

FERTILITY, HOUSEHOLD SIZE AND UNEMPLOYMENT IN RURAL INDIA:
A CROSS SECTIONAL ANALYSIS

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Chapter 1

INTRODUCTION

The relationship between human fertility and employment in underdeveloped countries has invariably been studied from the perspective of the effect of high fertility on employment at the aggregate level: the consequences of sustained or slowly declining high fertility in a period of falling mortality on the size of the labour force, on the participation rates and on the rates of unemployment. Such studies have sought to demonstrate that in stagnant societies (where economic opportunities are not expanding rapidly) high fertility results in a very high rate of growth of the labour force and therefore in a very high incidence of unemployment. In short, they implicitly point towards the dangers of "over-population" which, if not the cause of poverty, aggravates the situation. ✓

✓ This perspective is common to analyses which treat the fertility behaviour of any population as given and then examine its consequences. Examples of these are Coale and Hoover (1958), Sinha (1975), and Cassen (1976). Even the traditional three stage theory of demographic transition (based on the observed movements in mortality and fertility in Western Europe between the 18th and 20th centuries) which postulates that with rising incomes, fertility would fall is not free from such an understanding. Rising per capita incomes have implications for fertility behaviour only because they are the result of industrialisation and industrialisation is associated with the rise of rationality and it is rationality which brings fertility within the realm of human control. See Habakkuk's (1972) comments on the "Theory of Demographic Transition."

However the relationship between employment and fertility needs to be studied from the perspective of whether employment or the demand for labour exercises any influence on fertility. This analysis is required in so far as it would indicate whether there is any economic basis for fertility. There are two aspects to such an analysis. First, there have been studies of demographic behaviour in pre-industrial societies of Western Europe which suggest that fertility is adjusted to changing economic circumstances. It would be interesting to see whether such behaviour is in evidence in present day underdeveloped societies as well, as it would then indicate whether or not fertility has been beyond the realm of human control in such societies. Secondly, there have been some village level studies attempting to prove that high fertility is economically advantageous in agrarian societies. But there have been few attempts to examine to what extent or under what conditions such a proposition could be deemed universally valid. Before formulating any hypotheses we shall first make a fairly detailed review of the available literature on this subject, as many of the propositions as stated in these studies, (particularly those purporting to show that high fertility is economically advantageous) have to be substantially modified before they can even be considered theoretically tenable.

II

ADJUSTMENT OF FERTILITY TO CHANGES IN LEVELS
OF EMPLOYMENT

When unemployment is high, one should expect that in order to minimize the effect of economic deprivation, there would be a voluntary attempt to control reproductive behaviour. On the other hand when unemployment is low and consequently the economic welfare of a family improves, the pressures to regulate reproduction may ease.

(However it is not just employment but the level of income as well that will be important in determining the extent of adjustment of reproductive behaviour. Clearly, if incomes are high, changes in the unemployment rate are unlikely to call forth a corresponding adjustment in reproductive behaviour, such adjustments being necessary only when there are sharp changes e.g. a steep rise in the rate of unemployment which results in widespread and acute unemployment. On the other hand, if incomes are low - the low level of incomes arising not only from high unemployment (or high underemployment) but also from low productivity (in the case of the self-employed) and low wages (wage workers) then a higher rate of unemployment implies a further worsening of a family's level of consumption (which

is already low) while a fall in the unemployment rate could perhaps noticeably alleviate such deprivation. It would therefore appear that it is when incomes are low that adjustments in reproductive behaviour would be common while with high incomes, reproductive behaviour would be considerably less responsive to changes in the unemployment rate. This reasoning is equally valid for reproductive behaviour between income classes within any economy as well as between economies which differ in terms of per capita income. In the former case, as high income by providing households with a sufficient margin over subsistence does not require any control of reproductive behaviour. Secondly, the fact that to a greater or lesser extent their incomes are linked to income from property, it provides them with a fair protection from any worsening in the extent of availability of work. On the other hand among households whose incomes are low and linked to employment and not to property, the adjustment mechanism should be most prevalent, for it is in households which own little or no property that any change in the availability of work will have a definite impact on consumption levels. Similarly in an economy where the vast majority of the population earns a very low per capita income the tendency for reproductive behaviour to adjust itself to changes in the unemployment rate would be more common than in an economy

where incomes are, in general, higher.

Hence in an underdeveloped country like India where low productivity is a characteristic feature of the economy and incomes correspondingly low and an overwhelming majority of the population - wage labour as well as poor peasant households - depends for its income on the prevailing demand for labour ^{2/} one should expect that

(i) when unemployment is high (low), fertility will be low (high)

and (ii) changes in the rates of unemployment would lead to changes in the opposite direction in the overall rates of reproduction.

Although evidence of such an adjustment is not, to the best of our knowledge, available for any of the present day under developed countries, there is such evidence for pre-industrial Europe. There are basically three different ways of regulating reproductive behaviour: through changes in (i) the average age at marriage (ii) the

^{2/} Although demand for labour is strictly relevant only to wage workers, even in the case of poor peasants work on farm and income derived therefrom tends to be more or less fixed and it is work available outside which contributes to the variable part of income. Demand for labour is not relevant for other agrarian classes.

nuptiality rate (iii) marital fertility.^{3/}

The possibilities of adjustment of age at marriage and nuptiality to changing economic conditions had been noted even by Adam Smith and Malthus. Habakkuk cites their comments on a rising demand for labour which by raising the wage rates and/or by lowering the rate of unemployment leads to a lower age at marriage, while in periods of severe unemployment and low wage rates, the average age at marriage rises. This direct relation between demand for labour and age at marriage was, of course, linked to the West European tradition of formation of a separate household on marriage. There marriage was dependent on the couple's ability to earn a sufficiently large income to

^{3/} It may appear that conditions which cause movements of one of these factors in a particular direction must also cause related movements of the other factors resulting in a high or low birth rate as the case may be i.e. (i) a low age at marriage associated with near universal marriage of women and high marital fertility leading to a high birth rate (ii) a high age at marriage, widespread prevalence of spinsterhood and low marital fertility leading to a low birth rate. There has been evidence showing, for example, that a lower age at marriage is associated with almost universal marriage, and ~~what was~~ (See Hajnal (1965) where he talks of 'European' marriage patterns of a high average age at marriage and low nuptiality and 'non-European' marriage patterns of low average age at marriage and high nuptiality.) But this need not always be so - a rise in the average age at marriage may be the result of a higher nuptiality. "If we suppose that some people are prone to marry and some inclined to celibacy, the average age at marriage will rise if circumstances induce celibates to overcome their inclinations, even though the marriage prone continue to marry at the same age as before" - See Habakkuk op.cit page 97. The relationship between age at marriage and marital fertility also need show

support themselves. However, to the extent that the extended family household which permits a low age at marriage as well as high nuptiality is a fairly common phenomenon in India, such an adjustment would come about more from variations in marital fertility than through changes in the average age at marriage or extent of nuptiality.^{4/}

Although the evidence of adjustment of reproductive behaviour to changes in economic conditions in pre-industrial Europe is mainly in terms of changes in the average age at marriage and extent of nuptiality rather than in marital fertility behaviour, there is some isolated evidence of birth control within marriage accompanying a worsening in economic conditions. For example, Andorka (1977) links the changes in fertility behaviour in Hungary between 1700 and

contn. of footnote 3

no systematic relationship; in pre-industrial England a rise in age at marriage was associated with a fall in the number of births/marriage; while with the spread of modern birth control in the late 19th century, where births were controlled, marriages were early, (the births being concentrated in the early years of married life)

^{4/} The view that a joint or extended household is a characteristic of rural households has been questioned by Dandekar and Unde (1967). They use the headship rate (defined as the proportion of the married men or women in a given population who are heads of households) as an index of the degree of prevalence of extended or joint households. This index, computed for various states, is on the average about 60% - 80% in rural households for 1961 and much higher for all households (rural and urban combined) in 1951. (A figure of 100% would mean that all households are single couple or nuclear households) But an extended household consists not only of married couples and their young children but of unmarried adults as well as the widowed. The inclusion of such persons would (by increasing the magnitude of the denominator) lower the headship rate.

1867 to the extent of availability of 'serf-plots' for cultivation by the peasants. The period 1700-1787 witnessed early marriages, low celibacy and high fertility while in the subsequent years of this 'late' feudal phase (between 1787 and 1867) a fertility declined dramatically though early marriages and low celibacy levels continued. In the first period, with a large amount of hitherto uncultivated land available for cultivation, peasants could easily obtain 'serf-plots', while in the second period, growth of population accompanied by restriction of the serfs' access to pastures reduced the allocation of land to serfs. Andorka argues that the decline in marital fertility between 1787 and 1867 cannot be viewed as an adjustment of fertility to falling mortality - fertility did decline but its fall was insignificant compared to the fall in mortality - but was rather the result of decreasing availability of land which would have led to a deterioration in the level of living of the serfs if birth control was not practised.^{5/}

In the case of England, though Habakkuk stresses the role of age at marriage rather than birth control as a

^{5/} The persistence of early marriages and almost universal marriage in these changed circumstances can perhaps be explained by the continuation of the existence of the extended household in Hungary i.e. marriage was not linked to formation of a separate household.

mechanism of demographic adjustment to economic changes, he does acknowledge that in the century before the industrial revolution, the growth of the economy "exerted some stimulating effect on births". The numerous economic depressions during the 19th century are also believed to have had a depressing effect on the number of births both by delaying marriages and by restriction of births within marriage.^{6/} Levine's (1977) research on family formation during the phase of 'nascent' capitalism in England during the 17th and 18th centuries also throws light on this adjustment mechanism. The thrust of Levine's argument is to demonstrate that "the ebb and flow in the demand for labour in nascent capitalist industry and agriculture acted as a powerful disequilibrating factor in the demographic equation": the disequilibrium (between births and deaths) was caused by the increasing proleterianisation and pauperisation of peasants and artisans.^{7/} But Levine's study of four villages

^{6/} "There were signs in the 1820s and 1830s of a fall in fertility which looks in some measure as if it were an equilibrating response to the difficulty of obtaining work. The hypothesis is that, when it was particularly difficult for men to find jobs, bachelors deferred marriages and the married couples were reluctant parents" - Habakkuk op cit p.61-62.

^{7/} Before the onset of capitalism "members of each new generation were expected to wait until their fathers retired or died before assuming any control over their family farms or workshops. For this reason, peasants and artisans adopted a prudent, calculating approach to marriage". Levine op cit p.11 With proleterianisation

in England also shows that this disequilibrium was accompanied by attempts by these proleterians to regulate fertility as the conditions of employment changed. For example, when the local 'framework knitting' textile industry in the village of Shepshed was thriving in the latter half of the 18th century, the average age at marriage was low and marital fertility high in the framework knitting families (engaged in a kind of putting out system). But with a declining demand in the early part of the 19th century, marital fertility declined as the families tried adjusting their lives to their declining fortunes.

