INEQUALITY AND ECONOMIC MOBILITY: AN ANALYSIS OF PANEL DATA FROM A SOUTH INDIAN VILLAGE



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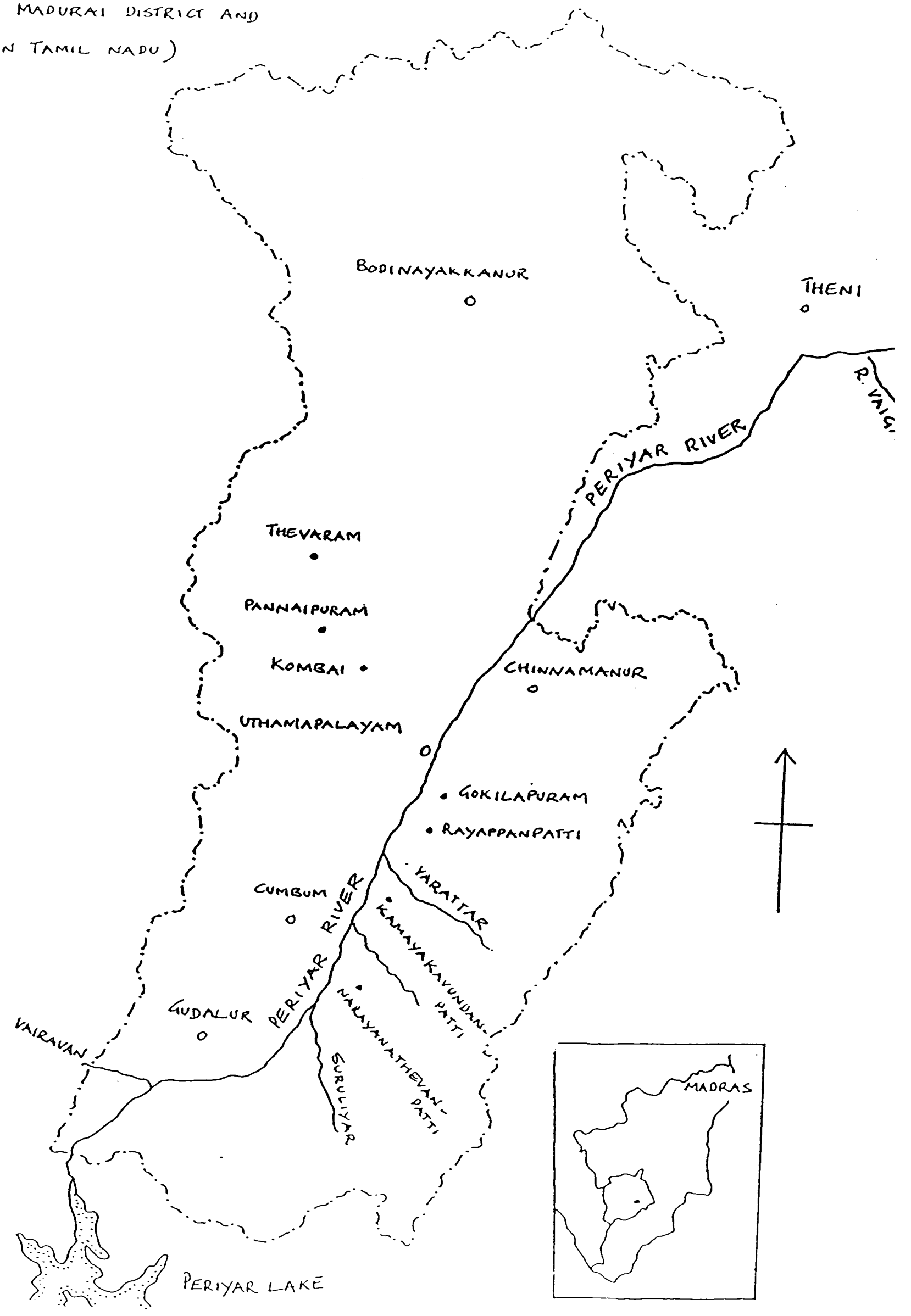
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1

INTRODUCTION

This thesis is concerned with dynamic aspects of the distribution of wealth among rural households. It investigates the characteristics of economic mobility, and examines their implications for the design of economic policy. This thesis is an attempt to examine the properties and characteristics of economic mobility at a theoretical and an empirical level. The thesis is primarily empirical; the empirical material, however, is also used to illustrate and extend methodological issues raised in the literature on economic mobility. Among the issues discussed are the use of panel data in developing countries, and the role of mobility studies in specific areas of growth and development policy, such as the role of the state in the process of accumulation. The thesis also identifies areas for further research in the field of mobility studies. The empirical work is based on primary data collected from a village in south-western Tamil Nadu, India.

1.1 Introduction to Mobility Studies

Studies of economic mobility attempt to analyze the dynamic behaviour underlying aggregate shifts in economic structure. A study based on the comparison of two independent samples, for instance, may show that the share of national income accruing to individuals in the bottom decile of an income distribution has remained constant over time. Mobility studies can help identify the individuals in the bottom decile at two different points in time. Unless the exact composition of the decile is known in the second period, the changes in the well-being of individuals cannot be observed. Since an important concern for economics is the welfare of people, it is important to observe mobility or what happens to the same individuals (and households) in the course of development or of structural changes in an economy.

Mobility studies raise questions that cannot be tackled by an analysis of economic change based on time-series data. These include issues such as: Are households which comprise the rich (poor) constant over time? Do individuals who are born into one economic status remain there? What is the probability of a household in a given situation being able to move up or down?

Interest in the study of economic mobility, both at a theoretical and an empirical level, has grown in recent years. A major part of the research on economic mobility derives from the study of income distribution and, in particular, a concern with changes in inequality over time.[1] The absence of "a bridge between the figures on vertical mobility and income distribution" (Pen, 1971) formed the starting point for Atkinson's (1983) seminal paper on the measurement of mobility. Atkinson used a social welfare function defined over income at different points in time to measure economic mobility. Other contributors to the literature on economic mobility, who have been concerned with earnings and occupational changes, have proposed different methods of measuring economic mobility. Some researchers have emphasized the properties of mobility indices (e.g., Shorrocks, 1978b). Others have looked at underlying determinants of mobility such as inequality in opportunity, or the role of age, sex and race (e.g., McCall, 1971; Schiller, 1977; Joshi and Newell, 1987). Research has also been concerned with specifying dynamic mobility criteria with which to rank income distributions (Kanbur and Stromberg, 1986). The interaction between socioeconomic mobility and growth has been introduced into planning models (Robinson and Dervis, 1977). Each of these contributions has added a new dimension to the study of economic mobility.

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[1] Another area of research on mobility with a slightly different focus is the realm of labour markets, search theory, and job mobility.

On the empirical front, while numerous attempts have been made to compare what Hart (1976) termed 'snapshot' views of a distribution over time, the study of 'movies' is more recent. An important reason for this is the paucity of data designed for longitudinal study. At the same time, however, there have been major and pioneering empirical contributions to this field; examples are the Michigan *Panel Study of Income Dynamics* (henceforth termed PSID, see Duncan, 1984) and the research on inter-generational income in the United Kingdom (e.g., Atkinson *et. al.*, 1978). Panel data relating to indicators of welfare in the developing countries are particularly difficult to obtain. The study of economic mobility in developing countries by means of the collection and analysis of panel data remains an important area for research.

While mobility studies constitute an independent area of enquiry their significance is enhanced by important feedbacks into economic theory and policy. It is these connections with, and implications for, economic theory that impart a special attraction to mobility studies. I shall illustrate some of the ways in which a study of mobility is relevant to general economic issues.

First, the measurement of economic mobility has important implications for other standard economic concepts and their evaluation. The influence of the measurement of economic mobility on studies of inequality can be taken as an example. A substantial part of the theoretical work on mobility derives from a concern with the dynamic properties of income distributions. A welfare function that incorporates both mobility and inequality might well present a radically different picture of an economy than one based purely on static changes in inequality. In Hart's words: "The ranking of two countries, for example, by 'snapshots' of incomes might well have to be reversed when their two 'movies' are compared" (Hart, 1976:1).

Further research on mobility will doubtless identify other areas of economic theory that may have to be modified by new findings on economic mobility.

Secondly, economic mobility and its specific characteristics have implications for assumptions about individual behaviour that are commonly made in economic modelling. To take an example, it is sometimes argued that the expansion of social security is undesirable because it leads to a dependence on welfare payments. The verification of this proposition requires that the beneficiaries of welfare payments be studied over time; it must also be shown that these beneficiaries are common in each time period. The PSID, for example, negated the assumption that children of parents receiving welfare payments also became dependent on welfare grants.

Another example is the assumption that the poor live in large families. The evidence from both cross-section and time-series data from India suggests the opposite, namely that household size rises with total expenditure or wealth. Krishnaji (1984) sums it up neatly: "As total household expenditure or land holding increases, so does the average household size". In other words the rich live in larger households than the poor. When factors relating to economic mobility are introduced the relation between household size and poverty becomes fuzzy. Do households become poor in a particular phase of their life-cycle or do households remain poor irrespective of changes in household structure? Understanding economic mobility can provide insights into the motivation and constraints operating on individual behaviour in the long run.

Thirdly, mobility studies are of relevance to the design and structure of economic policy. This follows from the fact that mobility studies affect our assumptions about individual behaviour and alter the evaluation or implication of commonly-used concepts. One application of studies of economic mobility, for

instance, is to poverty-alleviation programmes, where studies of economic mobility make new categorizations of target groups feasible. By determining how *long* individuals remain in a state of poverty, mobility studies help distinguish between those in chronic poverty from those in temporary poverty. This necessitates the identification of specific indicators of chronic poverty and temporary poverty; the study of economic mobility also helps to design specific policy interventions suitable to each category. In the PSID study, Duncan (Duncan, 1984) points out that since "many policies are designed with a definition of poverty based on annual income and needs, it is crucial to know the extent to which annual figures misclassify the short- and the longer-term poor" (ibid.:34). This distinction may also influence the priorities facing policy-makers. Greater emphasis may be placed, for instance, on the eradication of chronic poverty. By identifying specific characteristics of individuals or households whose economic status is characterized by different degrees of economic mobility (in this example, the characteristics of people in a state of persistent poverty), studies of economic mobility can alter the nature of economic policy in a significant manner.

The relative paucity of longitudinal studies is apparent in Indian studies too. Studies based on panel data are few in number. They include, among others, studies of all-India data collected by the National Council for Applied Economic Research (henceforth referred to as NCAER; analyses of NCAER data are in Adelman *et. al.*, 1985, Gaiha, 1988 and NCAER, 1986 and 1987), studies of occupational mobility in Gujarat (Shah *et. al.*, 1985) and in Bihar (Rodgers, 1983), and a study of farm incomes in Punjab (Junankar, 1986).

Since large-scale macro-level panel data sets are not easily available, micro-level case studies provide the only available source of data for research on economic mobility. Micro-studies are also important in understanding particular situations in a

country marked by considerable diversity. At one level this thesis is an attempt to explore both methodologically and empirically some aspects of economic mobility with reference to a particular micro-data set.

Definition of mobility

In this thesis, the term "mobility" is used in a very specific sense.[2] It refers to the movement of households from one economic status, as defined by the ownership of wealth, to another. The time period of the study is eight years, a period long enough for change to occur in the economic status of households. Mobility can be thought of as having two components: exchange mobility, i.e., the movements occurring when the overall structure or distribution is unchanged, and structural mobility, i.e., movement caused by changes in the aggregate. If we assume that structural changes have been limited over the eight-year period (as will become evident later), the time-frame used in the thesis places a greater emphasis on exchange mobility or individual variations.

The scope for individual mobility is undoubtedly linked to changes in the overall structure of an economy. A distinction between absolute and relative mobility may be useful here.[3] While absolute mobility denotes the mobility experienced by any person in the population, relative mobility refers to the mobility of individuals in a given class *relative* to other classes. Relative mobility can take better account of

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[2] Apart from income mobility other types of mobility have also been of interest to social scientists. These include, social mobility studies that examine social stratification (Goldthorpe, 1987), caste mobility studies (e.g., Srinivas, 1970). Another major body of work relates to peasant mobility and deals with the processes of economic differentiation and polarization (see Shanin, 1972, van Schendel, 1981). This type of research on social and peasant mobility has focussed on long-run historical processes underlying mobility.

[3] A similar idea is used by Goldthorpe (1987) who defines relative mobility rates as those that result when absolute rates are compared to a norm.

structural change. For example, if the poor as a class are expanding then the relative probability of a poor person moving out of this class will be low. In the very short run the rates of relative and absolute mobility may be expected to be quite similar.

There are several grounds on which to expect less mobility with respect to wealth than with respect to income (see section 1.3). Mobility in wealth is more likely to represent a permanent change in economic status. 'Wealth' has been defined, or operationalized, in terms of specific indicators. These are the assets owned by a household and the credit status of a household. The data on mobility in the thesis are supplemented by data on occupational change. As mentioned above, household wealth has been chosen as the indicator of changing economic status.

The relationship between a household's wealth and its ownership of assets is evident enough. Changes in wealth are also closely related to savings behaviour: higher savings would tend to increase wealth. Savings can also be viewed as a function of income, and in a poor economy this aspect of savings is likely to be more important than aspects such as savings as returns to investment. For a household with a low level of income, the marginal propensity to consume is likely to be high and personal savings are therefore likely to be small. Among poor households, then, access to external finance may be viewed as an important catalyst in the process of asset accumulation. A study of the structure of credit, its availability and cost, thus ties into a study of wealth-mobility. So also would any other process affecting income generation, but given a large number of poor households the emphasis on credit is not misplaced. Furthermore *the thrust of government anti-poverty policy has been the attempt to create income-bearing assets with the poor by means of credit market interventions*. In examining wealth-mobility in this thesis we shall look specifically at the links with credit and at the effects of market structure and the role played by government intervention.

1.2 The Main Issues

Let us turn to some of the specific issues raised in this thesis. The investigation begins with the question of aggregate changes in the distribution of wealth. Do such changes represent a tendency towards polarization or towards equalization? The pattern of change in inequality in wealth is an important signal of the nature of the accumulation process since the observed measure of control over productive resources also embodies the potential for future growth.

The study village, Gokilapuram, is located in a region with a large modernizing and commercial agricultural sector. Although agricultural growth and productivity have not been investigated in detail here, changes in inequality provide an interesting insight into the distribution of gains from growth. Has there been any trickle-down or have new opportunities been seized only by richer households?

I have attempted a critical survey of the literature on mobility measurement. This survey is in chapter 3. The objective of this review is to identify measures that are suited to an application of mobility analysis to a village economy and developing country. An estimate of the degree of mobility can be based either on some objective standards or derived from a normative approach. The latter, which incorporates the preference for mobility into a social welfare function and then ranks alternative mobility patterns (as in Atkinson, 1983), is not pursued in detail. Our purpose has been to identify indices of mobility that satisfy certain properties and provide a good *description* of the pattern of mobility, so as to arrive at positive or descriptive measures of mobility. However, this does not imply that these measures are value-free. In fact a measure is proposed which attaches special weight to mobility among

the poor. A set of measures is estimated to identify aggregate mobility in our panel data set.

How is the extent of economic mobility to be assessed and valued? An interest in promoting greater equality of access or 'openness' in society would suggest imputing a positive value to economic mobility. Mobility has been shown to lower long-run inequality (Shorrocks, 1978a). The maximum choice set for each person would arise under conditions of perfect mobility, i.e., where each individual could avail of opportunities to attain any of the feasible income states in an economy (see section 3.2 on reconciling perfect mobility and maximum mobility). A critic could argue that such mobility would result in a chaotic and unstable economic structure. While recognizing the limits to mobility, the advantages of providing greater scope for well-being freedom should not be forgotten.[4] The task of valuing mobility is clearly not an easy one.

After obtaining a measure of overall mobility, the next step is to segregate households according to the degree of mobility experienced by them. We propose a four-fold classification that combines a measure of mobility with a measure of relative poverty. Using a relative poverty cut-off line defined in terms of household asset ownership, we identify households which were below the cut-off point in both years (immobile or chronically poor households); households which were below the cut-off point in either year (the upwardly or downwardly mobile); and households that remained non-poor in both years of the study period (the non-poor). This kind of disaggregation further clarifies patterns of mobility and helps to identify characteristics of households with differing longer-run economic positions, e.g., the temporary versus chronically poor.

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[4] The availability of real opportunities to a person is termed well-being freedom by Sen (1985).

Do these four groups have separate and distinct characteristics? In order to answer this question we examine some of the demographic, occupational, wealth and indebtedness characteristics of households in each group. We thus search for some of the concomitant features of mobility as well as consequences of mobility. Our interest in the long-run welfare of individuals leads us to investigate the features of the immobile category in greater detail and ask what type of household remained immobile and why.

The relationship between variables such as household size and labour force participation on the one hand and poverty on the other have been studied quite rigorously on the basis of cross-section and time-series evidence (Krishnaji, 1983, 1984; Lipton, 1983b; Visaria, 1980). Constrained by a small data set, our intention is to set out questions relating to the characteristics of households in poverty that can be tested on larger samples in the future. There is no attempt to generalize from the case of a single village. We also wish to highlight the variety of new questions that can be examined with the use of panel data.

Next we turn to the links between the accumulation of wealth and the availability of credit. The Government of India has identified credit as the means by which new productive assets are to be created for the poor. From 1979 this policy has found expression in the Integrated Rural Development Programme (IRDP), the major national scheme for the alleviation of poverty. This policy can be viewed both as a credit intervention, i.e., one that is aimed at correcting imperfections in the credit market, as well as an anti-poverty measure that involves a direct transfer of resources. It appears to be the latter objective that has been the guiding force behind the

government's initiative.[5] Has this interventionist policy targeted at the 'poorest of the poor' had the effect of reducing disparities in wealth? Has state intervention had a systematic effect on economic mobility? With panel data we have examined changes in the magnitude and composition of household wealth and debt among households that are beneficiaries under the IRDP as well as among non-beneficiary households. From this we have attempted to isolate the role of IRDP in the process of wealth accumulation among the poor.

How has the structure of the agrarian credit market and its functioning influenced wealth-creation and household mobility? This is a particularly interesting question in the present context, since there has been a remarkable transformation of traditional credit markets subsequent to the massive expansion of rural banking and government subsidized credit in the 1970s and 1980s. The major changes in the rural credit market are a weakening of the segmentation between the formal and informal sectors of credit and a lowering of real interest rates in rural areas. Have these changes had a uniform or differential impact on households at differing levels of wealth? Has it strengthened or weakened the tendencies towards polarization? This thesis attempts to answer these questions by examining the impact of structural changes in rural credit on different groups of households, in particular on the immobile or chronically poor category of households.

1.3 The Data Set

Empirical analysis in this thesis draws on both primary and secondary sources of data. Details of these are provided in the next two sections. The following two

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[5] For example the plan documents which describe the programme and the numerous official evaluation reports focus on the income and assets of the poor and not on the impact of the cheap credit policy on the credit market.

sections discuss the advantages and disadvantages, general and specific, of using panel data.

1.3.1 Sources of Primary Data

I was fortunate to acquire a data set that appears to be unique in the context of village-level research on mobility in South India. The data from a socioeconomic survey of Gokilapuram village undertaken in 1977 by a group of researchers from Madras were made available to me. In 1985, I re-surveyed a sub-set of households from this village and acquired an update on certain aspects of the village economy. I obtained eight-year panel data for 83 households resident in Gokilapuram. The total number of persons in the panel households was 458 in 1977 and 447 in 1985.

The principal source of data for this thesis is material collected personally from the village of Gokilapuram. The fieldwork was undertaken in the course of a research project aimed at studying certain economic (particularly credit) relationships at the village level in two contrasting agro-economic regions.[6] While the first village belonged to a relatively backward agrarian region, Gokilapuram, the second village, was located in a region with a relatively advanced agrarian system. It was not a random selection procedure that dictated the choice of village but a generous offer of material from the 1977 benchmark survey of Gokilapuram. This opened up a whole new area of research, namely on movements over time, and made it a desirable choice.

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[6] My research in Madurai district began in November 1984 under the aegis of a project on 'Credit for Rural Development in Southern Tamil Nadu' undertaken jointly by the University of Reading and Tamil Nadu Agricultural University. Residence in the first village was taken up in January 1985 and continued through to May 1985. After a three-month interval I collected data in the second village, Gokilapuram, from September 1985 to December 1985.

Gokilapuram village is in the Cumbum Valley, an area of relatively advanced agriculture. The Valley roughly coincides with Uthamapalayam taluk which is in Madurai district, Tamil Nadu. In the Valley, there is a relatively stable sector of high-yielding paddy cultivation on surface-irrigated land and a diversified commercial cropping on land irrigated by groundwater. The area also has a relatively well-developed system of agricultural extension, a well-developed transport and infrastructural base, and relatively wide credit coverage.

The complete census-type enumeration of households that was undertaken in 1977 was not repeated in 1985 since the basic features of the system of ownership of land and other resources, of the labour market and aspects of the credit market, and of the nature of productive forces, were made available from the earlier baseline survey. The task was also not feasible given our time and resource constraints. Instead, 90 households from the house-listing of 1977, i.e., 14 per cent of the original list of 650 households, were re-interviewed. The households were selected approximately in proportion to the socioeconomic stratification of 1977. An exception was made in the case of landlords, from among whom a larger number of households were purposely included.[7] Within each socioeconomic category, after the total number of households was decided, the selection was random. Seven households had to be dropped from the final panel due to incomplete data and an inability to obtain a correct matching of households over time. The distribution of households by socioeconomic strata in the original survey, in the 1985 sample and in the panel data set are shown in Table 1.1 below. Categories in 1985 are defined as closely as possible to earlier definitions.

[7] These constitute rich households with large external borrowings and it was in order to explore the relations with the formal sector of credit that such a selection was made.

TABLE 1.1: DISTRIBUTION OF SURVEY HOUSEHOLDS IN OCCUPATIONAL CATEGORIES

Occupational category	As percentage of all households		
	1977 Survey	1985 Sample	Panel
Landlords	4.7	11.1	9.6
Peasants	15.2	13.3	14.4
Manual labourers	53.7	48.9	46.9
Major income from Business	12.5	11.2	12.0
Salaried employees	4.9	5.5	6.0
Artisans & workers at traditional caste callings	5.6	5.5	6.0
Others	3.1	4.4	4.8
All households	100	100	100

The method of survey involved interviewing individual households for two to four hours at a stretch. The household questionnaire canvassed information on the age, sex, educational status and occupation of each member. Comprehensive data were collected on household asset ownership. They included, *inter alia*, data on land holdings, other types of agricultural assets (such as machinery), non-agricultural business assets, gold, housing and consumer durables. Financial assets were included in the survey but did not constitute a significant form of investment. Cash on hand and stocks of commodities were excluded. In addition, questions relating to indebtedness sought details of the date, source and purpose of borrowing, the interest rate and collateral on each loan, the total amounts borrowed, repaid and outstanding.

The information on debt is likely to be subject to some error and is not easy to check. People are likely to be hesitant to discuss their indebtedness and the data on debt should therefore be interpreted with care and be used to identify broad tendencies. It must be noted, however, that during the period of fieldwork we experienced a remarkable degree of openness among respondents in discussing their debt obligations and household crises. This was particularly so in the case of poorer households.

As information on borrowing is more reliable than on lending; estimates of debt are built up from the borrower side. The category "amount borrowed" reports the original amount borrowed by a household in the case of loans that were outstanding at the time of the survey. "Debt outstanding" refers to the sum of principal outstanding and interest due but unpaid on the loan at the time of the survey. In the informal sector of credit we observed a variety of forms and terms of repayment on loans; estimates of amount borrowed are thus considered to be more accurate than estimates of debt outstanding.[8]

These data on the assets and indebtedness of households and on the implementation of IRDP provide the core variables of the data set. Unfortunately income data in both surveys are incomplete and have therefore not been utilised for detailed empirical analysis. While reasonably good estimates of the earnings and incomes of agricultural labourers are available from the 1977 survey, income data on households engaged in other occupations are inadequate. From the 1985 survey, income data of reliable accuracy are only available for IRDP beneficiary households, and refers to the income generated by the IRDP asset.

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[8] For example, interest payment may accumulate on a loan and be counted in as part of debt outstanding, but may be written off at a future date.

Although questionnaire-based, the method of interview was kept flexible. Responses were obtained from the head of each household, but with all members of the household present and participating in the interview. Beneficiaries of four major schemes under the Integrated Rural Development Programme (IRDP) were also interviewed on their experience of the scheme. These four schemes were loans for milch cattle, loans for goat and sheep, bullock-and-cart loans, and loans under the Industry and Small Business scheme. These interviews provide information on the implementation of the scheme, and on the subsequent impact of this scheme on the incomes, assets and indebtedness of beneficiary households.

Case-studies of individual households were also conducted. Households that typified special aspects of village socioeconomic life relevant to the study, such as the household of a chit fund proprietor who operated a local rotating saving and credit association, were selected for these case-studies. Village-level revenue records and discussions with the village administrative officer were used to correct possible reporting errors, for example, errors in the extent of land ownership.

During the course of field work, almost all the households that were interviewed responded with friendly helpfulness and an appreciation of the research agenda itself. This I owe to the excellent rapport built up by earlier researchers in the field.

1.3.2 Sources of Secondary Data

In addition to primary data, I also collected data from official documents and other publications on the village, block, district and State. Data have been extracted from reports of the Census of India, from Tamil Nadu govemment publications such

as *Season and Crop Report*, and from records at taluk statistical offices. An estimate of State-level rural asset distribution was built up from reports of the All India Debt and Investment Surveys of 1971-72 and 1981-82. There is a discussion of the quality of these data in section 2.4.

On rural credit, basic statistics were obtained from the District Credit Plan for Madurai prepared by the Canara Bank, the lead bank for the district.[9] Information was also collected from the ledgers of commercial banks, cooperative banks and the primary agricultural cooperative society serving Gokilapuram village. Secondary material on the implementation of IRDP was collated from several evaluation reports and statistics held by the Block Development Office. In addition, a few interviews with bank and block-level officials provided insights into the implementation of rural credit policies.

Last but not least, we have drawn heavily on earlier reports on the village arising out of the 1977 survey and subsequent field research.[10]

1.3.3 Using Panel Data

What advantages do studies based on panel data have over empirical work based on independent cross-section or time-series data? And what are their specific disadvantages? This section attempts brief answers to these questions, leaving a more detailed discussion of the specific problems of the panel used in this thesis to the next

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[9] The "lead bank" is the nationalized bank that is selected to formulate credit plans for a particular district.

[10] In particular these refer to Ramachandran (1983) and Ramachandran (1986).

section. Three issues are discussed in this section: data unique to a panel, sampling and measurement problems, and econometric analysis.[11]

(1) Data availability: The overriding advantage of panel data is that they can be used to measure the *dynamics* of income and wealth. Time-series data can indicate the direction of change in an economy or in a sector of an economy but cannot actually plot the path of a particular individual's (or household's) living standard over time. Thus, there is an important class of issues that can *only* be handled with panel data.

(2) Sampling and measurement errors: Are there large measurement or sampling errors that wipe out the benefits of a panel study? One major problem of panel studies is that generalizing from them is difficult, since a panel is not necessarily representative of a population over time. Even if a panel is drawn as a representative sample in the initial year, unless panel households mirror changes in the economy, the panel does not necessarily remain representative of the population in subsequent rounds of the study. One way of overcoming this problem is to compromise between independent cross-section data and panel data by using a rotating panel. In other words, a fraction of original households is retained in subsequent rounds of a survey.

Which sample is better, a representative cross-section or a panel? The answer depends on the variable being estimated. If a change variable is being measured, then the variance of the estimate of a difference is given by

$$\sigma^2 (x_2-x_1) = \sigma^2(x_1) + \sigma^2(x_2) - 2\mathrm{cov}(x_1,x_2)$$

[11] A discussion of these issues can also be found in Ashenfelter, Deaton and Solon (1985).

where x_1 and x_2 are the values of the variable in time periods 1 and 2 respectively. Total variance is negatively related to the covariance term. We know that expected covariance is zero in independent cross-sections while it is maximized in the case of a completely overlapping panel. Consequently, *the most accurate estimates of change from a given sample size are obtained from panel data.* However, the precision of mean variables is lower the higher the positive correlation between two rounds of a survey. Hence an independent cross-section that provides additional new information in each round has an advantage in the estimation of population averages.

A rotating panel, i.e., a panel where a proportion of households is retained over time, can be designed when reasonable precision of mean and difference variables is required.[12] The PSID study, for example, made adjustments for new entrants into the population (see Duncan, 1983). The improvement in estimates will have to be set against the additional costs resulting from the complexity inherent in this type of sampling design and procedure. However, panel data are not likely to be much more expensive than a multiple-round cross-section study.[13]

A second problem is the presence of measurement errors. All samples have some error; however, the different modes of data collection produce different types and magnitudes of errors. There is an extensive literature on types of measurement error, and while some may be heightened in panels others may be mitigated. For instance, an interviewer bias may be lessened by the continuity of frequent interviews with the same households over time. Similarly, the quality of response may be superior in a panel survey where frequent contact can improve the reporting of data.

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[12] For a formal proof see Ashenfelter *et. al.*, op. cit, Appendix, pp 44-46.

[13] Clearly the cost advantages will have to be worked out in each case but an estimate by Duncan *et. al.* (1984) indicates that the cost of panel-data collection may compare reasonably well with several rounds of cross-section surveys.

For instance, the quality of panel data is likely to be superior as compared to similar information gathered from retrospective data which are affected by problems of inaccurate recall.

If the variables in a panel have large measurement errors it could be argued that estimates of change or the difference between two estimates would be misleading, the true changes being small in relation to the large error terms. However, the issues can be posed differently. Consider the total response error as the sum of two types of errors, namely random errors and persistent errors (which are common across time periods). Random errors have the same implication for all samples. Panel data, however, can deal with persistent errors more easily, for example, by differencing variables and eliminating the error.

Let the measured value of a variable y_i (for individual i at time t) consist of a true value x_i and an error term e_i. Further let us assume e_i has two components, a persistent error, v_i and a random error, w_{it}.

$$y_i = x_i + e_i \quad \text{and} \quad e_i = v_i + w_{it}$$

or $$y_{it} = x_{it} + v_i + w_{it}$$

Now it can be shown that the standard error of the difference variable ($\Delta y = y_2 - y_1$) in a cross-section estimate will be (dropping the t subscripts):

$$S.E\,(\Delta y) = [\{\, \sigma^2(x_1) + \sigma^2(x_2) + 2\sigma^2(e)\,\}/n]^{1/2}$$

whereas in a panel data it will equal:

$$S.E\,(\Delta y) = [\{\ \sigma^2(x_1-x_2) + 2\sigma^2(w)\ \}/n]^{1/2}$$

where

$$\sigma^2(x_1-x_2) = \sigma^2(x_1) + \sigma^2(x_2) - 2cov(x_1,x_2)$$

And assuming that the persistent and random error terms are independent, the variance of e_i is given by:

$$\sigma^2(e) = \sigma^2(v) + \sigma^2(w).$$

So only the random error term enters the standard error in the panel estimate. Thus presence of autocorrelated measurement error and positive correlation between x_1 and x_2 enhances the usefulness of results from a panel. Only when reported errors have a negative serial correlation will a panel be inferior to a cross-section sample i.e., $\{\sigma^2(e) < \sigma^2(w)\}$.

(3) Econometric analysis: The increased scope for analysis from a panel data set has been highlighted by econometricians (see Hsiao, 1986). One advantage is that individual fixed effects (a variable associated with each individual and constant over time) can be corrected for by using a first-difference of two observations on the same household in a regression (see Appendix 4). Another illustration is a case of first-order autocorrelation in error terms which can again be corrected by a suitably lagged instrumental variable. However, our panel study only covers two time-periods (as do many other panels), hence only a limited application of econometric analysis to our panel data is feasible.

Drawing together these observations on the advantages and disadvantages of a panel data set, the collection of more panel data in developing countries can certainly

be recommended. The particular type of information collected in such studies can be extremely valuable in understanding dynamic economic behaviour.

1.3.4 Specific Features of the Gokilapuram Panel

There are some distinct features of the panel used in this thesis. These include the size of the panel, the unit of mobility, the length of study period, and the choice of a wealth indicator to monitor household mobility. Other specific data-related issues, such as the choice of an appropriate price-deflator, have been discussed at appropriate points in the thesis. It is to be noted that at the time of fieldwork our objective was to obtain a cross-section comparison of two village economies; problems specific to selection and interpretation of panel data were thus unfortunately not taken into account in the early stages of research.

(1) Size of panel and data interpretation: One drawback of this empirical study is the small size of the data set. This imposes constraints on the analysis; it inhibits, for instance, the extent of feasible disaggregation. When households are ranked by deciles of wealth and arranged in a mobility matrix, there is a higher probability of obtaining empty cell values as compared to a similar analysis on a larger data set (see section 3.3). This limitation must be recognized when interpreting the results. However, there are no grounds to suggest a particular bias in observed mobility from the use of this panel. Although the number of households is small, the number of individuals is not, and for that reason certain indices that are characteristic of individuals, such as literacy, can be built up on a stronger base. Added to this is the fact that a panel data set is not representative of the population it is drawn from. Great care must therefore be exercised in data interpretation, and in generalization. Our attempt is to illustrate the *type* of mobility processes at work in a village economy, not to claim to have identified the representative pattern.

