard of any other ways or methods that women or men can use to avoid pregnancy?". 1 _____ (SPECIFY) 2 _____ (SPECIFY) 3 _____ (SPECIFY)	YES/SPONT.....................1 NO...........................3	YES...............1 NO................2 YES...............1 NO................2 YES...............1 NO................2	** CODES FOR 304 GOVERNMENT HOSPITAL........01 PRIVATE HOSPITAL...........02 HEALTH CENTER (PUSKESMAS)..03 PRIVATE CLINIC.............04 HEALTH POST (POSYANDU).....05 FP POST/VCDC/PACUTUBAN.....06 FIELDWORKER (PLKB).........07 FP MOBILE UNIT.(TKBK/TMK)..08 PHARMACY/DRUGSTORE.........09 PRIVATE DOCTOR.............10 PRIVATE MIDWIFE............11 TRADITIONAL HEALER (DUKUN).12 FRIENDS/RELATIVES..........13 FP SAFARI..................14 NOWHERE....................15 OTHER_____ (SPECIFY) DON'T KNOW.................98

305	CHECK 303: NOT A SINGLE "YES" ☐ (NEVER USED)	AT LEAST ONE "YES" ☐ → SKIP TO 309 (EVER-USED)

7

230

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP TO
306	Have you ever used anything or tried in any way to delay or avoid getting pregnant?	YES........................... ☐ NO............................. ☐	→308
307	ENTER "0" IN COLUMN 1 OF CALENDAR IN EACH BLANK MONTH ─────		→330
308	What have you used or done? CORRECT 303-305 (AND 302 IF NECESSARY).		
309	What is the first thing you ever did or method you ever used to delay or avoid getting pregnant?	PILL.............................01 IUD..............................02 INJECTIONS.......................03 INTRAVAG.........................04 CONDOM...........................05 NORPLANT.........................06 FEMALE STERILIZATION.............07 MALE STERILIZATION...............08 PERIODIC ABSTINENCE..............09 WITHDRAWAL.......................10 OTHER_____11 (SPECIFY)	→311
310	Where did you go to get this method the first time?	GOVERNMENT HOSPITAL..............01 PRIVATE HOSPITAL.................02 HEALTH CENTER (PUSKESMAS).......03 PRIVATE CLINIC..................04 HEALTH POST (POSTANDU)..........05 FP POST/VCDC/PACUTUBAN..........06 FIELDWORKER (PLKB)..............07 FP MOBILE UNIT.(TKBK/TMK).......08 PHARMACY/DRUGSTORE..............09 PRIVATE DOCTOR..................10 PRIVATE MIDWIFE.................11 TRADITIONAL HEALER (DUKUN).....12 FRIENDS/RELATIVES..............13 FP SAFARI......................14 NOWHERE........................15 OTHER_____16 (SPECIFY) DON'T KNOW.....................98	
311	How many living children did you have at that time, if any? IF NONE ENTER '00'.	NUMBER OF CHILDREN......... ☐☐	
312	CHECK 225: NOT PREGNANT ☐ PREGNANT ☐ OR UNSURE		→331
313	CHECK 303: WOMAN NOT ☐ WOMAN ☐ STERILIZED STERILIZED		→315A
313A	CHECK 104A: CURRENTLY ☐ WIDOWED/ ☐ MARRIED DIVORCED		→331
314	Are you currently doing something or using any method to delay or avoid getting pregnant?	YES............................1 NO.............................2	→331
315	Which method are you using?	PILL.............................01 IUD..............................02 →323 INJECTIONS.......................03 →316J INTRAVAG.........................04 →323 CONDOM...........................05 →316M NORPLANT.........................06 →323 FEMALE STERILIZATION.............07 MALE STERILIZATION...............08 →321 PERIODIC ABSTINENCE..............09 WITHDRAWAL.......................10 →326 OTHER_____11 (SPECIFY)	
315A	CIRCLE '07' FOR FEMALE STERILIZATION.		