III

ECONOMIC RATIONALITY OF FERTILITY BEHAVIOUR

A hypothesis of fertility behaviour in rural areas of underdeveloped countries that has been fairly widely discussed is one which postulates that high fertility confers definite economic advantages on individual families.

contd. of footnote 7

during the phase of nascent capitalism, when there was no longer any question of sons 'succeeding' their fathers or inheriting family farms or workshops, the traditional sanctions against early marriage were weakened. The age at which earnings were maximum was reached early and there was little point in postponing marriage. Age at marriage fell and constraints on marital fertility also weakened as a result.

The basic premise of the argument is that in a rural society where the family is the unit of work and consumption, for most families additional labour power within the family is the only means by which total family income can be increased. Moreover where state sponsored old age security is completely absent it is only the offspring who can provide support in the later years of the parents' lives. A larger family size adds to total income either directly through the incremental earning provided by the offspring or indirectly (when they are still children) by assigning them the simple yet time consuming tasks of grazing cattle, fetching water, collecting firewood etc. and thus relieving the elder members of the family for income ~~making~~ earning tasks.

One can term this hypothesis as a hypothesis of 'economic rationality' of fertility. In as much as our earlier hypothesis of adjustment of reproductive behaviour deals with the adjustment of fertility to changes in economic conditions, it also implies that fertility is economically rational. But we will be using the term 'economic rationality' in the sense that fertility decisions are made in a manner so as to derive benefits from the 'economic' value of children and from a large family etc. which is not necessarily implied by the hypothesis of

fertility adjustment which merely postulates that when economic conditions worsen/improve fertility is controlled/relaxed. In other words, the former hypothesis postulates that fertility decisions are made with reference to the income provided by the offspring in their role as earners while no such proposition is either explicitly or implicitly stated in the latter.^{8/} Hence it should be noted that when we refer to the 'economic rationality' of fertility we are referring to a hypothesis which says more than that fertility adjusts itself to changes in economic conditions. We use the term 'economic rationality' only to distinguish between the two hypotheses. There is no implication that one is 'economically rational' and the other is not.

The most well known village level study attempting to demonstrate that there is a definite 'economic rationality' behind high fertility is Mandani's (1972) examination of the reasons for the failure of the birth control programme sponsored by the Rockefeller Foundation and the Government of India in Ludhiana District in the 1950's.^{9/} Based on a

^{8/} Obviously, if fertility is to be 'economically rational' in the sense used here it must adjust itself to changes in the demand for labour and to that extent the two hypotheses set forth above are not mutually exclusive. This is discussed at greater length later in this Section.

^{9/} See Wyon and Gordon (1971). This is commonly referred to as 'The Khanna Study'

series of interviews conducted more than a decade later with the inhabitants of Manupur; one of the villages, brought under the birth control programme, the more important of Mandani's ~~the~~ conclusions are as follows:

1. The advantages of a larger family apply with minor variations to all groups in the rural population - cultivators, agricultural labourers and non-agricultural labourers. This is so because the new technology of cultivation that was introduced in Ludhiana in the early 60's was such that it generated additional demand for labour and it was in every family's interest to have a larger family.
2. For the cultivators, credit facilities accompanying the introduction of the new technology brought the possibility of considerable increases in income from multiple cropping, through greater irrigation facilities, application of fertilisers, use of the new high yield varieties of seeds etc. This also brought with it considerable additional labour requirements throughout the year but with particular peaks during certain seasons when wage rates register sharp increases. Thus for the cultivators it is important to have a large family which can provide the additional labour required and so minimise the hiring of labour (No distinction

is made between cultivators who depend mainly on family labour for cultivation and capitalist farmers who depend largely on hired labour for cultivation). The farmers are aware that large families lead to greater fragmentation of land. But the more immediate problem is the problem of making "a living off the land in his own life time to meet the costs of production in the present generation".^{10/}

3. The additional labour demand has meant that agricultural labourers can earn a higher income but, in as much as the earning capacity is limited by family size, a larger family is beneficial as only then, for example, can it undertake to harvest a larger area and with these higher earnings have sufficient savings for the relatively lean seasons of unemployment.

On the basis of this evidence it is difficult to generalise that high fertility is 'economically rational' in all agrarian economies. High fertility would be 'economically rational' only if the demand for labour is high. Only then would the earners in the family be able to make substantial contributions to the family income.

^{10/} Namdani op.cit p.74.

On the other hand, when the demand for labour is low and there is little work available, there would be no advantage in having a large family. For fertility to be 'rational', it must be related to the prevailing demand for labour, or more precisely, to the rate of growth of demand for labour. It is then obvious that in Mandani's analysis, large families that result from high fertility would be advantageous only if the rate of increase of the demand for labour is high. In Ludhiana, the new technology generated considerable increases in the demand for labour. Moreover, the specific form of technology introduced - "partial mechanisation" as Mandani calls it - generated this demand and made large families advantageous in the short run. But what were the fertility decisions in this village before the introduction of this technology?^{11/} It follows from Mandani's line of reasoning that if the villagers were conscious of the benefits derived from a large family in the current situation, they must have been conscious of the

^{11/} Actually the Khanna study, was spread over 6 years between 1954 and 1960 (with a follow up study in 1969) when various forms of birth control were introduced in selected villages of Ludhiana District. In analysing the failure of this programme, the reasons put forward by Mandani i.e. introduction of the new technology etc. cannot provide an adequate explanation since the new technology was introduced only in the early 60's, when the birth control programme had already ended.

disadvantages of ^a large family in the past (when the demand for labour was lower) and therefore attempted to control their fertility.

In short, if high fertility confers economic benefits in a period of rising demand for labour, fertility should correspondingly be low when the demand for labour falls or for that matter when it does not increase or increases only slowly. However, if in general, fertility does not fall when the demand for labour falls, large families will prove to be a burden rather than an advantage and fertility is really not 'economically rational'. In which case the evidence of high fertility in Manupur on the basis of which Mandani implicitly states that observed levels of high fertility in all under-developed agrarian economies is 'economically rational' could be nothing more than a situation where certain forms of technological changes create additional demand for labour and what was in past circumstances 'under-employed' labour is now fully utilised and there is - as was the case in Manupur - resistance to any form of birth control.

A more generalised variant of this proposition has been put forward by Caldwell (1976^b, 1978) based largely on investigations in Western Africa. Caldwell's 'fundamental'

thesis' is that high fertility in both pre-transitional and post-transitional^{12/} societies is economically rational within the context of socially determined economic goals and within bounds largely set by biological and physiological factors.^{13/} In pre-transitional and pre-industrial societies it is high fertility which is 'economically rational'. But high fertility is caused not so much by the desire to supplement family income as by the need of the 'more powerful' within the family to enjoy material as well as non-material advantages and it is therefore the exploitative relationship within the family which provides the 'rationality' for high fertility, as a rule, in all pre-industrial societies.

Starting from the same premise as Mandani, i.e. that in traditional societies, the family is the unit of work as well as consumption, Caldwell states that high fertility is

^{12/} 'Transition' here refers to the movement from a high-fertility and high mortality situation to one of low fertility and low mortality.

^{13/} Caldwell (1978) p.553.

beneficial to the entire family as well as to its 'most powerful members'. Like Hamdani, he states that large families permit emigration, minimise hiring of labour (for cultivator families) which is particularly important during seasons of intensive agricultural activity when wages reach 'scarcity' levels. But his central tenet is that the incentives towards large families lie in the differing advantages enjoyed by ~~an~~ members according to their position within the family and these advantages are "characterised by both material advantages and advantages in terms of power". They are "advantages in type and amount of labour activity, in services rendered^{14/}..... they include consuming the kind and amount of food eaten, precedence in feeding, the clothing customarily worn..... They include labour, the amount of work done, the kind of work done, the right to control one's own working....."^{15/}

The exploitative relationships within the family in such societies dictate that services be provided by the young to the old i.e. by inter-generational wealth flows from the young to the old and marital fertility is therefore

^{14/} Caldwell op.cit p.555

^{15/} Ibid p.560

consciously uncontrolled.^{16/}

Caldwell's 'Theory of Fertility' framed in this manner does not on first sight, need to answer the questions raised by Mandani's formulation, since the fundamental point is not, as in Mandani's formulation, that additional family labour power increases family income but that by virtue of traditional sanction, heads of large families benefit from the exploitative relationships within the family. The advantage of large families for all the members is only incidental and even this is

^{16/} On the other hand, in developed capitalist economies given the absence of any services provided by the younger members, the families are characteristic by inter-generational wealth flows from the old to the young. Thus the 'wealth flows' are reverse in the post-transitional societies and hence act as incentives towards control of fertility. The transition comes about in advanced capitalist economies as the "familial-based economy" is curtailed with a large proportion of household needs provided by the market and "not by the members of the family as in the past..... High fertility in an advanced capitalist society reduces a family's potential standard of living, while in a peasant society it does not" (Ibid p.566)

left open.^{17/} While uncontrolled fertility leading to large families may in Caldwell's scheme provide definite advantage to the "more powerful" in terms of the kind and amount of work to be done etc., the 'greater' material needs of these persons as well as the subsistence requirements of the numerous other members must be met and large families are not always advantageous unless there are adequate economic opportunities both on and off the family farm to utilise the larger family labour available. Here again the questions unanswered by Mandani weaken Caldwell's hypothesis even if we ignore the more controversial proposition of differential material advantages to different members of the household etc.

^{17/} "Whether as most people in the region believe, high fertility families also prosper more over time than less fertile ones is a question for which adequate longitudinal or retrospective measurement is lacking. No existing data seems to show however, that high fertility families are at present poorer on a per capita basis" (Ibid p.562). But there is data showing that for developed as well as underdeveloped countries large families though having a larger total income than small families are poorer on a per capita basis. This has been well documented in the case of India and appears true for other countries as well. Kusnets (1976) provides such evidence for the USA, Germany, Israel and Taiwan. However it is debatable if such evidence can be used to refute the proposition that large families are better off than small families. This is discussed below.