(2) Unit of mobility: Which is the appropriate unit for the study of economic mobility, the individual or the household? In this study, the *household* is chosen as the basic unit of mobility analysis. A household is defined as a group of persons normally living together and taking food from a common kitchen. In a village economy, the household is recognized as being a well-defined economic entity. Most village surveys, for instance, use the household thus defined as a basic unit for data collection. The household is undoubtedly the most appropriate unit for the collection of data on land holdings, asset holdings, and on links with the credit market. Land and assets are held by the household, and debt is incurred by the household. It would make little sense, apart from being very difficult operationally, to collect data on the assets owned by individual members of a household in the village, although levels of ownership per capita within households can be calculated after information has been collected on the aggregate ownership of assets of households.

However, there are problems with using the household as the basic unit of a panel study. These arise from the fact that the composition of households may change over time. (For details of what constitutes the 'same' household, see section 3.3.) One way of handling this is to include only households that remain fundamentally unchanged, that is, composed of the same individuals at different points in time. This is clearly a severe restriction on the data set. It also depends on the time-interval of the panel; long-run panels cannot operate on the assumption of unchanging households although it may be a workable assumption for shorter-term studies.

Apart from the identification problem (i.e., non-sameness of a household due to changes in composition and structure) what is more important is that family or household economic status has a marked impact on individual well-being (for evidence on this, see Duncan, 1984). By selecting the individual as the unit of study,

changes in household composition can be treated as explanatory variables. To some extent, the explanatory role played by the dynamics of family structure can be retained by assigning variables to a household unit that take account of household size and composition. For example, while retaining a household as unit, the per capita income of its members can be calculated. This helps to correct for variations in the size of household and better reflects the welfare of its individual members.

In the thesis we are constrained by data availability to use the household as unit but are able to adjust partially for changes in the size of each household. Analysing the data in terms of individual mobility is a long process, and one that I hope to undertake in the future.

(3) Length of study period: The time frame of this panel is eight years, a period that is relatively short in relation to historical studies but is 'medium-term' with reference to single-year or short-term studies. In the thesis, economic mobility denotes this medium-term mobility in wealth though for simplicity we refer to the panel as long-term. The two end points of the panel were not subject to any extreme agricultural crisis that may otherwise have affected a comparison (see section 1.4). However, the timing of the study is such that the major period of implementation of IRDP was in the inter-survey years.

Since it is a two-point panel, procedures that invoke more than two time periods (e.g., testing for time homogeneity, see section 3.2) are not applicable. It would be very useful to build up panels that span at least a few decades.

(4) Choice of variable: Household wealth has been chosen as the key variable with which to monitor household economic mobility. Data on wealth are relatively accessible to the data-collector. In addition, there are other factors that provide a

rationale for using wealth as a key variable. Conceptually wealth incorporates a longer-term view of economic status than measured income, and thus acts as an indicator of long-run well-being. It can be assumed that wealth has fewer transitory components as compared to current income. There are exceptions to this: for example, livestock that frequently enter transactions could be treated as transitory components of wealth. Wealth is also affected by life-cycle considerations; for example, a trough may be encountered after the marriage of a daughter for whom a large dowry was paid. The timing of the survey may affect the value of assets held. A wealth-indicator captures advantages that accrue from inheritance and prior accumulation, factors that provide a headstart to some persons. Wealth also serves as security against risk, playing a critical role in situations where human capital is not accepted on par with physical assets as collateral.[14]

In analytical terms, wealth is thus likely to be a better indicator of long-run economic status than current income. This is so because by definition (of a stock variable) it eliminates more transitory components than does income, a flow variable. To take an example, seasonal variations in land holdings are likely to be negligible in comparison to seasonal variations in wage income.[15] Land, the primary asset of an agricultural economy, is in most cases only sold under extreme distress and as a last option. Land holdings and land assets have also been considered as proxy variables for assessing the economic status of households by other researchers in the field of village studies, poverty, and household mobility (e.g. Krishnaji, 1984; Cain, 1981).[16]

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14 A true measure of wealth in fact should incorporate human wealth. Unfortunately we do not have sufficient data on human capital.

15 As stocks of grains and cash on hand, two relatively transitory and seasonally fluctuating components of assets are not included in our definition of wealth (see chapter 2), the measure used in this thesis is more likely to capture the long-run wealth status of a household.

16 Krishnaji cogently argues a case for the selection of "land holding or more generally holdings of all income earning assets" as a classificatory variable because

Although the wealth variable has some conceptual attractions, a stronger case for its selection emerges from the empirical front. In developing countries, where data collection is neither easy nor accurate, wealth is a variable that can be identified and measured more accurately than income. For example, while a reasonably accurate estimate of wealth can be obtained from a single-time interview, good estimates of income cannot be based on a recall method and require repeated interviewing. This is both cost- and time-intensive. The extent of bias and reporting errors can be reduced in the measurement of wealth, a stock variable, since quick checks on assets held by a household are feasible (except for cash on hand, bank deposits, etc.). In contrast, reliable estimates of income, a flow variable, would require repeated visits and cross-checking over the time period to which the flow refers.

In the particular context of our survey, and other similar small budget village surveys, estimates of wealth are considered to be more reliable and accurate than estimates of income. Residence in the village at the time of the survey allowed us to physically check on the ownership of assets such as livestock, on the quality of housing (a mud hut is, of course, easily distinguished from a permanent brick and mortar building), on the ownership of durable consumer goods, etc. In the case of land holdings, we were able to cross-check reported values with records held by the village administrative officer. Similar cross-checks are not easy in the case of income. Since income is measured over a certain time period, say a year, cross-checking of income would require the tracking of income over the entire year. Rural households derive income from a variety of sources, among others, earnings from agricultural and non-agricultural wages, earnings from land holdings and other productive assets. A good estimate of income would require detailed accounting of all sources of

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"such asset holdings remain fairly stable over long periods and may reflect better the 'economic status' of the family..." (Krishnaji, 1984:248).

income including self employment, where accounting is more difficult. Problems in estimation of rural incomes, in methods of imputing prices for family labour, in calculation of costs of cultivation, etc., are, of course, well known. Errors in estimation are likely to be higher in the case of income. In empirical terms, although the collection of good income data is clearly desirable, we shall argue that a village survey based on single interviews with households can collect better estimates of wealth than of income.

An added attraction of measuring changes in wealth derives from the fact that the objective of the major anti-poverty programme, IRDP, is to increase the *productive assets owned* by the poor.

To conclude, we argue that wealth is a variable that can be measured with greater ease and accuracy in developing countries; it also possesses attractive conceptual properties, making it a useful indicator of the dynamics of distribution.

1.4 The Village Setting

This section describes the features of the economy of the village and the region of study that are relevant to the thesis. It begins with a brief sketch of agro-economic conditions in the village. The village is part of a relatively advanced agrarian system. The evidence on levels of rainfall in the region, which follows, demonstrates that the two years of the study are roughly comparable in terms of rainfall. The final subsection describes broad features of the socioeconomic structure of the village. It deals with the distribution of different castes among households of the village, with occupational patterns and with the distribution of land and other assets among households. Taken together, these provide the setting for subsequent analysis of economic mobility.

Gokilapuram village is located about 6 kilometres to the east of Uthamapalayam town, the headquarters of the block and taluk of the same name (see map). The village belongs to a region called Cumbum Valley. The valley is a distinct geographical and agroeconomic zone in the district, wedged between the Western ghats on the west and southwest and an offshoot of the ghats -- the High Wavy and Erasakkanayakkanur hills -- on the east, consisting of about 50 villages in all.

Population

The population of Gokilapuram in the Census of 1981 was 3,945 persons in 755 households. The annual compound rate of growth of population was 1.35 per cent in the inter-censal decade of 1961-71, falling sharply to 0.57 per cent in the following decade. An important factor underlying this decline was large-scale out-migration from the village, especially to plantations in Kerala and Tamil Nadu. The village is characterized by a higher representation of persons of scheduled castes (23.2 per cent in 1981) as compared with the averages for the taluk (13.7 per cent), district (15.1 per cent) and State (18.5 per cent).

Work force

In 1981 the Census estimate of work force participation in the village was 48.3 per cent for main workers alone and 58 per cent when marginal workers were included.[17] The estimates of work participation from the 1977 survey are higher:

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17 The definition of workers in the 1981 Census differed from earlier Censuses. Using the time criterion, main workers were defined as those who worked for at least 183 days in the year, while those who worked for some time during the previous year were counted as marginal workers. Those who had not worked in the last year were defined as non-workers.

52.1 per cent among men, 47.7 per cent among women and 50 per cent for men and women.[18]

The Agricultural System

Gokilapuram is endowed with rich and fertile soils, an assured system of surface irrigation and a climate suitable to intensive agriculture.

Rainfall in the Uthamapalayam Agricultural division, which more or less coincides with the taluk and the valley, has averaged 745.3 mm per annum over the decade 1973-74 to 1983-84. The heaviest precipitation occurs during the north-east monsoon period (October to December), which accounts for 50 per cent of total annual rainfall.

Rainfall data for Madurai district as a whole indicate that both 1976-77 and 1984-85 experienced a shortfall in relation to the norm though the shortfall was greater in 1984-85 (24 per cent as compared to 7 per cent in 1976-77). On irrigated land both 1976-77 and 1984-85 were years of good harvests, while dry land cultivation suffered due to rainfall shortage in both years. The two years were roughly comparable in terms of climate and agricultural harvests.

Historically, the major source of surface irrigation was from the Suruliyar-Vairavanar river system. From the turn of this century, however, the waters of the Periyar system have been dammed and diverted eastwards from Thekkady in Kerala and through the river beds of the valley. Land irrigated by canals that branch off from

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18 The comparability of Census statistics over time, and with independent surveys, is not easy due to definitional variations, problems in categorization etc.; a detailed discussion can be found in Ramachandran (1980).

the river forms the central core of the Cumbum Valley which is flanked (to its east and west) by 'garden lands', or fields irrigated by wells. The unirrigated dry land of the valley is scattered between the lift-irrigated fields and stretch beyond them to the foothills. While the level of irrigation in the Valley is roughly equivalent to that of Tamil Nadu, the irrigation system based on the Periyar canal network and an expanding sector of land irrigated by wells is considerably more reliable here than in the rest of the state.

The distribution of net sown area in Gokilapuram classified by the source of irrigation is shown in Table 1.2 below. The three categories of land are: *nanjai* or fields that are irrigated by a system of canals and tanks (linked to the Periyar system), *thottam* land where wells are the source of irrigation, and *punjai* or unirrigated rain-fed dry land. These statistics from the revenue records of the village of Gokilapuram highlight the predominance of *nanjai* land, which accounted for 89.4 per cent of the total -- land with a good and assured source of irrigation.

TABLE 1.2: NET SOWN AREA BY TYPE OF IRRIGATION, GOKILAPURAM, 1980-81

Irrigation type	Extent	
	in acres	as per cent of total
Nanjai	685	89.43
Punjai	48	6.26
Thottam	33	4.31
Net Sown Area	766	100.0

Source: Revenue records, 1980-81.

The distribution of land by sources of irrigation given in Table 1.2 is derived from village records, and they refer to the revenue village, or village boundaries as defined in revenue records. Households resident in the village, however, own and operate holdings that are in the revenue precincts of Gokilapuram as well as in contiguous revenue villages. Since neighbouring villages have a higher proportion of dry land and land irrigated by wells than does Gokilapuram, the actual ownership and operational holdings of households resident in the village have a higher proportion of *punjai* and *thottam* land than the revenue village of Gokilapuram (see Table 1.3).

TABLE 1.3: SHARE OF DIFFERENT IRRIGATION TYPES OF LAND IN THE AGGREGATE HOLDINGS OF LAND OF HOUSEHOLDS RESIDENT IN GOKILAPURAM, 1977

(in per cent)

Irrigation-type of land	Share in total holdings	
	Ownership	Operational
Nanjai	22	24
Thottam	19	22
Punjai	59	54
All types	100	100

Source: 1977 Survey Data

Each irrigation-type of land has distinct cropping patterns. *Nanjai* land is largely double cropped paddy land, sown with high-yielding varieties of rice. Often, there is a third crop sown with a fodder crop, with pulses or with green manure. *Thottam* cultivation is characterized by diversification, particularly into a variety of

non-cereal irrigated crops such as banana, cotton, vegetables, and fruits. Traditional and high-yielding varieties of coarse grains such as cholam and ragi are also grown on *thottam*. The expansion of commercial cultivation has involved high expenditure on inputs especially purchased inputs. It is also associated with the expansion of the transport network, and has drawn Gokilapuram firmly into the wider market economy of South India.

Although *punjai* is of varying quality, dry land in the vicinity of the village is characterized by low yields and backward methods of cultivation. Crops grown on *punjai* are generally coarse grains of traditional varieties. Cholam, ragi, varagu, samai and unirrigated groundnut, are some of the crops grown. Lastly, there is *thope* land, on which tree crops are raised; these include coconut groves, tamarind groves and land planted with other fruit trees.

The irrigated sector of agriculture in Gokilapuram is characterized by a high level of development of the productive forces. The entire area under paddy, for example, is planted with high-yielding seed varieties, and chemical fertilizers and pesticides are used intensively. Paddy farming in the village and region is also characterized by careful water control. The diversified cultivation on *thottam* involves the cultivation of crops that require a high level of initial investment and the intensive use of modern inputs. Mechanization in the Valley is limited. Tractors have displaced field operations where men worked with bullocks, such as ploughing, carting and the second threshing of paddy. On *thottam*, wells at which human labour and bullock-power were used to draw water have now been fitted with electric water-pumps.

Crop yields are high, particularly paddy yields. The average yield varied from 6 to 8 tonnes per hectare per crop. These levels are among the highest in Tamil Nadu and compare well with yields in other parts of east and south-east Asia.

Amenities and Infrastructure

Gokilapuram is only 6 kilometres from the taluk headquarters at Uthamapalayam. Frequent bus services on paved roads link Gokilapuram to nearby towns and villages. There is a post office in the village.

The village has an old and well-established Cooperative Milk Supply society. The Primary Agicultural Cooperative society for Gokilapuram, located in Uthamapalayam, provided crop loans for the cultivation of paddy, banana and coconut. The society also operated a fair-price retail shop in the village. Rural branches of several commercial and cooperative banks are located in Uthamapalayam, in the neighbouring village of Rayappanpatty and in other nearby towns. Residents of Gokilapuram have relatively easy access, in terms of their physical proximity, to credit institutions.

Occupational Structure

A major feature of the occupational classification of persons in Gokilapuram and Uthamapalyam taluk that is available in the Census of 1981 is the high proportion of agricultural labourers among all workers (Table 1.4).[19] This high incidence of agricultural labourers is particularly marked in the case of female workers. By way of

[19] Ramachandran (1980) in a taluk-wise analysis of labour force participation has shown that Uthamapalayam taluk has both a higher incidence or proportion of agricultural labour in the working population than the state average and has experienced a high rate of growth in the proportion of agricultural labour over the years 1961-81.

comparison, the proportion of female agricultural labourers to total female workers was 75 per cent in the village against a state average of 52 per cent.

TABLE 1.4: SHARE OF DIFFERENT OCCUPATIONAL CATEGORIES IN THE WORK FORCE, GOKILAPURAM VILLAGE AND UTHAMAPALAYAM TALUK, 1981

(in per cent)

Census occupational category	Gokilapuram village	Uthamapalayam taluk
Cultivator	20.04	18.32
Agricultural labour	59.97	57.3
Other categories	19.99	24.38

Source: Census of India 1981, main workers only.

Note: 'Other categories' includes workers in mining, manufacturing, construction, trade, commerce and other services.

A socioeconomic classification of households on the basis of the survey of 1977 is available and provides a more detailed picture of the occupational structure of the village (see Table 1.5).[20] The definition of different socioeconomic categories follow the definitions used for the survey of 1977.[21] I attempted to identify broadly similar occupational categories although (given the size of the sample) some of the finer distinctions within categories were not made. For purposes of this thesis, the categories are defined as follows:

[20] A detailed presentation of the definitions of each category can be found in Ramachandran (1986).

[21] These are reported in Ramachandran (1986).

(1) *Landlord* households are those who own and control land and whose members do not participate in any manual tasks of cultivation. (They also hold a position of dominance in the socio-economic structure of the village.) In Gokilapuram, more than 90 per cent of their land holdings are worked by hired labour.

(2) *Peasants*: Peasant households own or operate land; members of peasant households participate in the major manual tasks of cultivation. Peasants are a very heterogeneous group. A detailed stratification of the peasantry on the basis of a labour ratio (which measures the ratio of total days of manual labour performed by a household to the total days of labour hired in by a household) was undertaken on the basis of the 1977 survey but was not attempted on the basis of the 1985 sample survey data. Since the number of peasants was small, no attempt was made to stratify the category for purposes of the computations in this thesis. Nevertheless, a simple division of peasants into "rich" and "poor" peasants was initially undertaken. "Rich" peasants were defined as those who did not work as hired labourers on fields other than their own. Since there were only two rich peasants in the panel data set, the two categories were combined.

(3) *Manual workers*: This category refers to households whose earnings are predominantly from employment at manual tasks. It includes both agricultural and non-agricultural labour households. Agricultural labour households are defined as households where the primary source of earnings is from manual work at agricultural operations. Non-agricultural labour households are households whose earnings are mainly from tasks outside direct crop production. In the panel data set, all agricultural labour households were landless though this need not necessarily be the case.

(4) *Households with main income from business activity other than crop production*: These are households whose primary income is from business and entrepreneurial activities such as trading.

(5) *Households whose major income is from artisan activity or work at traditional caste callings*: This category includes, among others, blacksmiths, carpenters, washerpersons, barbers, etc.

(6) *Households whose major income is from salaried persons*: This category refers to households whose main source of income is the salary of persons employed at (service) occupations; the category includes teachers, clerks, and shop assistants.

(7) *Households with main income from rents, remittances, etc.*: These are households that rely on small rents, remittances from relations, and pensions for their living and are generally comprise elderly persons.

In 1977, an additional category was that of *non-labouring small landholders*, households that had traditionally owned and controlled land in the village, but which were in decline.

Here again, the predominance of manual labourers in the occupational structure of the village is striking. All manual labour (agricultural and non-agricultural) households together constituted 53 per cent of all households. At the other end of the scale are the landlord households, whose members do not participate in any manual operations. Landlord households constituted 3 per cent of households in the village and owned 43 per cent of the land owned by households resident in the village and owned 58 per cent of all asset holdings. Within the landlord class, two strata can be identified, major landlords and medium landlords. Major landlord

households constituted 1.7 per cent of all households in the village and medium landlords 1.5 per cent of all households. Major landlord households derived income from diverse sources, from crop land, from *thope* land and plantations, and from various business activities. The medium landlords had lower levels of asset ownership and income than the major landlords. The next largest group was the peasantry, which is not, however, a homogeneous group. It is divided into different strata, whose members worked in varying degrees at the major manual operations on cultivated land.

Households whose major income was from business activities outside direct crop production constituted a relatively large proportion of village households. This group included households engaged in a variety of activities, ranging from petty shopkeepers at one end to large tamarind merchants at the other. Traditional artisan households constituted 6 per cent of village households. Among them are potters, whose products face increasingly stiff competition from industrial products. There are also blacksmiths and carpenters, who directly serve the needs of cultivators. There are also households engaged in traditional service occupations, for example, barbers and washerpeople. The few households with salaried persons refer, in the main, to households in which teachers, clerks or other persons with jobs with small salaries are the main earners.

TABLE 1.5: DISTRIBUTION OF HOUSEHOLDS BY SOCIO-ECONOMIC CATEGORIES, GOKILAPURAM, 1977

Socio-economic category	Households in category	
	number	as per cent of all households
Landlords	21	3.23
Non-labouring small landholders	11	1.69
Peasantry: upper, middle, and lower strata	104	16.0
Agricultural labourers		
a. with own and/or operated land	61	9.38
b. with neither own nor operated land	257	39.54
Non-agricultural labourers	29	4.46
Households with main income from business activities other than direct crop production	44	12.31
Households with main income from artisan activity or work at caste callings	36	5.54
Households with main income from salaried persons	33	4.07
Households with main income from rents, remittances, etc.	11	1.69
Unclassified households	7	1.08
All households	650	100

Source: 1977 Survey data

Caste Distribution

Gokilapuram is a multi-caste village. Table 1.6 presents the caste composition of households in Gokilapuram as at the 1977 survey. Maravars are the most numerous caste and by popular account they were the first settlers in the village. Households belonging to the scheduled castes constitute a relatively high proportion of the village population and were mainly manual labourers. There are only two castes represented among the landlords, Maravar and Chettiar. Maravar and Kallar households dominate the peasantry, and Chettiar households are an important component of the group of households whose main income is from business. Households whose main income is from artisan activity and work at traditional caste callings are drawn from the major artisan caste, the Achari caste and other service castes. A major feature of the caste and occupation profile of the village is that manual labour is the most caste-heterogenous occupation in the village.

TABLE 1.6: DISTRIBUTION OF HOUSEHOLDS BY CASTE, GOKILAPURAM VILLAGE

(in per cent)

Caste	Households in caste as proportion of all households	
	1977 Survey	1985 Panel data
Maravar	28.9	22.9
Scheduled castes	25.2	33.7
Kallar	11.7	12.0
Chettiar	10.6	10.8
Artisans, traditional services	13.4	13.2
Others	10.2	7.2
All castes	100	100

Source: Survey data, 1977 and 1985

Distribution of Land

The distribution of land and other assets in the village was, and continues to be, marked by great disparity.

The benchmark survey has data on land ownership for all households resident in the village. The first major feature of land ownership in Gokilapuram (Table 1.7) is the extent of landlessness: 69.4 per cent of all households possessed no land. By contrast, households with the largest land holdings, who constituted 2.5 per cent of households, owned 38 per cent of the area of all ownership holdings. Alongside this,

a substantial sector of cultivation on small holdings persists in the village: 53 per cent of all households that owned land, owned less than 2.5 acres each. The combined area of their holdings constituted 17 per cent of all ownership holdings.

TABLE 1.7: DISTRIBUTION OF OWNERSHIP HOLDINGS AMONG HOUSEHOLDS, GOKILAPURAM, 1977

Size class in acres	Households		Extent	
	number	as per cent of all households	area in acres	as per cent of total acreage
0	446	69.36	0	0
0 - 1.25	62	9.65	50.81	6.4
1.25- 2.47	42	6.53	80.49	10.21
2.47 - 4.9	49	7.62	170.37	21.61
4.9 - 9.8	28	4.35	187.83	23.83
9.8 - 14.8	6	0.93	65.95	8.37
14.8 - 19.7	5	0.78	77.14	9.79
19.7 +	5	0.78	155.69	19.75
All holdings	643	100	788.2	100

Source: Survey data, 1977

Note: One hectare = 2.47 acres

Land concentration varied on different irrigation-types of land. "Concentration of ownership and operational holdings is particularly marked in the more productive tracts -- *nanjai* and *thottam* -- where more modern techniques of production are gaining ground; it is less marked on *punjai* land, which represents the

backward traditional sector of agriculture" (Ramachandran, 1986:96). Inequality in the distribution of ownership holdings of land was most marked on surface-irrigated wet land. The Gini coefficient for the distribution was 0.53 (if landless households are excluded) and 0.85 (when landless households are included).

Data from the panel reveal an interesting pattern of change over eight years between the surveys (Table 1.8). The data show, first, increased landlessness. There was a decline in the proportion of households with marginal holdings. The proportion of households with ownership holdings between 1 and 5 acres increased. There was no change in the proportion of households at the upper end of the distribution.

TABLE 1.8: DISTRIBUTION OF OWNERSHIP HOLDINGS OF LAND AMONG HOUSEHOLDS IN THE PANEL, GOKILAPURAM, 1977 AND 1985

Size class in acres	Percentage of house-holds in the group		Percentage of area owned	
	1977	1985	1977	1985
0	57.8	60.2	0	0
0 < 1.0	6.0	4.8	1.5	0.5
1.0<2.5	10.8	12.0	5.5	6.7
2.5<5.0	7.2	10.8	9.3	13.9
5.0<10.0	10.8	4.8	25.2	10.7
10.0+	7.2	7.2	58.8	68.1
All	100	100	100	100

Asset Distribution

This section provides a preliminary description of the distribution of household assets. Dynamic aspects of patterns of asset ownership are examined in chapters that follow. The asset categories used at the two surveys are defined as follows:

(1) *Crop land* refers to the value of all ownership holdings of cultivable land (excluding groves); in particular, it comprises the aggregate value of ownership holdings of *nanjai*, *thottam* and *punjai* land.

(2) *Thope* land refers to land on which trees, such as coconut and tamarind, are grown. The category also incorporates the ownership of individual trees.

(3) *Plantation land* held by residents of Gokilapuram is located in the hill regions that surround the Cumbum Valley. The common plantation crops are cardamom and coffee.

(4) The category of *other agricultural assets* includes agricultural implements and machinery such as ploughs, pesticide sprayers, electric and diesel motor pumps, tractors, and carts.

(5) *Draught animals* refers to animals that are used for ploughing, threshing, and carting.

(6) *Other livestock* comprises all milch cattle, poultry, goats and sheep and donkeys (used by washerpersons).

(7) *Business assets* refer to assets used in non-agricultural enterprises such as the tools of a carpenter or tailor. This category was only used in the 1985 survey.

(8) *Non-agricultural assets* includes all other assets. It mainly comprises housing and durable consumer goods.[22] It also includes gold and financial assets. Data on gold were identified under a separate category at the survey of 1985 (see Table 4.14B).

Before proceeding further with an analysis of asset distribution in the panel, it is useful to identify the relative significance of different assets in total wealth.

The All India Debt and Investment Surveys (AIDIS) of 1971-72 and 1981-82 provide an estimate of the relative importance of different types of assets held by rural households in Tamil Nadu. (The quality of the AIDIS data is discussed in section 2.4.1.) The surveys provide information on (a) the average value of assets of each type and (b) the proportion of households reporting ownership of each type of asset. A ranking of assets by relative importance can be obtained with this information.[23] Unfortunately, the published reports of the AIDIS surveys for Tamil Nadu do not have tables on the percentage share of different types of assets in total assets. This would have been the ideal indicator of the relative significance of different assets. It would also have facilitated a comparison with the data on relative significance of assets in Gokilapuram.

Using the average value of assets as a ranking variable, the relative significance of different forms of wealth is as follows:

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[22] The household questionnaire had a checklist of consumer durables which included items such as radios, bicycles and pieces of furniture.

[23] The ranking is based on data reported in Table 3 of AIDIS, 1971-72 and Table 7 of AIDIS, 1981-82.

Rank	1971-72	1981-82
1	land	land
2	building	building
3	consumer durables	bank deposits
4	agricultural tools	consumer durables
5	livestock	livestock
6	financial assets	agricultural tools

Both surveys concur in identifying land as the primary asset held by rural households, followed by buildings. The latter category is particularly important for households in the lower asset categories. For example, in 1971-72, building were the most important assets in terms of value for households with less than Rs. 1,000 worth of total assets.

An alternative ranking of households can be obtained by using the proportion of households reporting a particular asset as the ranking variable. The new ranking of assets is as follows:

Rank	1971-72	1981-82
1	consumer durables	consumer durables
2	building	building
3	agricultural tools	land
4	livestock	agricultural tools
5	land	livestock
6	financial assets	financial assets

The second ranking brings out the nature of assets owned by the majority of rural households. Irrespective of total wealth, most households reported ownership of some durable household goods and building. Land came fifth in 1971-72 and was third in 1981-82. In terms of the proportion of rural households that owned a particular asset, land was not a primary asset. This indicates the magnitude of landlessness in rural areas.

Data processed in the course of the 1977 survey of Gokilapuram provide evidence on the relative importance of different assets among households from differing socioeconomic categories.[24] Among landlords, crop land dominated all other assets, with non-agricultural assets coming a far second. Crop land was also the most important asset among the peasantry. For agricultural labourers, the category of non-agricultural assets (consumer durables, housing, etc.) accounted for the bulk of total assets. A further subdivision among the class of agricultural labourers showed

[24] The following section is based on Table 3.19, Ramachandran (1986).

that for households without any ownership or operational holdings of land, non-agricultural assets accounted for as much as 89 per cent of their total wealth. Pooling all socioeconomic categories in Gokilapuram village, a ranking of different forms of wealth can be obtained. Assets are ranked in descending order on the basis of total value as follows:

Rank	Asset	Percentage of total assets
1	crop land	53.9
2	non-agricultural assets	28.8
3	thope land	7.4
4	plantation	6.2
5	other agricultural assets	2.1
6	livestock	0.8
7	draught animals	0.6

Although not directly comparable, the picture that emerges from the detailed survey of assets in Gokilapuram village is similar to the ranking obtained with the AIDIS data. Crop land emerges as the most important component of total wealth held by rural households. Non-agricultural assets are second in importance. The anomaly is in the case of financial assets which are accorded relatively greater importance in the AIDIS surveys. The village surveys of 1977 and 1985 showed this to be a very minor category of assets (which has been combined for purposes of analysis with non-agricultural assets).

TABLE 1.9: ASSET OWNERSHIP BY SOCIOECONOMIC CATEGORIES, GOKILAPURAM PANEL, 1977-1985

Socioeconomic category	Percentage of assets owned	
	1977	1985
Landlord	81.48	86.1
Peasantry	7.45	4.72
Manual labour	2.54	1.69
Income from business	3.08	4.68
Salaried employees	3.25	2.23
Artisan & traditional services	2.13	0.55
Other	0.07	0.07
All	100	100

The economic power wielded by the big landlords is reflected in their control over assets. They owned 81 per cent and 86 per cent of all assets in the village in 1977 and 1985 respectively (Table 1.9). The peasantry comes a far second. Their share in the ownership of all assets fell sharply between 1977 and 1985. The other classes lag far behind. Among the other classes, households with major incomes from business activity gained in terms of their ownership of assets between 1977 and 1985. Manual labour households, who constituted 53.7 per cent of households at the 1977 survey and 46.9 per cent of households in our panel, owned 2.5 and 2 per cent of all assets in the village in 1977 and 1985, respectively.

When total assets are disaggregated into different categories of assets, a more detailed picture of landlord control over the most productive assets in the village emerges (Tables 1.10 and 1.11).

TABLE 1.10: SHARE OF DIFFERENT SOCIOECONOMIC CATEGORIES IN THE OWNERSHIP OF ASSETS, BY TYPE OF ASSET, GOKILAPURAM PANEL, 1977

Class	Percentage of assets owned						
	Crop land	Thope	Plan-tation	Draught animals	Live-stock	Non-agri.	Other agri.
Landlords	88.3	96.1	98.3	49.1	43.5	71.3	86.4
Peasants	8.6	1.6	1.7	38.8	34.6	11.7	10.4
Manual labour	0.2	0.1	0	8.2	19.3	6.1	0.03
Business households	0.2	0.1	0	2.6	0.6	8.2	0.02
Salaried households	0	0	0	0	0.03	1.1	0
Artisan households	2.5	1.9	0	1.3	2.0	1.6	3.2
All households	100	100	100	100	100	100	100

Note: "Nonagri." refers to all non-agricultural assets and "Other agri." to agricultural assets other than land, such as machines and tools.

TABLE 1.11: SHARE OF DIFFERENT SOCIO-ECONOMIC CATEGORIES IN THE OWNERSHIP OF ASSETS, BY TYPE OF ASSET, GOKILAPURAM PANEL, 1985

Class	Percentage of assets owned							
	Crop land	Thope	Plan-tation	Draught animals	Live-stock	Non-agri.	Other agri.	Misc.
Landlords	87.1	97.9	92.3	52.5	40.2	15.6	85.7	63.1
Peasants	5.7	0.1	1.4	24.0	18.1	4.4	8.9	11.8
Manual labour	0.5	0.1	0	14.1	40.8	4.2	2.3	7.8
Business households	4.2	1.4	3.5	3.7	0	64.4	0.9	12.7
Salaried households	2.1	0.4	2.8	5.6	0	0	2.1	2.3
Artisan households	0.4	0	0	0	0.8	11.3	0	2.1

Note: See Table 1.10

Landlords owned the bulk of *thope* and plantation land, crop land and other agricultural assets. Peasants owned a higher proportion of draught animals and livestock than they did of other assets; labour households also owned a substantial chunk of total livestock assets. An earlier study of asset ownership in Gokilapuram concluded that "the dominant feature of the asset holdings of these (landless agricultural labour) households is their emerging propertylessness in respect of ownership of means of production -- assets of these households are mainly concentrated in relatively minor household assets and small holdings of livestock" (ibid:100).

To conclude, Gokilapuram village is characterized by a relatively advanced agricultural production system alongside a highly unequal distribution of land and other productive resources.

1.5 Chapter Structure

Chapter 2 selects and estimates suitable measures of vertical inequality in the panel distribution of wealth. The changes in inequality that are gauged from two static distributions of wealth, eight years apart, provide a preliminary idea of the tendency towards polarization in the village economy. The sources of inequality are examined by means of a decomposition of inequality measures by factor components (type of wealth) and by subgroups of the population (occupational categories). The attributes of inequality are identified in this chapter by means of an appraisal of the between-group and within-group components of decomposed inequality indices.

Chapter 3 discusses the measurement of economic mobility. I have surveyed the literature in order to identify methods of measurement that provide a good description of the complex pattern of mobility, and identify methods of measurement that are appropriate for an application to developing countries. The chapter discusses matrix-based measures in some detail and modifies them to reflect the concern of this thesis with mobility among the poor. Mobility measures are estimated using four classificatory variables, namely, household wealth, per capita wealth, occupation, and land. Together these estimates provide a good description of the nature of mobility in our panel.