8

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP TO
501	Have you been married only once, or more than once?	ONCE..........................1 MORE THAN ONCE.................2	
502	How old were you when you started living with your (first) husband?	AGE........................ ☐☐	
503	In what month and year did you start living with him? COMPARE AND CORRECT 502 AND/OR 503 IF INCONSISTENT.	MONTH......................☐☐ DK MONTH.......................98 YEAR.......................☐☐ DK YEAR........................98	
504	DETERMINE MONTHS MARRIED SINCE JANUARY 1986. ENTER "X" IN COLUMN 6 OF CALENDAR FOR EACH MONTH MARRIED, AND ENTER "O" FOR EACH MONTH NOT MARRIED, SINCE JANUARY 1986. FOR WOMEN NOT CURRENTLY MARRIED OR WITH MORE THAN ONE MARRIAGE: PROBE FOR DATE COUPLE TERMINATED THEIR MARRIAGE OR DATE WIDOWED, AND FOR STARTING DATE OF ANY SUBSEQUENT MARRIAGE.		
505	CHECK 104A: CURRENTLY MARRIED WIDOWED, DIVORCED ☐ ☐		→510
506	Now we need some details about your sexual activity in order to get a better understanding of family planning and fertility. How many times did you have sexual intercourse in the last four weeks?	TIMES......................☐☐	
507	How many times in a month do you <u>usually</u> have sexual intercourse?	TIMES......................☐☐	
508	When was the last time you had sexual intercourse?	DAYS AGO...................1 ☐☐ WEEKS AGO..................2 ☐☐ MONTHS AGO.................3 ☐☐ YEARS AGO..................4 ☐☐ BEFORE LAST BIRTH..............996	
509	How old were you when you first had sexual intercourse?	AGE........................ ☐☐ FIRST TIME WHEN MARRIED........96	
510	PRESENCE OF OTHERS AT THIS POINT.	YES NO CHILDREN UNDER 10............1 2 HUSBAND.....................1 2 OTHER MALES.................1 2 OTHER FEMALES...............1 2	

26

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP TO
601	CHECK 315: NEITHER STERILIZED ☐ HE OR SHE STERILIZED ☐ ──────────────────		→606
602	CHECK 104A: CURRENTLY MARRIED ☐ WIDOWED/ DIVORCED ☐ ──────────────────		→611
603	CHECK 225: NOT PREGNANT OR UNSURE ☐ PREGNANT ☐ ↓ Now I have some questions about the future. Would you like to have (a/another) child or would you prefer not to have any (more) children? ↓ Now I have some questions about the future. After the child you are expecting, would you like to have another child or would you prefer not to have any more children?	HAVE A (ANOTHER) CHILD..........1 NO MORE/NONE....................2 SAYS SHE CAN'T GET PREGNANT.....3 UNDECIDED OR DK.................8	→609
603A	How many additional children do you want?	NUMBER OF CHILDREN............ ☐	
604	CHECK 225: NOT PREGNANT OR UNSURE ☐ PREGNANT ☐ ↓ How long would you like to wait from now before the birth of (a/another) child? ↓ How long would you like to wait after the birth of the child you are expecting before the birth of another child?	MONTHS...................1 ☐☐ YEARS....................2 SOON/NOW.................994 SAYS SHE CAN'T GET PREGNANT...995 OTHER_____996 (SPECIFY) DK........................998	→609
604A	CHECK 216 AND 225: HAS LIVING CHILDREN OR PREGNANT? YES ☐ NO ☐ ──────────────────		→609
605	CHECK 225: NOT PREGNANT OR UNSURE ☐ PREGNANT ☐ ↓ How old would you like your youngest child to be when your next child is born? ↓ How old would you like the child you are expecting to be when your next child is born?	AGE OF CHILD YEARS...................... ☐☐ DK.........................98	→609
606	Do you regret that you (your husband) had the operation not to have any (more) children?	YES.............................1 NO..............................2	→611
607	Why do you regret it?	RESPONDENT WANTS ANOTHER CHILD..1 HUSBAND WANTS ANOTHER CHILD.....2 SIDE EFFECTS....................3 OTHER REASON_____ (SPECIFY)	→611