If as Mandani states large families are advantageous to all the members of a family, then it would imply that per capita expenditure or per capita income must be higher in large families. But the ~~str~~ evidence (e.g. visaria 1973) shows that in India the reverse is true: in a given expenditure class the per capita expenditure is higher in small rather than in large families. However such evidence is an average of households where the earner-dependent ratio is low as well as of those where it is high. It is the latter case (where a couple's children have become adults) that is more relevant to the proposition that a large family is better off than a small family. In other words, in the short run though children also contribute to the family income, in certain ways they may be a burden; but when they are adults the reverse is true. Hence a comparison of average per capita, expenditure between large and small families cannot be used to refute this proposition. This is particularly true in a 'young' population like the Indian population where the age composition will be weighted heavily in favour of younger age groups in a majority of the households. ^{18/}

^{18/} In developed countries like the US or Germany where the per capita income in small households is higher than in large households (Kuznets op.cit.), the population is not 'young' as in India. However no one argues that the proposition that large families are better placed than small families is relevant to developed economies.

The basic defect of the studies we have reviewed is that the possibility of variations in fertility in both directions is not considered. If there are economic advantages arising from high fertility, then fertility should vary as economic conditions change over time or differ between regions. Moreover, changes in mortality over time mean that if fertility remains constant, the rates of natural increase would change, which in turn mean changes in the family size. Therefore, if there is a notion of 'desired family size' as there must be if fertility is 'economically rational', then changes in mortality must affect planned or expected fertility behaviour. In a regime of falling mortality, as is the situation in almost all underdeveloped countries at present, it is not enough to talk, as Mandani and Caldwell do, of 'high fertility' or 'large families'. Fertility cannot, independently of movements in mortality, remain indefinitely at a 'high' level. The influence of mortality changes, as well as the speed and extent of such changes on fertility behaviour are, however, not dealt with by Mandani and Caldwell.

A discussion of these aspects of fertility behaviour makes any formulation of a hypothesis of 'rationality' of fertility much more complicated but it does make it more

realistic. We shall attempt such a formulation in the next chapter before trying to empirically examine it.

IV

In as much as we are dealing with a hypothesis which not only postulates that when unemployment is high/low, fertility is low/high but also states that fertility responds (in the opposite direction) to changes in unemployment levels, we are in effect dealing with an inter-temporal hypothesis which needs to be tested with inter-temporal data. Moreover, an inter-temporal analysis is necessary in as much as there may be (as we shall see in the next Chapter) lags in adjustment of fertility behaviour to changes in both mortality and economic conditions. Thirdly it would also throw light on whether such adjustments take place in response only to long run (or permanent economic changes) or to short run fluctuations as well. These aspects cannot be brought out in a cross sectional analysis. For these reasons, in order to test the empirical validity of both the relationships - the adjustment of fertility to changing levels of employment and the 'economic rationality' of fertility behaviour - we should study fertility behaviour

in a region (or a group of socio-economically dissimilar regions) over a relatively long span of time.

But it is well known that relatively reliable demographic data are available (from the Sample Registration Scheme) only for the past decade. The annual figures of registered birth and death rates that are available for a much longer period are grossly underestimated and the degree of underestimation also varies between states, rendering these data quite unsuitable for analysis. For this reason we are compelled to restrict ourselves to an inter-state analysis in the years for which adequate data are available. To the extent that any lagged adjustments exist and demographic behaviour may not respond uniformly to both short run and long run economic changes this cross-sectional analysis would have only limited validity.

We restrict ourselves to an analysis of fertility behaviour in rural India for two reasons. The first is that the 'economic rationality of fertility' hypothesis is relevant only where work is distributed among different members of the household, each member being assigned a specific task - i.e. where the family is the production as well as the consumption unit - and this is perhaps

more true of conditions of rural rather than urban India. Secondly, as mentioned at the beginning of this Chapter, we are interested in studying to what extent economic forces affect fertility and a relationship between employment and fertility would indicate that fertility is not determined by tradition and custom alone. To the extent that such traditions are loosened in urban India, evidence of any relationship between fertility and employment in rural India would be stronger proof that tradition and custom alone cannot explain fertility behaviour.

In the next Chapter we shall examine, separately, the two aspects to the relationship between fertility and employment. In Chapter 3 we shall examine the effect of employment and income on the size of agricultural labour and small cultivator households. Conclusions are set forth in Chapter 4.

Chapter 2

FERTILITY AND EMPLOYMENT IN RURAL INDIA: TWO HYPOTHESES

In this chapter we shall first discuss and empirically verify the hypothesis of adjustment of fertility to changes in levels of unemployment. This is followed by a discussion of the hypothesis of 'economic rationality' of fertility.

I

Before proceeding to an empirical examination of the relationship between fertility and unemployment we need to discuss two issues which have important implications for a hypothesis about adjustment of fertility to variations in levels of unemployment. The first question is how responsive is fertility to changes in the demand for labour in a period of high or declining mortality. The second is the validity of the assumption of voluntary control of fertility that is implicit in any hypothesis of fertility adjustment.

Historically, high birth and death rates have been a feature of all pre-transitional societies. The high

death rates that prevailed before the advent of modern medicine and introduction of public health safeguards would have made imperative the maintenance of high fertility, if reproduction of population was to take place. A Malthusian explanation of the association between high mortality and high fertility would be that high mortality was a consequence of high fertility i.e. high fertility was sustained by tradition and when the population increased relative to the available means of sustenance, mortality rose and served as a 'positive check' in bringing population into line with available resources. Even if one were to acknowledge that such an argument has some validity it cannot be denied that mortality independent of the level of fertility would have been high in all pre-transitional societies, characterised as these societies were by the absence of effective means of controlling disease as well as their susceptibility to famines.

Thus, as long as mortality was high, in order to provide for generational replacement of the population fertility necessarily had to be maintained at a high level.^{1/}

^{1/} We are making a reasonable assumption here that at the macro level of the community as well as at the micro level of individual couples there is an identity of interests in maintaining replacement of generations.

The frequent phases of 'crises mortality' - i.e. periods of extra-ordinarily high mortality - caused by famines or a serious epidemic disease, which often lead to a fall in the population, only served to sustain high fertility. It is probable that under these circumstances, crucial importance was necessarily given to the role of fertility in reproduction of the population leaving little room for any adjustment of fertility to the overall level of employment. However one cannot rule out the possibility of (i) a more or less permanent adjustment of fertility to the overall level of the demand for labour in stagnant economies (ii) temporary restriction of births induced by crises like famines^{2/} and (iii) a slow and gradual adjustment of fertility to long term changes in economic opportunities. As we did see in Chapter 1, there is evidence of fertility adjustment in regimes of high mortality; such adjustments perhaps indicating the importance given to fertility regulation as a means of ameliorating poverty. But the relationship between high mortality and high fertility does make implausible (when both fertility and mortality are high) any adjustment of fertility to short run fluctuations in economic opportunity.

We are however more interested in examining the presence of any movement of fertility with changes in

^{2/} See Habakkuk op.cit pp.10-15

unemployment levels in India at present. Mortality in India having declined fairly sharply over the past 50 years and continuing to do so, such an adjustment of fertility is possible without negative consequences for replacement of the population. But declining mortality may result in muting the effect of fertility adjustment. For given the importance of mortality in determining fertility; fertility will have to adjust to changes in mortality as well as to changes in unemployment and a regime of declining mortality the accuracy of couples' expectations about mortality levels would determine whether or not the adjustment of fertility to changes in unemployment is fully effective.^{3/}

^{3/} The importance of mortality in determining fertility indicates that fertility decline cannot precede mortality decline. Though there have been exceptions to this, historically it is mortality which first declined followed with a lag by fertility decline. (France is a well known exception - fertility and mortality declined more or less at the same time in the 19th century). Mortality decline, independent of any other factors contributing to a decline in fertility, would indicate the redundancy of continued high fertility. But the pace of fertility decline would depend not only upon the rate of decline of mortality in the past and the consistency of this downward trend but also on the perception of such a decline. Under these conditions, fertility at a point of time would depend upon expectations of future trends in mortality; these expectations being based on certain perceptions of past and current mortality.

The evidence of lagged adjustment of fertility to mortality at the aggregate level seems to indicate that either out of caution or otherwise, couples tend to over-estimate future mortality levels. This suggests that in a period of declining mortality when the demand for labour either falls or increases, fertility will be higher than if mortality were stable, thus reducing the intended effect of the adjustment of fertility to changes in the demand for labour.^{4/5/}

^{4/} The reduction of fertility when unemployment increases as 'intended' while the increase in fertility when unemployment decreases is not 'intended' but is the result of a relaxation of the pressures to control reproduction.

^{5/} We would then expect the adjustment of fertility to changes in unemployment levels to be most prominent only when couples are aware that mortality is low and stable. It is therefore not surprising that in the USA during the 1950s when mortality was low and stable, fertility changed as the economy passed through a boom and then a depression. Easterlin (1968) has argued that the prosperity of the USA in the early and mid 1950s was a major factor in causing the 'baby boom' of that period, while the recessions in the later years of that decade were accompanied and followed by a marked reduction in the birth rate. This however contradicts our earlier observation that the adjustment of fertility is likely to be relatively less important when average incomes are high. (See pp.3-5 above)

Moreover, the ability of couples to regulate births would also determine whether or not the adjustment of fertility takes place.^{6/} But when modern methods of contraception are not widely practised how prevalent is the regulation of marital fertility? Leibenstein (1975) lists various traditional forms of birth control that have been evident in high fertility countries. They include periods of non-cohabitation, ritual taboo on sexual intercourse on certain occasions, long periods of lactation (which temporarily reduce the fecundity of women), chemical and mechanical as well as non-chemical and non-mechanical means of contraception.^{7/}

^{6/} Such an ability is clearly more important when the demand for labour falls, i.e. when fertility has to be reduced, rather than when the demand for labour increases when pressures to control fertility are relaxed.

^{7/} When such measures fail, self-induced abortions or in the extreme case even infanticide ~~are~~ practised. Leibenstein goes one step further in arguing that a comparison of the biologically maximum possible number of births of 13.3 children over a 30 year reproductive period (The maximum observed number of births is between 10-11 among the Hutterites of America) and the actual values of 5.5 - 6.5 in Africa, Asia and the pre-transition~~ing~~ Europe suggest fertility control. But a comparison of the biologically maximum number of births and the observed levels is not really correct since the observed maximum level of fertility can vary for a variety of reasons other than voluntary control of fertility. Malnutrition, for instance, can induce temporary sterility. It is also possible that biological and physiological differences can be responsible for variations in the actual number of births.