In chapter 4 I have grouped households with differing degrees of mobility. Using a combination of a relative poverty cut-off line and the extent of mobility, four sub-groups have been defined. For each subgroup, household characteristics relating

to demographic features, occupational status, pattern of asset ownership, and indebtedness have been examined. This exercise identifies specific concomitants of mobility and also helps to distinguish the hard-core or persistently poor households from other households.

Chapter 5 deals with the role of the state in altering access to credit and the effects of government policy on the accumulation of wealth and on economic mobility. This chapter has an evaluation of the Government's credit-based anti-poverty programme, the IRDP. The chapter brings together results of earlier evaluation reports with evidence from the panel and examines issues relating to the methodology of evaluation. These issues include criteria for evaluating the IRDP and its long-run impact.

Chapter 6 deals with the structure of the rural credit market and the links between the credit market and wealth-accumulation. The question that is taken up for discussion is the following: Have changes in the agrarian credit market of Gokilapuram improved the terms on which credit is extended to the poor?

Chapter 7 states the major conclusions of the thesis.

2

VERTICAL INEQUALITY IN THE DISTRIBUTION OF WEALTH, GOKILAPURAM, 1977-1985

2.1 Introduction

The relationship between the distribution of income (or wealth) and the growth process has been a major interest of development economists. As early as 1955 Kuznets postulated a rise in inequality in the early stages of development as a consequence of the shift from agricultural to non-agricultural sectors as well as a growing accumulation of savings by the rich. He argued that "other conditions being equal, the cumulative effect of inequality in savings would be the concentration of an increasing proportion of income-yielding assets in the hands of the upper group" (Kuznets, 1965:264). Since then, strong arguments that question the inevitability of a rise in inequality have been put forward. For instance, it has been argued that greater equality may be achieved with higher growth as improvements in human capital increase opportunities for a larger number of people. Greater equality may also be achieved by means of direct redistributive measures taken by the state, or as a consequence of policies designed to provide alternative non-agricultural employment to unemployed and under-employed members of the rural labour force (see Cline, 1975, for a survey of this debate). The effects of redistribution on growth have also been the subject of research. There is a large body of empirical work relating to different parts of the world in this field. These studies are based on cross-sectional and on time series data.

This study attempts to investigate the effects of certain aspects of the growth process on patterns of inequality in household wealth on the basis of micro-level

panel data. The fact that the two surveys were conducted in 1977 and 1985 also make an assessment of the Integrated Rural Development Programme (IRDP), a major redistributive policy, possible.

There are no estimates of the rates of growth below the level of the state in India. For this reason, estimates of the rates of growth of the State Domestic Product (SDP) in Tamil Nadu are used here as standard measures of growth. In Tamil Nadu, the compound rate of growth of net SDP was 3.3 per cent per annum between the years 1970-73 and 1983-86 (Guhan, 1987),[1] below the All India average of 4 per cent per annum over the same period. In per capita terms, the growth performance was lower still; the compound rate of growth was 1.6 per cent per annum between 1970 and 1986. This is the 'growth context' in which changes have taken place in our village of study. Although there are no village-level estimates of growth, the expansion of cultivation of commercial crops, the continuing high yield on paddy, the widening network of transport and banking, etc. indicate the occurrence of some growth in Gokilapuram. Changes in inequality in wealth in Gokilapuram help provide an interesting insight into the distribution of gains from growth.

2.2 Measurement of Inequality

In this section we briefly review the literature on certain measures of vertical inequality and select those that are applicable to our data set.[2]

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[1] The rate of growth was computed on the basis of three-year moving averages for the period 1970-1986. Estimates for recent years are not very accurate: observations for 1984-85 are preliminary estimates while those for 1985-86 are quick estimates. Using an earlier cutoff point, e.g., upto 1980-83, reveals a slower rate of growth of 2.4 per cent per annum as compared to an All India average of 3.7 per cent per annum. (Guhan, 1987.)

[2] This section relies heavily on earlier work, especially Anand (1983) and Sen (1973). It is not a comprehensive survey of inequality measures and their properties.

2.2.1 Some Measures of Vertical Inequality

(a) The simplest measures of inequality are the range and other inter-quartile and inter-decile measures of dispersion. These measures ignore all values that lie between the chosen extremes.

(b) Next, there are measures based on deviations from a central value, be it the mean or median, e.g., the relative mean deviation which measures the sum of the absolute differences from the mean of the distribution. It is defined as

$$M = \sum_{i=1}^{n} [\mu - y_i] / n\mu$$

and lies between $0 < M < 2(n-1)/n$. The mean deviation ignores transfers that occur on the same side of the mean μ.

(c) Variance, or the sum of the squares of the differences from the mean, satisfies the Pigou-Dalton condition, namely, the requirement that a transfer of income from a richer to a poorer person lowers inequality. However, the variance is not mean-independent and hence is often replaced by the coefficient of variation, which is the standard deviation divided by the mean. The variance however, is attractive because it can be easily decomposed.

$$\text{Variance} = V = \sum_{i=1}^{n} (\mu - y_i)^2 / n$$

$$\text{Coefficient of variation} = V^{1/2}/\mu$$

(d) The standard deviation of logarithms (H) is a measure that gives greater weight to the lower segments of a distribution. This is because logarithmic values stretch income values at the bottom relative to the top of the distribution. The standard

deviation of logarithms thus displays greater sensitivity to distribution at the lower end of the scale.[3]

$$H = [\sum_{i=1}^{n} (\log\mu - \log y_i)^2 / n]^{1/2}.$$

(e) The Gini concentration ratio (or Gini coefficient), unlike the preceding measure, considers the absolute difference between every pair of incomes in a distribution.[4] The Gini coefficient also satisfies the Pigou-Dalton condition, although it does not show higher sensitivity to transfers at the lower end of the distribution vis-a-vis the upper end of the distribution.[5] The Gini coefficient lies in the range [0,1]. For estimation, we use the definition

$$G = 1/(2n^2\mu).\sum_{i=1}^{n}\sum_{j=1}^{n}[y_i - y_j].$$

The main drawback of the Gini coefficient is that the ranking is arbitrary when Lorenz curves intersect. Higher weights are, in fact, given to modal classes.

(f) Theil's entropy measure T, derived from entropy in information theory, satisfies the property of mean-independence, population-size independence and the Pigou-Dalton condition, but it has no easy intuitive meaning. If x is the probability of occurrence of an event, the informational content of observing the event must be a decreasing function of x. This is satisfied by a function such as h(x)=log(1/x) The

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[3] This measure need not always be convex in incomes and may violate the Pigou-Dalton condition in the upper income range.

[4] For a complete account of different definitions of the Gini coefficient, their equivalence and properties, see the Appendices in Anand, 1983.

[5] In relation to the welfare implications of the Gini coefficient, it has been shown that the associated social welfare function would result in a marginal social rate of substitution between income accruing to individual i and individual j which depended simply on the ratio of the ranks of the two individuals in the income ordering.

Theil T index is based on the expected information of the message which transforms population shares into income shares. The main attraction of the Theil index lies in its easy decomposability. The expected information content can be viewed as a sum :

$$H(x) = \sum_{i=1}^{n} x_i h(x_i) = \sum_{i=1}^{n} x_i \log(1/x_i).$$

The Theil T measure of inequality considers the difference of the actual information from the maximal value of H(x).

$$T = \log n - H(x)$$

$$T = \log n - \sum_{i=1}^{n} x_i \log(1/x_i) = \sum_{i=1}^{n} x_i \log n x_i$$

where n is the number of individuals and x_i the income share of the i^{th} individual. The Theil measure lies in the range zero to log n.

Theil proposed a second measure, L, which reverses the role of population and income shares. The L measure can be defined in the following way:

$$L = \sum_{i=1}^{n} (1/n) \log (1/n/y_i/Y) \text{ where } Y=n\mu.$$

Also, $L = (1/n) \sum_{i=1}^{n} \log \mu/y_i$ which reduces to $L = \log \mu/\tilde{\mu}$. Hence, L is a logarithm of the ratio of the arithmetic mean to the geometric mean. The Theil L index is also mean-independent and population-size independent.

We turn to some normative measures of inequality.

(g) Dalton defined a measure of equality as the ratio of the actual level of welfare obtained to the maximal welfare possible, achieved under an egalitarian distribution of income where all incomes equal μ, the mean income with a welfare function concave in utilities and diminishing marginal utility.

$$D = \sum_{i=1}^{n} U(y_i)/\, nU(\mu)$$

(h) Atkinson (1970) introduced welfare comparisons through an additively separable and symmetric function of individual incomes. He defined an equally distributed equivalent income y_e as that income level which when equally distributed gave the same total welfare as the existing distribution. Then he defined a measure of inequality as:

$$A = 1 - y_e/\mu \quad \text{where } n\, U(y_e) = \sum_{i=1}^{n} U(y_i).$$

In order to obtain a complete ordering, the form of the utility function needs to be precisely specified. A mean-independent inequality measure can be obtained by the use of a constant elasticity form for the utility function.

$$U(y) = y^{1-e}/1-e \quad \text{for } e \geq 0\,,\ e \neq 1 \text{ and}$$

$$U(y) = \log_e y \qquad \text{for } e=1$$

where e, a constant relative inequality aversion parameter reflects the degree of inequality aversion and depends on the value judgement of the evaluator. For instance as e tends to infinity, more weight is attached to transfers at the lower end of the distribution, the limiting case of the welfare function being $\min_i\{y_i\}$. These normative measures make restrictive assumptions that have come in for strong criticism (Sen, 1973).

(i) An alternative normative measure propounded by Sen (Sen, 1973) considers welfare directly as a function over incomes and not indirectly through utility.

$$W = W(y1,...,yn).$$

A generalized equally distributed equivalent income y_f can now be defined as

$$W(y_f,...,y_f) = W(y1,...,yn)$$

and the new measure of inequality as

$$N = 1 - y_f/\mu.$$

If $W = \sum_{i=1}^{n} U(y_i)$ then N equals the Atkinson measure.

2.2.2 Application to Panel Data

Some problems arise when we apply inequality indices to our data set. The first one relates to the choice of appropriate measures. Due to the presence of zero-valued observations in our data, the use of either the standard deviation of logarithms or the Theil L measure is ruled out.[6]

The second problem is whether one can compare distributions of wealth at two points in time when the size of the population at each point is different. Although the panel households are the same, the exact number of individuals is not identical and this remains a relevant problem. If a symmetry assumption can be invoked such as a replication of an economy n times leaving per capita welfare unchanged,[7] then two distributions with differing populations can be normalized on a uniform population size. This method applies only to per capita changes and not to total

[6] The Theil T measure can be computed with zero-valued observations because xlogx tends to zero as x tends to zero.

[7] See the Symmetry axiom in Sen, 1973.

wealth variables. So if households are considered as the unit of measurement of welfare then one has to correct for changes in household composition. One possibility is to apply adult equivalence scales. However, obtaining a representative bundle of needs for different individuals in a household is a complex task, and while such a procedure may be feasible for consumption and calorie requirements, the problem is less tractable in the case of wealth. Thus we rely on the conventional method and correct for household size alone, i.e., we use per capita wealth values in estimating changes in inequality.

The third problem is whether comparisons can be made when absolute wealth varies over time. There are several aspects to this problem. First, there is the need to separate changes in nominal values from variations in real values. An index number approach can be used to overcome this problem. If a single reference price vector is used to deflate money wealth of all households then relative prices do not change and there is no additional conceptual difficulty in replacing nominal variables with real variables. The problem becomes tricky when the increase in prices is not uniform across households. For instance it has been shown that if the price index is a monotonic increasing function of the variable (in the present case, wealth) with respect to which inequality is being measured, then the nominal distribution exaggerates the true extent of inequality (Iyengar and Bhattacharya, 1965). The solution is to identify true cost-of-living indices for households belonging to different economic classes which own different baskets of goods. This is an exercise that is rarely undertaken because of the limited availability of disaggregated price data.[8] The use of a simple uniform deflator may be problematic when applied to total wealth. This is because total wealth is composed of a basket of assets, with different assets

[8] An attempt to construct cost-of-living price indices for different fractiles in order to measure inequality in real consumption has been made by Rajaraman, 1975.

being subject to different rates of inflation, and affecting households according to the composition of assets owned by them.

Secondly, even if an ideal index were constructed, the problem of a changed mean level of wealth remains. In such cases, the use of a mean-independent measure has certain obvious attractions, since the problem of price deflation is avoided (see section 2.4). The relative mean deviation, the coefficient of variation, the Gini coefficient, the standard deviation of logarithms and the Theil T and L are all mean-independent measures. The Atkinson measure too can be shown to be mean independent when the utility function takes a constant-elasticity form.

A mean-independent index implies that if all incomes were raised by the same proportion then the inequality measure would remain unaltered and therefore the absolute wealth of the population would not matter. Two major strands of criticism can be identified here. One, argued by Sen (Sen, 1973), shows that the actual level of incomes can affect the evaluation of a given inequality measure. For example in a poor economy, inequality may lead to the starvation of individuals at the lower end of the distribution while for a richer economy inequality may not represent such a crucial life or death condition. It may be desirable to place greater emphasis on inequality in the context of a poor economy where mean incomes are low. Mean-independence ignores this problem. "What matters in a more fundamental sense", Sen writes, "is whether these values are brought in through the measure itself or through the evaluation of the measure" (ibid:37).

Another strand of criticism comes from Kolm who argues (Kolm, 1976) that if a proportionate rise in incomes were to leave a measure of inequality unchanged it does so in a situation where in absolute terms the rich would have received a higher income supplement than the poor. Hence he argues for a 'leftist' measure of

inequality which would be neutral to across-the-board absolute increases in income but would worsen (improve) for an equiproportionate rise (fall) in all incomes. Kolm proposes an alternative index with constant absolute inequality aversion,[9] i.e., a measure which remains constant when all incomes are changed by equal absolute amounts.

Although not wholly satisfactory, an easy solution for comparative research is to use mean-independent measures while keeping in mind the extent of absolute change in mean wealth before arriving at a final interpretation.

2.3 Decomposition of Inequality Measures

2.3.1 Inequality Decomposition by Factor Components

A decomposition of inequality is useful in understanding the nature of observed inequality, its roots, and the reasons for its continued persistence or worsening in terms of certain underlying characteristics. This in itself suggests several possible ways of decomposition: it could be in terms of features of the population, such as occupational patterns, or in terms of factor components, such as the ownership of land and non-land wealth. Properties that may be considered desirable in a decomposable index are mean-independence, population-size independence and the Pigou-Dalton condition.[10]

The variance and variance of logarithms are easily decomposable measures; the former, however, is not mean-independent and the latter cannot be estimated with

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9 This is in contrast to an Atkinson type index, which embodies constant relative inequality aversion.

10 An axiomatic treatment of certain principles of decomposition may be found in Shorrocks, 1980 and 1982.

zero valued observations. The squared coefficient of variation, C^2, overcomes both problems.

Let y_{ij} stand for the income of the i^{th} individual from the j^{th} component, and $\bar{y}_j$ and $\bar{y}$ for the mean of the j^{th} component and of total wealth respectively. Then C^2 can be disaggregated into two components:

$$C^2 = \sum_{i,j} (y_{ij} - \bar{y})^2 / \bar{y}^2$$

$$= \sum_{i,j} [(y_{ij} - \bar{y}_j) + (\bar{y}_j - \bar{y})]^2 / \bar{y}^2$$

$$= \sum_{j=1}^{n} \bar{y}_j^2 / \bar{y}^2 \sum_{i=1}^{n} (y_{ij} - \bar{y}_j)^2 / \bar{y}^2_j + \sum_{j=1}^{n} (\bar{y}_j - \bar{y})^2 / \bar{y}^2$$

$$= \sum_{j=1}^{n} (\bar{y}_j / \bar{y})^2 \, C^2_w + C^2_b.$$

This is a sum of within-group coefficients weighted by the ratio of the squares of the mean income of factor j to average total income and a between-group component.[11]

While both the Theil L and Theil T measures can be disaggregated by factor components, the former has to be discarded due to individuals with zero wealth. If y_i is the share of the i^{th} individual in total income, y_j is the share of the j^{th} component, then the Theil T measure can be written as

$$T = \sum_{i,j} y_{ij} \log (y_{ij}/1/n)$$

Multiplying and dividing by y_j, and n_j, the number of individuals with income type j, we get

$$T = \sum_{i,j} y_{ij} . y_j / y_j \log \{(y_{ij}/y_j \, . y_j)/(n_j . n/n_j)\}$$

$$= \sum_{j=1}^{n} y_j \log (y_j/n_j/n) + \sum_{j=1}^{n} y_j \sum_{i=1}^{n} (y_{ij}/y_j) \log (y_{ij}/y_j/1/n_j)$$

$$= T \text{ (between-group)} + \sum_{j=1}^{n} y_j \, T \text{ (within-group)}.$$

[11] The third term of the expansion vanishes when summed over all j.

Thus the Theil index can be written as a sum of a between-group Theil measure and a weighted sum of within-group Theil indices.

Next let us consider the decomposition of the Gini coefficient. If wealth is divided into two components, y_1 and y_2 respectively, then it has been proved by Rao (1969) that

$$G(y) \leq (\bar{y}_1/\bar{y})\, G(y_1) + (\bar{y}_2/\bar{y})\, G(y_2)$$

where the weights are the shares of each component in total income.[12] The total Gini is thus less than or equal to the weighted average of the Gini coefficient for the factor components. They are exactly equal if and only if the rank ordering of individuals by different components is the same and equals the rank ordering by total wealth. For a disaggregation by wealth, there is no reason to expect the rank ordering, say, by land owned, to be identical to that by non-land wealth, i.e., to expect equality in the above relation.

An alternative approach estimates the Gini coefficient for the individual components of total wealth by a ranking of individuals according to total wealth. The total Gini could then be written as

$$\hat{G}(y) = (\bar{y}_1/\bar{y})\hat{G}(y_1) + (\bar{y}_2/\bar{y})\hat{G}(y_2).$$

These Gini measures, however, are termed pseudo-Gini coefficients (see Fei *et. al.*, 1978) since the coefficent is not determined by the correct ranking of the distribution

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[12] A proof can be found in Anand, 1983.

of y_1 and y_2. The difference between this estimated pseudo-Gini and the true Gini is the Gini error.

The decomposition of the Atkinson index is not very straightforward and it is difficult to interpret the meaning of the disaggregated components (see Szal and Robinson, 1977).

To sum up, we shall calculate inequality by types of wealth for the (psuedo) Gini coefficient, the Theil T measure and the squared coefficient of variation.

2.3.2 Decomposition of Inequality by Population Groups

The following measures are decomposable into components based on population subgroups: variance of logarithms, squared coefficient of variation, Theil L, Theil T and an Atkinson type index.[13] Of these, only the variance of logarithms and Theil L measure are additively decomposable, i.e., total inequality can be written as a sum of between-group and within-group components. However, the variance of logarithms and Theil L cannot be computed when the distribution includes observations of wealth ownership whose values are zero. The Gini coefficient is not amenable to easy decomposition. It has been shown that the overall Gini is greater than or equal to both a population-weighted average and an income-weighted average of subgroup Ginis unless the subgroups are non-overlapping (Anand, 1983).

We shall therefore estimate a population decomposition of the Theil T measure and the squared coefficient of variation. If there are i subgroups in the

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[13] This index is defined as $A = 1 - \{y(ede)/u\}^{1-e}$, $0<e<1$, where y(ede) is the equally distributed equivalent income (Anand, 1983:89).

population with n_i individuals and mean income μ_i, then the Theil T can be decomposed into:

$$T = \sum_{i=1}^{n} (1/n)(y_i/\mu) \log (y_i/\mu)$$

$$= \sum_{i=1}^{n} (n_i\mu_i/n\mu)\, T_i + T_b$$

$$= T_w + T_b.$$

The within-group component is a weighted average of subgroup Theil measures, with income shares as weights. The squared coefficient of variation, C^2, is decomposed as follows:

$$C^2 = \sigma^2/\mu^2$$

$$= \sum_{i=1}^{n} (n_i\mu_i^2)/(n\mu 2).C_i^2 + C^2_b$$

$$= C^2_w + C^2_b$$

In this case the weights do not add up to unity.

2.4 Empirical Estimates of Inequality

Section 2.4 is an empirical section in which different measures of inequality are applied to our data. The section begins with an estimate of inequality in rural assets in Tamil Nadu (2.4.1). This is followed by definitions of the variables used in panel estimates (2.4.2). In section 2.4.3, measures of inequality are applied to the panel data.

2.4.1 Some Evidence on the Distribution of Assets in Tamil Nadu, 1971-72 to 1981-82

Sources of Data

At the state and regional levels, the only source of data on rural asset ownership is the All-India Debt and Investment Survey (AIDIS) of the Reserve Bank of India. The decennial AIDIS surveys of 1971-72 and 1981-82 provide data from which aggregate levels of inequality in the distribution of assets in Tamil Nadu can be estimated. The surveys corresponded to the 26th and 37th rounds of the National Sample Survey (NSS). The AIDIS results also permit some study of changes in inequality over the 1970s. Data on asset holdings in Tamil Nadu from earlier rounds of the AIDIS showed an increase in inequality in the distribution of assets among rural households in the 1960s (Kurien, 1981).[14]

In the AIDIS/NSS sample design, states were subdivided into regions. Regions, and strata within them, were selected on the basis of similarity in cropping pattern and population density. In the case of Tamil Nadu, however, each region encompasses very different agrarian zones, and do not provide a meaningful basis for comparison.[15] For this reason, only state-level data are examined in this section.

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[14] For instance, the share of the bottom 10 per cent dropped from 0.08 to 0.04 per cent of total assets while that of the top 10 per cent increased from 72.5 to 77.6 per cent in the period 1961-62 to 1971-72 (Kurien, 1981).

[15] In Tamil Nadu the three regions identified were:
(i) Northern coastal comprising Madras, Chengalpattu, North and South Arcot;
(ii) Southern coastal comprising Thanjavur, Ramanathapuram, Tirunelveli and Kanniyakumari districts; and
(iii) Inland covering the districts of Salem, Dharmapuri, Madurai, Tiruchi, Coimbatore, and Nilgiris.

Sampling Design

The surveys of 1971-72 and 1981-82 are based on a two-stage stratified random sampling procedure where villages are the first-stage units and households are adopted as the second-stage units. In 1971-72, two independent subsamples of 12 villages were selected from each region while in 1981-82, the sample villages were selected with probability proportional to the number of households (and with replacement). In each selected village the households were divided into four substrata on the basis of land owned. The first substratum consisted of non-cultivators, or households with less than 0.005 acres of land. These households were further divided into agricultural labourers, artisans, and others. The cultivators were divided into three strata, namely small, medium and large.[16] From each substratum, three and two households were selected in 1971-72 and 1981-82 respectively. Thus, for each village, 12 households in 1971-72 and 8 households in 1981-82 were chosen by means of stratified random sampling.[17]

The changes in sampling design have affected the variance of estimators; calculations by Narayana (1987) show an increase in total sampling variance between 1971-72 and 1981-82 due to a change in the number of villages and households sampled (by decomposing total variance into between-village and within-village components).

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16 The categories were chosen in such a way that the total area owned by each category was equal. Thus in terms of land ownership, the sample in each village could be picking up different types of households.

17 In contrast to the earlier 1961-62 survey, there is both a shift towards larger number of villages with fewer households in each and a shift from simple random sampling to stratified (according to land) sampling.

Assessment of the Data Set: Reliability and Comparability

Definitional Issues

On the whole it appears that definitions, categories, and concepts used in the 1981-82 survey are similar to those adopted in 1971-72. This enhances the scope of comparability of estimates from the two surveys. Nonetheless, some problematic features remain. For example, in the definition of substrata we observe that a household with more than 0.005 acres of land is defined as a 'cultivator'. Clearly this is a very generous definition of a cultivator and probably includes a large number of agricultural labourers or others owning tiny plots of land.

The asset coverage of the AIDIS surveys is quite comprehensive including all items which had a money valued owned by a household excluding standing crops, currency in hand and stock of commodities. Most assets which were not sold or purchased during the reference period were valued at the price prevalent in the locality on the date of the survey. These are left to the discretion of local investigators and constitute a possible source of error (especially in the valuation of land). Dues receivable in cash or kind are included in the estimate of total assets; it seems logical, then, to net out dues payable in cash or kind to arrive at *net total assets*. Our calculations are based on net assets rather than gross assets. However, if indebtedness is under-reported (as argued later) this would result in an over estimate of true wealth unless lending out was under-reported to the same extent.[18] It is of great help to comparative analysis that the coverage of the two AIDIS studies is similar and that the definitions used at the two surveys remained more or less unaltered. A problem that remains, and for which the AIDIS data provide no solution, is that of finding appropriate deflators with which to compute real asset values.

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[18] Of course, for estimation of inequality a uniform under- or over-reporting would not matter; if the misreporting varied with level of assets then true inequality will differ from estimated values.

Reliability of Estimates

Two types of variables appear in the AIDIS: the incidence or proportion of households reporting a variable(such as debt), and the quantity or value of debts and of assets per household. The method of stratified sampling provides estimates of variables which bear a linear relationship with land owned,[19] an indication of their relative reliability. As quantity variables are likely to have a linear relationship with land, their estimates may be more reliable than those of incidence variables.

Extrapolations from the data show that non-cultivators and small cultivators, who accounted for 50 per cent of the sample in each village, constituted at least 80 per cent of village households. The two remaining strata, which also accounted for half the sample, constituted only 20 per cent of the rural population. Thus the full-blown estimates of the lower strata are less reliable, and since they receive a higher weight in the overall estimates, they lower the overall reliability of estimates.

Estimates of the incidence of indebtedness in the AIDIS are lower than in other rural surveys. The AIDIS for 1971-72 reported that 49 per cent of all rural households in Tamil Nadu were indebted. In 1981-82, according to AIDIS data, the proportion of rural households in Tamil Nadu in debt declined to 29 per cent. Disaggregating the data by household type, the AIDIS data showed 35 per cent of cultivators and only 14 per cent of non-cultivators as being in debt in 1981-82. Similarly, according to the AIDIS data, the debt-asset ratio (debts as a percentage of total assets) in Tamil Nadu halved over the decade, declining from 10 per cent in

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19 For instance, estimates of the coefficient of variation suggest that variables related to land, and variables for cultivator rather than non-cultivator households are more reliable (see Table A, AIDIS, Statistical Tables for Tamil Nadu).

1971-72 to 5 per cent in 1981-82. Evidence from our own study and other research in rural Tamil Nadu differs sharply and does not support this view of a large fall in indebtedness (see, for instance, Athreya *et. al.*, 1985). The magnitude of loans received from cooperative institutions has also been underestimated. For example, Narayana reports (Narayana, 1987) that in 1971-72, the AIDIS estimates of debts incurred from cooperatives were 51 per cent below debt outstanding as reported by the Cooperative Societies.

The data on asset holdings are probably the most reliable of all the items estimated in both surveys. While data from the AIDIS reports need to be interpreted with caution, they do provide a rough order of magnitude of inequality in the distribution of assets in rural Tamil Nadu.

Results

Using the total sample of households in the AIDIS data on Tamil Nadu for 1971-72 and 1981-82, we have estimated the Gini coefficient for the distribution of rural assets. The variables used are net total assets, decomposed into land and non-land assets.[20]

In 1971-72, the Gini coefficient equalled 0.72 for net total assets, indicating an extremely high degree of inequality. The share of the top quintile of households in total assets was 178 times that of the bottom quintile. On decomposition into land and non-land assets, the Gini coefficients equalled 0.76 and 0.57, respectively. Inequality in the distribution of land was the major contributor to overall inequality (land assets constituted 70.8 per cent of total assets).

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[20] For 1971-72 the data are obtained from Tables 1 and 3 of the AIDIS, Statistical Tables for Tamil Nadu. The 1981-82 data are based on Table 7, p. S-113 of *Sarvekshana*, Vol. X, No. 1, July 1986.

In 1981-82 the Gini coefficient for net total assets among all households in Tamil Nadu was 0.65, a decline of 9.7 per cent over the decade. The Gini ratio for land value dropped to 0.69 whereas that for non-land assets rose to 0.61. The two surveys together suggest a slight equalization in the distribution of total assets -- primarily through changes in the distribution of land. The Lorenz curves are non-intersecting and corroborate the decline in inequality (Figure 1).

In the earlier decade, 1961-62 to 1971-72, Tamil Nadu was marked out as a state with a low level of rural asset ownership (below the national average) in conjunction with a high degree of inequality.[21] Evidence for the subsequent decade indicates the persistence of a heavy concentration of rural assets.

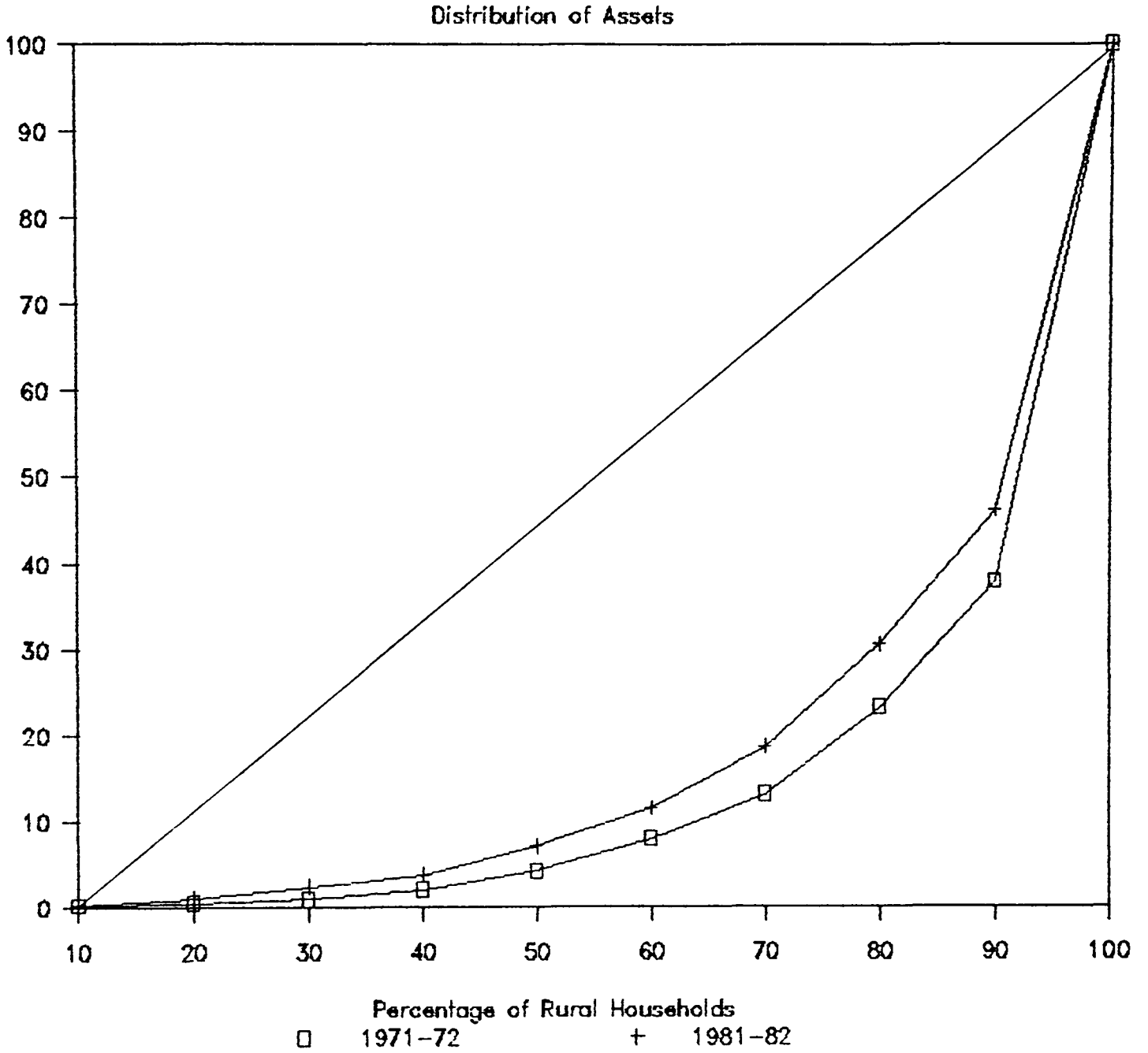
2.4.2 Inequality in Gokilapuram: Variables Used in Estimation

In applying measures of inequality to the primary data from Gokilapuram, total wealth rather than net worth (or wealth net of indebtedness) has been taken to be the appropriate variable for estimation. The main reason for this is the immense variety in the nature of loans and the forms in which they are repaid. For instance, certain households continually reschedule debt, with the principal eventually being forgiven or written-off. Others may not have a large total debt but bear a heavy burden because of high annual interest payments. There is no simple or uniform way

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[21] The stark contrast between Tamil Nadu and other states is brought out in a paper by Pathak, Ganapathy and Sharma (1977). The Gini coefficient for rural asset distribution rose from 0.67 in 1961-62 to 0.7 in 1971-72 on an All India basis; it increased from 0.77 to 0.79 in Tamil Nadu during the same decade. (It should be pointed out that these estimates of the Gini differ slightly from our estimates based on group data as Pathak *et. al.* fitted the data to a lognormal distribution and estimated inequality indices on the basis of the fitted distribution.) In comparison with other high inequality states like Punjab and Haryana, Tamil Nadu also had a lower average value of assets. The average for Tamil Nadu was Rs 6,826 in 1971-72 while the national mean equalled Rs 11,310. Further the difference between mean assets per household in Tamil Nadu and All India are particularly marked in the lower deciles.