27

233

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP TO
609	Have you and your husband ever discussed the number of children you would like to have?	YES.............................1 NO..............................2	
610	Do you think your husband wants the same number of children that you want, or does he want more or fewer than you want?	SAME NUMBER......................1 MORE CHILDREN....................2 FEWER CHILDREN...................3 DK..............................8	
611	CHECK 216: NO LIVING CHILDREN ☐　　HAS LIVING ☐ 　　　　　　　　　　　　CHILDREN If you could choose exactly　If you could go back to the number of children to　the time you did not have in your whole life,　have any children and how many would that be?　could choose exactly the 　　　　　　　　　　　　number to have in your 　　　　　　　　　　　　whole life, how many 　　　　　　　　　　　　would that be? RECORD SINGLE NUMBER OR OTHER ANSWER.	NUMBER.................☐☐ OTHER ANSWER_____96 →701 　　　　　(SPECIFY)	→701
611A	How many boys and how many girls?	BOYS....................☐☐ GIRLS...................☐☐ OTHER ANSWER_____96 　　　　　(SPECIFY)	

28

234

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP TO
701	ASK QUESTIONS ABOUT CURRENT OR MOST RECENT HUSBAND.		
	Now I have some questions about your (most recent) husband.		
702	Did your (last) husband ever attend school?	YES.........................1 NO..........................2	→705
703	What was the highest level of school he attended: primary, junior high, senior high, academy, or university?	PRIMARY ....1 JUNIOR HIGH SCHOOL..........2 SENIOR HIGH SCHOOL..........3 ACADEMY/UNIVERSITY..........4 DK..........................8	
704	What was the highest grade or class he completed at that level?	GRADE.................. ▢ DK..........................8	
705	What kind of work does (did) your (last) husband mainly do? DO NOT CIRCLE, EXCEPT CODE "00".	NEVER WORKED................00 PROFESSIONAL, TECHNICAL.....01 MANAGERS AND ADMINISTRATORS.02 CLERICAL....................03 SALES.......................04 SERVICE.....................05 AGRICULTURAL WORKER.........06 INDUSTRIAL WORKER...........07 OTHER.......................08 MILITARY MEMBERS............09 DON'T KNOW..................98	→708
706	CHECK 705: WORKS (WORKED) ▢ DOES (DID) ▢ IN AGRICULTURE NOT WORK ▼ IN AGRICULTURE		→707B
707	Does (did) your husband work mainly on his own land or family land, or does he rent land or does he work on someone else's land?	HIS/FAMILY LAND.............1 RENTED LAND.................2 SOMEONE ELSE'S LAND.........3	→708
707A	Does (did) he work mainly for money or a share of the crops?	MONEY.......................1 SHARE OF THE CROPS..........2 DK..........................8	→708
707B	Does (did) he earn a regular wage or salary?	YES.........................1 NO..........................2 DK..........................8	

29

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP TO
708	Since you were first married, how many different communities (desas) have you lived in for 6 months or more?	NUMBER OF DESAS............ ☐☐	
713	I would like to ask you some questions about working. As you know, many women work - I mean aside from doing their own housework. Some take up jobs for which they are paid in cash or kind. Others sell things, have a small business or work on the family farm or in the family business. Before you married your (first) husband, did you ever do any of these things or any other work?	YES..............................1 NO...............................2	
714	Since you were first married, have you ever worked?	YES..............................1 NO...............................2	
715	CHECK 713 AND 714: EVER WORKED ☐ NEVER WORKED ☐		→718
716	Are you currently working?	YES..............................1 NO...............................2	
717	What is (was) your (most recent) occupation? That is, what kind of work do (did) you mainly do? _____ _____ _____	PROFESSIONAL, TECHNICAL........01 MANAGERS AND ADMINISTRATORS....02 CLERICAL.......................03 SALES..........................04 SERVICE........................05 AGRICULTURAL WORKER............06 INDUSTRIAL WORKER..............07 OTHER..........................08 MILITARY MEMBERS...............09	
718	RECORD THE TIME	HOURS...................... ☐☐ MINUTES.................... ☐☐	

30