There has, however, been little detailed examination of marital fertility in India or for that matter in any other underdeveloped country.^{8/} in order to determine whether traditionally birth control has been practised whenever it has been necessary to control fertility. But there has been a fair amount of evidence of control of fertility in pre-transitional Europe. However there is also some evidence indicating the absence of control and the debate is by no means settled.^{9/} On the basis of the available evidence one cannot make a categorical statement about the extent of voluntary control of marital fertility in the absence of modern methods of birth prevention. Much more investigation, particularly of fertility in under-developed countries at present is required before making any definite conclusions. However, even if traditional forms of birth

^{8/} There are of course exceptions like the study of Caldwell and Caldwell (1977) of the importance of sexual abstinence in controlling fertility in Nigeria.

^{9/} We have already cited evidence of marital fertility control in late feudal Hungary and in preo-industrial England. The most well known study on fertility control in pre-industrial England is Wrigley's (1966) study of family limitation in the village of Clayton in England between 1538 and 1837, where he found evidence of considerable control of marital fertility. Other studies include Buissinck's (1971) explanation of regional differences in Dutch birth rates between 1800 and 1850 in terms of differences in marital fertility rather than in terms of differences in the average age at marriage, nuptiality or variations in biological or physiological factors. On the other hand, Knodel (1977 & 1978) has done much to prove that no such control did exist and fertility in pre-industrial Europe corresponded to 'natural fertility'. In a study of marital fertility in a group of German villages in the 18th and 19th centuries he found that marital fertility closely corresponded to 'natural fertility'. (See Knodel 1978)

control are commonly practised, they are unlikely to be very effective thus compounding the effect of over-estimation of mortality in raising fertility levels in periods of falling as well as rising demand for labour.^{10/}

To conclude, over-estimation of mortality as well as ineffective means of birth control contribute to raising fertility levels higher than would have otherwise been the case. But this does not imply that under such conditions couples would not attempt to reduce fertility when the demand for labour falls. If anything these factors strengthen the need to reduce fertility.

II

We had stated in Chapter I that in the absence of time series data we have to fall back on a cross-sectional analysis of what is in part an inter-temporal hypothesis - i.e. we will not be relating the adjustment of fertility to changes in unemployment but rather relating inter-state differences in fertility to inter-state differences in unemployment levels. A cross-sectional analysis would,

^{10/} Although the causes of 'surplus' or 'underutilised' in social and economic than in demographic factors, its widescale prevalence in Indian agriculture suggests that a process of fertility adjustment if it does exist has not been very effective.

strictly speaking, suffice only if we can identify and control for the influence of other possible determinants of fertility. In our analysis we shall control for the influence of one such important variable - mortality. There is, however, another problem and that is the problem posed by the possibility of a lagged adjustment of fertility to changes in the rate of unemployment. The unemployment rate may have changed in some regions and not in others; while in regions in which it has changed, fertility may not have fully adjusted itself. In such situations, a cross sectional analysis is quite inappropriate for testing for the presence of adjustment of fertility to the level of unemployment. One way of getting round this problem is to see if in the period preceding our point of analysis, the ranking of states with respect to unemployment has not altered. Substantial differences in terms of growth or decline of unemployment would be reflected in an alteration of the ranking. If such alterations have not taken place the problem created by any lagged adjustment of fertility to changes in the unemployment level would not arise and we may be justified in carrying out a cross-sectional examination.^{11/} Before

^{11/} We would still be abstracting from the effect of minor differences as may exist in inter-state changes in the unemployment rate i.e. differences which do not affect the ranking of states.

doing so we shall discuss the quality of the data since there is a fair deal of controversy about the reliability of the estimates of fertility, mortality and unemployment.

(a) Fertility: The most reliable estimates of fertility are those obtained from the Sample Registration Scheme (SRS)^{12/}. Though re-surveys have indicated some degree of under-enumeration, the SRS estimates are considered fairly reliable and we shall use these estimates for our

^{12/} Other sources for data on fertility include the Civil Registration Scheme which has been in operation for over a century in certain parts of India but the estimates suffer from extreme levels of under-registration, particularly in rural areas. This under-reporting also varies between states and this precludes their use even for ranking of states according to fertility. The National Sample Survey (NSS) has periodically collected data on fertility but the NSS estimates also suffer from under-estimation since recall lapse is quite common. Here again the degree of under-estimation seems to vary between states. (The rank correlation coefficient between NSS estimates of birth rates in 1964/65 and 1965-66 with 1966/67 estimates of the SRS show no significant positive association. On the assumption that the interstate ranking would not have radically changed in one or two years and the SRS estimates were reliable in the very first year of operation of the scheme, a significantly positive association would have enabled the use of NSS state-wise ranks for at least two years). Inter-censal estimates of birth rates can also be derived from the census age distributions. But such estimates are not very useful since, in the first place, they are Average values for a period of ten years and secondly, they are based on the census age composition data which are known to be subject to serious distortions arising particularly from 'digital' preference in reporting of age.

analysis. However, the SRS has been in operation for only a little over ten years and this effectively limits the period of our analysis. Another problem is that the SRS estimates are invariably only estimates of the Crude Birth Rate (CBR is the number of live births/1000 people) and for a precise measure of fertility one requires estimates of measures which are not influenced by the age composition of the population. It is easy to see how regional differences in the CBR or even the Gross Fertility Rate (GFR) can be due not only to actual differences in fertility but due to differences in the age composition of the respective population as well.^{13/} Measures like the Total Fertility Rate (TFR) or Gross Reproduction Rate (GRR)^{14/} are independent of

^{13/} The extent of error possible is well illustrated by Coale (1972): "...the Japanese birth rate of 1956 was higher than the birth rate in the UK in 1961, although Japanese fertility rates at every age were lower..... The source of the anomaly is the difference in the age distribution in the population compared.... Japan had a higher birth rate with a lower fertility schedule because of larger proportion at the child bearing age than in the UK" (pp.10-11). However inter-state differences in India of the age composition are not large enough to cause a serious problem e.g. the range of the proportion of females in the age group 15-44 to the total population is only 19% - 24%.

^{14/} TFR in any year is the sum of the currently prevailing age specific fertility rates i.e. the number of children a woman would have if she passed through her reproductive years exhibiting the age specific fertility rates prevailing in that year. GRR is simply the TFR multiplied by the appropriate sex ratio at birth to give the total number of daughters that would be born.

the age composition. Unfortunately published estimates of the TFR or GRR for all states are available for only two years (1969 and 1972) for which corresponding estimates of unemployment are not available.

(b) Mortality: The problem of inadequate data on fertility is naturally true of mortality as well. But it is slightly more serious in that the absence of a reliable and comparable series of annual estimates of mortality prevents us from taking into account the lagged adjustment of fertility to mortality. It is of course difficult to specify what the period of the lag is as well as the extent of influence of mortality in each of the preceding years on fertility in any given year. But if data were available, one could have as an approximation taken into account the level of mortality as well as its decline over a period of 10-15 years. An adequate proxy would have been the rate of growth of per capita government expenditure on medical and public health. It is almost universally accepted that the introduction of inexpensive public and medical health measures in the Third World countries has contributed to the control and in some cases eradication of a variety of epidemic and endemic diseases (e.g. smallpox) and it

is this which over the past 50 years or so has led to the decline in mortality in these countries.^{15/} Data on state-wise per capita expenditure on public and medical health are available from 1950 onwards, but it is unfortunate that rural and urban expenditure are not given separately. An assumption of a uniform division across states between rural and urban expenditure is too extreme a one and hence we have to rely on an unsatisfactory measure of the influence of mortality. The influence of mortality on fertility in any given year being represented by the average of the Crude Death Rates (CDR)^{16/} prevailing in the immediately preceding three years.^{17/}

(c) Unemployment: There has been a perennial controversy about what the NSS estimates of unemployment do represent and what they do not as well as they should

^{15/} See Habakkuk op.cit and Davies (1956)

^{16/} The CDR like the CBR is affected by the age composition of the population since the age specific death rates vary with age.

^{17/} Estimates of the CDR are SRS estimates.

measure.^{18/} Here we shall consider only two aspects. First, whether state wise NSS unemployment rates with all their shortcomings can be taken to be indicators of the inter-state variations in the availability of work.

Even if NSS unemployment do not correctly measure the magnitude of unemployment, as long as they uniformly underestimate it across states it would, since we are interested in variations rather than the absolute magnitude, suffice for our purpose. But it is difficult to determine whether or not the under-estimation, if any, is uniform across states.^{19/}

In the absence of any other more reliable

^{18/} For a sampling of this controversy see the papers presented at the "Symposium on Concepts and Measurement of Rural Unemployment: Practical Issues and Empirical Findings", Trivandrum, 1976.

^{19/} There would be uniformity of under-estimation only if the measures of unemployment do not reflect the unemployment of one group(s) in the labour force more accurately than another. If they do disproportionately reflect the unemployment of one or more distinct groups, then the probable varying incidence across states of such group(s) in the labour force would render unreasonable any assumption of uniformity of unemployment. Visaria (1978) has found a very close and significantly positive association between the proportion of casual labourers in the labour force and the person day unemployment rate (PDUR) across states. This correlation can be interpreted in two ways. If the framing of NSS questions as well as the interpretations of the responses are such that only open unemployment is considered, then naturally the unemployment rate would reflect more the unemployment of the casual labourers (who suffer the most from open unemployment) than of the entire rural population and the positive association would be nothing more than a statistical artifact - a state with a high proportion of casual labourers will have a higher rate of unemployment. ~~and when~~ (This would be modified to some extent with regional differences in the employment opportunities of casual labourers).

Alternatively, even if the unemployment surveys capture only the unemployment of the casual labour households, it can be argued that their unemployment

.....contd.

↳ under-estimation
of

estimates we shall use the NSS data for our analysis - fully aware that given their possible deficiencies, the results of our analysis are open to criticism.

The second aspect which is of relevance to us is: which measure best reflects unemployment in any region? Of the three measures - Usual Status Rate (USR), Current Status Rate (CSR) and the Person day Unemployment Rate (PDUR) - the PDUR seems to be the best measure. Unlike the other two measures, by considering variations in the employment status within any week it is a measure of underemployment as well.^{20/} In our analysis we have used the PDUR as well as the CSR, since the latter may reflect some permanency in the employed - unemployed status of the members of the labour force.

contn. of footnote 19

is determined largely by the overall demand for labour which in turn affects the degree of availability of work for the entire working population. The rates of unemployment, which would then be influenced by any worsening or improvement of the overall demand for labour, would be indicators of the level of unemployment for the entire population.

^{20/} Since it measures unemployment by taking ~~with~~ into account the changes in the employment status (of those in the labour force) from half-day to half-day during the reference week.