Figure 1: Lorenz Curves for Tamil Nadu



of netting out debt. The calculation of net wealth may also create a large number of observations with zero or negative values, causing difficulties in estimation.

The wealth data in both years derive from a household's own estimation of the current value of their assets. These assets include all types of land; other agricultural assets such as machinery; livestock and draught animals; assets used in business activity; buildings; gold and all other durable household goods.[22] Clothing and earthenware vessels are excluded from the calculation. Some independent estimates of the range to which village asset values belonged provide a check to these estimates.

Two methods of classifying household assets have been used in the thesis. The first is to classify assets into productive assets and non-productive assets. Productive assets include land, livestock, agricultural machinery and business assets, and non-productive assets include housing, consumer durables, and gold.

The alternative two-fold classification is the division of all assets into land and non-land categories. The 'land' category includes crop land, plantation land and trees and the 'non-land' category is composed of all other household asset categories. In a predominantly agrarian economy such as that of Gokilapuram, land is the primary asset and the ownership of land is an important indicator of the possibilities for further productive accumulation.

To measure real asset accumulation or the change in real wealth, an appropriate deflator must be estimated. There are different options here and no simple

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[22] Financial assets were owned by only a few households, and referred mainly to insurance policies.

deflator was entirely satisfactory. The deflator that has been used here is the Index Number of Wholesale Prices for Tamil Nadu (WPI).

There is no comprehensive asset price series for rural or for urban India. The Reserve Bank of India (RBI) publishes an Index of Security Prices. Since the spread of financial assets and shares is minimal in rural areas, this measure is not appropriate for our purpose. The RBI also provides data on bullion prices (spot rates from Bombay). Gold is an important component of the asset bundle of rural households. Gold prices, however fluctuate widely and are subject to international movements that do not reflect the degree of inflation in other rural assets.[23] On its own an index of gold prices is an inadequate measure of rural-asset inflation. The choice then is between the Consumer Price Index for Agricultural Labourers and the Index Number of Wholesale Prices.[24] From officially available statistics, the best option is to use the series on wholesale prices which indicate the overall trends in commodity price movement. While food items account for the largest weight, of about 32 per cent, in the WPI, it also gives sufficient weight to other goods such as fuel, manufactures, etc.

The use of the CPIAL for Tamil Nadu does not, however, alter the estimates of change in real wealth to any significant degree. The CPIAL price deflator for 1985 (in terms of 1977 prices) equals 1.71 which is slightly lower than the WPI deflator, which equals 1.91. The use of the CPIAL deflator would thus result in somewhat higher estimates of real wealth in 1985 (in terms of 1977 prices).[25] If a household's real wealth doubled using the WPI deflator, it would have increased by 110 per cent

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[23] In fact the price of gold in India has been rising in the 1980s, a period when the world price was on a downward trend.

[24] It is also possible to deflate with foodgrain prices; this is a good deflator for income or expenditure where the price of wage goods is relevant but not as suitable for assets.

[25] Since we are using a uniform deflator across wealth classes, the relative ranking of households (for estimates of inequality and mobility) is unaffected.

if we had used the alternative CPIAL price deflator. In short, the rise in real wealth between 1977 and 1985 would have been 10 per cent higher with the CPIAL deflator. Unfortunately, disaggregated data on the CPIAL deflator for different centres in Tamil Nadu were only available up to 1982-83 from the Season and Crop Reports. When the magnitude of change between 1977-78 and 1982-83 in the WPI is compared with the magnitude of change in the Rural Price Index Numbers (RPI) for Madurai district, which is the CPIAL for the district, over the same period, there was very little difference between the two. The price relative equalled 1.61 with the Rural Price Index for Madurai district and equalled 1.55 with the WPI for Tamil Nadu. Estimates of real wealth in 1985 that are reported in the thesis are thus not very sensitive to the choice of deflator.

Most longitudinal studies to date have relied on nominal assets and skirted the problem of finding an appropriate deflator for determining real asset values over time. In the NCAER panel study, however, a deflator based on survey data was constructed for each household. Ramesh (1986) constructed a series on bullock prices using data from the 'Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops'. A similar exercise could be undertaken for Tamil Nadu; an asset deflator could be determined from raw data collected by the 'Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops'. Data collection under this scheme began in 1970-71. The data include material on asset-values for a range of assets, including land, buildings, well and irrigation structures, implements and machinery and livestock. At present, however, the data are only available in raw form and the task of collating the asset data over the eight-year period (1977-85), assigning appropriate weights, and constructing a single index of asset prices is a mammoth task in itself.

There were limitations to constructing an index from land values recorded at our survey. These limitations can be illustrated by a simple analysis of variance of land values. Such an analysis revealed an enormous variability in the unit price of land. All three irrigation types of land showed a high variation in unit land prices (Table 2.1).

TABLE 2.1: MEAN AND VARIANCE OF UNIT LAND VALUES BY TYPE OF LAND, GOKILAPURAM, 1985

Type of land t	N	Unit price (in rupees)			Coefficien of variation
		Mean	Median	Mode	
Nanjai	16	68,771.5	70,000	80,000	26.1
Thottam	14	40,245.6	40,000	40,000	60.6
Punjai	22	5,293.1	5,000	5,000	43.1

Note: N represents the number of plots of land for which price data readings were taken.

The coefficient of variation was highest for *thottam* land followed by *nanjai* and finally dry land. This suggests that there are important differences in land quality that result in this large variation in unit price. These differences relate to soil, topography, location, and the extent of investment in land. An analysis of variance of land value based on the equation

$$\text{var}(p.q) = \text{var}(p) + \text{var}(q) + \text{cov}(p,q)$$

shows a remarkably large covariance term (see Table 2.2). Large landowners own land of high quality, valued at high prices. They stand a clear advantage over other

sections of the village population in their ability to invest in land and to buy the best land available.

TABLE 2.2: ANALYSIS OF VARIANCE FOR LAND VALUES, GOKILAPURAM, 1985

	Irrigation type of land		
	Nanjai	Thottam	Punjai
Var(pq)	5.5E+10	11.5E+10	4.9E+9
Var(p)	3.2E+8	5.9E+8	6.4E+6
Var(q)	15	67	68
Cov (pq)	5.4E+10	11.4E+10	4.8E+9

Given the wide variation in land prices despite adjustment for irrigation-type, it was almost impossible to distinguish a pure price rise from differences in the original quality of land and improvements on it. The task of constructing a land-price index is one of great complexity, and such an index would not be an accurate one unless it incorporated data on the quality of different types of land. For these reasons, we have not attempted to obtain a rural asset-price index based on primary data on land values. Even if we were to construct a unique index for each household, the problems of separating price and quality changes would remain daunting.

The alternative deflator we are left with is the Index Number of Wholesale Prices in Tamil Nadu.[26] This is not an altogether satisfactory deflator, since it could give rise to two kinds of bias. First, as asset prices have probably risen faster than

[26] This is taken from different issues of *Tamil Nadu, An Economic Appraisal.*

commodity prices, using this deflator could overestimate the growth in real wealth. Secondly, it is a uniform deflator and does not take account of differences in commodity (asset) composition among households in the village. Informal discussions suggest that land and gold prices have accelerated in comparison to other assets, such as livestock. If richer households have experienced higher inflation in asset values, then estimates of inequality based on a uniform deflator could over-estimate true inequality in wealth.

The calculations below deal with per capita household wealth, i.e., the aggregate assets of each household divided by the number of persons in that household. Measures of inequality are based on the distribution of individuals in the panel, 458 persons in 1977 and 447 persons in 1985. The measure of per capita wealth is not adjusted for the age structure of the household; there is no attempt to assign weights to individuals of different ages in order to obtain an adult equivalent scale. Equivalence methods are beset with problems, not the least of them being the non-uniformity in the weights assigned to individuals by different researchers. A more fundamental problem, however, is that the comparison invokes judgements in assigning needs and requirements to different members of a household. The assumptions involved in such analyses are often not made explicit.

It is useful at this stage to point out the differences between a distribution based on per capita values and one based on aggregate household values. Anand (1983) showed how a per capita distribution can be derived from a joint distribution of household income and household size. Anand also clarified the conditions under which the per capita distribution would be more or less unequal (in the Lorenz sense) to the total distribution. The popular view that a per capita distribution is more equal than a total income distribution if household size rises with income was shown to be valid only under special conditions. When households are ranked by increasing

household income, a per capita distribution is more equal than a total income distribution if household size rises with household income but at a rate no faster than income. The two distributions will differ as a result of variability in household size between income classes and as a result of variability in household size within a class.

2.4.3 Estimates of Inequality in the Distribution of Wealth in Gokilapuram

A simple ranking of panel households cumulated by deciles of household wealth (Table 2.3) establishes the extreme concentration of wealth in the hands of households in the tenth decile. Households in the top decile owned more than 80 per cent of all assets in 1977 and in 1985. There was a perceptible worsening of the distribution of wealth over time; the Lorenz curve for 1985 was *unambiguously outside* that for 1977 (Figure 2). A one-tailed Kolmogorov-Smirnov test showed the difference between the 1985 and 1977 Lorenz curves to be statistically significant.[27] Taking the ratio of the wealth share of the top quintile to that of the bottom quintile, it expanded from 463 in 1977 to 531 in 1985.

[27] A one-tailed test on a large sample (N>40) is based on the statistic $4D^2n_1n_2/(n_1+n_2) \sim \chi^2$ with two degrees of freedom where D is the maximum difference between the two cumulative frequency distributions being compared. See Siegel, 1956.

Figure 2: Lorenz Curves for Gokilapuram

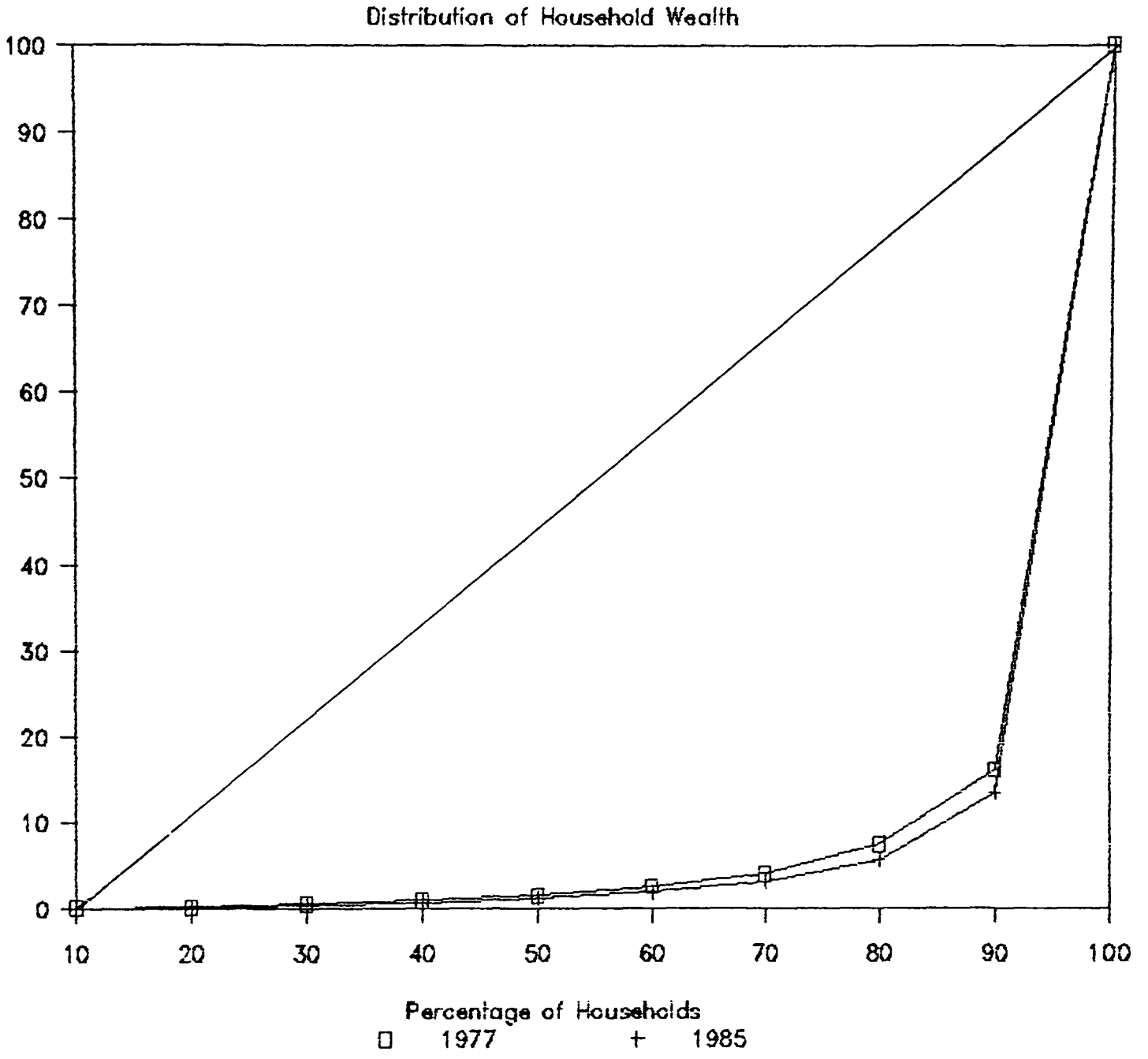


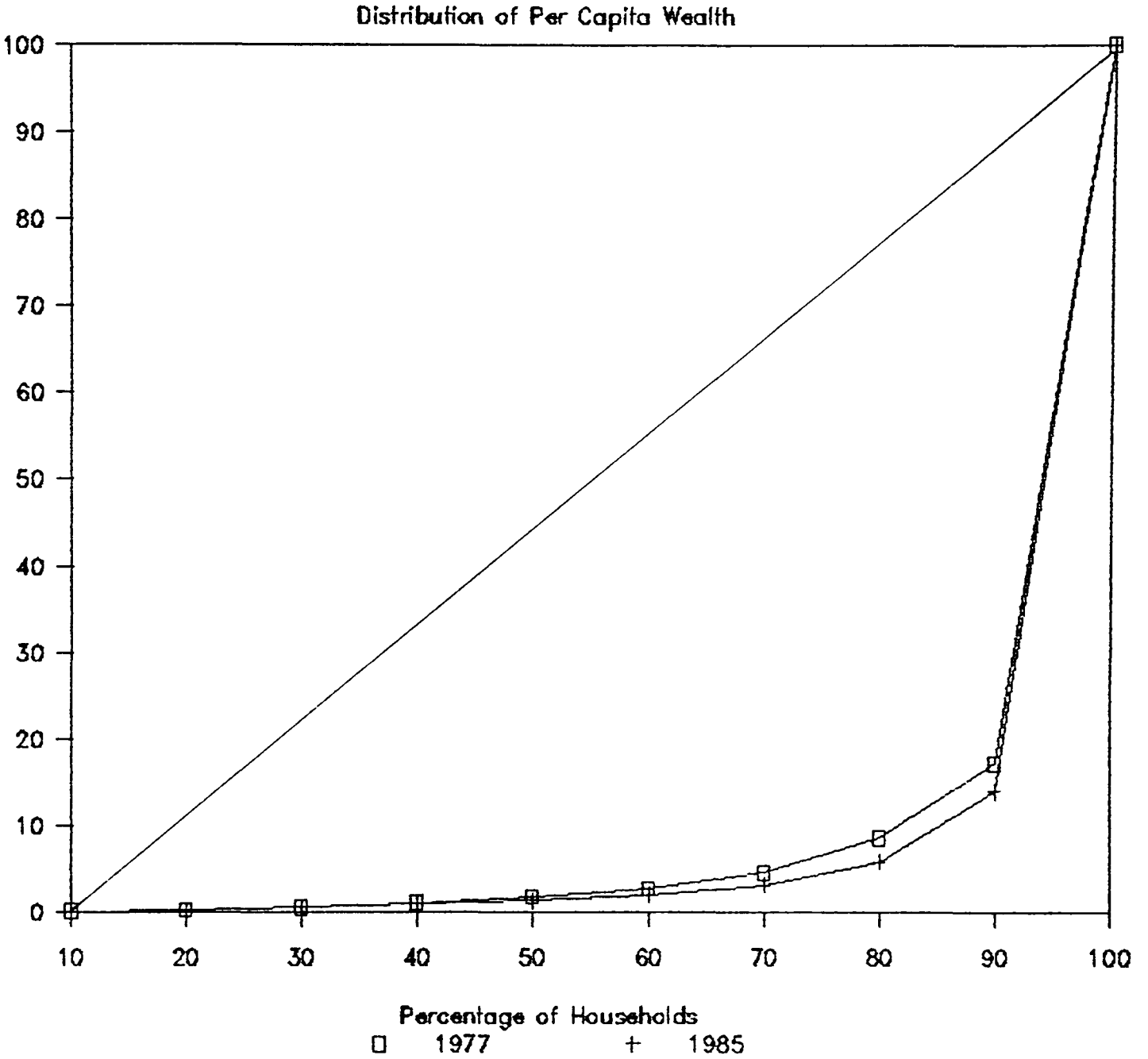
TABLE 2.3: CUMULATIVE SHARE OF HOUSEHOLD WEALTH BY DECILES OF HOUSEHOLDS, 1977 AND 1985

Decile	Households (cumulative number)	Cumulative share share of wealth (in per cent)	
		1977	1985
1	9	0.03	0.04
2	18	0.17	0.14
3	27	0.48	0.36
4	35	0.88	0.69
5	43	1.53	1.2
6	51	2.52	1.9
7	59	4.01	3.1
8	67	7.39	5.6
9	75	16.11	13.4
10	83	99.98	99.98

Similar conclusions emerge when households are ranked by cumulative shares of per capita household wealth (Table 2.4 and Figure 3). The gap between the rich and poor widened between 1977 and 1985. The share of total assets owned by households belonging to the bottom 80 per cent of the distribution declined from 8.6 per cent of total wealth in 1977 to 5.8 per cent in 1985. Table 2.4 also shows that in terms of changes in the ratio of the share of the top quintile to the bottom quintile, inequality worsened. The ratio increased from 339 in 1977 to 494 in 1985.

The distribution of per capita wealth between households assigns a slightly larger share of wealth to the lower deciles as compared with the previous ranking by

Figure 3: Lorenz Curves for Gokilapuram



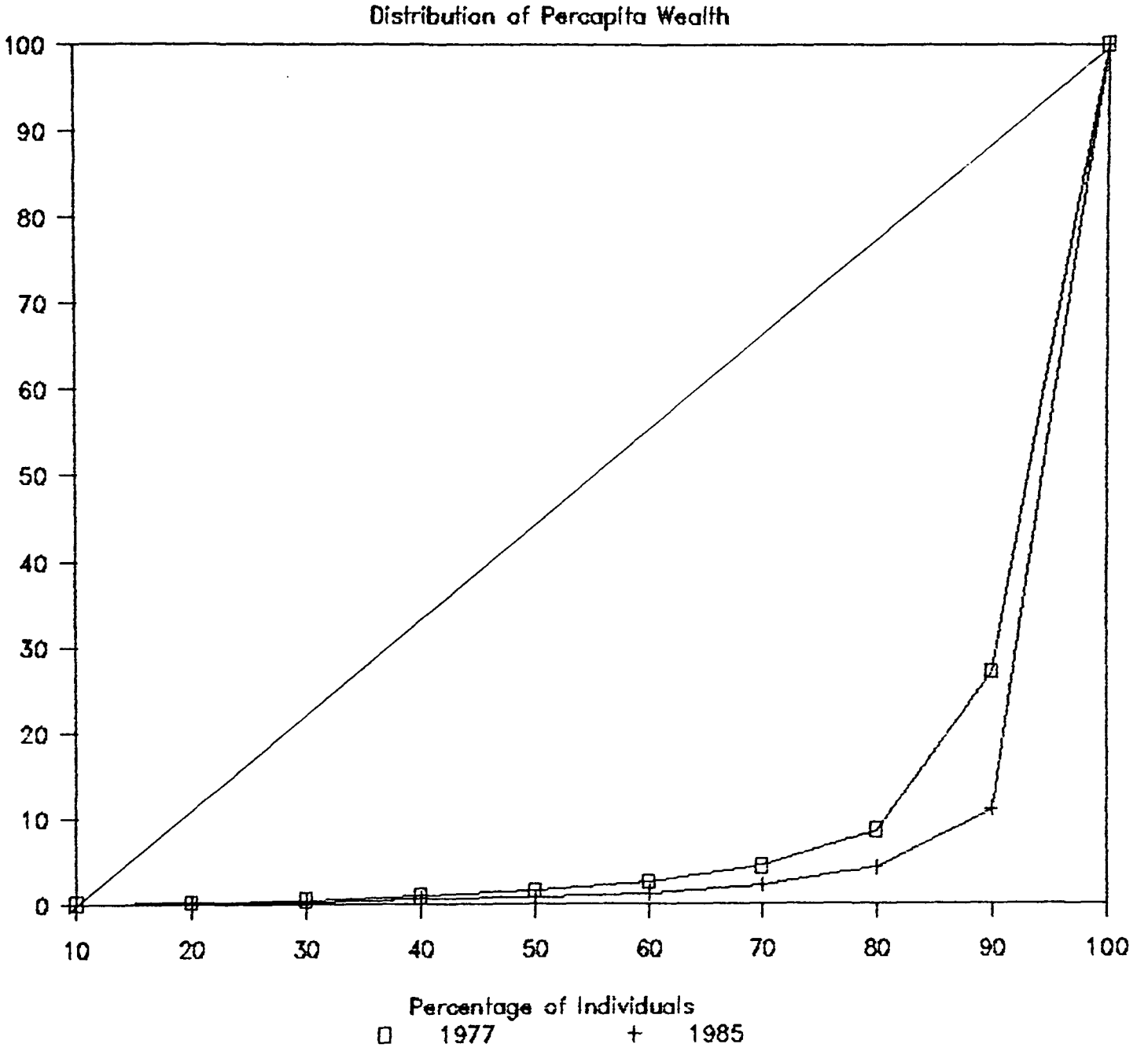
household wealth. In other words, household size had a minor equalizing effect on inequality.

TABLE 2.4: CUMULATIVE SHARE OF WEALTH, HOUSEHOLDS RANKED BY PER CAPITA WEALTH, 1977 AND 1985

Decile	Households (cumulative number)	Cumulative share share of wealth (in per cent)	
		1977	1985
1	9	0.06	0.06
2	18	0.20	0.18
3	27	0.53	0.55
4	35	1.03	0.88
5	43	1.74	1.28
6	51	2.67	1.94
7	59	4.55	3.16
8	67	8.58	5.82
9	75	17.22	13.94
10	83	99.98	99.98

Table 2.5 is the distribution of *individuals* ranked by cumulative per capita wealth. Here, as in Tables 2.3 and 2.4, the comparative data for 1977 and 1985 show increased inequality (see Figure 4). The difference between the distribution in Table 2.5 and the distribution in Table 2.4 is in the ranking of the 1977 data. In Table 2.5, the top decile but one accounted for 18.5 per cent of total wealth. This is significantly higher than the share of the same decile in Table 2.4, which was 8.6 per cent. Given that rich households have more members than other households (see section 4.2), the difference mentioned above suggests that *individuals* in the 9th decile of the

Figure 4: Lorenz Curves for Gokilapuram



distribution in Table 2.5 are drawn partly from households located in the 10th decile of the distribution in Table 2.4.

TABLE 2.5: CUMULATIVE SHARE OF WEALTH, INDIVIDUALS RANKED BY PER CAPITA WEALTH, 1977 AND 1985

Decile	Cumulative share of wealth (in per cent)	
	1977	1985
1	0.06	0.04
2	0.21	0.14
3	0.46	0.29
4	0.94	0.49
5	1.59	0.77
6	2.54	1.25
7	4.38	2.15
8	8.51	4.20
9	27.06	11.03
10	99.99	99.99

To conclude, each of the three alternative rankings of households and individuals in the panel shows a highly unequal distribution of wealth in Gokilapuram and an unambiguous accentuation of inequality between 1977 and 1985.

There remains the question of whether households and individuals at the lower end of the distributions have made gains in absolute levels of real wealth. Such shifts in the distribution of wealth must also be taken into consideration when conclusions are drawn from mean-independent inequality measures.

For all panel households, both household and per capita wealth increased by less than a factor of two in real terms (Table 2.6). Land wealth, which accounted for nearly three-quarters of total household wealth in 1977, grew at a faster rate than non-land wealth. With rapidly accelerating land prices, the use of a uniform deflator may in part be responsible for this differential rise in wealth.

TABLE 2.6: AVERAGE HOUSEHOLD ASSET HOLDINGS, GOKILAPURAM, 1977 AND 1985

Wealth category	Average asset holdings per household	
	1977	1985
Household wealth	79,043	131,883
Per capita wealth	10,499	19,015
Land wealth	58,031	107,447
Nonland wealth	21,013	24,435
Productive wealth	61,473	111,205
Nonproductive wealth	17,570	20,677

Note: 1985 values are deflated to 1977 prices. All figures have been rounded off.

An interesting feature of the disaggregated data, that is, from a ranking by deciles of per capita wealth, is that per capita real wealth more than doubled for those in the lowest decile (Table 2.7). Although these households remain extremely deprived by any standard, the data do not show an absolute deterioration in their conditions. (A rise in the decile average need not, of course, mean that all households became better-off.) All other deciles showed a slightly lower rate of growth of per capita wealth.

TABLE 2.7: PER CAPITA WEALTH OF HOUSEHOLDS RANKED BY PER CAPITA HOUSEHOLD WEALTH, GOKILAPURAM, 1977 AND 1985

Rank	N	Average per capita wealth in the decile (in rupees)	
		1977	1985
1	8	49	131
2	8	206	384
3	9	418	758
4	8	672	1,064
5	8	1,080	1,287
6	9	1,413	1,988
7	8	2,328	3,201
8	9	5,063	5,797
9	8	13,810	15,505
10	8	83,025	87,423

Note: Each per capita wealth column is derived by ranking all households by the relevant variable, i.e., per capita wealth 1977, and per capita real wealth 1985, respectively. N is number of households.

Table 2.8 presents data on land and non-land assets of households in 1977 and 1985. The growth of land wealth is particularly marked in the upper deciles, groups in which land wealth dominates total household wealth. Non-land wealth, as may be expected, forms the bulk of total wealth among the lower deciles. A noteworthy feature of the data is that households in the lowest quintile acquired some land -- although the land holdings that they acquired were very small -- between 1977 and 1985.

TABLE 2.8: AVERAGE HOLDINGS OF LAND AND NON-LAND WEALTH PER HOUSEHOLD FOR HOUSEHOLDS RANKED BY PER CAPITA WEALTH, GOKILAPURAM, 1977 AND 1985

(in 1977 rupees)

Rank Decile	N	Land wealth		Non-land wealth	
		1977	1985	1977	1985
1	8	0	98	344	808
2	8	0	13	927	1,658
3	9	133	205	1,946	4,210
4	8	400	757	3,491	3,808
5	8	837	329	4,741	5,738
6	9	717	1,228	6,021	6,786
7	8	2,969	4,007	10,887	12,667
8	9	16,494	13,386	15,782	19,007
9	8	45,969	72,135	25,135	38,903
10	8	532,381	1020,757	410,931	156,783

Table 2.9 presents a size distribution of household wealth using class-intervals employed in the AIDIS. In both survey years, 51 per cent of households belonged to the wealth bracket Rs 1,000 to Rs 10,000. This modal category accounted for 2.8 per cent of aggregate wealth in 1977 and 1.6 per cent of total wealth in 1985. At the upper end of the distribution, the number of households in the highest category, Rs 1 million and above, remained unchanged, but the share of wealth owned by households in this category jumped from 57.4 per cent in 1977 to 65.2 per cent in 1985. Although the frequency distribution of households in different wealth categories was similar in the two years, there was a shift in the distribution of wealth.

TABLE 2.9: DISTRIBUTION OF HOUSEHOLDS BY SIZE-CLASS OF WEALTH OWNERSHIP, 1977-1985

Size class of wealth ownership (in rupees)	Number of households in class		Percentage of total wealth owned	
	1977	1985	1977	1985
0-500	8	4	0.02	0.01
500-1,000	3	2	0.03	0.01
1,000-2,500	13	14	0.31	0.21
2,500-5,000	14	11	0.71	0.36
5,000-10,000	15	17	1.75	1.08
10,000-15,000	4	5	0.71	0.54
15,000-20,000	3	1	0.8	0.14
20,000-30,000	4	8	1.53	1.78
30,000-50,000	5	8	2.99	2.67
50,000-100,000	4	2	4.0	1.23
100,000-1000,000	7	8	29.73	26.77
1000,000+	3	3	57.43	65.2
All households	83	83	100	100

Note: Figures for 1985 were obtained after asset values were corrected for inflation.

Vertical Inequality Measures

The measures of vertical inequality discussed earlier have been estimated for the entire population of individuals in the Gokilapuram panel in 1977 and 1985. The variable that was used for these estimates was per capita household wealth. The results are summarized in Table 2.10. Without exception, the measures confirm the intense disparity in the distribution of wealth in the village. All the indices show an increase over time; the Gini coefficient, for instance, increased by nearly 5 per cent.

TABLE 2.10: MEASURES OF VERTICAL INEQUALITY, GOKILAPURAM

Measures	1977	1985
1. Range/mean	14.6	22.4
2. Coefficient of variation	270.5	377.9
3. Relative mean deviation	1.42	1.45
4. Gini coefficient	0.82	0.86
5. Theil T	1.51	1.82
6. Atkinson index	0.61	0.66

Note: The Atkinson measure is computed for a value of e = 0.5.

The panel, however, is not representative of the village population as a whole; most notably it over-represents the rich landlord households. For this reason, the estimated inequality measures may be upwardly biased in relation to true estimates of village inequality. In the paragraphs that follow, we attempt to restore population representativeness by introducing correction factors into the estimates. The 1977 survey data provide us with a socioeconomic classification of *all* households in the village, since the survey in that year was a census-type survey. We have used the

distribution of households into socioeconomic categories from the 1977 survey to devise correction factors for estimates from the panel data. By comparing the distribution of households in the baseline survey with that in the panel, appropriate weights that bring the two in line can be obtained (see Table 2.11). It is still not possible to gauge the overall change in the socioeconomic structure of the village since there is neither a comparable village census for 1985 nor are sufficiently disaggregated data available from the village-level returns of the Census of 1981.

TABLE 2.11: CORRECTION FACTORS

Socioeconomic category	Percentage of households in category		Correction factor
	in 1977	in 1985	
Landlords	4.9	9.6	0.51
Peasants	15.2	14.4	1.05
Manual labour	53.7	46.9	1.14
Business	12.5	12.0	1.04
Artisans and traditional services	5.6	6.0	0.93
Salaried employees	4.9	6.0	0.81
Others	3.1	4.8	0.64

With these qualifications, that is, assuming that the distribution of the population between socioeconomic strata has remained the same, measures of inequality have been re-estimated with a weighted per capita wealth variable.

TABLE 2.12: CORRECTED INEQUALITY MEASURES, GOKILAPURAM

Measure	1977	1985
1. Range/mean	18.8	21.2
2. Coefficient of variation	219.5	328.2
3. Relative mean deviation	1.25	1.32
4. Gini coefficient	0.77	0.81
5. Theil T	1.23	1.55
6. Atkinson	0.52	0.57

Note: The Atkinson measure is computed for a value of e = 0.5.

The weighted inequality indices, as may be expected, give slightly lower estimates of overall inequality (Table 2.12). The Gini, for example, rises from 0.77 to 0.81 over the period 1977-1985 as compared to an earlier increase from 0.82 to 0.86 in the case of uncorrected panel estimates. The relative mean deviation increases from 1.25 to 1.32; in both years these estimates are close to the upper bound for this index (= 1.9).

The Atkinson measure cannot be computed for values greater than one due to the presence of zero values in the data set;[28] for a value of e=1, the index reduces to a transform of the Theil L measure. Estimates reported above were thus computed for a value of the inequality aversion parameter e, equalling 0.5. In other words, if wealth were equally distributed the same welfare could be achieved with 48 per cent of total

[28] A value of e = 2 that is recommended in the literature (see Anand, 1983) cannot be used for estimation.

wealth in 1977 ($y_e/\mu = 48$ per cent). As e tends to unity, the index also becomes very close to unity, a condition of perfect inequality. The Atkinson measure must be interpreted carefully as the index is very sensitive to the value of e, the inequality aversion parameter.

The corrected inequality measures are lower than the earlier estimates. However they substantiate the two major conclusions of this analysis: first, that inequality by every measure was extremely high in both years; and secondly, that inequality increased between 1977 and 1985.

2.5 Decomposition of Wealth by Factor Components and Population Groups

2.5.1 Land and Non-land Assets

The first decomposition that is attempted is of wealth into land and non-land components. Estimates of the Theil T measure, the squared coefficient of variation and the Gini coefficient indicate a higher degree of inequality in the distribution of land than in the distribution of other assets (Table 2.13). Furthermore, there was a rise in inequality in the distribution of land wealth over time.[29] A decomposition analysis shows that inequality in the distribution of land and non-land wealth moved in opposite directions. Inequality in the distribution of land wealth increased, while there was a tendency towards a less unequal distribution of non-land assets. The higher weight attached to land wealth in total wealth is an important factor in the overall increase in inequality.

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[29] Estimates of the Gini coefficient for owned and operated land holdings in 1985 confirm the hypothesis that both are distributed unequally; the coefficients are 0.85 and 0.84, respectively.

TABLE 2.13: DECOMPOSITION OF INEQUALITY IN WEALTH, LAND WEALTH AND NON-LAND WEALTH, GOKILAPURAM, 1977 AND 1985

Measure	Land wealth		Non-land wealth	
	1977	1985	1977	1985
C^2	260.3^2	426^2	163.1^2	203.7^2
Theil T	1.95	2.26	1.1	0.61
Gini	0.89	0.91	0.71	0.67

Note: The pseudo-Gini coefficients estimated as a sum of weighted Ginis using the share of wealth as weights equalled 0.82 in 1977 and 0.85 in 1985. The Gini error is thus not very large equalling 0.05 and 0.04 in the two years, respectively.

2.5.2 Productive and Unproductive Wealth

Inequality was also estimated after decomposing wealth into productive and non-productive assets (Table 2.14). Inequality in the distribution of productive wealth is markedly greater than for non-productive wealth. For example, in 1985 the Gini coefficient equalled 0.9 and 0.58 for productive and nonproductive wealth, respectively. Similar results are obtained from the Theil T and squared coefficient of variation. The contribution of between-group inequality declined over time; for example the inter-component contribution to inequality using the squared coefficient of variation declined from 25 per cent to 9 per cent.

TABLE 2.14: DECOMPOSITION OF INEQUALITY IN WEALTH, PRODUCTIVE ASSETS AND NON-PRODUCTIVE ASSETS, GOKILAPURAM, 1977 AND 1985

Measure	Productive assets		Non-productive assets	
	1977	1985	1977	1985
C^2	255.3^2	389.4^2	170.1^2	143.9^2
Theil T	1.64	2.27	0.8	0.63
Gini	0.85	0.90	0.64	0.58

Note: The pseudo Gini coefficients equalled 0.79 and 0.85 in 1977 and 1985 respectively.

The two decompositions of wealth confirm the view that land, the major productive asset of an agrarian economy, is distributed very unequally. Ownership of other productive assets, mainly livestock, is more widespread but has a limited impact on overall inequality because of its small weight in total wealth. The Gini ratio for land wealth rose from 0.89 to 0.91 over the study period, and that for productive wealth from 0.85 to 0.90. These changes in the Gini ratio reflected a process of land dispossession and the accrual of differential gains in respect of land acquisition. A more detailed study of the extent of private investment in land improvement and a history of land transactions is needed to explain the observed changes in inequality more satisfactorily.

2.5.3 Population Decomposition: Occupational Groups

Measures of inequality were also estimated for the panel after disaggregating households into six occupational strata. The six broad occupational categories used were: landlords, peasants, manual labourers, artisans and households employed at traditional caste callings, households whose major income was from business activities other than direct crop cultivation, and others.

Estimates obtained after decomposing the Theil T measure and the squared coefficient of variation indicate that the between-group or inter-occupation component was the major source of inequality (Table 2.15). The contribution of between-group inequality was very high in 1977. For example, the contribution was 91.5 per cent in terms of C^2. This declined considerably in 1985. Nevertheless, the substantial contribution of inter-occupational inequality to total inequality in 1977 suggests that the selected occupational categories were reasonably homogeneous and constituted a good basis for socioeconomic categorization.[30] The decomposition strongly suggests that occupational mobility can play an important role in changing the structure of ownership of wealth.

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[30] The fact of a very large contribution by inter-occupational inequality to total inequality in 1977 could be attributed partly to the fineness of the classification.

TABLE 2.15: DECOMPOSITION OF INEQUALITY, OCCUPATIONAL CATEGORIES, GOKILAPURAM, 1977 AND 1985

Measure	Contribution of between-group component (in per cent)	
	1977	1985
Theil T	82.1	60.5
C^2	91.5	44.2

Note: C^2 is the squared coefficient of variation.

2.6 Concluding Remarks

A brief survey of inequality measures was undertaken to identify those suitable to an application to panel data from Gokilapuram. The standard deviation of logarithms and Theil L measures were rejected due to the presence of zero-valued observations. An estimation of inequality indices with respect to per capita wealth in the Gokilapuram panel showed an extremely high degree of inequality in 1977. The inequality worsened in 1985. However, there was an absolute increase in per capita wealth in all deciles. Using data on the socioeconomic stratification of the village in 1977, inequality measures were re-estimated, and again, they pointed to a rise in disparity in the distribution of wealth. State level estimates for Tamil Nadu also showed an extremely high degree of inequality in asset ownership in 1971-72 and 1981-82.

Wealth was disaggregated into components and inequality measures were re-estimated for individual components. Inequality in the distribution of land wealth and productive wealth increased. The distribution of non-land wealth and non-productive assets between households showed a tendency towards greater equality. The ownership of *productive* resources, the source of further accumulation, became concentrated in fewer hands between 1977 and 1985. A decomposition of inequality measures by occupational groups indicated that within-group inequality was lower than between-group or inter-occupational inequality.

These observations on the magnitude of inequality and on changes in inequality over time have to be assessed in the larger context of growth and development in the village economy. Though we lack data on rates of growth of income at the village-level, it is known that a major redistributive effort was undertaken by the government during the study period. Gokilapuram was one among the specially selected 'cluster' villages, which received a relatively high allocation of resources under this programme. In this context, the observed *rise* in inequality is doubly worrying. This shows that the redistributive programme has not altered the structure of ownership of assets in the village in any substantial way.

3

THE NATURE OF ECONOMIC MOBILITY: AN APPLICATION TO GOKILAPURAM, 1977-1985

3.1 Introduction

This chapter deals with economic mobility among individuals and households in the village. The discussion of economic mobility acquires particular relevance in the context of the rising inequality that has been shown to characterize the distribution of wealth in the village. When there is mobility or a re-ranking of individuals over time, single-period inequality differs from long-run or multi-period inequality.[1] Our concern in this chapter is to monitor changes in longer-run economic status by observing changes in wealth as reflected in the actual movement of people in and out of different wealth categories over time.

As mentioned earlier, there are some questions of relevance to the study of changes in the economic status of households that cannot be answered through comparative-static study alone. Some of these questions, discussed in this chapter, are: Are households in the lowest decile at a point in time the same, or descendants of the same, households who were in the lowest decile in earlier periods? If there is economic mobility, what is the degree of mobility and how do people of different economic backgrounds differ from each other with regard to mobility? Who have gained through upward mobility and who have lost from downward mobility?

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1 For instance, Shorrocks (1978a) has shown that a mean-independent measure of inequality is independent of the measurement period if and only if there is complete immobility; the presence of mobility lowers long-run inequality as compared to single-year measures.

This chapter discusses the methods that are available to answer these questions and then attempts to answer them by applying these methods to the 1977 and 1985 panel data from Gokilapuram. It identifies the magnitude and direction of movement with regard to the ownership of wealth in the economy of Gokilapuram. This forms the basis for further exploration of the characteristics of mobility, and the role of government policy.

3.2 Measures of Mobility

Different measures of economic mobility are discussed in this section. First, we consider simple correlation and regresssion based measures (3.2.1) followed by a Lorenz-based measure (3.2.2). A more detailed exposition of matrix-based measures is taken up in section 3.2.3. We end with a brief review of normative measures (3.2.4) and a summing up (3.2.5).

3.2.1 Correlation and Regression Methods

(a) Rank Correlation

The Spearman and Kendall rank correlation coefficients are simple means of measuring the change in ranking between two time periods (and thus in mobility). If households are ranked by wealth in both periods, the difference in ranking (d_i) can be determined for each observation and the Spearman rank correlation coefficent (ρ) defined over these differences as:

$$\rho = 1 - 6 \sum_{i=1}^{n} d_i^2 / n(n^2 - 1)$$

If there is perfect correlation between the two distributions then each $d_i = 0$ and $\rho = 1$. Similarly $\rho = 0$ depicts perfect mobility. For large N (greater than 30), the t-statistic can be computed and used to test for a correlation in the population from which the sample is drawn.[2]

Alternatively, using the same kind of information, the Kendall rank correlation coefficient (τ) can be computed. When the variable is ranked in the two periods, an upward move in rank gives a positive score (+1) while a downward movement results in a negative score (-1). The Kendall coefficient measures the ratio of actual score to maximum possible score and equals:

$$\tau = \text{Actual Score}/[1/2.N(N-1)]$$

since the maximum score is a positive value of one for all possible combinations; the maximum score is 1/2N(N-1) times. Once again for N greater than 8, τ is found to be normally distributed and a standard test of significance can be applied (Siegel, 1956).

Both these ranking tests use the same information and show similar efficiency in testing. They are both insensitive to the initial position in a ranking.[3] Further, it is possible that horizontal equality is violated even when ranks are unchanged (Kendall, 1962), e.g., as caused by changes in absolute values. For instance, in a two-person society, if the wealth of the poorer person falls sharply, the ranking will remain unchanged. In addition, when incomes are low, small changes can lead to large

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[2] For details on the derivation of rank correlation coefficients, their properties and estimation, see Siegel, 1956.

[3] Although the Kendall (τ) and Spearman (ρ) coefficients are different, "they are equally powerful in rejecting H_0, in as much as they make equivalent use of the information in the data" (Seigel, 1956:223).

fluctuations in rank and large apparent mobility. Rank correlation methods are thus not ideally suited to such a population. With unchanged ranks, it is possible that a household has moved significantly, say from a poor to a non-poor condition (or vice versa), a change that clearly needs to be picked up by a measure of mobility. (This can be introduced by use of absolute wealth matrices, see section 3.2.3.)

A similar procedure was adopted by Rosen (1978) who estimated the Spearman rank correlation coefficient for utility changes over time, in order to measure the extent of horizontal inequality or mobility.[4]

(b) Autoregression Procedures

A simple autoregressive model can be used to estimate changes in inequality and mobility over time. Let us take a quick look first at certain advantages of regression analysis when working with panel data. As panel data provides information on the same individual or household (in contrast to cross-section data) it can be used to correct for specification bias, as illustrated below (see Hsiao,1986). For an equation of the form

$$y_{it} = a_{it} + b_i x_{it} + u_{it} \quad \text{with } i = 1,...,n;\ t = 1,...,T$$

---

4 The key advantage of this method is the absence of restrictions on the form of the utility function, since the measure is ordinal and only dependent on the rank. Clearly horizontal equality can be violated, even when rankings are unchanged for there may have been utility changes. Rosen proposed a modification that ranked the difference in utility and measured the correlation between these differences. If i and i-1 are two individuals, then a change from t-1 to t is given by:

$$DU(t) = [\ U_t(i) - U_t(i-1)\ ]$$

and

$$DU(t-1) = [\ U_{t-1}(i) - U_{t-1}(i-1)\ ].$$

He then estimated the correlation (ρ) between DU_{t-1} and DU_t. This measure is more restricted in meaning; it only tells us that if ρ were near unity, individuals whose position was initially closer than the average would remain so after introduction of a tax.

it is possible to test for the heterogeneity of the intercept and slope coefficients. First, consider a simple model where b varies with time but is constant across individuals. Unbiased estimates of b can be obtained by regressing the deviations from the mean of the variable as follows:

$$y_{it} - \bar{y} = b(x_{it} - \bar{x}) + u.$$

Alternatively if b varied with i, individuals, it could be corrected for by taking a first difference such as:

$$y_{it} - y_{i,t-1} = b(x_{it} - x_{i,t-1}) + (u_{it} - u_{i,t-1}).$$

Hart (1976) assumed that an individual's income change is approximated by a first-order autoregressive process:

$$y(t) = by(t-1) + e(t)$$

where y(t) is measured as logarithmic deviation from the mean, and e(t) is a stochastic term with zero mean, constant variance $\sigma^2(e)$ and is independent of y(t-1). If b = 1 , then

$$y(t) = e(t) + e(t-1) + \ldots + y(o)$$

$$= y(o) + \sum_{i=0}^{t-1} e(t-i).$$

and var y(t) = var y(o) + t.$\sigma^2(e)$

In this model, the variance of y(t) increases with time, hence inequality measured by the variance also increases over time.

If $0<b<1$, there is a tendency of regression towards the mean, or towards equality.

$$y(t) = e(t) + be(t-1) +...+ b^t y(o)$$

$$y(t) = b^t y(o) + \sum_{i=0}^{t-1} b^i e(t-i)$$

$$\text{var } y(t) = b^{2t} \text{ var } y(o) + \sum_{i=0}^{t-1} b^{2i} \sigma^2(e)$$

Putting $t = 1$ we can see that

$$\text{var}(y_1) = \text{var}(y_0)\, b^2 + \sigma^2(e)$$

$$\text{var}(y_1)/\text{var}(y_0) = b^2/\rho^2$$

where

$$\rho^2 = 1-\{\sigma^2(e)/\text{var}(y_1)\}$$

the correlation between y_0 and y_1. Mobility can be captured through ρ, since the larger the variance of the error term (i.e., smaller ρ) the greater the mobility. For a move towards equality we therefore require that $b/\rho < 1$ or $b<\rho$. Even with $b<1$, we could get increasing inequality depending on the value of ρ.

Now a high value of ρ signifies low mobility and vice versa. In the dynamic context, this criterion would aim for a reduction in b and a rise in ρ (greater mobility) to keep the ratio below one, a dilemma (if one desires to maintain horizontal equality) for which Hart provides no satisfactory solution. The problem may stem from undue

reliance on the standard deviation of logarithms as the sole measure of inequality and correlation coefficients as an index of mobility.

This model is also restricted by its assumptions about the error terms and possible bias from omission of other dependent variables. There are two problems here. The first is a selection bias, i.e., a panel cannot be considered representative of a given population. For example, it may be representative of one year but not of the other. For that reason the true relation between the variables in the population is not obtained from a regression of the same variables in the panel. The second problem is that there could be a large number of unobserved variables that are related systematically to, say, the wealth of each household. The b coefficient in the above model may be picking up the effects of all these omitted variables. Unless a suitable instrument variable can be found (which requires data for at least four time periods in order to remove dependence between the error terms), the estimated coefficients remain biased. Estimates are also sensitive to the time interval chosen, e.g., measures in yearly/monthly/weekly periods (Creedy, 1985). Hence one must be careful in interpreting the estimates. Finally, there is the question of whether wealth can be assumed to follow a simple auto-regressive process.

Junankar (1986) tests this model on farm income data from the Farm Management Surveys for the Punjab.[5] Assuming population homogeneity, i.e., $b_i = b$, he estimates b_t for three consecutive years taken two at a time. The results show that b_1 is not equal to b_2. In other words, the assumption of time homogeneity ($b_t = b$ for all t) does not hold. If this is not a valid assumption, the basis of such models is considerably weakened.

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[5] Empirical results are generally cited only for material relating to India.

In an extension, Junankar specifies a model with serial correlation in the error terms, as follows.

Let $y_{it} = b_1 y_{i,t-1} + u_{it}$

$y_{i,t-1} = b_2 y_{i,t-2} + u_{i,t-1}$

where $u_{i,t} = a\, u_{i,t-1} + e_{it}$.

Combining these we get

$y_{it} = (b_1+a) y_{i,t-1} - b_2 a y_{i,t-2} + e_{it}$.

This equation is estimated by jointly estimating the first two equations using Zellner's seemingly unrelated estimation procedure. The results were interesting:

(1) Time homogeneity was shown to be an invalid assumption, i.e., $b_1 = b_2$.

(2) The estimate of a was found to be negative. The direction of serial correlation in the error terms was thus counter-intuitive and suggested that income advantages did not cumulate over time.

Such models require further refinement and panel data over several time periods in order to obtain better results. The seemingly unrelated regression method is not recommended for a sample with large i and relatively small t (Maddala, 1977) as is the case in Junankar's estimation (i = 150 and t = 3). Also three years seems too short a period in which to expect a regression towards the mean. For these reasons, the results must be treated as tentative.

Regression analysis can be extended into probabilistic models based on qualititative dependent variables. For instance, the estimation of the probability of being in a particular state, e.g., in poverty or in the bottom quintile of wealth ownership, in any given year, could be extended into a study of a sequence of poverty-states.[6] One way of formulating this is in the form of a distributed lag model of the type (Maddala, 1983):

$$y_{it} = a y_{i,t-1} + b\, x_{it} + u_{it}$$

$$\text{where } y_i = \begin{cases} 1 \text{ if } y_i < c \\ 0 \text{ otherwise.} \end{cases}$$

Thus y_i is a binary variable taking a value of one if the state of poverty occurs (here defined as income less than c) and zero otherwise. A positive value for the coefficient on past poverty does not necessarily imply a strong state-dependence between the two time-periods. The higher probability of poverty in year t may result from the occurrence of poverty in the previous year or it may be the effects of unmeasured individual variables which are correlated with past levels of poverty. Thus we need to separate state-dependence, i.e., the effect of the state of poverty itself, from characteristics associated with poverty (what has been termed heterogeneity; see Hill, 1981). Empirically the two effects can be separated if panel data are available for more than two time-periods.

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6 An application of a probabilistic model to estimate a sequence of poverty-states (based on an earnings model) can be found in Lillard and Willis (1978).

3.2.2 Lorenz-based Measure

(c) Modified Gini Coefficient

Plotnick (1981) uses an adaptation of the Lorenz curve and Gini coefficient which incorporates horizontal equality. He states the principle of horizontal equality simply as 'equals should be treated equally'. Of course, assuming that the initial distribution of income is fair, one may desire that taxes maintain horizontal equality. He begins with the traditional pre- and post-distribution Lorenz curves (A and B respectively, Figure 5) which indicate an unambiguous decline in inequality after redistribution (say, via taxation). However this does not tell us whether the bottom, say, 10 per cent are the same people in the two distributions. So he considers another curve C, which orders persons along the abscissa by their pre-distribution incomes but plots the cumulative share of their post-distribution income along the ordinate. Now C will be everywhere equal to or above the curve B since inequality has declined and the share of income accruing to the initial bottom decile will be at least as great as that received by the present bottom decile. The area between B and C normalized by the maximum possible area is taken as a measure of horizontal inequality.

The Plotnick 'preordered inequity' measure is defined as:

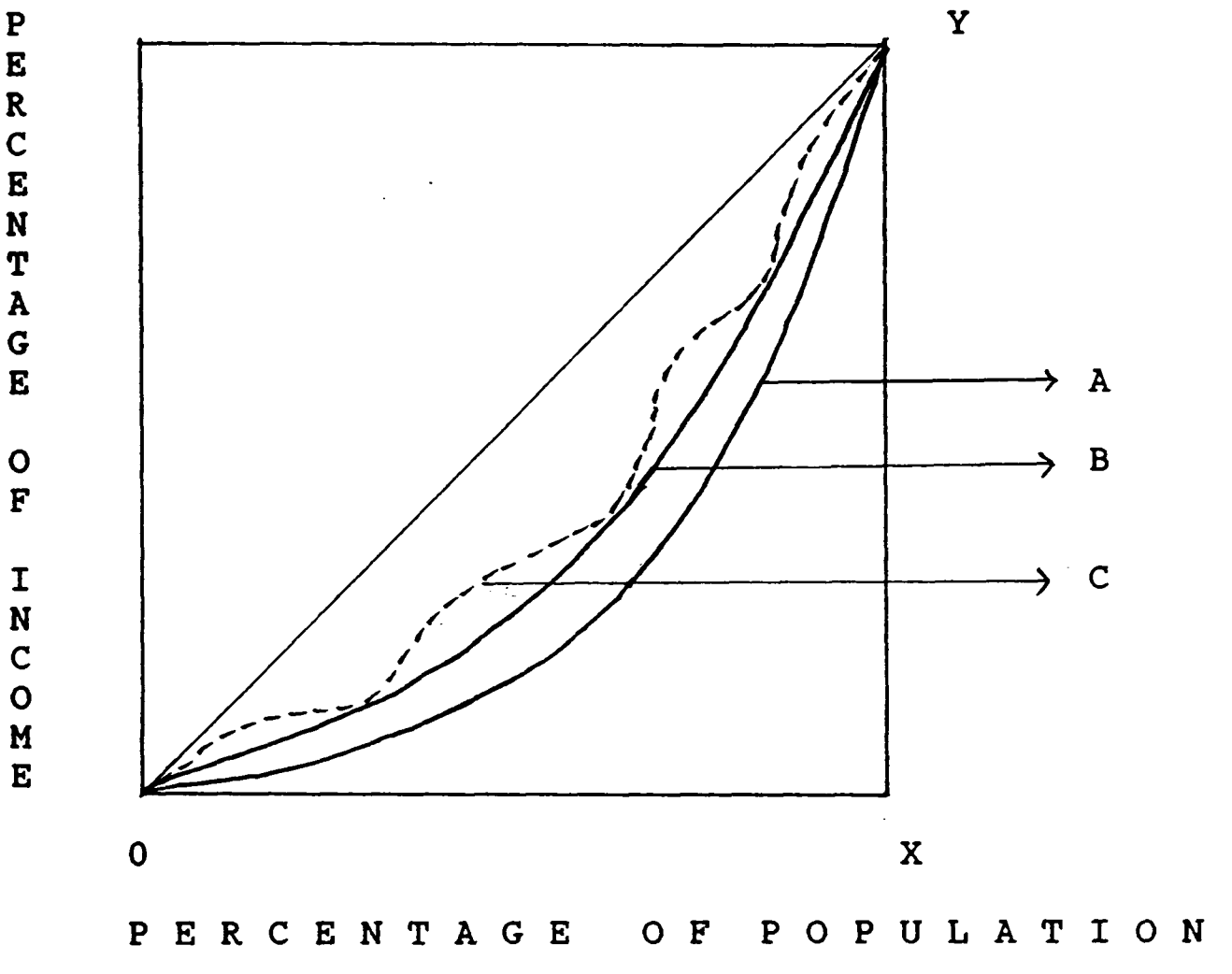
PI = (Gini C - Gini B) / (Gini A - Gini B).

This can be reinterpreted in a mobility context as the occurrence of zero mobility when B and C are identical.

FIGURE 5

PLOTNICK ADAPTATION OF LORENZ CURVES

A= PRE-DISTRIBUTION LORENZ CURVE
B= POST-DISTRIBUTION LORENZ CURVE
C= POST-DISTRIBUTION INCOME WITH PRE-DISTRIBUTION RANKS



This measure is likely to run into problems where Lorenz curves intersect, i.e., if the post-distribution curve is not Lorenz superior to the pre-distribution curve. Plotnick also shows that this index attaches greater weight to inequalities occurring among people with high pre-distribution ranks rather than to those affecting people with lower rank. This may not be a popular value judgement. It is important to recognize the kind of motivation behind measures of horizontal equality proposed in the tax literature. These were based on the premise that a tax should not violate horizontal equality. Our motivation is fundamentally different and does not value a no-change or immobile structure *per se* as a good one. Such measures are inappropriate for our purpose as they do not bring out the character of mobility.

3.2.3 Matrix-based Measures

The measures discussed so far have attempted to arrive at a single summary statistic representing mobility (or the lack of it, i.e., horizontal inequality) over time. A more satisfactory method, and one richer in informational content, is the matrix method. A matrix of mobility can be defined as a matrix of transition probabilities where m_{ij}, the ij^{th} cell, refers to the probability of a person in the i^{th} class in period t moving to the j^{th} class in period (t+1). Clearly such a matrix can only refer to panel data and not to time series data.

Let us take an example of a mobility matrix with three wealth classes:

$$M = \begin{bmatrix} 0.8 & 0.2 & 0.0 \\ 0.3 & 0.5 & 0.2 \\ 0.1 & 0.7 & 0.2 \end{bmatrix}$$

The elements along the diagonal give the probability of an individual remaining in the same class. Now if these individuals were ranked in ascending order of wealth, one could immediately get comparative information on mobility among different wealth levels, e.g., the least wealthy are also the least mobile in the M matrix above. The rows of each matrix sum to one since we must account for the same number of individuals in the two time-periods.

Examination of such transition or mobility matrices is a useful task in itself. For instance, the observed transition probabilities can be compared with predictions based on alternative theoretical formulations. A theory of rigid stratification in society where occupations are inherited, for example, would be characterized by a matrix with $m_{ii} = 1$ for all i and $m_{ij} = 0$ for all $i \neq j$, i.e., total immobility. Alternatively one could envisage a theory of discrimination which argued that individuals from certain deprived classes (e.g., the scheduled castes) only experience limited mobility. If b is the barrier of discrimination then this theory predicts transition probabilities of the type: $m(i<b,j>b) = 0$ and $m(i>b,j<b) = 0$. However, mobility within submatrices created by the divisor b may be possible.[7] Others who argue that the spread of education provides equal opportunities to all would expect a transition matrix with non-zero m_{ij} elements. One possibility is a matrix with $m_{ij} = 1/n$ for all i,j, i.e., equal opportunity.

Szal and Robinson(1977) suggest a range of measures of mobility, both individual cell-related and aggregate measures based on a transition matrix. Some of the measures they consider are based on a constant mobility matrix that converges to a stable distribution over time, termed an ergodic matrix (for a definition see Kemeny

[7] Theories of labour market segmentation suggest a similar set of transition probabilities; see, for example, Schiller (1977).

and Snell, 1960), independent of the initial distribution. In the context of a developing economy, the assumption of a constant, stable mobility matrix over time is far from realistic and hence this approach appears unattractive.

Let us turn to the specific measures.

(d) Cell-related Measures

(i) Index of Average Time Spent In A Class

If there are, say, f_i people in the i^{th} class today, there will be $f_i.m_{ii}$ of these in the second period and $f_i.m_{ii}^2$ in the next and so on. The total time spent in the i^{th} class by the f_i original members is

$$T_i = f_i + f_i m_{ii} + f_i m_{ii}^2 + \ldots.$$

Hence the average time spent in class i on entering it is:

$$T_i/f_i = 1 + m_{ii} + m_{ii}^2 + \ldots.$$
$$= 1/(1-m_{ii}).$$

This measure compares movement of different wealth classes and thus allows us to monitor mobility across wealth groups. However, it only tells of the existence of mobility not of its direction. A variant of this suggested by Prais (1955) standardizes mean time spent in a class by expressing it in terms of the mean for a standard population. Prais chose the perfectly mobile society with the same equilibrium structure as the given population as the norm and defined a measure:

$$P = (1-f_i^*)/(1-m_{ii})$$

where f_i^* are the equilibrium numbers in class i. This approach, however, rests on the assumption of a regular Markov chain that is necessary for a limit distribution to exist.

(ii) Mean First-Passage Times

This generates a separate value for each cell that tells us the length of time required to go from class i to class j. Here again one has to rely on the existence of a stable transition matrix. This is a strong requirement to impose on a mobility matrix.

(iii) Relative mobility rates

Some measures used by sociologists to capture the movement of individuals over time belong to the same genre of cell-related measures. For instance, Goldthorpe (1987) suggests a measure of relative mobility which in the case of a (2x2) matrix --

$$\begin{bmatrix} f_{11} & f_{12} \\ f_{21} & f_{22} \end{bmatrix}$$

is $(f_{11}/f_1)/(f_{21}/f_2)$ called the disparity ratio

and $(f_{11}/f_{12})/(f_{21}/f_{22})$ called the odds ratio.

where $f_i = \sum_{j=1}^{n} f_{ij}$.

The odds ratio, for instance, can be measured across cohorts. The closer it is to one, the more equal the opportunities among cohorts. These measures are useful but become less tractable in the case of large matrices. However, they allow a distinction between absolute mobility, e.g., f_{11}, and relative mobility, e.g., the odds ratio. Absolute and relative mobility could move in opposing directions if the marginal distribution changes over time.

(e) Aggregate Measures

For a quick appraisal of mobility, the following summary measures can be considered:

(i) Trace measure (T)

This is based on the trace of the matrix (sum of diagonal terms) and is defined as:

$$T = n - \text{trace } M/(n-1).$$

Since the trace measure only takes account of the diagonal terms, it can provide a good shorthand representation of overall immobility. However, the measure does not utilize all the available information and does not capture the pattern of mobility.

(ii) The Determinant (D) of M

A measure suggested by Szal and Robinson (1977) for the measurement of mobility is the determinant which lies in the range between -1 and +1. (This is

because each element of the matrix is less than or equal to one, and each row sums to unity.) A value of one for the determinant signifies no movement whereas D equal to -1 inverts the frequency distribution. This measure has two disadvantages: first, no intuitive meaning can be attached to the determinant of a matrix; and second, any linear dependency among rows of the matrix would make the value of the determinant zero, rendering it inapplicable.

(iii) Bartholomew Measure

This measures mobility by counting the number of class boundaries crossed and can be defined as:

$$B = \sum_{i=1}^{n} f^*_i \sum_{j=1}^{n} m_{ij}[i-j]$$

where $\underline{f}^*_i$ are the proportion in class i in the equilibrium structure. This combines the average number of class boundaries crossed by an individual originally in class i weighted by the proportions in the corresponding equilibrium distribution $\underline{f}^*$ where $\underline{f}'^*M=\underline{f}'^*$. Again a reliance on stable transition matrices is introduced.

(iv) A Distance Measure (MD)

An identity matrix, I, with all diagonal elements equal to one and zero non-diagonal elements would represent total immobility in a population as all individuals remain in their original position. So the extent of "off-diagonalness" or distance from the diagonal can represent the degree of mobility. This is one of the more attractive measures proposed in the literature. It captures both the distance from the diagonal and the magnitude of the off-diagonal elements. It measures the distance from the

diagonal by using the square of the distance and so attaches greater weight to terms further away from the diagonal. Using the transition probabilities as weights, a distance measure MD is defined as:

$$MD = \sum_{i=1}^{n} \sum_{j=1}^{n} (i-j)^2 m_{ij} / \text{maximum value}$$

where the maximum value $= 2 \sum_{i=1}^{n/2} (i-n)^2$ for even n,

and $2 \sum_{i=1}^{n/2} (i-n)^2 + ((n-1)/2)^2$ for odd n.

This measure ranges from zero to one, and equals zero when there is perfect immobility (when the numerator equals zero). It is also possible to define a distance measure in terms of absolute movements that takes account of the direction of change, by modifying the numerator of MD. The new measure (MD') lies between -1 and +1 and is defined as

$$MD' = \sum_{i=1}^{n} \sum_{j=1}^{n} (i-j)\, m_{ij} / \text{maximum value.}$$

Distance measures also leave scope for further interpretation. For instance, if the matrix were block diagonal it could be partitioned into sub-matrices, and MD defined as a combination of the sub-measures. This would illustrate the permissible range of mobility in a given economy, i.e., the constraints on mobility.

(v) Progressive Weighted Distance Measure

So far no explicit value judgements about mobility have been made. Given a concern with upward mobility among the poor, it is possible to introduce an emphasis

on mobility among the poor in a measure of overall mobility. One way of introducing such a value judgement is to impose a condition that a mobility measure give a higher weight to movement in the lower ranks.[8] I have attempted to construct such a progressively weighted (PW) measure.

Households are ranked by increasing wealth, and classified into deciles. Weights are then allocated to each decile. If the wealth ranking is of the form:

$$w_1 > w_2 > \ldots > w_{10}$$

then the associated weights can be written as:

$$a_1 < a_2 < \ldots < a_{10} \text{ with } \sum_{i=1}^{10} a_i = 1.$$

A progressive weigted distance measure is then defined as

$$PW = \sum_{i=1}^{n} a_i \sum_{j=1}^{n} (i-j)^2 m_{ij} / \text{maximum value.}$$

(The denominator too will have weights attached to it.) An example helps to illustrate the properties of this index. Let A and B be two different mobility matrices, with two wealth categories, say rich and poor where row 1 refers to the poor and row 2 to the rich.

$$A = \begin{bmatrix} 0.2 & 0.8 \\ 0.3 & 0.7 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} 0.7 & 0.3 \\ 0.8 & 0.2 \end{bmatrix}.$$

[8] This is akin to the Pigou-Dalton condition in vertical inequality.

Distribution A gives greater mobility to the poor and B reverses the situation assuming wealth is ranked in ascending order.

Now the original distance measure (MD) gives identical values for both distributions, the numerator of MD equalling 1.1 in both cases. If we introduce a weighting procedure, with a weight, say, 0.9 to mobility among the poor and 0.1 to that among the rich, the new measure differs significantly for the two distributions. The value of the numerator equals 0.75 for distribution A and drops to 0.35 for distribution B. Thus a matrix with higher mobility among the poor gives a higher numerical value with the modified criterion. (In this case the value of the denominator is unchanged.) In the limit one could view this as tending towards a Rawlsian situation where only mobility of the poorest mattered.

The mobility indices that have been discussed do not take absolute changes in economic status (in our case, absolute changes in wealth) into account. This is because these are mean-independent measures. This problem, however, can be overcome by constructing a transition matrix based on absolute levels of real wealth where movement between classes reflect both relative and absolute changes in wealth. When constructing the transition matrix, wealth brackets or intervals must be chosen so as to provide a meaningful categorization. In addition, it is essential that each class refer to the same level of *real* wealth in different time periods. All the matrix-based measures discussed above can then be applied to an absolute wealth matrix.