Rural unemployment estimates for the various states are available for only three years 1964/65 (CSR only), 1972/73 and 1977/78 (CSR and PDUR).^{21/} But we shall use only the latter two sets of estimates since the estimates for 1964/65 are based on the Integrated Household Survey of the 19th round and are therefore liable to be subject to a much larger degree of error. Further, the only estimates of fertility and mortality that are available for 1964/65 are the unreliable NSS estimates.

It should be noted that there is a problem of comparability of the 1972/73 and 1977/78 estimates since the former are based on the working population aged 4+ while for the latter only the population between the ages 15-59 is included.

Data on fertility, mortality and unemployment are therefore available for only two periods: 1972/73 and 1976/78.^{22/} The analysis is restricted to states (excluding union territories) for which data are available for all three variables.

^{21/} The 19th, 27th and 32nd rounds of the NSS respectively. The 32nd round estimates are provisional estimates.

^{22/} In 1976/78, unemployment data are for 1977/78 and fertility and mortality data for 1976/77. Both sets of estimates are provisional estimates.

III

Before proceeding to test for the relationship between fertility and unemployment we should, as outlined above, (page 34) besides controlling for the influence of mortality justify a cross-sectional analysis by establishing that the inter-state ranking of unemployment rates has not changed. As is evident from our discussion immediately preceding this ~~time~~ section only a comparison of inter-state ranks between 1972/73 and 1977/78 is possible. The rank correlation coefficients using the CSR \bar{x} ($n = 16$) and PDUR ($n = 14$) are 0.786 and 0.859 respectively. Both are statistically significant at the 1% level. Since the changes in ranking over this short period of five years have not been large we can assume that at least for 1977/78 the presence of any lagged adjustment of fertility would not vitiate the cross sectional analysis. There is however no way of establishing that this is true for 1972/73 as well.^{23/}

^{23/} The rank correlation coefficient of the State CSRs between 1964/65 and 1972/73 is significant at the 5% level (0.625; $n = 16$). But it would be inappropriate to use the 1964/65 data based as they are on the Integrated Household Survey of the NSS.

We shall now examine the association between fertility and unemployment - net of the effect of mortality - in rural India across states. A statistically significant negative association between fertility and unemployment i.e. a high(low) unemployment rate being associated with low(high) fertility would indicate the presence of adjustment of fertility to differences in the unemployment levels. We shall also try to explain the variation in inter-state rural fertility in terms of differences in the rates of unemployment and mortality.

We had earlier argued that in examining the association between fertility and unemployment, the effect of mortality on fertility, (particularly in a period of declining mortality) has to be removed. One way of doing this is with a two-way classification of states with unemployment and mortality as classificatory variables.

Tables 2.1 and 2.2 give the average CBR of each group of states classified according to their respective PDUR (unemployment) and CDR (mortality) for 1972/73 and 1976/78.^{24/}

^{24/} The cut-off points of unemployment and mortality are their respective median values and this is the case for all bivariate classifications presented hereafter.

Table 2.1Average Rural Birth Rates of States according to their PDUR - CDR status in 1972/73

	CDR \leq 14.2	CDR $>$ 14.2
PDUR \leq 5.94%	37.85 (4)	41.40 (5)
PDUR $>$ 5.94%	33.30 (4)	34.25 (4)

1. Figures in parentheses are the number of states in each group

Table 2.2Average Rural Birth Rates of States according to their PDUR - CDR Status in 1976/78

	CDR \leq 15.9	CDR $>$ 15.9
PDUR \leq 6.14%	34.20 (3)	37.88 (4)
PDUR $>$ 6.14%	31.70 (4)	34.07 (3)

Tables 2.1 and 2.2 show that in both periods, for a given range of mortality, a higher/lower unemployment rate is consistently associated with lower/higher fertility. Another consistent and expected pattern is that for a given range of unemployment, a higher mortality is associated with a higher fertility. A similar classification, not presented here, with mortality and unemployment (as measured by the CSR) as classificatory variables also indicates a consistently negative association between fertility and unemployment in 1972/73 and 1976/78.

To test whether this association is significant, partial correlation coefficients (controlling for the influence of mortality) between the fertility and unemployment rates have been computed and presented in Table 2.3. These correlation coefficients are all of the expected sign, but are significant only for the 1972/73 data.

Table 2.3Partial Correlation Coefficient between Fertility
and Unemployment

<u>Variables</u>	<u>1972/73</u>	<u>1976/78</u>
FDUR and BR	-0.6725 *** (17)	-0.2405 (14)

CSR and BR	-0.6069 *** (17)	-0.1545 (14)

1. *** : Significant at the 1% level
2. Figures in parentheses are the number of states.

Multiple linear regression equations of birth rates on unemployment and death rates have been estimated to see how much of the inter-state variation in fertility can be explained by the variation in unemployment and mortality. The estimated equations are of the form:

$$Y_1 = L_0 + L_1 X_{11} + L_2 X_{31} + U_1$$

where Y is the CBR

X_1 is the PDUR

and X_3 is the CDR

and
$$Y_1 = B_0 + B_1 X_{21} + B_2 X_{31} + R_1$$

where X_2 is the CSR

Y_1 & X_3 as above.

The estimated equations for 1972/73 and 1976/78 are presented below.

1972/73

$$Y = 35.2652 - 0.4765 X_1^{***} + 0.3497 X_3^* \quad R^2 = 0.5994$$

(3.4) (1.8365) n = 17

$$Y = 34.2 - 1.8312 X_2^{**} + 0.4140 X_3^* \quad R^2 = 0.5383$$

(2.8617) (2.0710) n = 17

1976/78

$$Y = 19.8234 - 0.0361 X_1 + 0.9735 X_3^{**} \quad R^2 = 0.5046$$

(0.0778) (2.3936) n = 14

$$Y = 22.8648 - 0.1447 X_2 + 0.8416 X_3^{**} \quad R^2 = 0.5326$$

(0.8219) (2.4452) n = 14

1. Figures in parentheses are t values
2. *, **, and *** indicate 10%, 5% and 1% levels of significance respectively in the above equations as well as in all statistical tests hereafter.

The R^2 values indicate a moderate explanatory power of the unemployment and mortality variables. But, as in the case of the partial correlation coefficients between fertility and unemployment, the coefficient of unemployment though having the expected negative sign in all equations is significant only for the 1972/73 data.

IV

ECONOMIC RATIONALITY OF FERTILITY

In Chapter I we saw that the studies purporting to demonstrate that there is an 'economic rationality',^{25/} to high fertility behaviour are open to criticism since they do not take into account conditions under which high or uncontrolled fertility need not confer material advantages on families. We argued that for the hypothesis of economic motives determining fertility behaviour to be tenable one must, since there are variations in the level of the demand for labour, allow for variations in fertility. In other words for a fertility be 'economically rational', it has to be related to the demand for labour. Differences in the demand for labour should then cause differential fertility over time or over space.

Although the evidence is by no means definitive; we did observe in Section III that there is a negative relationship between birth rates and unemployment, i.e. fertility appears to vary directly with the demand for labour.

^{25/} In order to avoid confusion it needs to be repeated here that though the adjustment of fertility to differences in the demand for labour is also economically rational, 'economic rationality' of fertility in the sense used here has a more restricted meaning.

But obviously this observed relationship does not necessarily indicate that there is an 'economic rationality' to fertility behaviour; for while it does indicate that fertility is kept in line with the prevailing demand for labour, one cannot infer that fertility decisions are made with any reference to the income provided by the offspring in their role as earners as is meant by 'economic rationality' in fertility behaviour. The only valid inference one can draw from the results of our empirical analysis is that they are consistent with the hypothesis that when economic conditions worsen, fertility is reduced and when conditions improve, fertility rises.

Hence while there is confirmative evidence about a 'necessary condition' - the condition that fertility should vary with the demand for labour - it still leaves open whether or not there is any 'economic rationality' in fertility behaviour. The answer cannot be found by analysis of secondary data. But it is possible to outline the other conditions under which fertility can be 'economically rational' and also whether or not such conditions are restrictive enough to make improbable any successful efforts to use fertility as a means of for raising individual levels of consumption.

A hypothesis of 'economic rationality' of fertility behaviour implies a notion of 'desired' family size.^{26/} a family size that is planned according to a couple's expectations about future employment opportunities. Since the family size is to be determined by future employment opportunities it means that fertility decisions at any point of time are made with a time horizon of about a generation.^{27/} They are therefore based on expected levels of availability of work over a relatively long period in the future. It can be argued that fertility decisions are not made once and for all at any given point of time but possibly over the entire reproductive life of a couple. Hence a couple can change its fertility decisions in accordance with changes in employment opportunities. But it would still mean that decisions are made with reference to the future and to a period which is not short but long - not a few years but a few decades. It is difficult to affirm that such predictions of the availability of work over long

^{26/} Such a notion of a 'desired' family size could be relevant to any theory of fertility behaviour and is not exclusive to the hypothesis we are discussing here. But it is in this hypothesis that the family size is of crucial importance since it is by manipulation of the family size (through fertility decisions) that a couple is presumed to be able to increase each member's consumption level i.e. depending on the demand for labour a couple decides on the number of children they could have - children who are potential earners.

^{27/} The period between marriage and death.

periods can be made with a reasonable degree of accuracy. Clearly if the expectations of future levels of employment opportunity are on the high side a large family will be a burden rather than an advantage.

A couple's fertility decisions will also have to take into account the expected levels of infant and child mortality.^{28/} For reasons similar to that discussed in Section I of this Chapter, the actual family size can differ (in either direction) from the 'desired' family size. That is, depending upon the over or under estimation of current and future mortality levels - there will be an over or under 'realisation' of the desired family size. We also argued that the over-estimation of mortality is more likely in a ~~past~~ period of falling mortality as at present in India. Thus over-estimation of mortality would result in an actual family size which is larger than the desired family size.

The implications of errors in predictions about the levels of both employment opportunities and mortality are obvious. If couples over-estimate future mortality

^{28/} For a discussion on the influence of infant and child mortality on fertility see Schultz (1969, 1976), Preston ed. (1973).

and employment levels; efforts to use fertility to increase per capita consumption would fail and would only result in a lower rather than a higher per capita consumption. On the other hand under-estimation of both variables would prove beneficial to a family while the same would be true if the over-estimation of one cancels out the effect of an under-estimation of the other.^{29/} Thus the necessary and sufficient conditions for fertility to be 'economically rational' appear to be

- (a) Fertility should vary directly with the demand for labour
- (b) Couples' expectations of future levels of the demand for labour and mortality which form the basis of fertility decisions should not turn out to be over-estimates.