(f) Markov Process

Theil (1972) suggests the use of a Markov chain model for explaining inter-generational occupational mobility. The crucial assumption of a first-order Markov process is that current outcomes only depend on the position or status in the previous period. An example is a situation where the position of a son depends solely on the position of his father.[9]

If there were initially q_{oi} proportion of the population in the i^{th} category then the total population that enters the j^{th} category is obtained by summing entrants from all the i categories. So the population in the next period in the j^{th} category is

$$q_{1j} = \sum_{i=1}^{n} q_{oi}\, m_{ij}$$

or $\underline{q}_1' = \underline{q}_0'\, M$

where $\underline{q}'$ refers to the transpose of the column vector $\underline{q} = (...)'$.

Similarly if we take q_1 as the starting point:

$$\underline{q}_2' = \underline{q}_1'\, M = \underline{q}_0'\, .M^2$$

By repeated application

$$\underline{q}_t' = \underline{q}_0'\, .M^t$$

---

[9] This can be rationalized by arguing that other factors like years of education which determine current occupation also depend on father's occupational status and so on.

For a regular (i.e., ergodic) Markov chain, there is always convergence to a limit:

$$\lim \underline{q}_0' M^t = \pi' \text{ and } \sum_{i=1}^{n} \pi'_i = 1 \text{ and } \pi_i > 0$$

Once π' the equilibrium distribution is reached, a population distribution reproduces itself, i.e., it is a steady-state distribution (see proof in Theil, 1972).

This kind of model makes several restrictive assumptions. Shorrocks (1976) identified them as:

(i) population homogeneity: the same transition rates apply to all individuals in a class;

(ii) first-order Markov process: only current incomes matter in determining future moves; and

(iii) time homogeneity: transition rates remain constant over time.

These assumptions have been criticized on theoretical and empirical grounds.[10] One such criticism is that only certain types of matrices have the property of ultimately leading to a limit distribution with positive proportions. For instance if M were of the form:

---

[10] Shorrocks (1976) has a detailed critique of the applicability of the first-order Markov model to income mobility. One empirical problem encountered, for instance, was a systematic deviation between actual probabilities and values predicted by the model. Shorrocks set out an alternative model with a second-order Markov process. This however requires simplifying assumptions in order to make the estimation of the number of parameters tractable.

Bartholomew (1973) recognizes these limitations and sets out a model without the time-homogeneity assumption. It leads to a very complex model where it becomes difficult to devise a useful measure of mobility. It is possible, through models such as 'cumulative' inertia (McGinnis, 1968 quoted in Bartholomew, 1973) that link an individual's chance of moving to the length of stay in a class, to set up a semi-Markov model which is less restrictive.

$$M = \begin{bmatrix} 1/2 & 1/2 \\ 0 & 1 \end{bmatrix}$$

then $M^2 = \begin{bmatrix} 1/4 & 3/4 \\ 0 & 1 \end{bmatrix}$ and $M^3 = \begin{bmatrix} 1/8 & 7/8 \\ 0 & 1 \end{bmatrix}$.

Hence, in the limit

$$M^t = \begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}.$$

Such a matrix is called an absorbing matrix since one column disappears over time. Therefore, a sufficient condition for regularity in a Markov chain process is that the transition matrix M consist exclusively of nonzero elements. Alternatively we need the assumption that P^t for some t consist of nonzero elements. Hence this approach and measures based on it (such as Bartholomew, 1973) can be used only when the economy under study is characterized by a stable and regular transition matrix. Another problem that is not taken into consideration by the equilibrium approach is that of sampling errors. A panel is known to be unrepresentative of a population over time. This fact alone, apart from other types of sampling errors, implies that the observed proportions in a cell may not represent population proportions. For that reason determination of equilibrium or long-run distributions on this basis appears to be a doubtful procedure.

The objective of this type of research was to arrive at a long-run income distribution and to map its path. Its relevance to our concerns in the context of a developing country is limited.[11]

(g) An Axiomatic Approach

Shorrocks (1978b) uses the matrix framework to suggest a set of axioms that embody properties desirable in an index of mobility. An index of mobility is defined as a continuous real function M(.) over the set of transition matrices, P. The desirable properties of an index are:

(1) N or normalization, i.e., $0 \leq M(P) \leq 1$ for all P, restricting the index to the [0,1] interval.

(2) M or monotonicity, i.e., if $P > P'$ then $M(P) > M(P')$ such that $p_{ij} \geq p'_{ij}$ for all $i \neq j$ and $p_{ij} > p'_{ij}$ for some $i \neq j$.
The identity matrix will thus be ranked below any other transition matrix and could be associated with the minimum value of the index.

(3) I or immobiltiy, where $M(I) = 0$ or the identity matrix defines zero mobility.
In a matrix with identical rows, the probability of moving to any class is independent of that originally occupied, and so it could be called perfectly mobile.

(4) Therefore PM or perfect mobility occurs when $M(P) = 1$
if $P = ux'$ where $u = (1,...,1)'$ and $x'u = 1$.

[11] Adelman *et. al.* (1985), however, do attempt to make a long run projection for India on the basis of the 1968-70 NCAER panel.

Stricter versions of the last two are possible, e.g., strong immobility states that M(P) = 0 if and only if P = I and strong perfect mobility occurs if and only if P has identical rows.

Then considering a measure of mobility such as the one proposed by Bartholomew:

$$B = \sum_{i=1}^{n} f^*_i \sum_{j=1}^{n} m_{ij}[i-j]$$

Shorrocks finds that it does not satisfy all the four properties; specifically there is incompatability between normalization, monotonocity and perfect mobility.[12]

One solution is to drop the monotonicity assumption, and assume a weak inequality ($M(P) \geq M(P')$) such that maximum values may be assigned to a large class of matrices. Alternatively one can abandon the perfect mobility condition. Shorrocks suggests that this property be retained for purposes of 'predictability'. (For example if a matrix were perfectly mobile then it would show the least predictability.) He avoids the inconsistency between axioms by imposing a restriction on the nature of the mobility matrix to matrices that have a maximal or quasi-maximal diagonal,[13] i.e.,

$p_{ii} \geq p_{ij}$ for all i,j.

The trace measure was then found to satisfy all the properties.

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[12] This can be proved by constructing an example where $M(P_2) > M(P_1) = 1$, i.e., it is possible to define a transition matrix in such a way that the measure is greater than 1.

[13] This can be weakened to the condition of a quasi-maximal diagonal, i.e., if there exist positive $u_1,...u_n$ such that $u_i p_{ii} \geq u_j p_{ij}$ for all i,j.

The contribution Shorrocks makes is to set out axioms for the selection of a desirable mobility index. However, his choice of two indices to illustrate these properties is open to question. First, the Bartholomew measure, which is found not to satisfy the four properties, has limited application because of its being restricted to stable transition matrices. Furthermore, the imposition of a condition of a maximal (or quasi-maximal) diagonal on a matrix is a strong one,[14] and places a restriction that favours immobility. Secondly, Shorrocks recommends the use of the trace measure, which performs well in terms of the four axioms, but which ignores all off-diagonal elements and is insensitive to the pattern of movement (non-diagonal terms).

The Szal distance measure satisfies three of these axioms, namely normalization, monotonicity and immobility. Perfect mobility (MD = 1) however does not occur when all rows are identical.[15] The presence of identical rows implies that movement is independent of the original position, although it does not represent a case of maximum movement. The question to be raised therefore is whether the perfect mobility axiom can be relaxed in the choice of a measure. Shorrock's justification of the axiom in terms of its relevance for prediction is not altogether satisfactory, especially if one is not concerned with projections or the estimation of long-run stable equilibrium distributions.

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[14] In fact jumping ahead a little our matrices do not seem to satisfy this property of a maximal diagonal (see Tables 3.1 and 3.2).

[15] In fact the condition for maximum movement is not one where all rows are identical. To take an example, in a 4x4 matrix, the maximum value occurs when the matrix has two sets of identical rows such as

M = [0 0 0 1]
[0 0 0 1]
[1 0 0 0]
[1 0 0 0]

In making comparisons of mobility, another problem is that of matrices which are not defined over identical time-periods. It is to be expected that as the time interval is lengthened, the scope for mobility will be greater. Large-scale shifts in the economic structure, for instance, may occur over a long time-period. For this reason, a direct comparison of mobility defined over different time-periods is not feasible. If the mobility process follows a Markov chain, then $M^2 = M^1 M^1$. In other words, a two-year matrix can be compared with a single-year matrix by a suitable transformation of the latter (by matrix multiplication) or vice versa. Shorrocks (1978b) attempted to deal with this question of varying observation period, and introduced two desirable conditions on mobility measures:

(i) a condition of period consistency:

$$M(P) > M(Q) \Rightarrow M(P^k) > M(Q^k) \text{ for } k>1$$

and

(ii) a condition of period invariance:

$$M(P;T) = M(P^k; kT) \text{ for } k > 1.$$

These were, however, found to be very stringent conditions that were not easily satisfied by mobility indices except under specific assumptions about Markov processes. The question of varying time-intervals thus poses a difficulty for comparative work on mobility; one has to be very careful in drawing implications from mobility studies for different time-periods. It is also not easy to recommend a standard observation period. A standard time-period could be annual to be compatible with income accounts, while a 25-year period may be considered suitable for measuring inter-generational movements. A period of a decade could usefully be adopted as a standard time-period for mobility studies in India. It is an interval long enough for interesting structural movements to be identified. Since other national

surveys such as the Census and the RBI's asset and debt survey also adopt a decade as the time-interval, this would facilitate comparability across surveys.

3.2.4 Normative Measures

Thus far we examined "evaluative" measures of mobility, measures that had a large descriptive content, though not entirely free of value judgements. We now turn to "prescriptive" or "ethical measures". These assess economic mobility in terms of its effects on social welfare.

(h) Atkinson (1983) Measure

Atkinson's approach compares and ranks alternative mobility structures with the help of a social welfare function but without resort to a specific index.[16] In a two-period or two-generation model welfare is made a function of the economic status in each period as well as of the link between them. Welfare is thus considered to be a function of mobility.

Let y_1, y_2 be the economic status of generations 1 and 2, respectively and let $f(y_1,y_2)$ be the joint distribution function. Then welfare is given by

$$W = \int_0^{y_2}\int_0^{y_1} U(y_1,y_2)\, f(y_1,y_2)\, dy_2\, dy_1.$$

W is assumed to be additively separable and symmetric in respect of individuals or households. The latter can be considered a simplifying assumption.

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[16] This approach has been carried forward by Kanbur and Stiglitz (1986) who develop an operational rule for comparing mobility mechanisms to check for social welfare dominance.

However, when dealing with a household it would require correction for differences in size and composition. An important assumption is that of separability, i.e., the assumption that y_2 only depends on mobility which in turn is independent of the initial position. This is obviously a strong assumption. It is equivalent to assuming a stable Markov process where the transition probabilities are independent of the initial structure.[17]

If two alternative distributions f and f* are being compared, the difference is given by

$$\Delta f = f(y_1,y_2) - f^*(y_1,y_2) \quad \text{and}$$

$$\Delta W = \int_0^{y_2} \int_0^{y_1} U(y_1,y_2)\, \Delta f(y_1,y_2)\, dy_2\, dy_1.$$

The differences in the two distributions can be separated into differences in the marginal distributions and differences in the relation between y_1 and y_2. To separate out the 'mobility' effect, Atkinson assumes the marginal distributions to be constant:

$$m_1(y_1) = m_1^*(y_1) \text{ for all } y_1$$

$$m_2(y_2) = m_2^*(y_2) \text{ for all } y_2$$

where $m_1(y_1) = \int_0^{y_2} f(y_1,y_2)\, dy_2$

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17 Atkinson uses consumption as an illustration. This independence may hold true for consumption, i.e., consumption in the second generation could depend on the pattern of transfer of assets between periods 1 and 2 and not on y_1 itself. Such behaviour is not as likely in the case of income or wealth. Also see Sen (1973) on additive separability.

is the marginal distribution of y_1. In other words, Atkinson focusses on exchange mobility and rules out changes in welfare due to structural shifts or structural mobility. An interesting attempt to decompose total welfare change into its structural and exchange components can be found in Markandaya (1984).[18]

In ranking the transition matrices and mobility, the properties of the social welfare function play a key role.

(a) Take the simplest case where U is an additively separable function of the form

$$U(y_1,y_2) = z(y_1) + q(y_2).$$

Then if the marginal distributions are identical, so is social welfare, since mobility does not matter (because U_{12} is assumed to equal zero).

(b) For U_{12} not equal to zero, a concave transformation such as the following can be considered:

$$U = \psi\{z(y_1) + q(y_2)\}.$$

Atkinson uses results on stochastic dominance to rank distributions given certain specifications of the utility function. For the general class of utility function U U- ($U_{12}<0$), F first-order stochastically dominates F* (the cumulative distribution functions) if

$$F(y_1,y_2) \leq F^*(y_1,y_2)$$

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[18] To make these calculations, Markandaya (1984) compares actual changes in welfare with those that would have occurred (an as if type proposition) under stable equilibrium conditions.

i.e., the F function is at all points no greater than F*. The intuitive explanation underlying this condition is that since U_{12} is negative the social marginal valuation of y_2 and y_1 are negatively related. A distribution with higher mobility or smaller diagonal elements of a transition matrix (or lower correlation between y_1 and y_2) will thus be preferred. The reverse condition holds for U+ i.e., $U_{12} > 0$.

(c) This condition can be made weaker by imposing a set of stronger assumptions on the utility function. If

$$U \in U^{--} \qquad (U_{12}<0,\ U_{112}>0,\ U_{122}>0,\ U_{1122}<0)$$

then the cumulative distribution function F dominates F* if the integral of F remains below the corresponding integral of F*, i.e., each and every element of F need not be less than or equal to the corresponding element of F* as long as the integral of F lies below that of F* (second-order dominance). Therefore if U is restricted to the class U-- a more complete ranking can be obtained.

Atkinson (1980-81) also suggests a method for comparing the degree of mobility of two separate matrices. He begins with a bistochastic matrix, such as,

$$\sum_{i=1}^{n} m_{ij} = \sum_{j=1}^{n} m_{ij} = 1$$

and considers a transformation that preserves this property. An example is where the m(i+1,j+1) term of a matrix is increased by ε while m(i+1,j) and m(i,j+1) terms are decreased by ε. This transformation shifts the weight towards the diagonal (lower mobility). If a matrix A can be reached from a matrix B by a series of diagonalizing transformations and $U_{12}<0$ then B is superior to A.[19]

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[19] To check this one can define a matrix S with elements

The degree of off-diagonalness is the basic criterion by which the results on stochastic dominance rank matrices. The utility function only posits the desirability ($U_{12}>0$) or undesirability ($U_{12}<0$) of larger diagonal elements. It then follows that transition matrices can be ranked on the basis of certain properties independent of a specific utility function in this approach.[20] The process of testing and modifying objective measures of mobility is thus emphasized.

(i) King Index

In this approach, too, social welfare is a direct function of incomes and mobility (King, 1983).

Let y_{pi} and y_{ai} be the ex-post and ex-ante income rank of individual i. Then one can define a scale order statistic, s_i as

$$s_i = y_{pi} - y_{ai} / \bar{y}$$

where $\bar{y}$ is the mean income of the distribution.

A normative index of mobility (F) is constructed with F as an increasing function of both incomes and the scale order statistic s. Higher mobility here provides

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$S_{ij} = \sum_{k=1}^{i} \sum_{m=1}^{j} (a_{km} - b_{km})$.

where A and B are two matrices being compared. If S has both positive and negative terms then the two matrices are incomparable. If S has only positive terms then B is superior to A (assuming $U_{12} < 0$).

[20] To take an example from inequality, Kanbur and Stromberg (1986) use similar results on stochastic dominance to rank income distributions in two periods without introducing specific utility and welfare functions.

greater welfare. One can then define the zero mobility equivalent proportion p as the proportionate increase in all incomes with zero mobility that gives the same welfare as the initial distribution.

$$\sum_{i=1}^{n} F(py_i,0) = \sum_{i=1}^{n} F(y_i,s_i).$$

So the income to be sacrificed from a position of zero mobility to arrive at the existing distribution is 1-1/p, which is an index of mobility.

$$IM = 1-1/p$$

To arrive at a specific measure certain restrictions need to be imposed on the form of the welfare function. King assumes the welfare function to be homothetic in incomes. His method also imposes an anonymity condition and a condition of locally constant absolute immobility aversion.[21] The index is then defined as:

$$F(y,s) = \begin{cases} (1/k)\,(y\,e^{qs})^k & k < 1 \\ = \ln y + qs & k = 0 \end{cases}$$

where q is nonnegative and represents the degree of immobility aversion. When q = 0 there is no preference for mobility and when q tends to infinity there is complete aversion to immobility. This mobility index can also be used to determine a tradeoff between increasing mobility and increasing inequality since it can be shown that overall inequality is a function of the form (1-IV)/(1-IM) where IV is an index of

[21] The major assumptions are: additive separability of the welfare function, homotheticity in incomes, an anonymity condition namely that relative social marginal valuation of income is independent of s, the scale-order statistic, and constant absolute immobility aversion, i.e., df/ds/df/dy is independent of s for small changes in s (see King, 1983).

vertical inequality.[22] The main drawback of the approach is that the ranking is closely tied to the specification of the utility function (this will be illustrated in section 3.3).

3.2.5 Summing Up

Having surveyed alternative ways of gauging the nature of economic mobility the task now is to select measures suitable to estimation of wealth mobility in a village economy characterized by high levels of poverty. One set of measures derived from principles of horizontal equity (such as the Plotnick measure) is not suited to our concern with mobility in a developing economy. Methods of rank correlation and autoregression are useful starting points for estimating the relation between economic status (wealth) in consecutive time periods. These statistical associations are, however, limited in content and only constitute a preliminary guide to the pattern of mobility. Matrix-based measures emerge as the most useful descriptive and analytical means to understanding the complex nature of mobility. Since we are not concerned with long-term projections, a class of these measures that relies on stable transition matrices (e.g., Bartholomew, 1973) is rejected. In addition, with a single matrix (data for two time-points) it is not possible to test the time homogeneity assumption.

To sum up, the preceding sections highlighted a distance measure that combined transition probabilities with the distance moved. A new measure was suggested which weighted mobility in accordance with initial ranking; higher weights were attached to mobility among the poorer sections. In this way a progressive weighted measure was obtained which was more sensitive to mobility among the

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[22] One can define an index of vertical inequality as:
$IV = 1 - y'/y$
where $W(y',...,y',0,...,0) = W(y_1,...,y_n)$
y' being the equally distributed equivalent income.

poor. This measure could be useful in future research where alternative mobility patterns are being compared for their specific impact on certain depressed sections of the population.

3.3 Estimation of Wealth and Occupational Mobility in Gokilapuram, 1977-1985

This section reports on an empirical estimation of economic mobility in Gokilapuram.

3.3.1 Panel Data

The data set, concepts and definitions used in this empirical estimation have been discussed earlier (see section 1.3). A few additional comments may be useful. The unit of mobility in this study is the *household*, unlike many other panel or inter-generational studies which take the *individual* as unit. A household is defined as a group of persons normally living together (and normally belonging to the same family) and taking food from a common kitchen. This is the definition of the household that is used by the National Sample Survey (NSS), the Census of India conducting village studies. The household includes members who are temporary migrants but who spend a large part of the year in the village household. A complete listing of households in Gokilapuram was available for 1977. With this list in hand, I identified a subset of households in 1985. The head of each household in the 1985 subset was

-- either the same person as in 1977

-- or the spouse of the head of the household in 1977

-- or a direct descendant of the head of the household in 1977 who was living in the same residence as the head of the household in 1977.[23]

The subset, then, consisted of households that were either the same as in 1977 or a continuation, as it were, of that household through lineal descent. A few households that had more complex forms of partitioning (such as a division of property between siblings) were dropped from the data set for purposes of this study.[24] Of course, as the panel does not have any households that were newly formed, e.g., immigrants or newly married couples, the data cannot be used to identify differences between older, settled households and new households.[25] As stated earlier, the panel is not representative of the village population in 1985. Estimates of mobility based on a set of households selected from the list of households resident in the village in 1977 (as is the case in this thesis) is not more or less representative of village mobility than estimates based on a sample drawn from households resident in the village in 1985 (and which traced their position back to 1977). The panel is only representative of households that were present in the village in 1977 and in 1985.

It is thus feasible to talk of the 'same' household in 1977 and 1985 although the size and composition of the household is not, and could hardly have been, invariant over the period. It can be argued that the family is not unique across a panel

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23 This is similar to the NCAER definition of a panel household which includes:
-- those where the original head of household was alive and the household was intact;
-- those where the head of household was alive but all the members had not stayed together; and
-- those where the head of the household was dead but the rest of the household was intact (see Appendix 1 of NCAER, 1986a).

24 2 households were dropped from the 1985 survey as the heads of households were brothers who had been counted in as part of a joint family in 1977.

25 There is some evidence from Shah *et. al.* (1985) to suggest that satellite households (which have broken away from older households) are more likely to be found among the downwardly mobile. Households with satellites show greater mobility than households without satellites. The net effect on mobility of excluding new households (such as satellites) remains unclear.

and so constitutes an inappropriate unit of analysis (e.g., Duncan, 1984). This is a recognized shortcoming of our approach; the task of identifying individuals from the raw data has been set aside for the present. However, some adjustment for changes in household size can be made by analyzing household well-being in terms of variables such as per capita household wealth.[26]

A useful feature of our data is that the eight-year time frame of the panel makes it possible to compare this study with other panel studies, such as, NCAER (1986) and Shah *et. al.* (1985). The time frame of each of these panel studies was a decade. The Junankar study (Junankar, 1986) considers mobility between three consecutive years, and unless assumptions about period invariance are made, it is not easy to make direct comparisons between his results and those reported here.

3.3.2 Correlation and Regression Estimates

(i) The Spearman rank correlation coefficient for change in per capita wealth (and household wealth) between the two observations periods 1977-85 was estimated. The results were significant and showed a strong positive correlation with values of 0.76 and 0.78 for per capita and household wealth respectively.

(ii) A simple autoregressive loglinear regression model was set up. Since the panel refers only to two points in time, we cannot correct for the specification bias that is likely to arise in regression equations; care must therefore be taken in interpretation.

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[26] Duncan (1983) suggests ways of dealing with non-uniqueness of families in a panel data set for econometric purposes. One suggestion is to stick to unchanged families but this would be a severe restriction. Another is to use the individual as unit and assign a measure of family welfare such as family income per head to the individual. Changing family size then enters as an explanatory variable. The paper also has a useful section on sampling design and the question of population representativeness.

$$w_{it} = a + b\, w_{i,t-1} + e_{it}$$

where w_{it} is the deviation from the mean of the logarithmic variable ($w_{it} = W_t - W$, W_t = log per capita wealth). The results obtained are (t statistics in parentheses):

$$w(85) = -0.004 + 0.68\, w(77)$$
$$(-0.03)\quad (12.05)$$
$$S.E\,(\hat{a}) = 0.123 \qquad R^2 = 0.64 \qquad S.E.E = 1.17$$
$$S.E\,(\hat{b}) = 0.056 \qquad N = 82$$

The test $\hat{b} = 1$ is rejected ($F(1,81) = 32.14$). Thus $b<1$ or there is a regression towards the mean value of wealth. Since the mobility coefficient $\rho = 0.8$ and since $b<\rho$, inequality is not being worsened by mobility.[27]

(iii) Junankar's specification which normalized wealth in order to eliminate heteroskedasticity was also estimated. This requires the transformation $w_t = W_t/u_t$ where W_t is per capita wealth and u_t is the mean across per capita wealth.

The equation estimated is of the form:

$$w_{it} = a + b\, w_{i,t-1} + e_{it}$$

[27] We omitted one observation with zero wealth in 1977 to estimate this equation. An additional test on the lognormality of the per capita wealth distribution, was not rejected by the Kolmogorov-Smirnov test for either 1977 or 1985. The disparity between this result and all other inequality results (which indicate a worsening of inequality) could arise from some specification bias.

The results are (t statistics in parentheses):

$$w(85) = -0.08 + \underset{(-0.3)}{} \quad \underset{(11.08)}{1.08\, w(77)}$$

$S.E(\hat{a}) = 0.28 \quad R^2 = 0.60 \quad S.E.E = 2.39$

$S.E(\hat{b}) = 0.097 \quad N = 82$

The test of $\hat{b} = 1$ is not rejected ($F(1,81) = 0.74$); inequality cannot be said to have declined.[28]

(iv) A simple probabilistic model was estimated.

$$y_{it} = a + b\, y_{i,t-1} + u_{it}$$

where $y_i = 1$ if in poverty and 0 otherwise.

This equation was estimated using the bottom 40 per cent of the wealth distribution as the cut-off for defining relative poverty. So if household (per capita) wealth was below Rs 5,800 (1,230) and Rs 3,700 (900) in 1985 and 1977, respectively, then the household was defined as being in a state of poverty. The maximum likelihood estimates of the b coefficient were 1.2 and 1.95 for household and per capita wealth, respectively (using probit and logit equations). We obtained positive and significant coefficients in both cases. The chances of being in poverty in 1985 were thus positively associated with the probability of being poor in 1977. As mentioned earlier, only a part of this association may stem from state-dependence, the rest may arise from individual characteristics, that cannot be fully accounted for in a two-period panel.

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[28] By applying the formula $G(t) = bG(t-1)$ for the Gini coefficient, see Junankar, 1986.

The regression estimates support the view that economic advantages (and disadvantages) tend to cumulate over time; however a strong statement cannot be made given that a large number of unobserved variables may be systematically related to wealth (e.g., earnings).

3.3.3. Measures based on a Household Mobility Matrix

Two transition matrices were created from the panel data on households. The first ranked households by household wealth, and the second ranked households by per capita household wealth (each in ascending order). These matrices have 1985 wealth deciles along the rows and 1977 wealth deciles along the columns. Hence a value m_{ij}, in the ij^{th} cell is interpreted as the probability that a member of the i^{th} decile in 1985 came from the j^{th} decile in 1977. The two matrices are shown in Tables 3.1 and 3.2.

TABLE 3.1: MOBILITY MATRIX FOR HOUSEHOLDS RANKED IN ASCENDING ORDER OF TOTAL HOUSEHOLD WEALTH, GOKILAPURAM

Decile	1977									
1985	1	2	3	4	5	6	7	8	9	10
1	**0.5**	0.25	0.12	0.0	0.0	0.12	0.0	0.0	0.0	0.0
2	0.12	**0.25**	0.12	0.0	0.12	0.37	0.0	0.0	0.0	0.0
3	0.22	0.11	**0.33**	0.11	0.11	0.11	0.0	0.0	0.0	0.0
4	0.0	0.0	0.25	**0.25**	0.25	0.12	0.12	0.0	0.0	0.0
5	0.0	0.11	0.11	0.44	**0.22**	0.11	0.0	0.0	0.0	0.0
6	0.12	0.37	0.0	0.12	0.0	**0.0**	0.25	0.12	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.25	**0.25**	0.12	0.12	0.25
8	0.0	0.0	0.0	0.0	0.0	0.0	0.22	**0.44**	0.33	0.0
9	0.0	0.0	0.0	0.0	0.0	0.12	0.0	0.37	**0.37**	0.12
10	0.0	0.0	0.0	0.0	0.0	0.12	0.0	0.0	0.0	**0.87**

Source: Panel data on household wealth (N = 83).

Note: The rows sum to one, each m_{ij} refers to the probability that a household from class j in 1977 moved to class i in 1985. Diagonal terms are in bold type.

A striking feature of the two matrices is the low mobility among the rich. The top decile showed the highest diagonal coefficient in both matrices. Households in the lowest decile were not totally immobile. However, they did not show as much movement as visible in the median rows of the matrices. For example, households in the fifth and sixth deciles in 1985 came from several deciles of 1977 including many

of the lower deciles. On the whole, the two matrices indicate much mobility. The matrices depart from the maximal diagonal form, particularly in the median rows.

TABLE 3.2: MOBILITY MATRIX FOR HOUSEHOLDS RANKED IN ASCENDING ORDER OF PER CAPITA WEALTH, GOKILAPURAM

Decile	1977									
1985	1	2	3	4	5	6	7	8	9	10
1	**0.22**	0.33	0.11	0.11	0.0	0.0	0.11	0.11	0.0	0.0
2	0.33	**0.33**	0.11	0.0	0.11	0.11	0.0	0.0	0.0	0.0
3	0.22	0.0	**0.11**	0.22	0.11	0.33	0.0	0.0	0.0	0.0
4	0.0	0.12	0.25	**0.25**	0.25	0.0	0.0	0.0	0.12	0.0
5	0.12	0.25	0.25	0.0	**0.12**	0.12	0.12	0.0	0.0	0.0
6	0.12	0.0	0.12	0.12	0.12	**0.12**	0.0	0.37	0.0	0.0
7	0.0	0.0	0.12	0.25	0.12	0.0	**0.37**	0.0	0.12	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.37	**0.37**	0.25	0.0
9	0.0	0.0	0.0	0.0	0.12	0.12	0.0	0.12	**0.37**	0.25
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.12	0.12	**0.75**

Note: The rows sum to one. Diagonal terms are in bold type.

A detailed examination brings out the complexity of overall mobility and reveals the barriers to mobility. Take the household wealth matrix (Table 3.1). In the bottom five deciles (rows) households that belonged here in 1985 came primarily from the bottom six deciles of 1977 with one exception ($m_{4,7}$). Similarly, among the top four rows, movement up or down remained within a certain range. In other words, there was little evidence of extreme movement from very poor to very rich or vice

versa. Further, if we omit the sixth row, the matrix is very close to a partitionable one (with rows one to five and seven to ten forming two nearly exclusive blocks) which implies that there were barriers to mobility in this panel.

The per capita wealth matrix (Table 3.2) showed similar trends. However, the matrix was not as easily partitionable as the household wealth matrix. It appears that life-cycle factors such as household size tend to smooth out some of the difference in movement between deciles.

Let us turn to some mobility indices.

TABLE 3.3: INDEX OF AVERAGE TIME SPENT IN A WEALTH CLASS

$$t_i = 1/(1-m_{ii})$$

Decile	Household wealth	Per capita wealth
1	2.0	1.3
2	1.3	1.5
3	1.5	1.1
4	1.3	1.3
5	1.3	1.1
6	1.0	1.1
7	1.3	1.6
8	1.8	1.6
9	1.6	1.6
10	8.0	4.0

Note: The units refer to a time-interval of eight years, e.g., two time-periods implies 16 years.

(i) Estimates of the average time spent in a class (in Table 3.3) are above 1. This implies that m_{ii} (the probability of staying in the original status) is positive. Since each period refers to eight years, the highest average time of 8 periods in the same decile, for the richest decile, is equivalent to an average of 64 years in the same decile. Immobility among the rich is particularly marked in the ranking by household wealth, when there is no dilution as a result of dividing aggregate wealth between the members of a household.

(ii) The trace measure {P = n-traceM/(n-1)} equalled 0.72 and 0.77 for the matrices based on household and per capita wealth, respectively. This indicates a relatively high degree of overall mobility since values for the trace are low (3.0 and 3.48 as compared to a maximum of 10). However as the two matrices do not have maximal diagonals, this measure is inadequate as it fails to take account of any off-diagonal terms.

(iii) The determinant of M was proposed as a possible measure of mobility. A value of the determinant equal to +1 signifies immobility while a value of -1 inverts the original ordering. For both matrices the value of the determinant was very close to zero. This could either be the consequence of a high degree of mobility or stem from a singular matrix (due to linear dependence). (The estimated values of the determinant were .0000038 and -0.00000094 for the household wealth and per capita wealth matrices respectively.) Szal and Robinson (1977) had assumed a matrix with a dominant diagonal when suggesting this measure, an assumption that does not hold in our case. On empirical application, the determinant is revealed to be a poor measure of mobility.

(iv) The distance measure was found to be 0.094 for the household wealth matrix and 0.073 for the per capita wealth matrix. This could be interpreted as a sluggish change in the distribution of wealth, since the order of movement is less than 10 per cent. Although visually our matrices appear to show mobility, this figure of low mobility establishes that *(a) only a small proportion of each class are moving, and (b) the distance moved is small compared to the maximum possible movement.*[29]

(v) Weighted distance measures were also estimated. The weights assigned to different deciles for this estimation have been discussed earlier. The weights were chosen to satisfy the condition:

$a_1 > a_2 > \ldots > a_{10}$ such that $\sum_{i=1}^{10} a_i = 1$.

If the weights follow a geometric progression of the form:

$a, ar, ar^2, \ldots, ar^9$

then progressively lower weights are attached to households with more wealth.

The sum of the weights $= \sum_{i=1}^{10} a_i = a(1-r^{10})/1-r = 1$

Choose $r = 1/2$ then $a.2(1-1/1024) = 1$

Solving this for a, we get $a_1 = 512/1023$, $a_2 = 256/1023$, etc.[30]

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[29] The denominator of the index, the maximum value, is given by

$$2\sum_{i=1}^{n/2}(i-n)^2 + (n-1/2)^2$$

with probability one which is quite large.

[30] This is an arbitrary system of weighting but it gives a large weight to the lowest decile; after the bottom 4 deciles, the weight becomes quite small.

Using these weights, the modified measure equalled 0.072 for household wealth and 0.112 for per capita wealth. The value of weighted mobility indices were roughly of the same order of magnitude as the earlier unweighted distance measures. *The difference lies in a reversal of the order of mobility between household and per capita wealth distributions.* The standard distance measure showed relatively greater mobility in household wealth whereas the weighted measure indicates higher mobility in the per capita wealth matrix. In other words, the poorer households experienced greater movement in terms of per capita wealth. These households are characterized by extremely low levels of wealth and their ranking on a per capita wealth scale is likely to be sensitive to even small changes in household size. A possible conclusion is that demographic factors are more important in determining a household's relative economic status among the poorest sections of the population than among richer households.