^{29/} There is a paradox here: lower mortality by reducing the number of deaths improves in one sense, the welfare of a family. But when employment opportunities are limited and incomes are low, by increasing the size of the family, a reduction in mortality indirectly contributes to a lower per capita consumption within a family. Similarly a higher number of deaths (i.e. higher mortality) as long as it is not the main earners who die raises the per capita consumption of the surviving members of a family. Throughout our discussion we are perhaps unjustified in viewing the effect of higher (lower) mortality solely in terms of the resulting higher (lower) per capita consumption within the family. However we must emphasize that this is in no way akin to the opinion of some commentators who go to the extent of arguing for a consideration of the 'positive' as well as 'negative' consequences of mortality reducing health programmes (e.g. Preston, 1975). No such inference for policy purposes is implicit in our discussion. The only legitimate inference that can be drawn is not that the negative consequences of a reduction in mortality be considered but that conditions should be created for rapid increases in employment and income. Our focus on the effect of mortality on consumption levels within the family has been only for analytical purposes.

Although we have observed that fertility appears to vary directly with unemployment rates in rural India, we have tried to argue that at present with mortality declining, more often than not there would be an over-estimation of mortality making infeasible any 'economically rational' fertility behaviour. While we cannot make any definitive statement about whether the expectations of the demand for labour are over or under-estimates, the condition that expectations of both mortality and the demand for labour should not be under-estimates appears to be highly restrictive. If this is true then attempts of families in agrarian societies to use fertility for increasing their consumption would be self-defeating.

Whether or not couples would yet attempt to 'economically rational' in their fertility behaviour is a different question. But if in the past such an approach has been adopted in certain agrarian societies and failed as is likely; then it is debatable if succeeding generation would have continued attempting to be 'economically rational' in making fertility decisions. In any case that they attempt to be 'economically rational' in their fertility behaviour is different from stating, as Mandani does, that such fertility behaviour does ex post prove to be 'economically rational'.

We should however note that the economic and social conditions particular to under developed agrarian economies make necessary the maintenance of fertility at a level higher than would have otherwise been the case. The absence of any forms of old age security like pensions makes important the role of children as providers^{of} sustenance in old age. This is but one reason why fertility has to be higher in under developed agrarian economies. However uncontrolled fertility in a period of rapidly falling mortality would in general be inimical to a family's interests and not as sometimes argued a means for increasing the family's welfare.

Chapter 3INTER-REGIONAL DIFFERENCES IN HOUSEHOLD SIZE OF WAGE
LABOUR AND SMALL CULTIVATOR HOUSEHOLDS

If the level of employment influences fertility behaviour then, by implication, the size of households must also indirectly be influenced by the available employment opportunities. However, employment could also have a direct effect on household size since the household size is determined not only by the rate of natural increase within such households but by the rate of partitioning as well^{1/} and this rate of partitioning in certain classes may be influenced by the demand for labour.

It has been hypothesised^{2/} that the rates of partitioning vary from class to class depending upon the incentive or disincentive for families to stay together and these incentives/disincentives are related to the economic circumstances specific to each class. The

^{1/} When b , d and p are the birth, death and partitioning rates in any year, a population of size N increases over the year to $N(1+b-d)$ and the number of households (H) to $H(1+p)$. Hence the rate of increase of the average household size would be $\frac{b-d-p}{1+p}$. See Krishnaji (1979).

^{2/} Ibid

wage labour and poor peasant classes are faced with the pressure to partition since income is low and employment uncertain, intra-family sharing of income is therefore difficult. Moreover, their involvement in the market (as sellers of produce) is limited, and hence there are no economic advantages to an undivided household. On the other hand, for members of rich peasant and capitalist farmer households, there are definite economic advantages in staying together. The size of the holding confers advantages on these households in their involvement in markets as buyers and sellers as well as in obtaining credit. Moreover the number of diverse activities in which these households participate - i.e. not only in production and sale of agricultural produce but in their prior processing, in trade and in transport (ownership of bus and lorry services etc.) - requires the participation of many members of the household in supervisory work. For these reasons, there are economic disincentives preventing partitioning.

Although data on the household size of each of the above classes cannot be provided, we do have data on the average household size in different operational land holding size groups. Reproduced below (Table 3.1) are figures of the average household size in each operational landholding size class. They show a consistent

increase with a rise in the size of the operational holding.^{3/}

Table 3.1

Average Household Size in Different Operational
Holding Classes (1961-62)

Landholding class (acres)	Average Household size	Landholding class (acres)	Average household size
0	4.52	10.00 - 12.49	6.54
0 - 0.49	2.71	12.50 - 14.99	6.70
0.50 - 0.99	4.59	15.00 - 19.99	6.91
1.00 - 2.49	4.77	20.00 - 24.99	7.40
2.50 - 4.99	5.27	25.00 - 29.99	7.24
5.00 - 7.49	5.85	30.00 - 49.99	7.84
7.50 - 9.99	6.13	50.00 +	8.73

Source: NSS Report No.144 (17th Round)

It would appear that the effect of employment or income on household size would be most pronounced in the wage labour and poor peasant households. The pressure to partition in these households, (perhaps more important than the lack of any incentive to stay together) comes

^{3/} The household size in the 0 landholding class is of course fairly large but it is the average of not only landless labour households (where we would expect the household size to be much smaller) but of rural artisans, merchants and even large landowners (who have leased out their land) who do not have any operational holdings.

from the low level of incomes which makes sharing between families within any household difficult. If income were to be larger, clearly the pressure to break up would be less and, other conditions remaining unchanged, household size larger. Secondly as we have argued in Chapter 2 wage labour households own little or no productive assets and the income that does accrue to them is earned solely from the hiring out of family labour. The poor peasant households own some productive assets but here again it is only through family labour in wage as well as self employment that income is obtained. On the other hand, in the case of the capitalist farmer class while the scale of employment (mainly in supervisory activities) in farm and off farm activities is no doubt an important factor in determining household size, it is one among many which include the involvement of these households in markets and the consequent economic advantage of staying together. For the landlord classes, 'employment' is of course, not important, as income is determined solely from the services conferred by ownership of capital like leasing of land, money lending etc. It is therefore in the wage labour and poor peasant households that the effect of

employment or income on household size is likely to be most pronounced, depending as they do for their income exclusively on the use of family labour.

So far we have assumed that there is little difference in the pressure to partition between the wage labour and poor peasant households. On first sight, there is no reason to doubt that in poor peasant households as in wage labour households, it is income which is the critical factor in causing partition. The poor peasant's income is also derived solely from employment of family labour, the only difference being that income is from cultivation of land in addition to wage income. Income remains low and there should be constant pressure to break up as the household size increases. However the ownership of land should also be important in determining the rate of partitioning. First, since land is the only form of security, there is a natural tendency to cling to whatever little land is available. Second, the average size of the landholding is undoubtedly very small and this makes further fragmentation, that follows from partitioning of the household, extremely unattractive. Under these conditions, though the pressure to partition as a result of low incomes continues to remain high, the actual rate of partitioning relative to that of wage labour households is likely to be less.

Hence the rate of partitioning among poor peasant households should be determined both by the size of the holding as well as by income.

Cross sectional data on household size and income of wage labour and poor peasant households show that while the size of household income between these two classes shows little systematic difference, the household size is almost always larger in the poor peasant households. Tables 3.2 and 3.3 provide data on the average household size and income of wage earner, and small cultivator^{4/}

Table 3.2
Average Household Size in Wage Earner and Small Cultivator Households

State	Small cultivators	Wage Earners	State	Small Cultivators	Wage Earners
Assam	4.77	4.47	U.P.	4.30	4.10
Bihar	4.58	4.14	Gujarat	5.31	4.66
Orissa	4.23	3.64	M.P.	4.42	3.76
West Bengal	4.57	4.30	Maharashtra	4.80	4.54
Maryana	5.59	4.67	A.P.	4.15	3.75
Punjab	4.93	4.89	Kerala	4.94	5.04
Rajasthan	4.40	3.61	Mysore	4.65	4.11
			Tamil Nadu	3.97	3.64

Source: NSS Report No.233 (25th Round)

^{4/} In the NSS (25th Round) on 'weaker sections of the rural population', data have been collected separately for 'small cultivators' and 'non-cultivating & wage earners'.

....contd.

Table 3.3Average Annual Household Income (in Rs) of Wage Earners and Small Cultivators

State	Small Cultivators	Wage Earners	State	Small Cultivators	Wage Earners
Assam	1575	1663	U.P.	1080	1273
Bihar	1051	1001	Gujarat	1413	1385
Orissa	883	814	M.P.	995	1011
W. Bengal	1303	1193	Maharashtra	1302	1284
Haryana	2570	2044	A.P.	1031	1024
Punjab	2430	2599	Kerala	1267	1556
Rajasthan	1154	1281	Mysore	1161	1083
			Tamil Nadu	967	912

households across states.

While income of small cultivator households is higher than that of wage earner households in only 8 out of the 15 states; the average size of small cultivator households is, except in the case of Kerala, always higher. This suggests ^{the} that rate of partitioning and/or the rate of natural increase

contd. of footnote 4

Small cultivation households are defined as the 'lowest 10% of the households having some cultivated land' and deriving the major part of their income from agriculture. This group of households corresponds to the class of poor peasants whose income is drawn from cultivation as well as from wage labour. Non-cultivating wage earner households defined as those who derive most of their income from wage labour are, of course, the wage labour households.

in small cultivator households are relatively lower and/or higher respectively than that in wage earner households. And as argued above a lower rate of partitioning is likely as a result of ownership of land by these households which provides a disincentive to partitioning.

However it should be noted that though for the class of poor peasant households as a whole, the ownership of land would act as a deterrent to partitioning, this does not mean that among such households, the rate of partitioning is lower when the landholding is smaller in size. On the contrary, a higher rate of partitioning is to be expected as the pressures to partition would be greater when the landholding is small rather than large in size. Secondly, while income may not be as important a determinant of the rate of partitioning in poor peasant households as it is in agricultural labour households, the low income of the poor peasant households would still exert pressure to partition. Hence variations in household size of poor peasant households would be directly related to the size of the landholding as well as to the household income.

II

We shall now examine the association between income^{5/}

^{5/} We use 'income' rather than 'employment' for two reasons. First, income would reflect better the capacity of the earners to provide for the subsistence needs of the households. Secondly, as we shall argue below, we need to express this in terms of 'per earner' ability or inability to do so and since this cannot be expressed as the 'rate of unemployment/earner' we express it as 'income/earner'.

and average household size of wage labour households across various regions in India.^{6/} Inter-regional variations in household income should be accompanied by inter-regional variations in the average size of these households. In other words, a higher (lower) income should reduce (increase) the pressure to partition and the average size of households would be larger (smaller). In the case of poor peasant households, variations in average household size should be accompanied by variations in the average size of landholdings as well as by variations in income.

It needs to be mentioned here that to examine the effect of income on household size it is not the relationship of total household income with household size that needs to be studied, but the relationship between income per earner^{7/} and the household size. A larger household implies an increase in the number of potential earners and therefore a probable larger total income. Hence it would not be clear if household income is larger (smaller) because the household size is larger (smaller) or vice versa. But differential pressure

^{6/} Since the average household size is also determined by the rate of natural increase we shall examine this association net of the effect of the rate of natural increase.

^{7/} Income per earner being defined as the ratio of total household income to the total number of earners within a family.

to partition must arise from differences in the ability or inability of the earning members of a household to support the entire household and therefore to mitigate or increase the pressure to break up. Hence, 'income per earner' is a more appropriate indicator of the degree of pressure being exerted on the household.

In studying regional variations in the household size of poor peasant and wage labour households, one has to also consider the possibility of differential rates of natural increase across regions as such differences in the rate of natural increase as may exist could contribute to differences in household size across regions. Moreover differences in the rate of natural increase may exist not only across states but between different classes of the population as well. Hence, in our analysis of household size variations we will have to take into account the possibility of differences in the rates of natural increase across regions: rate of natural increase which are specific to the class of households under consideration.

The hypotheses we have formulated are tested with the use of NBS data collected in the 25th Round (1970/71) survey on 'weaker sections of the rural population'. As mentioned earlier, the small cultivator and non-cultivating

wage earner households surveyed in the 25th round of the NSS correspond to the categories of poor peasant and wage labour households respectively. The survey has presented data not merely for individual states but for regions within each state as well (a total of 56 regions in the various states) and this permits an analysis at a much more disaggregated level. In order to test out hypotheses we need estimates of (a) average household size (b) income per earner (c) size of land holding and (d) rates of natural increase.

(a) Average household size: Under the NSS definition of a household - "A group of persons normally living together and taking food from a common kitchen" - it is not just members of a family (nuclear or joint family) who are included, but possibly permanent farm servants as well. Inclusion of such persons is likely to vitiate our analysis. However it is unlikely that in the class of households we are studying permanent farm servants are commonly members of such households.

(b) Income per earner: The estimates of total income include not only wage income but income (net) from cultivation and other forms of self-employment. Likewise, earners (men, women and children) are defined as those who work for

wage income and are self employed in farm and off-farm activities. However, the labour force participation as well as the relative contribution towards total income between men, women and children varies between regions and 'income per earner' without adjusting for these variations is bound to introduce errors in our analysis. But to make such adjustments, i.e. to 'standardise' the estimates of income per earner, we need information on income earned by men, women and children separately for each region and such estimates are neither provided nor can they be derived from the data published in the NSS reports.

(c) Size of holding: The NSS reports of the 25th Round publish estimates of the size of cultivated land holding - owned plus leased in for the small cultivator class. But these data would not serve our purpose for various reasons. First, it is owned and not leased land that needs to be considered, for, if the size of land holding affects the rate of partitioning of the household then it must be related to the permanency of land ownership^{8/} and for this

^{8/} To the extent that the degree of permanency in tenurial rights could vary between regions, this needs to be modified. If the state of record of tenancy rights can be taken as an indicator of the degree of permanency; then from such data one could perceive if there are such differences. Unfortunately, the distribution of tenancy

the size of owned land is obviously the correct indicator.

Second and more important is the need to measure the landholding in terms of value rather than area. The size of the holding (owned or operational), irrespective of differences in productivity between regions can be a misleading indicator of the disincentive to partition since this disincentive would be related to the productivity or value of the land. The value of land as determined by natural fertility, locational aspects, as well as by man-made factors, is the best possible measure. But there are no data on the value of land holdings (owned or operational). What we do have is the value of total owned assets. We use this as a proxy for the value of owned land on the assumption that differences in total asset value broadly reflect differences in the value of land owned. To make possible comparisons between households of different sizes, we use the value of total assets per capita as an indicator of the value of land owned per capita.

(d) Rates of natural increase: A measure of this characteristic is perhaps the most difficult to obtain. For

contd. of footnote 8

rights between 'recorded', 'not recorded', 'now known' etc. of the small cultivator households that is published in the 25th round reports is of the sampled households only and therefore cannot form the basis for any inference. Moreover if there are regional differences in the possibilities of small cultivators leasing in additional land, then the ease or difficulty with which land can be leased in would correspondingly reduce or increase the pressure to partition. Here we are abstracting from such possibilities.

1970/71 there are no estimates of births and deaths for each regions and for each class separately and one has to therefore look for some other measure which reflects the rate of natural increase. From the data published by the NSS we have a choice between the child: woman ratios and the age composition within the households of the relevant populations.

The child: woman ratio normally defined as the ratio of the number of children in the age π group (0-5) or (0-9) to the total number of women in the reproductive ages (15-44) or (15-49) is generally considered the crudest estimate of reproductive behaviour since it ignores infant and child mortality. One can however use it as an approximate indicator of the rate of natural increase since, as a ratio of the number of living children to the total number of women it is an estimate net of infant and child mortality. And, ^{as} infant and child mortality (0-14) account for over 60% of total deaths in rural India^{2/}

^{2/} In general, the percentage distribution of deaths among different age groups depends upon the age composition of the population as well as on the age specific death rates. The age specific death curve is generally U shaped - and particularly so in India - very high for infants, then declines and rises again in the older age groups. In a population, such as the Indian population, where the age composition is weighted heavily in favour of the younger age groups, the percentage distribution of deaths would naturally show that deaths in the younger age groups account for a very high proportion of total deaths. In rural India in the years 1968 and 1969, the deaths in the age group (0-9) accounted for 59.4% and 57.7% respectively, while that of the 0-14 age group 59.5% and 61.1% (Measures of Fertility and Mortality in India' - Government of India', 1972).

the level of overall mortality would fairly closely correspond to the level of child mortality. Therefore, differences in the child: women ratio can be assumed to reflect differences in the rate of natural increase. However a further approximation that is forced by the data is that the age-sex composition figures that are presented are only of the persons in the sample households and not estimates of the entire population. Estimates are presented only of the number of children (0-14) and all women aged 15+. A child: women ratio based on such estimates would naturally be a very crude indicator of the rate of natural increase.

A better measure of the rate of natural increase is perhaps the age composition of the population, more specifically, the proportion of children. The age composition of a population is much more sensitive to the birth rate rather than the death^{10/} rate. This fact along with the concentration of deaths in the younger ages suggest that the proportion of children in the total population would be an

^{10/} ".....birth rates have about ten times as much effect as do death rates on the proportion of a population under 15 years of age.... It is the fact that people are always born at age 0, whereas they die at all ages that gives the birth rate more leverage on age distribution in a cross-section analysis" - Keyfitz (1977) p. 167-170.

adequate indicator of the rate of natural increase.
 (lower)
 In a region where this proportion is higher/the rate
 of natural increase would be higher ~~and lower~~ (lower).
 Hence we take the ratio of the average number of persons
 under age 14 in a household to average household size in
 each region and in each class of households (small culti-
 vator or wage earner) as representing the rate of natural
 increase ~~is~~ specific to that region and to that class.

III

To first establish that differences in the household size are not solely due to differences in the rates of natural increase but are also associated with differences in income per earner and asset per capita, a three-way classification of the 56 regions according to their respective levels of population age composition, income per earner and asset per capita has been constructed. Though according to our hypothesis, differences in asset per capita in wage earner households should not have any impact on household size, we have included it as a variable to study the comparative importance of income per earner and asset per capita in explaining variation in household size between wage earner and small cultivator households. Tables 3.4 and 3.5 give the average household size of regions in each group for the wage earner and small cultivator households respectively.

Table 3.4

Wage Earner Households: Average Household Size according to the Proportion of household size aged 14 and under, Asset per capita and Income per earner in each region

	Asset per capita, A_1 (\leq Rs.207.46)		A_2 ($>$ Rs.207.46)	
	Income per earner Y_1 (\leq Rs.656.14)	Y_2 ($>$ Rs.656.14)	Y_1 (\leq Rs.656.14)	Y_2 ($>$ Rs.656.14)
Proportion of household size aged 14 and under	3.58 (13)	4.14 (4)	4.07 (7)	3.89 (4)
P_1 (\leq 0.4243)	$P_1 A_1 = 3.71$ (17)		$P_1 A_2 = 4.01$ (11)	
P_2 ($>$ 0.4243)	4.11(7)	4.64(4)	4.07(1)	4.62 (16)
	$P_2 A_1 = 4.30$ (11)		$P_2 A_2 = 4.59$ (17)	

Figures in parentheses are the number of regions in each group.

Table 3.5

Small Cultivator Households: Average Household Size according to the
Proportion of household size aged 14 and under, Asset per capita and
Income per earner in each region

	A_1 (\leq B.549.32)		A_2 ($>$ B.549.32)	
	Y_1 (\leq B.612.50)	Y_2 ($>$ B.612.50)	Y_1 (\leq B.612.50)	Y_2 ($>$ B.612.50)
P_1 (\leq 0.4436)	4.08 (9)	4.58 (7)	4.62 (5)	4.76 (7)
	$P_1 A_1 = 4.30$ (16)		$P_1 A_2 = 4.70$ (12)	
P_2 ($>$ 0.4436)	4.52 (6)	4.63 (6)	4.51 (8)	5.10 (8)
	$P_2 A_1 = 4.57$ (12)		$P_2 A_2 = 4.81$ (16)	

The above Tables clearly indicate that in both small cultivator households and wage earner households, for any given range of the proportion of population aged 14 and under, there are differences in the average household size between regions belonging to different asset per capita ranges and within each of these ranges, there are differences according to the magnitude of income per earner. Moreover, the differences in average household size are in the expected direction except in two cases. In the $P_1 A_2$ group of regions in the case of wage earner households, the average household size in regions with income Y_1 is greater than those with income Y_2 , when it should have been the reverse. In the case of small cultivator households, average household size of regions in the $P_1 A_2 Y_1$ group is higher than, instead of lower (i.e. because of a lower rate of natural increase), those of regions in $P_2 A_2 Y_1$.