(vi) To illustrate the role of normative measures, King's social mobility index was estimated. The value taken by the index is closely tied to the assumptions made, namely the specification of k (form of utility function) and q, the immobility aversion parameter. Using different values for q and k in the formula below, mobility indices were estimated (Table 3.4).

$$IM = 1 - \exp(-q/n \sum_{i=1}^{n} s_i) \text{ for } k = 0$$

$$IM = 1 - \{ \sum_{i=1}^{n} [y_i \exp(q s_i)^k] / \sum_{i=1}^{n} y_i^k \}^{-1/k} \quad \text{for other k.}$$

For values of q = 0, i.e., where there is no preference for mobility, the index takes the value zero. Otherwise, for each k, as the value of q increases, i.e., preference for

mobility rises, the value of the index also increases. For example, with k = 0 and q = 5, the index takes a value of 0.05. This implies that the valuation attached to observed mobility in the panel is equivalent to 5 per cent of total wealth. In other words, society is ready to give up 5 per cent of total wealth to obtain the given level of mobility. The index gives greater values for higher k and higher q. The largest value of 0.76 in Table 3.4 was for k = 0.9 and q = 8. A range of mobility indices is thus obtained with magnitude varying according to the weight attached to mobility aversion.

TABLE 3.4: ESTIMATES OF THE KING SOCIAL MOBILITY INDEX BASED ON PER CAPITA WEALTH, GOKILAPURAM, 1977-1985

k / q	0	1	2	5	6	7	8
0.0	0.0	0.01	0.02	0.04	0.05	0.06	0.07
0.25	0.0	0.03	0.06	0.15	0.18	0.21	0.24
0.5	0.0	0.07	0.14	0.34	0.40	0.46	0.52
0.75	0.0	0.12	0.23	0.51	0.58	0.65	0.71
0.9	0.0	0.14	0.27	0.57	0.65	0.71	0.76

Note: q is the value of the coefficient of immobility aversion and k a parameter of the utility function.

3.3.4 A Discussion on Wealth Mobility in Gokilapuram

The changing distribution of wealth in this panel from Gokilapuram displays a low degree of mobility. Where movement occurs, it is often within bounds. This was illustrated by high values of correlation in wealth over time, by significant positive

coefficients for autoregressive models, and by the pattern of wealth mobility matrices. Immobility was pronounced among rich households: 86 per cent of those in the top two deciles (of household wealth) moved less than one decile in either direction over the period 1977-85 (also see Table 3.3). (It should be noted that in absolute terms, the rich experienced upward mobility.) At the lower end, too, there was relatively low mobility (after accounting for the effect of changes in household size). The large number of cells with zero values in the two matrices add further support to the argument of restricted or bounded mobility. The increasing concentration of wealth is another indicator of a tendency towards the cumulation of economic advantage.

In relation to the extremes, households in the median categories showed greater mobility. This could reflect transitory phenomena; by force of circumstance households have either been pushed up or pulled down from their long-run economic position. It could also be related to the nature of the matrix itself, to the possibility for unidirectional movement at the extremes compared to two-way mobility in the intervening deciles. In addition, it could reflect the fact that households which are not very poor have greater opportunities for mobility. While there were signs of considerable mobility in the middle-wealth categories, for the bulk of the very poor the opportunities for upward mobility were severely restricted.

The economy represented by members of the panel was by no means a stationary one -- for example, less than a third of all households remained in the same wealth decile over the eight years. Nevertheless, the extent of movement was limited, the dominant image being one of remarkable stability.

An alternative classification of the panel by quintiles of wealth, which contracts the dimensions of the mobility matrix, does, of course, tend to lower mobility. For example, the trace measure for per capita wealth equals 0.6 if a quintile matrix is used as compared to 0.77 for a decile matrix. However, the distance measures are approximately of the same order of magnitude. The broad conclusions of the study are not highly sensitive to the level of disaggregation.

Finally, do mobility estimates of the panel reflect changes in the *village* economy? There are three possible sources of downward bias in the panel estimates in relation to true population mobility. The first is the small size of the panel. The large number of empty cells may not have occurred with larger numbers. Secondly, the fact that households remained in the same fractile at two points in time does not rule out movement in the interim years. Thirdly, the panel excluded new households that were formed after 1977. It also ignored in- and out-migration of entire families. There is some evidence to suggest that newly formed households ('satellite households') show greater mobility than the households they originally came from (Shat *et. al.*, 1985). However, as there has been no major change (a slight increase in inequality) in the distribution of wealth in the village economy, mobility due to structural shifts would have been limited. The panel estimates of exchange mobility show low mobility and stagnation in respect of household and per capita wealth. These estimates are unlikely to have a large (downward) bias in relation to true changes in the economy.

3.3.5 Economic Mobility: Occupations

Occupational status is another indicator of the socioeconomic position of a household. Since similar definitions of occupational categories were used in the two

survey periods, we can construct an occupational mobility matrix. We identify six broad occupational categories that are amenable to easy economic interpretation. Fine distinctions are avoided because of the small size of our panel. The six categories are: landlords, peasants, manual labour households (agricultural and non-agricultural workers), those employed at artisanal and service jobs, households with major income from business and others.

TABLE 3.5: OCCUPATIONAL MOBILITY OF HOUSEHOLDS IN GOKILAPURAM, 1977-1985

(number of households)

1985	1977						
Occupation	1	2	3	4	5	6	Total
1.Landlords	7	1					8
2.Peasants	1	10	1				12
3.Manual labourers		7	30	2			39
4.Business households		2		8			10
5.Artisan households			1		4		5
6.Other households	1	1	5			2	9
Total	9	21	37	10	4	2	83

Note: The numbers of the columns refer to the occupational categories. "Business households" refers to households whose main income is from business activities, "artisan households" to those employed at artisan work and traditional service jobs, and "others" to salaried employees and others dependent on remittances.

Occupational mobility is mapped in Table 3.5, and converted to a transition matrix, as in Table 3.6. Since the rows refer to 1985 and the columns to 1977, the interpretation of the ij^{th} value is the probability that a person in the i^{th} occupation in

1985 came from the j^{th} occupation in 1977. The occupational matrix reveals a remarkable degree of stability, the majority of households (73 per cent) remained in the same occupational category over the eight-year period. For example, 87 per cent of landlords in 1985 held the same occupation as in 1977, 83 per cent of the peasantry, 76 per cent of labourers, and 80 per cent of business and artisan households.

TABLE 3.6: OCCUPATIONAL TRANSITION MATRIX, 1977-1985

	1977					
1985	1	2	3	4	5	6
1. Landlords	**0.87**	0.12	0.0	0.0	0.0	0.0
2. Peasants	0.08	**0.83**	0.08	0.0	0.0	0.0
3. Manual labourers	0.0	0.17	**0.76**	0.05	0.0	0.0
4. Business households	0.0	0.20	0.0	**0.80**	0.0	0.0
5. Artisan households	0.0	0.0	0.20	0.0	**0.8**	0.0
6. Others	0.11	0.11	0.55	0.0	0.0	**0.22**

Note: The rows sum to one, each m_{ij} refers to the probability that a household from occupation j in 1977 moved to occupation i in 1985. Definitions as in Table 3.5. Diagonal terms are in bold type.

31 Of course, one reason for the observed low mobility is the relatively short time-span between the two survey periods. Van Schendel (1981) in his study on Bangladesh peasantry found that over a 40-to-80 year period only 9 to 21 per cent (varying across villages) of households had never left the economic category to which they initially belonged.

The transition matrix, which takes the form of a maximal diagonal matrix makes this point emphatically. It stands in sharp contrast to the wealth matrices (Tables 3.1 and 3.2).

Let us calculate some standard mobility measures for this occupational matrix.

(i) There were important differences between occupational groups in respect of the index of time spent by households as members of an occupational group (Table 3.7). Landlords had the highest index. Peasants came next, followed by artisans and business households. The low value of the index for manual labourers reflected the fact that there were a relatively large number of new entrants to the class, particularly from the peasantry.[32] The low value for 'others' is due to the amorphous character of the category. It includes salaried employees, a category where new jobs are not easy to obtain, and persons dependent on remittances.[33]

(ii) The trace measure, p = [n-traceM/(n-1)] equalled 0.34, a relatively low value (as compared to the per capita wealth matrix where the trace equalled 0.77) that substantiates a picture of occupational stability.

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[32] Kathleen Gough (Gough, 1987), who studied two Tamil Nadu villages in the early 1950s and again in the late 1970s, describes the category of landless labour as a "cul-de-sac into which many of the dispossessed villagers had fallen."

[33] See the discussion of four households who shifted from manual labour to reliance on pensions and remittances, in Appendix 3.

TABLE 3.7: INDEX OF AVERAGE TIME SPENT IN AN OCCUPATIONAL CLASS

Occupation	$t_i = 1/(1-m_{ii})$
1. Landlords	8.0
2. Peasants	6.0
3. Manual labourers	4.3
4. Business households	5.0
5. Artisan households	5.0
6. Others	1.3

Note: The units refer to a time-interval of eight years.

(iii) The Szal distance measure equalled 0.04 (excluding 'others'). *The actual occupational movement of households was only 4 per cent of the maximum possible movement.*

These measures and matrices bring out quite forcefully the low level of occupational mobility in our panel during the years 1977-85. Occupational mobility was found to be lower than wealth mobility. The reasons for this could be many. The higher mobility in wealth could arise, for instance, from greater income and asset diversification within a household. Such changes are not captured by occupational data at a household level. For example, an agricultural labour household may have raised its wealth by an expansion of livestock-breeding activities while remaining a predominantly labour household.

One limitation of this analysis is the fact that the matrices are based on households rather than individuals (where occupation of a household refers to the major source of income of the household). Using the occupation of each household member as the categorizing variable would probably reveal greater mobility. (Individual occupations are used to characterize mobility in section 4.4.)

Although occupational mobility has been limited in the panel, a case study of some households which experienced upward or downward mobility provides an illustration of the paths of mobility. This is taken up in Appendix 3.

One aspect of the conclusions from our data on low occupational mobility is corroborated by a longitudinal study of Gujarat over the period 1964-65 to 1974-75 (Shah *et. al.*, 1985). This study found that 82 per cent of agricultural labourers remained in the same occupation over the decade.[34] A feature of the Gujarat data was that occupational structure over the period of study remained more or less unchanged.

3.3.6 Economic Mobility: Ownership Holdings of Land

We turn to the primary asset of a rural economy, agricultural land, and assess the degree of mobility of households in respect of land ownership. The "land mobility" matrix for the Gokilapuram panel (Table 3.8) has some striking features. Immobility is extremely high among the landless, i.e., once a household is landless,

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[34] Evidence on occupation of head of household for 863 households drawn from 28 villages of Matar taluk in Gujarat over the period 1964/65-1974/75 was used to estimate the degree of occupational mobility. Mobility was lowest among agricultural labourers, followed by households engaged in trades, artisans, and lastly, cultivators. The higher mobility among cultivators was in large part due to changes in the size of their cultivated holding which shifted their position on a land scale. See Shah *et. al.* (1985). Based on a study of 46 labour households, Rodgers (1983) also reports a dominant diagonal for an occupational mobility matrix; the extent of mobility is however restricted by his focus on labourers alone.

landlessness tends to persist. The degree of upward mobility implied by this matrix is less than the degree of mobility in respect of per capita wealth (Table 3.2). In the case of wealth, households and individuals in the lowest decile of wealth experienced relatively greater upward mobility. Another interesting comparison is with occupational mobility (Table 3.6). The proportion of rural labourers who remained in the same status over time, although high, is lower than the proportion who stayed landless. *Landlessness appears to be a more pervasive and persistent phenomenon than propertylessness and occupational immobility.*[35]

Table 3.8 should be read in the following way. The first row shows that of all households that were landless in 1985, 86 per cent were landless in 1977, 4 per cent owned less than 1 acre in 1977, and 10 per cent owned between 1 and 2.5 acres in 1977. The index of time spent in a class (Table 3.9) illustrates the contrast between the land matrix and the wealth matrix. On average, the index of time spent in the lowest two land ownership categories was higher than the index of time spent in the comparable bottom two deciles of per capita wealth. At the upper end, the time spent in the top decile of wealth was larger than the time spent in the highest land category.[36]

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35 In the panel the percentage of landless households is greater than the percentage of labourers in both years, and the proportion who remained landless is greater than those who stayed in the class of labourers.

36 The ownership of land in acres does not take account of the quality and value of land. We noted that households with larger acreage tended to have better quality land (see section 2.4), so it is not surprising that there is greater concentration of wealth (as compared to land acreage) at the top.

TABLE 3.8: LAND MOBILITY MATRIX, GOKILAPURAM, 1977-1985

1985	1977					
Land class (in acres)	1	2	3	4	5	6
1. 0	**0.86**	0.04	0.10	0	0	0
2. 0<1.0	0	**0.75**	0.25	0	0	0
3. 1<2.5	0.20	0.10	**0.30**	0.10	0.20	0.10
4. 2.5<5	0.22	0	0	**0.22**	0.44	0.11
5. 5<10	0	0	0	0.50	**0.50**	0
6. 10+	0	0	0	0.16	0.16	**0.66**

Note: Each m_{ij} refers to the probability that a household from land class j in 1977 moved to land class i in 1985. The column numbers refer to the equivalent land class as defined for the rows. Diagonal terms are in bold type.

The trace measure, which had a value of 0.54, was higher than the trace measure estimated for occupational mobility but lower than the estimates of trace measures for the wealth matrices. The Szal distance measure (which was 0.09) was low. The proportion of mobile households and the distance moved by them was small, with the exception of the class of households that owned between 2.5 and 5 acres.[37] On introducing a set of declining weights (falling in a geometric progression with increases in land)[38] the distance measure declined to 0.06.

[37] Households with 2.5 to 5 acres of land are "small farmers" in official classifications.

[38] Three categories of land were defined, namely 0, 0-5 and above 5 acres. Weights were then assigned to each category using a geometric series with r = 1/2.

TABLE 3.9: INDEX OF AVERAGE TIME SPENT IN A SIZE CATEGORY OF LAND HOLDING, 1977-1985

Category (in acres)	$t_i = 1/(1-m_{ii})$
1. 0	7.14
2. 0<1.0	4.0
3. 1.0<2.5	1.42
4. 2.5<5.0	1.28
5. 5.0<10.0	2.0
6. 10.0+	2.94

Our observations support two contradictory phenomena: persistence or stability of existing patterns of land ownership on the one hand, and a rise in polarization on the other. The stability is particularly marked at the two extremes. Similar observations on land ownership patterns in Bangladesh, led Bhaduri *et. al.* (Bhaduri *et. al.*, 1986) to argue that "a tendency towards stabilization (is) based on contradictions generated by the process of polarization itself". The processes that lead to polarization, according to this view, also create new opportunities for earnings through hired labour for small farmers, thus enabling them to remain on their farms.[39]

Lastly, while 60 per cent of all households in 1985 lost land between 1977 and 1985 (i.e., the numbers above the diagonal of the land matrix), only 35 per cent gained land and the remaining 5 per cent showed no change.[40] It can be argued, then,

[39] In short there is sufficient 'outside' income to sustain households with small holdings.

[40] The majority of those who gained land were households with more than 2.5 acres in 1977.

that the likelihood of land loss was higher than that of land acquisition. The economic policies of the state (e.g., the lack of enforcement of land reform laws, low land taxes) have been one factor in perpetuating a situation of huge and rising landlessness on the one hand and a tenacious concentration of the ownership of land on the other.

3.4.1 A Comparison with the NCAER Mobility Study

How do these results compare with the all India NCAER panel study?[41] Estimates of mobility from the NCAER study, covering 3,139 households for the period 1970-71 to 1981-82, stand in sharp contrast to our observations on Gokilapuram. Flaws in the NCAER methodology raise serious doubts about the reliability and accuracy of their data and report; these are discussed in some detail below. The results reported in the NCAER study should therefore not be considered as conclusive.

The NCAER research project constitutes a unique longitudinal study of rural India on a national scale and it represents an important landmark in research using panel data in India. This section first attempts an assessment of the reliability and quality of the data base of the study and then reports some of their results. Unfortunately, the NCAER study does not appear to stand up under critical scrutiny. The study reports some remarkable results which are not fully justified, and the reliability of reported results is weakened by inconsistencies in the data.

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41 To date, only a handful of mobility studies have been attempted in India. The major All-India longitudinal study was conducted by the National Council of Applied Economic Research (NCAER, 1986). The NCAER also had an earlier three-year panel study (1968/69-1970/71) which was used as the base for the second study.

The report is based on a panel of 3,229 households drawn from 261 villages in the country. The initial survey was undertaken in three consecutive years, from 1968-69 to 1970-71. A re-survey was conducted in 1981-82, after a lapse of 11 years. A comparison of household information in nominal terms over the decade is corrected for by an internally generated price index. It remains unclear whether the price data were directly noted in each case or whether they were implicitly derived from expenditure and quantity data. If the latter practice was followed, there are serious measurement errors involved since the implicit unit price also subsumes a measure of quality.[42]

The inter-class movement of households over the decade was analyzed under two categories: changes in per capita income and changes in land ownership. The major focus of the report commented upon here was on changes in household and per capita income levels between 1970-71 and 1981-82 and associated changes in household size.[43] Subsequent reports deal with changes in consumption levels, in the incidence of poverty, and in demographic behaviour (NCAER 1986b, 1987a, 1987b). We shall confine our comments to the specific section on mobility in the first report (NCAER 1986a).

The main questions or doubts raised by our reading of the report are outlined below.

Some Inconsistencies: Contradictions were observed between results derived from per capita income deciles and those based on land ownership categories. Take, for

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[42] The extent and type of bias is estimated in Deaton (1986).

[43] This refers to *Changes in Household Income, Interclass Mobility and Income Distribution in Rural India, A Longitudinal Study 1970/71-1981/82*, (NCAER, 1986a).

example, the case of changes in land productivity (in Tables 3.2 and 3.3, NCAER, 1986a). Land productivity per hectare declined for the top most income decile, was stationary for households in the 9th decile, and again declined for those in the 8th decile. However, when the data were classified by land ownership, medium and large landowners showed a 14.6 per cent and 8.6 per cent rise in land productivity respectively. A considerable overlap is to be expected between households in the upper income deciles and those in the category of bigger landowners; for that reason, the stated results appear inconsistent. (The category 'other landless' which may include households from the upper income deciles is irrelevant for this discussion on land productivity.)

A similar inconsistency was observed with respect to work participation rates (Tables 3.8 and 3.10, NCAER, 1986a). While there was a big rise in work participation rates among medium and large landowners, there was a fall in work participation rate for households belonging to the 8th and 9th income deciles. (The other landless category showed no change in participation, and so do not disturb the argument.) Further, "work" was not clearly defined in the report. What did "work" mean, for example, in the case of a landlord who did not actively participate in cultivation? The NCAER study assumes an implicit link between the extent of participation and earnings; while this may apply to wage labourers, it is not necessarily true for other categories.[44]

The first step in sorting out these paradoxes would be to provide a simple two-way classification table of households by income deciles and by land categories in

[44] Changes in participation rate depend on many factors such as age and sex of household members, health and nutritional status of workers, and so on. To suggest, as the NCAER does, that "sanskritisation" among landless and marginal farm households (who remain poor) was responsible for a decline in participation constitutes a highly tenuous argument.

both years. This would clarify the type of overlap between the two categories. Based on that, additional ways of reconciling or correcting these inconsistencies may be sought. These paradoxes may also arise from a weakness of the land classication, which is based on acreage and takes no account of differences in the quality or value of land.

The reliability of the NCAER panel has also been questioned by Sundaram and Tendulkar (1985b) who point out a major discrepancy between the NCAER estimates of growth in real per capita income and those derived from National Accounts Statistics.[45] Since the NCAER panel was heavily biased in favour of higher income groups and better-off districts, a higher estimate of overall rate of growth is to be expected. The facts indicate the very opposite, a rate of growth that is considerably lower than estimates based on National Accounts.

There are also problems with the data on land holdings. Land holding refers to land owned by a household. The study, however, draws no distinction between arable land and non-arable land, nor does it specify if land of differing quality was standardised or simply aggregated. The quality of the land data is highly questionable. Data on land from the original benchmark survey were not put on a data tape because of their unreliability but have subsequently been used to construct a picture of change between 1970-71 and 1981-82 (Gaiha, 1987).

Given these problems with the data and methodology, in what direction are the estimates of mobility likely to be biased? It can be argued the estimates of upward

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[45] Sundaram and Tendulkar also discuss the question of representativeness of the panel, which is affected by a large dropout rate and the bias towards higher income groups. This is likely to affect the conclusions of the study on aggregate changes in poverty and the hypothesis of the 'poor getting richer'.

mobility among households in the lower deciles of income are likely to be upwardly biased due to greater error in estimates of income of the lower deciles. As the NCAER panel has favoured households in better developed regions and relatively higher income groups, the error in estimation of income of the lower deciles is likely to be higher. The NCAER study reported that the per capita mean income of the bottom decile increased by 128 per cent while that of the topmost decile declined by 43 per cent. Sundaram and Tendulkar have pointed out that the weighting of the sample in favour of higher income groups would tend to increase the variability around mean income to the extent that "the 128 per cent increase may very well turn out be due to sampling errors alone" (Sundaram and Tendulkar, 1985.:40).

With respect to household mobility in the ownership of land, we have noted that the quality of the land data are not very reliable. However, it is not clear in what direction this would bias estimates of mobility.

Turning to the results, two categorizations were adopted to measure mobility: per capita income deciles and land ownership categories. The major findings from NCAER (1986a) are examined below.

Extremely high mobility was observed in the per capita income matrix with very few 'stayers'. The highest diagonal coefficient (m_{ii}) was a value of 0.34 for the tenth income decile, i.e., only 34 per cent of households in the top decile belonged there in both time periods. The land matrix, by contrast, depicted a picture of greater stability. For instance, marginal and small farmer categories had diagonal coefficients of 0.62 and 0.63, respectively. Trace measures that we computed for the two matrices equalled 0.98 and 0.97 for the income and land classifications, respectively.

Movement in the panel was widespread, e.g., 5 per cent of the top income decile in 1970-71 moved to the bottom decile in 1981-82. A similar though narrower range of mobility was observed in the land matrix where landless households and smaller cultivators moved longer distances that the bigger landowners.

In terms of income, the study reports that there was substantial mobility or very few 'stayers' and that movement took place across large distances. An explanation for these rather striking results is required. A partial explanation is provided by the nature of change in land ownership described in the report which says that landless households gained land over the period while the biggest landowners lost land. Nevertheless some of the results remain counter-intuitive, for instance, the conclusion that only large landowners did not gain through diversification of activity into non-agricultural and non-farm activities. Further substantiation of these general results is necessary. Issues that shed light on the processes underlying mobility, as for example the pattern of occupational change, could have been investigated by the report.

In terms of changes in the ownership of land, again, a striking result was noted: 27.9 percent of households that were landless in 1971-72 acquired land over the decade 1971-72 to 1981-82. This observation runs counter to evidence and reports from other studies (see, for example, the panel study of Gujarat, Shah *et. al.*, 1985) that document a tendency towards rising landlessness and suggest that it may be an irreversible process. Since changes in the distribution of land, in particular the loss of land by richer sections and the gain by landless and marginal farmers, constituted a major explanation of observed mobility, an external verification of this tendency is an important task.

Demographic pressure was put forward as a major cause of the decline in land held by medium and large landowners. A similar process of demographic differentiation may be expected to operate among all cultivators and should logically lead to increasing landlessness at the lower end of the land distribution. Since household size increased among marginal and small farmers as well as larger landowners, the demographic argument about changing land distribution remains unconvincing.

Estimates of summary measures of total mobility in the panel would have been a useful addition to the report. As two classificatory variables were used, namely per capita income and land-owning categories (called social classes in the report), a contrast between total mobility in each case would have served as an indicator of differential mobility. The data suggest that total mobility in terms of land ownership was lower than estimates derived from income deciles; wealth or asset mobility was lower than income mobility. This could derive, for example, from the larger share of transitory components in income vis-a-vis wealth. This raises a whole set of questions related to the distinction between transitory versus permanent components, an issue that is not sufficiently taken account of in the report.

Setting aside doubts on the accuracy of the findings, the scale and coverage of the report make a direct comparison with a single village study difficult. Nevertheless, one factor that could account for some underlying differences between our estimates and these results is a distinction between transitory and permanent components of variables. The total household wealth variable (used in this chapter) captures more of the permanent status of a household as compared to the per capita income variable (used in the NCAER study) which could include larger transitory components. The lower degree of mobility in the land matrix vis-a-vis the income

matrix supports this hypothesis. Nonetheless, estimates of land mobility in the NCAER study which are more easily comparable with wealth mobility also show an unusually high degree of mobility. For example, 50 per cent of landless households were upwardly mobile between 1970-71 and 1981-82.

More importantly, the general thrust of the NCAER report, which favours the continuation of existing patterns of economic growth and intervention on the grounds that it is associated with high mobility and a tendency towards lower inequality, finds no support from our evidence. On the contrary, estimates of low mobility and increasing inequality (chapter 2) provide strong support to a case for major structural reforms.

3.4.2 A Comparison with Other Household Mobility Studies in India

In the literature on household economic mobility in peasant societies, there is an important debate on the question of the transformation of the peasantry in the context of the development of capitalism in agriculture. The writings of Lenin and Chayanov on the differentiation of the peasantry (particularly the differentiation of the Russian peasantry) have since been extended and tested against empirical evidence from peasant societies in different parts of the world. Contributors to this debate include, among others, Shanin (1972) on the Russian peasantry, Harriss 1985 on Tamil Nadu, Cain (1978, 1981), Van Schendel (1981) and Rahman (1986) on Bangladesh, and Deere and de Janvry (1981) on Peru.

This thesis has a different focus; it attempts to examine certain aspects of mobility in ownership of wealth among rural households over an 8-year period. It does not focus on the nature of peasant society and its relationship to the development

of capitalism in Indian agriculture nor has it examined intra-generational and inter-generational changes in economic status and their association with life cyclical factors such as fertility and mortality. Without undertaking a detailed analysis of the nature of the peasantry in Gokilapuram, its economic condition, and factors, both economic and demographic, contributing to change among the peasantry, it is not possible to do justice to the themes considered in the papers cited above. Nevertheless, in the course of studying the larger issues of the penetration of capitalism into rural society and its impact on class structure, some of these studies have also investigated household economic mobility in terms of changes in land ownership. In this section, we shall examine the results of three studies, and their relevance to the issues dealt with in this thesis. These studies are Cain (1981), Harriss (1985) and Attwood (1979). The studies pertain to household mobility in respect of land holdings and are based on empirical evidence on rural households in different parts of India.

Cain (1981) investigates the relationship between two sets of variables: first, the environmental and social risks faced by rural households, and secondly, fertility levels (or the derived demand for children) among these households. In order to identify the degree of risk and the nature of insurance mechanisms to cope with risk, he examines changes in the distribution of land and household mobility with respect to the ownership of land. The frequency of distress sales of land is taken as an indicator of high risk and of a concurrent failure of insurance. The hypothesis proposed by Cain is that a high risk environment with inadequate insurance mechanisms leads to a higher demand for children as a source of insurance.[46]

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46 Also, see Cain (1978) on the links between life cycle variables such as age of marriage, mortality and risk of gaining or losing land, both within and over generations.

Cain's study is based on three villages in the semi-arid regions of southern and central India (two in the state of Maharashtra and one in Andhra Pradesh) and one contrasting village in Bangladesh. We shall only comment on the empirical evidence relating to the Indian villages and on those sections of the paper that deal with changes in land distribution and mobility. Data were collected in 1980 from 119 households in three villages; households were stratified into four groups according to operational holdings of land. Information was collected, first, on the extent of land owned by a household at the time of the survey (1980); secondly, on the extent of land owned by a household "at inheritance"; and thirdly, on land transactions in the interim period. In the case of landless households, the initial time period ("at inheritance") refers to the date at which the household came into independent existence. Changes in the distribution of land and household mobility in terms of ownership of land were then measured between the time of inheritance and date of survey.

A major problem with the data base of the Cain study is that the initial time period ("at inheritance") does not refer to the same point in time for all households. Cain states that the median year of inheritance was 1957. There is no information on the actual range of years encountered in the sample. Since the survey was undertaken in 1980, "at inheritance" could refer to any point in time prior to the date of survey in 1980. It is not very meaningful to construct a distribution of land among households "at inheritance" (see Cain, 1981, Figure 1, p 441) since "at inheritance" refers not to a point in time, but to a period of uncertain length. It is this distribution of households "at inheritance" that Cain compares with current land holdings and on the basis of which he constructs a mobility matrix. Since the initial reference period is not the same for all households, it is not possible to aggregate all households (as in a matrix)

and compare their mobility over time. The aggregated empirical results on change in inequality and household mobility are therefore problematic.

Nevertheless, it is possible to examine the changes experienced by individual households from the time of their formation (or inheritance) to the present day. Although Cain describes these changes in land ownership as upward and downward "mobility", the method of his analysis does not allow a discussion of *relative* mobility as defined in this thesis and other panel studies. Cain is documenting *absolute* changes (or absolute mobility) in land holdings of different households over time. Households are categorised into four groups: landless, small, medium and large landowners. The pattern of change in land ownership observed in these three villages indicates that

(a) households experienced considerable change between the time of inheritance and the date of survey;

(b) 37 per cent of households gained land as compared to what they inherited, 18 per cent lost land that they had inherited and the remaining 45 per cent showed no change; and

(c) there was a remarkable degree of land-gain among the initially landless: of 39 households that were landless at the time that they were formed, 22 had acquired land by 1980.

Cain suggests that the implementation of land reform and other government policies has contributed to land-gain among the landless and to land-loss suffered by large land owners. This argument is based on rather shaky evidence as Cain also says that no land was actually confiscated or *redistributed.* On the basis of three transactions, which transferred land from landlords to tenants, Cain argues that land

reform (including tenancy legislation) has inhibited households with large land holdings from accumulating more land by creating a fear of land-loss among them. There was some distribution of government-owned common grazing land to scheduled caste and landless households in one of the villages. Twelve households in Cain's sample together gained 18 acres of land in this process and they accounted for over half of the reported land-gain among the landless.

Cain goes on to conclude that public policy in the form of land reform, employment guarantee schemes, and provision of credit infrastructure has led to a lowering of the concentration of land holdings, and has generated 'upward mobility' among the landless. These conclusions, strictly speaking, do not appear to derive from Cain's data base since the precise relationship between household transition and affirmative government action has not been investigated (although Cain could certainly be right in arguing that these factors are more important contributors to change in the Indian villages than in the Bangladesh village). In addition, considering that the "time of inheritance" spans, over all households, a variable period, other factors may have contributed to the changes in land ownership that Cain says have occurred. In other words, Cain has not controlled for the time of inheritance or the time of land reform legislation.

Given differences in the objectives, in the study regions, in the methodologies (particularly in the time frames of the two studies and the definition of mobility), it is not easy to compare Cain's results with our estimates of mobility in land ownership. As discussed earlier (section 3.2.3), *it is not theoretically easy to compare matrices defined over different time periods unless stringent assumptions about Markov processes are invoked*. Nevertheless, it can be stated that the degree of upward mobility among households (especially among landless households) in our panel is

much lower.[47] There are, of course, many differences between Gokilapuram and the villages that Cain has studied: differences in socio-economic conditions, in the nature of agriculture (the irrigated agriculture of Gokilapuram versus dryland cultivation in Cain's villages), in the initial distribution of land holdings, in the predominance of the class of agricultural labourers in the Cumbum Valley, and so on. We hope that as a strong empirical base consisting of detailed studies on household economic mobility in different parts of India is built up, it will be possible to identify more clearly the regional patterns and variations in mobility according to differences in agro-economic and social conditions.

In a paper on the impact of the new agricultural technology on the economies of five villages in North Arcot district of Tamil Nadu, Harriss (1985) also deals with changes in land ownership over time. This study is based on a panel of 155 households from 4 villages, who were interviewed in 1973-74 and again in 1984. The households in 1984 were selected randomly from the census of households conducted in 1973-74. These 155 households, however, include 13 cases of partitioning, i.e., households that were part of the survey household in 1974 but had formed independent households in 1984. Harriss states that his data on land holdings are for those households which were present in the 1984 sample, after "allowing for partitioning since 1973" (Harriss, 1985:54). It is not clear exactly what allowances were made. In addition, Harriss conducted a complete census of one of the five villages (Randam village) in both years and collected data on land holdings and land transactions as part of a larger survey. In the case of Randam, the data set includes households that were present in the village in 1974 and 1984 and those that were present in either one of the two years.

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[47] In absolute terms, landlords in Gokilapuram have accumulated land over the study period.

Harriss' introductory section on data collection indicates that he has interesting longitudinal data. The "mobility" of households in terms of their ownership of land as discussed by Harriss in this paper is similar to "mobility" as discussed in Cain (1981): it is based on changes experienced by households from the time of inheritance to the time of the survey in 1984. Harriss does not deal with household mobility in respect of changes in the ownership of land *between* the two survey years, 1974 and 1984 (which would, incidentally, have provided us with a useful point of comparison for our data).

The various problems that are associated with the construction of a distribution of land holdings "at inheritance" recur in the Harriss paper. A distribution of land holdings among households at what is deemed to be a point in time (i.e., "at inheritance") is in fact a distribution of land holdings held by different households at *different* points in time. Harriss also does not specify the range of years to which "at inheritance" refers. It is not feasible to compare the distribution of land holdings "at inheritance" with the distribution in 1974 or 1984 and comment on changes in inequality over time.