But these are the only exceptions in an otherwise specific and expected pattern. What is surprising is that there are variations in household size with changes in income per earner and asset per capita in both small cultivator as well as wage earner households. We would have expected that in the case of wage-earner households, increases in assets per capita would not be accompanied

by increases in household size.^{11/} That the association of income with household size exists independent of asset size is brought out in a two-way table with income per earner and the average proportion of a household aged 14 and under as classificatory variables. (Table 3.6 and 3.7)

Table 3.6

Wage Earner Households: Average Household Size according to the Proportion of household size aged 14 and under and Income per earner in each region

	Y_1 (\leq Rs.656.14)	Y_2 ($>$ Rs.656.14)
P_1 (\leq 0.4243)	3.76 (20)	4.01 (8)
P_2 ($>$ 0.4243)	4.10 (8)	4.62 (20)

^{11/} Unless even non-land assets such as durables can also prevent partition.

Table 3.7

Small Cultivator Households: Average Household Size according to the Proportion of household size aged 14 and under and Income per earner in each regions

	Y_1 (\leq Rs.612.5)	Y_2 ($>$ Rs.612.5)
P_1 (\leq 0.4436)	4.28 (14)	4.67 (14)
P_2 ($>$ 0.4436)	4.52 (14)	4.90 (14)

To test whether the association (net of the influence of the rate of natural increase) between (i) household size and income per earner and (ii) household size and asset/capita are significant, partial correlation coefficients have been computed and presented in Table 3.8. Two sets of correlation coefficients have been presented - in one (a) holding only the proxy for the rate of natural increase constant and in the other (b) with two of the three independent variables (the rate of natural increase as well as income per earner or asset per capita as the case may be) constant.

Table 3.8

		Wage Earner Households	Small Cultivator Households
A.1	$r_{yx_1 \cdot x_3}$	0.3684**	0.3407**
A.2	$r_{yx_2 \cdot x_3}$	0.0490	0.3937***
B.1	$r_{yx_1 \cdot x_2 x_3}$	0.3964***	0.1822
B.2	$r_{yx_2 \cdot x_1 x_3}$	0.1702	0.2753**

1. \bar{y} = Average Household size, x_1 = Income per earner,

x_2 = Asset per capita, x_3 = Proportion aged 14 and under.

2. *** and **: significant at the 1% and 5% level respectively.

The results more or less confirm our hypothesis:

in the wage earner households, as expected, the association between household size and income per earner is significant in both cases while that between household size and asset per capita is not. However in small cultivator households, though the association between household size and asset per capita is significant in both cases, that between household size and income per earner is significant only when the influence of asset per capita is not removed.^{12/}

^{12/} There is a close and highly significant positive association between income per earner and asset per capita and between household size and asset per capita (0.5105 and 0.4131 - both significant at the 0.1% level). This suggests that when the influence of asset per capita is not removed, the association between income per earner and household size i.e. $r_{yx_1 \cdot x_3}$ could be spurious.

Multiple linear regression equations have also been estimated to see how much of the inter-regional variation in average household size is explained by the corresponding variations in income per earner, asset per capita and the average proportion of a household aged 14 and under.^{13/} The estimated equations are given below. (with 't' values in parentheses)

Wage Earner Households:

$$Y = -0.0856 + 0.0749 X_1^{***} - 0.0405 X_2 + 8.929 X_3^{***}$$

(3.946) (1.147) (8.499)

$$R^2 = 0.6723$$

$$n = 56$$

Small Cultivator Households:

$$Y = 1.6266 + 0.0349 X_1^* + 0.03578 X_2^{***} + 5.5638 X_3^{***}$$

(1.391) (3.085) (2.773)

$$R^2 = 0.5752$$

$$n = 56$$

1. *** and ** and * ; and 10%
significant at the 1%, and 5% level
of significance

The estimated equations confirm our hypotheses about the factors affecting regional differences in average household size:

^{13/} In the case of small cultivator households, though there is a significant and positive correlation between income per earner and asset per capita (0.5105), it is not large enough to cause a problem of multi-collinearity.

- (i) In wage earner households, income per earner is significantly associated with household size variations and as we had hypothesised asset per capita is not.
- (ii) In small cultivator households, variations in both income per earner and asset per capita (our proxy for size of the land holding) are expectedly significantly associated with household size variation.

Before concluding we must note that in our analysis we have assumed that the structure of the households does not vary between regions. The structure of households can take various forms: it can be a simple family household (also referred to as a nuclear family or conjugal family unit) consisting of a married couple with/without offspring, or it can be an extended family household (extending upwards, downwards or laterally) consisting of a 'simple family with additions of one or more relative other than the offspring' or it can be a multiple family household consisting of two or more married couples with their offspring.^{14/} In our analysis of variations in household size, we have not

^{14/} For a description of the various structures of household, see Laslett (1972).

considered such differences in the structure of households across India. It is possible that in certain regions one particular structure may pre-dominate and another in other region etc. Such differences in structure would have definite implications for household size and may be an additional factor in explaining inter-regional household size variations. In as much as these differences in structure could have a definite material basis, their effect on household size should have been captured in our analysis i.e. it is plausible that extended or multiple family households rather than nuclear family households may number more in areas where the income per earner, land holding size etc. are larger. But it still leaves open the possibility that there are other reasons (which we have been unable to identify) behind the differences in structure of households.

Chapter 4

CONCLUSIONS

Studies on the factors affecting fertility behaviour in underdeveloped agrarian economies have, in general, not considered the possibility of fertility responding to the extent of availability of employment. This is not surprising since it is commonly presumed that fertility control is widespread only in developed economies. Such a view is but natural as the conditions deemed necessary for fertility control - a high level of literacy and income, availability, knowledge and acceptance of modern methods of contraception - are to be found only in developed economies. However recent research (Levine and Anderka for example) has shown that in what are now developed economies, fertility behaviour adjusted itself to changes in the economic environment well before the period of rapid industrial and economic development. Such evidence shows that people have not been unaware of the need to make their fertility behaviour correspond to economic changes. There is nothing to suggest that such behaviour

would not be present in present day underdeveloped agrarian economies like India. Our empirical analysis has indicated but not proved conclusively that fertility does respond to changes in the level of employment.

The other aspect of the fertility employment relationship - the argument of 'economic rationality' in fertility behaviour - has generally received relatively more attention since it is commonly posed as a counter argument to policies stressing the importance of population control in under-developed countries. In our discussion on this subject, while arguing that it is erroneous to state that uncontrolled fertility is 'economically rational' in all situations we have shown that village level studies such as that of Hamdani cannot in the first place provide sufficient basis for generalisation. Secondly, based as these studies are on interviews with the villagers there is the danger of equating what could, in some situations, be an ex post rationalisation with ex-ante rationality. More importantly/^{we} have tried to argue that given the uncertainty governing future mortality and the availability of work; ~~and~~ even if fertility varies with economic conditions, it is highly improbable that any attempt to be 'economically rational' in making fertility decisions would eventually turn out to be so.

It would therefore appear that a hypothesis of the responsiveness of fertility to the level of employment is on much firmer ground if it is restricted to a hypothesis of the adjustment of fertility to changes in the availability of work without any reference to the possibility of attaining higher consumption standards by having a larger family. The inconclusiveness of our empirical analysis of the adjustment of fertility to unemployment is not surprising as we had anticipated it when we pointed out the importance of an inter-temporal rather than a cross-sectional analysis.

The level of aggregation at which we examined the various relationships perhaps further contributed to the absence of any definitive results. We can however suggest future lines of study which would throw much more light on this aspect of demographic behaviour.

The phenomenon of fertility adjustment to changes in the availability of work is clearly best illustrated by historical investigation at a micro-level. Research in demographic history as is now frequently conducted of European villages is based on a 'reconstitution' of the births and deaths from the parish registers which at times give baptisms and burials from as far back as the 16th century. Such sources of demographic data are obviously unavailable in India except

in areas which have been populated predominantly by Christians. However, certain districts in India did and continue to have a fairly efficient civil registration of births and deaths.* If information of the economic history of such villages is also available it is possible to make detailed 'demo-economic' studies similar to those by Levine and Wrigley of W. European villages. One would then be able to discern to what extent reproductive behaviour was affected by changes in the economic environment, whether it responded only to long run changes or to short fluctuations as well, the speed of adjustment and the corresponding effectiveness of adjustment. If sufficiently detailed historical material could be located one could even see for example, to what extent local changes in the organisation of production in traditional industries were produced by demographic and economic changes.^{1/}

In discussing the response of fertility to unemployment we assumed that the extent of adjustment of fertility would not differ between classes. Such an assumption may be erroneous as it is among classes who depend upon income

^{1/} Such changes took place in the framework knitting industry in the English village of Shepshed in the 18th and 19th centuries (See Levine, op.cit).

* See ESCAP (1975).

from employment rather than from property that the adjustment of fertility to the level of unemployment would be most common. One can argue that, in general, the pressure to control fertility must be the strongest in the wage labour households, depending, as they do, for their income almost exclusively on wage employment - employment which is characterised by uncertainty as well as by its seasonal nature. If this is true, then regional variations in fertility should be some extent be explained by regional variations in the incidence of wage labour households. It is of course not correct to merely relate fertility differences across regions to regional differences in the incidence of wage labour households. As the regional variations in the availability of work for these households would also influence the level of fertility, such variations must be taken into account while relating fertility variations with differences in the incidence of wage labour households across regions. Unfortunately data on all three variables - fertility, the regional proportion of total rural households who are wage labour households and the extent of unemployment among such households across regions - are not together available for any single year. Once the results of the Rural Labour Enquiry (1974/75) are published in full, it should be possible to undertake such

an analysis.^{2/}

Any hypothesis of fertility adjustment has to conclusively demonstrate (which we have been unable to) the presence of voluntary control of marital fertility. Of course, it is plausible that when mortality is high and therefore the survival rate of children low, such control need be only minimal.^{3/} However evidence has to be provided of an awareness that births can be controlled besides the willingness and ability to do so.^{4/} A related issue that needs investigation is that in order to control reproductive behaviour, whether or not age at marriage and nuptiality have been regulated in India in the past. The tradition of extended households in India may permit a low age at marriage and high nuptiality but with any deterioration in economic conditions, these have to correspondingly adjust

^{2/} From the earlier Rural and Agricultural Labour Enquiries data on the incidence of wage labour households and the extent of unemployment are available but adequate data for the comparable on regional fertility levels are not available.

^{3/} Since the fecundity of women sets an upper limit to the number of children that any woman can have; in extreme conditions of very high infant mortality and/or a very high number of desired children, couples may not even be able to achieve their desired family size. See S.K.Rao (1976).

^{4/} The question that would then arise is what are the factors behind the apparent resistance to the spread of modern methods of birth prevention in India.

themselves. If, as is generally believed, such adjustments have not taken place - one has to explain why this has been the case.

Until further research on these lines has been undertaken the results of our analysis have to necessarily be treated as only inconclusive indicators of the influence of employment on fertility.

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