Harriss goes on to present matrices of changes in land ownership between the time of inheritance and 1984. Again, it is not easy to interpret these matrices since they are based on an aggregation of households that inherited land at different dates. As in Cain (1981), Harriss documents absolute changes in land ownership and not relative mobility. Harriss' tables indicate that the number of households who gained land since inheritance was, in most cases, greater than the number of households who lost land since inheritance in these five villages. It is also of note that for the two villages for which Harriss is most confident of the quality of the data, 73 per cent and

67 per cent of households showed no change in land ownership between the time of their inheritance and 1984.

To understand the pattern of changes in land ownership, Harriss examines the nature of land transactions and the purpose of land sale by households. The financing of investment, including investments in land improvement such as digging wells and purchasing land of good quality land, emerges as an important reason for the sale of land by medium and large landowners.[48] If this were so, then changes in land ownership (discussed above) that do not distinguish between land of differing quality provide an incomplete picture of change in economic status. A study of changes in land ownership disaggregated by *type* of land, a proxy for quality, would have provided a clearer indication of the changes in economic status experienced by different households.[49] An analysis of changes in the *value* of land held, as is the case in this thesis, can also overcome some of the problems that arise from a reliance on measures based on the extent (acres) of land.

The only discussion, in the Harriss paper, of mobility between 1974 and 1984 is that of *class* mobility (i.e., social classes defined in terms of Marxian categories) in the context of the spread of new agricultural technology in the region and the impact of such mobility on political mobilization. As the occupational categories used in this thesis were not defined in order to contribute to the debate on the differentiation of the peasantry and the penetration of capitalism into peasant societies or to the

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48 For example, in Randam village, 35 per cent of land sales by large landowners were reported to have been undertaken in order to purchase more land and invest in wells.

49 Harriss says that he undertook an analysis of changes in land value in order to identify the role of land quality. However, neither the method of analysis nor the complete results of this analysis are reported in the paper.

literature on the nature of agrarian politics, it is not possible to compare Harriss' class analysis with results reported in this thesis.

The study of household mobility by Attwood (1979) aims to compare two alternative theories concerning economic polarization and differentiation over time. Attwood attempts to test the predictions of a Malthusian theory of mass impoverishment due to population pressure against those of a Marxist theory of class polarization. Specific testable hypotheses that derive from these two perspectives (or Attwood's version of them) are examined against evidence on changes in household landholding in a village in western India over a period of approximately 50 years.[50]

On household mobility, the major conclusion of Attwood's study is that there was substantial mobility among households in all size categories of land ownership, including the landless. It is also argued that the concentration of land did not increase between 1920 and 1970 and that some of the poor (in terms of landholding) became richer.

Attwood's sample consists of 110 households from 'Olegao' village in Maharashtra, which were interviewed in 1970-71. Attwood seeks to compare the current distribution of landholdings among households in Olegao village with the distribution of landholdings of the "same" households two generations ago (in "1920"). The distribution of landholdings in 1970 is based on information gathered from interviews with households on their current landholdings at the time of the survey. Attwood then attempts to create a distribution of landholdings in 1920 on the

[50] It has been pointed out (Krishnaji, 1979, in Attwood, 1979) that by failing to define class categories in a Marxist framework, Attwood's results are inadequate to answer the very questions he sets out to examine. Attwood also does not deal with changes in household size or differential fertility across economic classes.

basis of *recall*. In order to do so, respondents were asked to report the extent of land held by their immediate ancestors, namely the fathers and grandfathers of the male respondent. The information on land ownership in 1920 is thus based on inter-generational recall, which is likely to be subject to substantial error. As memory lapse was noted by Attwood to be particularly serious among currently landless households that recalled that their ancestors owned land 50 years ago, Attwood has simply assumed that their fathers or grandfathers belonged to the category of small and medium land owners. There are also problems with selecting the multi-generational family as a unit of study. Attwood restricts the definition of a family to a single line of descent, tracing it back from the household interviewed in 1970. He does not take account of land partitioned among collaterals in any of the generations. As different branches of the family may differ in their ownership of land, there is no reason to expect the particular family interviewed in 1970 to represent the status of other siblings or collaterals who branched off from the ancestral family. The comparison of land held by a "household" in 1920 and in 1970 refers to changes reported by a single branch of the family. However, if it were the case that two brothers, who had formed separate households, were interviewed in the course of the survey, there would have been a double counting of the common land owned by their ancestors. Attwood does not mention if this problem occurred in his data set and how it was handled. Furthermore, Attwood reports that he was unable to check his figures on land ownership in 1920 with village land records. On all these counts, the notional distribution of land in 1920 must be viewed with great caution. Another major problem with the data is that it does not refer to two unique points in time. The term "1920" is used by Attwood to refer to the "decade before the depression of the 1930s". Again, as in Cain (1981), the distribution of land in 1920 is based on an aggregation of landholdings at different points in time.

Gini coefficients are then computed for the distribution of landholdings in 1970 and the reconstructed distribution of landholdings in 1920. Attwood argues that a decline in the value of the Gini coefficient for households that held land in both 1920 and 1970 contradicts the prediction (of the so-called "class polarization" theory) that the ownership of land becomes more unequal over time. Even this is not necessarily so, since his computation of this index does not take account of landless households in both periods, and households that owned land in *one* of the two periods.[51] Given the nature of the data, the analysis does not provide detailed evidence regarding changes in inequality over time. The data do, however, indicate that inequality in land ownership was extremely high in both periods (the Gini coefficient was 0.81 in "1920" and 0.82 in 1970).

On the basis of these data on changes in landholdings between 1920 and 1970, Attwood concludes that neither theory completely explains the facts although the population pressure theory appears more consistent with the evidence.

Given the differences in the data set (panel versus inter-generational recall), in methodology, and in reference periods (8 years versus 50 odd years), Attwood's results are not directly comparable with ours. A study of the economic mobility of households in terms of their asset holdings over an 8-year period cannot, of course, be used to draw conclusions about the relative contribution of factors such as population pressure and economic polarization. There is, however, some evidence from the earlier survey of Gokilapuram on inter-generational occupational mobility that points to noteworthy changes over a single generation. The head of each household in 1977 was asked the occupation of his or her father and whether or not the father owned or

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[51] It is also of note that the Gini coefficient is not a very good indicator of changes in inequality when Lorenz curves intersect, as is the case in Attwood's Figure 4 (p. 502).

operated land.[52] Of the 257 households who were landless agricultural labour households in 1977, 60 per cent descended from households that owned or operated land in the past. In addition, 58 per cent of landless agricultural labour households in 1977 were headed by persons whose fathers were not agricultural labourers (Ramachandran, 1986). The factors contributing to the sizable increase in the agricultural labour force were identified as, among others, the dispossession of the peasantry, the decline of traditional occupations, and migration. The evidence on changes between 1977 and 1985 does not indicate a major deviation from this tendency towards polarization (and indeed, the time period is too short for any major conclusion on this score). Nevertheless, the relative stability at the two extremes of the matrix of land ownership holdings and instability in the small farmer category (see Table 3.8) are consistent with a tendency towards a concentration of land ownership in fewer hands.

3.5 Concluding Remarks

A survey of the literature on measurement of mobility with reference to an application to a village economy located the specific advantages and disadvantages of different methods of estimation. It was suggested that the best descriptive detail on the pattern of mobility was to be obtained from matrix-based measures. The distance measure was highlighted as one that took account of both the direction of mobility and the degree of mobility (or distance moved). It was also a measure that is amenable to modifications and extensions. A new distance measure was outlined with the use of weights that attached progressively higher weights to mobility in the lower

[52] No attempt was made in the 1977 survey to estimate the actual amount of land held by the previous generation.

ranks. Normative measures were shown to be highly sensitive to the specification of the welfare function and were not elaborated upon in detail.

The second part of this chapter examined patterns of economic mobility as they emerged from panel data in Gokilapuram. We used four variables to monitor change. These variables were household wealth, per capita wealth, household ownership holdings of land and household occupations. Rates and patterns of mobility between classes (in respect of the different variables) behaved in rather complex ways. The evidence from the panel data is consistent with an increasing concentration of wealth (including land) in the hands of a few. There was considerable immobility in the bottom ranks of wealth deciles, land groups, and occupations. Mobility was least among the rich (top deciles, land categories and occupations) who consolidated their economic strength. Mobility in the median categories, on the other hand, was relatively high. Except for the median category, where there was movement, it was not over a long distance. The observed pattern of mobility has to be viewed in the context of overall changes in the structure of the panel, such as, the rise in proportion of landless households from 57 to 60 per cent (1977-85).

The extent of mobility also differed with the choice of variable. The highest degree of immobility was observed with respect to occupations, followed by landholdings. Growing landlessness and a shift towards manual labour occupations are important signals of the larger structural processes occurring in the village economy. By contrast, relatively higher rates of mobility were noted with respect to household wealth and, in particular, per capita wealth. Except for per capita wealth,

which is highly sensitive to changes in household size, the other three variables can be considered as approximations to long-run economic status. Our results on economic mobility, therefore, suggest that for households in the panel from Gokilapuram, opportunities for a permanent change in economic status were limited.

APPENDIX 3

CASE STUDIES OF OCCUPATIONAL MOBILITY

Social scientists have long been interested in case-studies of village households that have been occupationally mobile. Such studies depend on detailed descriptive features of the socioeconomic status of individual households and as such, there are limits to generalizing from them. At the same time, however, such studies provide insights into important details of village life. In a situation that has generally been accepted to be characterized by polarization, is there upward mobility in the village at all? And if there is, what are the features of households that have managed to win out? How do these features contrast with households whose position in the socioeconomic scale has slipped downwards? I have used material from four sources for households whose occupations changed between 1977 and 1985. They are the household schedules from the surveys of 1977 and 1985, field notes from earlier surveys made available to me, and my field notes from 1985.

While a major feature of occupational patterns in the village is *stability*, occupational mobility shows interesting patterns.

The most notable group, the group which lost the highest number of members during the 8-year period, was the peasantry. Of the 21 households in the panel that were peasants in 1977, 11 were no longer peasants. Of these 11, 7 households became manual labour households, i.e., moved downward, and 3 households improved their positions.[1]

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[1] On a socioeconomic scale the following ranking of occupations in descending order is used: landlords, salaried employees, business households, peasants, artisans and finally manual workers.

The group of manual labour households was relatively stable, although here again, the patterns of mobility are interesting. Of 37 manual labour households in the original panel, 7 moved out of this group by 1985: 4 became households living on pensions or remittances, 1 returned to the traditional family blacksmith trade, 1 household gained salaried jobs, and 1 climbed into the ranks of the peasantry.

What are the factors associated with *downward* mobility? Among the peasants, the major factor behind the shift of households to the class of manual labourers was the eviction of tenants. *All 7 households that lost peasant status and became manual labourers were tenants evicted between 1977 and 1985.* Of them, 6 were from the poorer, hard-labouring section of the peasantry and 1 was an erstwhile rich peasant. Another important feature of these 7 households is that 5 of them were scheduled caste households.

Another feature of downward mobility is that households which became manual labourers showed a steep increase in the level of household indebtedness. The debt-to-asset ratios of the 7 evicted tenant households who became manual labour households increased from 18 per cent in 1977 (when the mean debt-asset ratio for all households was 7 per cent) to 43 per cent in 1985 (when the mean debt-asset ratio for all households was 6 per cent). Two households which gained their major income from business activity outside crop production in 1977 lost their small sources of self-employment and became dependent on manual labour in 1977. The change in the debt-to-asset ratios of these two households is quite staggering: it increased from 0.7 per cent in 1977 to 148 per cent in 1985.

Changes in age structure have also played a role in occupational shifts. This phenomenon can be illustrated with two very different cases. The members of four households that were manual labour households in 1977 aged by 8 years over the period between surveys and ceased to be able to work on the fields. In 1985, they

lived on old age pensions or remittances: 2 households received small pensions from the Indian Army for ex-servicemen, 1 received an old age pension from the Tamil Nadu government, and 1 received remittances from an engineer-son. The other case is that of a household which was an ex-landlord family. By 1977, the household had sold land and its economic position was becoming steadily worse. Despite a worsening economic condition, the head of the household and other members of the family did not work on the landholdings of the family. By 1985, his young sons had grown old enough to work the land. They became the first members of this family to participate physically in the major manual operations on the land. Although they sold family holdings of *thottam* and dry land, they retained a small area (2 acres) of plantation land, which grows cardamom. By 1985, there was a measure of stability in the socioeconomic status of the family which did not exist in 1977.

I shall now turn to some of the features that characterized *upward* mobility. Two features stand out. Households that have made the most substantial move upwards in terms of occupational and general socioeconomic status have diversified their sources of income by taking advantage of opportunities for entrepreneurship outside crop production. Most of them have also benefitted from loans given by commercial banks through low-interest schemes or loan-cum-subsidy schemes. Some illustrations follow.

Three households moved out of the peasantry upwards. One came from a traditional landlord family whose income had declined because of the subdivision over generations of inherited landholdings. By 1977 the members of the household were working on the land; the household was a rich peasant household. Between 1977 and 1985, there was a shift towards the cultivation of coconut on lift-irrigated tracts in the Cumbum Valley and in the vicinity of the village. The household entered the coconut trade, buying coconut in the Valley and selling it in markets in different parts

of the state. With the new wealth that has accrued to the household, its members no longer participate in the major manual operations on the land.

Two households in the panel that were peasant households in 1977 (one from the rich peasantry and one from the poorer section of the peasantry) were, by 1985, households that derived their major incomes from business activities outside direct crop production. Both retained their landholdings and continued cultivation on them, but the primary sources of income had shifted decisively to business activities by 1985. The ex-rich peasant household bought plantation land and received a low-interest loan from the lead bank in the district to set up a shop. The shop is now the most important retail store for textiles, utensils, and floor mats in the village. The other household received a loan-cum-subsidy to set up a cycle shop; it also diversified by setting up an establishment to par-boil paddy.

Only one agricultural labour family moved into the peasantry; the economic status of that household, however, was characterized by a dramatic upswing. The household received a subsidy-cum-loan to set up a shop and another subsidy-cum-loan to buy a milch buffalo. Both of these were obtained under the Integrated Rural Development Programme (IRDP). The head of the household also bought a radio and loudspeakers to rent out, and the household was engaged in petty money-lending. The household also leased in *seven acres of thottam land.* This is remarkable for an agricultural labour household in a village where the major feature of tenancy is its declining importance in land tenure, and is indicative of the scale of the new resources generated by the business activity of the household.

The last illustration of a change in occupational status because of a loan-cum-subsidy comes from a household whose resource base is altogether smaller than the four preceding households. This was a family that was headed by a blacksmith, one whose family has been occupied in blacksmith work in the village over many

generations. By 1977, the demand for his services had declined, and although the head of the household continued to work as a blacksmith, agricultural labour was the major source of employment and income for the household. For the first time, the blacksmith's sons began to work as agricultural labourers. The household received a loan under IRDP for artisans in April 1985. This was a shot in the arm for the blacksmith and his household, and although his wife and children continued to work as hired labourers, the major source of income of the household had shifted back to earnings from blacksmith work. The conditions that had initially eroded the demand for his services, however, are still present in the village, and the task of the blacksmith is something of a sunset activity. In these circumstances, it cannot be said with any certainty that the new status of the household (or, in the present case, the return to the traditional occupation) will be sustained over the long term.

In contrast to households that were mobile downward, a feature of the upwardly mobile households is a decline in the household debt-to-asset ratio between 1977 and 1985. This is despite the fact that debt (mainly incurred as a result of loans from commercial banks) has risen for most of these households.

We have seen that 5 out of the 7 tenants who were evicted and who became landless agricultural labourers belonged to the scheduled castes. The only source of new employment other than manual labour for households of the scheduled castes in our panel (that changed their occupational status between 1977 and 1985) was salaried employment in public sector jobs. This employment was obtained through quotas reserved for the former 'untouchable' castes. Three individuals (from two households) obtained such employment between 1977 and 1985. The first household is headed by a person who was a tenant evicted at the end of the agricultural year 1976-77. He is also the person who provides traditional types of animal-cure in the village. After the eviction, the family has come to depend on the salary of a young male member (the evicted tenant's son), who has a minor job in the postal

department. The other two scheduled caste persons in our panel who secured employment in public sector jobs were a couple from a manual labour household. Both had school-leaving certificates and the husband had undergone a brief period of vocational education at a technical school near Madras. He now works as a bus conductor and his wife works as an assistant in a village-level centre of the Noon Meals Scheme for children. (The scheme was introduced in Tamil Nadu in the early 1980s.)

4

MOBILITY AMONG THE POOR: SOME DEMOGRAPHIC, OCCUPATIONAL, WEALTH AND INDEBTEDNESS CHARACTERISTICS

4.1 Introduction: A Time Dimension to Poverty

This chapter moves on to a more detailed categorization of households on the basis of the degree and direction of their economic mobility. It deals with three issues. First, it sets out a method for classification of households that incorporates a notion of economic mobility. Secondly, it examines the differential characteristics of these mobility-based groups. Thirdly, it uses the new classification and the differences between the mobility-groups to elaborate on the distinction between temporary and chronic poverty.

The identification of households that are transitorily poor rather than chronically poor is of relevance to the measurement of poverty. Such identification can also make an important contribution to policies that are targeted at groups that are in chronic poverty. Assume, for example, that each state in India is allocated development funds in accordance with the proportion of its population reported to be in poverty in a given year. If this proportion were to be very different from the proportion of the population in each state that was in a condition of long-run poverty, then state-wise allocations could be inefficient and inequitable in relation to the objective of eliminating long-run poverty. (This is assuming that the elimination of chronic poverty, which is a more primary problem than temporary poverty, is the primary concern of policy-makers.) The identification of these two types of groups in poverty, not necessarily overlapping, would be helpful in improving the design of policies aimed at alleviating chronic poverty.

If the characteristics of those in long-run poverty departs qualitatively from the characteristics of those who are temporarily poor, the basic structure of a programme aimed at alleviating long-run poverty could depart substantively from that of a programme aimed at alleviating short-run poverty. A remarkable finding of the PSID, for instance, was the low resemblance between households in poverty for a year or two and those in poverty for longer periods of time (Duncan, 1984). Conventional beliefs, such as the belief that poverty is relatively higher in urban slums, or the belief that poverty persists on account of attitudinal factors (that a 'culture' of poverty perpetuates poverty), were also disproved by the PSID study. The PSID report illustrates the potential gains to be achieved from a study of the characterisitics of long-run vis-a-vis short-run poverty.

The few panel studies undertaken in India have not examined the implications of this distinction between long-term poverty and short-term poverty in detail. However, earlier research based on cross-section or time-series data can be used to set out alternative hypotheses on the characteristics of poverty. By outlining the nature of static poverty and its characteristics, certain questions about dynamic poverty can be identified. The small size of the data set imposes a constraint on the analysis. This opportunity is used to explore new areas; it is not an exhaustive account of the dynamics of poverty in rural Tamil Nadu.

4.2 Characteristics of Poverty

First, household size and its variation across economic categories is examined. The data show considerable variation in household size across economic categories. Average household size is found to decline systematically with a rise in per capita expenditure but rise with increasing total household expenditure, land holding or

wealth more generally.[1] This paradoxical observation can be explained by the choice of classificatory variable. Krishnaji (1984) pointed out that the choice of per capita expenditure or per capita income as a classificatory variable was inappropriate for demographic analysis. Per capita income or expenditure is subject to short-run fluctuations whereas the demographic characteristics of a household are determined in the long run. The use of per capita income or expenditure creates a bias in the observed statistical relationship.[2] He thus argued in favour of adopting property, wealth or the class status of a household as a classificatory variable for demographic studies. These variables are likely to have a stronger influence on determinants of family size, such as, mortality, fertility, and household formation, than per capita variables.

Krishnaji explains the positive association between household size and household income, wealth, or class-status in the following way: "a low average size of family among agricultural labour and poor peasants arises mainly from high rates of mortality and family formation; and a high average size of family among big land-owners from low rates of mortality and a tendency for families to remain undivided" (Krishnaji, 1983:869). Consistent findings have been reported for Gokilapuram: agricultural labourers as a class lived in distinctly smaller households than the rest of the population. Households with major income from business activity lived in

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[1] For evidence on this paradox, see Lipton (1984).

[2] Krishnaji (1984) shows that this paradox may be explained as the result of statistical mis-specification or selection bias arising from the omission of a land or property variable, which is systematically related to per capita expenditure and to household size. When household size and per capita expenditure are independently examined, both are positively correlated with land-holding but inversely correlated themselves. Since a death rate paradox also arises from the use of per capita expenditure as the classificatory variable (i.e., infant mortality is positively correlated with per capita expenditure), there is a strong case for dropping per capita expenditure as the classificatory variable in demographic analysis.

relatively large households. The major landlords had the highest average size of households among classes in the village.[3]

Does household size vary systematically with mobility? How do life-cyclical changes in size and composition affect a household's economic status? Chayanov argued that demographic factors were the decisive force underlying change and polarization in society (Chayanov, 1986). He argued that cyclical movements in economic status were the result of changes in family size, in the household consumer-to-worker ratio, in the age structure of the household, etc. Doubts raised about Chayanov's logical argument and statistical evidence (Patnaik, 1979) are a caution against accepting the primacy of demographic factors in explaining change in economic status.[4] Patnaik has also argued that Chayanov's theory of demographic differentiation was only concerned with cyclical movements within a given economic structure, and did not constitute a dynamic theory of transition or of change in economic structure. Nevertheless, demographic variables may be associated with differences in mobility. By observing variations in household size or age-structure for groups with differing mobility, this chapter attempts to understand the role of such factors in economic mobility.[5]

A limitation of our study is that it takes the household as unit, and the effects of changing household composition on individual mobility can not be fully

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[3] Ramachandran (1986).

[4] For example, Utsa Patnaik points out that data to support the argument that farm size varies with family size is based on allotment land, which by law was distributed according to family size (Patnaik, 1979).

[5] This does not necessarily attach a causal role to demographic factors.

examined.[6] In addition the time period between the two surveys from which our data derive is only eight years, a period not long enough to study generational changes.

It has been argued that the poor live in households with a relatively unfavourable age structure, that poor households have a large number of children and a high proportion of dependents (Lipton, 1983b; Agarwal, 1986). This view emphasizes the cyclical aspect of poverty; a household with many children is said to be in an unfavourable demographic stage of its life cycle. The countervailing factor is that age and sex specific labour-force participation rates are generally higher among the poor, since young children may contribute to income. Both male and female work-participation rates are reported to be higher among the poor (Agarwal, 1986; Lipton, 1983b; Visaria, 1980). If demographic factors are associated with poverty then a high turnover of households in poverty may be expected. Does evidence on households which are upwardly or downwardly mobile lend support to such a link with age-structure?

The age and sex composition of a household are likely to be important factors affecting economic mobility. The influence can be illustrated with the case of female-headed households. These are believed to have a relatively low income due to limited access to productive resources. Visaria (1980) observed an over-representation of women-headed households in the lower household expenditure deciles. Evidence on changing work-participation among households with varying mobility can throw some light on this issue.

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[6] The PSID study identified changes in household structure such as divorce, separation, deaths and births as major explanatory factors of observed individual mobility. For example, the status of a widow dropped sharply at the death of her husband, if he was the prime earner of the household.

Poor rural households are also found to be over-represented among the agricultural labour category. Evidence from the 1977 Gokilapuram survey indicates that for landless agricultural labour households below the poverty line, earnings from agricultural labour constituted a higher proportion of total earnings than for households above the poverty line.[7] Furthermore, households who were above the poverty line had found alternative sources of income, such as better-paid non-manual employment or sideline activities, such as dairying. The extent of work participation and the occupational characteristics of a household are thus likely to affect the degree of economic mobility. The fact that occupational mobility was lower than wealth mobility (see section 3.3) and that inequality between occupational groups was an important contributor to total inequality (see section 2.5) indicates how limited job opportunities can act as a constraint to overall mobility.

Education is held to be a stepping stone to upward mobility.[8] Education may have a positive influence on the earnings capacity and occupational choice open to men and women. In rural areas of developing countries, the level and coverage of education is abysmally low; and education in most cases refers merely to literacy. It is unlikely that literacy *per se* will have a large impact on occupational choice, on the ability of a household to obtain higher income, or on a household's stock of wealth. Nevertheless, the acquisiton of skills is an important part of improving the quality of human capital, and it is problems in measurement and valuation of skills that make it difficult to incorporate human capital into wealth.[9]

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[7] Ramachandran (1986).

[8] Duncan (1984) pinpoints education as an important variable differentiating households in transitory poverty from those in persistent poverty.

[9] A simple indicator of skill acquisiton may be difficult to find, as skills may be based on experience rather than formal training, and the market may not reward differences in skill sufficiently or accurately.

Alongside its effects on earnings potential and occupational choice, literacy and education, especially female education, can influence mobility in many ways. For instance, it has been noted that the education of women tends to raise the proportion of children surviving, while lowering the number of children ever-born.[10] Women's education can make a favourable impact on child mortality and fertility; this change in household size and composition can affect mobility.

In section 4.4 we examine characteristics of households differing in wealth-mobility. Some of the questions raised on the dynamics of poverty are the following. Are households that are poor and immobile small households or large households? Are there major differences in literacy rate among households differing in mobility? Is work participation closely linked to mobility in wealth? What type of assets -- in particular productive assets -- are accumulated by different sets of households? And what is the burden of debt for poor immobile households versus the rest?

This is by no means an exhaustive list of questions relating to economic mobility. The specific characteristics of mobility groups that are examined in this chapter were selected primarily on the basis of availability of information. It would have also been interesting to examine the relationship between the caste of a household and the extent of household mobility. However, as households in the panel belong to 15 different castes, unless aggregated the identification of the caste characteristic would not have been very meaningful. A possible classification is into scheduled caste and non-scheduled caste households. Research based on the 1977 survey has shown, however, that in almost every caste the largest single group of households were manual labourers (Ramachandran, 1986). In addition, among scheduled caste households more than 80 per cent were manual labourers. If a two-

[10] The critical level was found to be six or more years of female education (NCAER, 1987a).

fold classification of households into scheduled caste and non-scheduled caste had been adopted, the non-scheduled caste group would have been too heterogeneous in respect of occupations, wealth and other socioeconomic indicators to be valuable as a classificatory variable. The status of "non-scheduled caste" would have been inadequate as a distinguishing characteristic of households. With a small data set, we felt that more reliable insights were to be gained by examining the occupational characteristics of households. A study of the pattern of mobility *among scheduled caste households* is, however, a subject worthy of separate study, one that we hope will be taken up in the course of future research.

We suggest that the current exercise be viewed as a preliminary study of certain aspects of mobility using available data. In addition, we hope it will raise questions to be pursued in future research on mobility.

One specific aspect of the panel data set, the choice of the household rather than the individual as unit of mobility has certain implications for subsequent analysis. Let us explain with an illustration. If the panel consisted of individuals, then the average age of its population would have increased by 8 years between the two survey years. However, since the composition of *households* has altered, the average age in each household cannto be expected to have increased by 8 years.

The possible bias arising from the omission of variables that may be systematically related to estimated variables must be reiterated. This is an important qualification since we are only examining certain attributes of mobility, with other attributes, such as household earnings having been excluded. This may result in errors in interpretation. The process of socioeconomic mobility is a complex one; and this analysis considers only selected features of the process.

4.3 Categorization into Temporary and Chronic Poverty

Four mobility groups have been defined on the basis of a combination of two criteria. The first criterion captures mobility by identifying the magnitude and direction of change in per capita household wealth over the 8-year period. The second criterion is used to differentiate the relatively poor from the rest by means of a boundary or cut-off point in the distribution.

All 83 households in the panel were ranked by household wealth and per capita household wealth in each year. The mobility of households across different deciles of the wealth distribution over the period, 1977-85 was then identified. To concentrate on the relatively poor households, the 40th percentile was selected as the dividing line between the poor and the non-poor. In other words, all households within the bottom four deciles of the wealth distribution were considered 'poor'.

One justification for the choice of the 40th percentile is that 46 per cent of households in the panel belonged to the class of manual labourers, households that are predominantly propertyless. As the ranking variable is wealth, this procedure places emphasis on the degree of mobility among the assetless poor. In addition, there is a qualitative difference in the pattern of mobility in the fifth and sixth deciles of the wealth distribution (see Tables 3.1 and 3.2). Using the fourth decile as the line of demarcation is a procedure that we consider likely to capture a relatively higher proportion of households in long-run poverty.

Henceforth we refer to households who fall below the 40th percentile as the 'poor' (for 'relatively poor'). This should not be confused with any standard definition of absolute poverty. However, the low average household (and per capita) wealth of all those in the bottom 40 per cent suggests that these households were

clearly not absolutely well-off. In 1985, the average household wealth of those in the bottom 40 per cent was Rs 7,708 at current prices. By way of comparison, the cost of construction of a one-roomed brick hutment was Rs 6,000 at 1985 prices.[11]

The poor have been subdivided into three groups: (i) households that were poor in 1977 *and* 1985; (ii) households that belonged to the bottom 40 per cent in 1977 and moved out of it in 1985; and (iii) households who did not belong to it in 1977 but did so in 1985. Households in the first of these subgroups spent close to a decade in relative poverty; we termed them the 'hard-core poor' or the 'chronically poor'. The latter two categories are termed the temporarily or transitory poor households in contrast to the hard-core or chronically poor group. Lastly, there are households which remained outside the bottom 40 per cent in both years, the non-poor category. This distinction between the temporary and chronically poor should be clearly demarcated from any static distinction among the poor as, for example, Lipton's difference between the moderately poor and the ultra-poor.[12]

Extent of Chronic Poverty

Table 4.1 presents a ranking of households by household wealth. In the first decile of household wealth, significantly, 50 per cent of households were common to both years. The bottom quintile in 1985 contained 56 per cent of households from the bottom quintile of 1977. Cumulating further, the figure sums to a remarkable 75 per cent for the bottom half of the population. In other words, only a quarter of the

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11 This is from my field notes. Among the poor, the homeless are viewed as destitute and the ownership of a simple hut does affect the status of a poor household.

12 Lipton's (1983a) definition is based on food adequacy at a given point in time: those able to satisfy 80 per cent or more of requirements are termed moderately poor, those falling below that and at risk of undernutrition (rather than at risk of hunger) are termed the ultra-poor.

households in the lowest 50 per cent in 1977 were upwardly mobile to the extent of crossing this half-way division.

TABLE 4.1: CUMULATIVE DISTRIBUTION OF HOUSEHOLDS RANKED BY HOUSEHOLD WEALTH

Decile	Number of Households		
	1977 & 1985 (1)	1977 (2)	(1)/(2)% (3)
Bottom 10%	4	8	50.0
Bottom 20%	9	16	56.2
Bottom 30%	15	24	62.5
Bottom 40%	20	33	60.6
Bottom 50%	31	41	75.6

The extent of immobility is altered slightly when the same households were ranked by per capita household wealth (Table 4.2). The important difference stemmed from the composition of the first decile, where only 22 per cent of households remained immobile over the period. This suggests that household *size* played a significant role in keeping households in the bottom decile of wealth. Given a constant level of aggregate household wealth, the birth of a child, for instance, would result in an immediate reduction in per capita wealth. A large number of households (62 per cent) in the first quintile, were, as in the previous table, immobile.

Of the bottom 50 per cent of households, 79 per cent remained immobile over the eight years.[13]

TABLE 4.2: CUMULATIVE DISTRIBUTION OF HOUSEHOLDS RANKED BY PER CAPITA WEALTH

Decile	Number of Households		
	1977 & 1985	1977	(1)/(2) %
	(1)	(2)	(3)
Bottom 10%	2	9	22.2
Bottom 20%	11	18	61.1
Bottom 30%	16	27	59.2
Bottom 40%	24	35	68.5
Bottom 50%	34	43	79.1

With the exception of the lowest decile, where aggregate and per capita wealth distributions differed significantly, the two rankings were similar and reflected a grave condition of immobility or stagnation. Of the bottom 40 per cent of households, 68.5 per cent constituted a hard-core component on a per capita wealth ranking. *The extent of chronic poverty and the overlap between single-year and long-run poverty is, by this account, extremely high in the panel from Gokilapuram village.*[14]

[13] The data refer, of course, to the two survey years; it is possible that there was movement out of these categories between the years.

[14] The NCAER (1986b) results are of striking dissimilarity. Constructing an income poverty line based on a minimum calorific requirement (2,200 calories), it is estimated that only 28 per cent of all households in the panel remained poor in 1970-71 and 1981-82. A quarter of all households moved up (i.e., were below the poverty line in 1970-71 and above it in 1981-82) while another 17 per cent moved down. The remaining 47 per cent were not poor in either year. On a land categorization, immobility was highest among the landless; even then only 47 per cent of households were poor in both years.

In subsequent sections, the subgroups are identified only on the basis of per capita wealth. Of the 35 households in the first four deciles, 68 per cent (24) were common to both years and constitute the hard-core category, 31 per cent (11) moved up and the same number moved down. These constitute the temporary poor of 1977 and 1985 respectively. The remaining 37 households, who were never in the bottom 40 per cent, constitute the non-poor group.

4.4 Mobility Groups: Some Features of Change

The features of the four sub-groups identified above are examined below under the following headings:

(1) demographic features such as household size, age structure, and literacy of members (4.4.1);

(2) work participation and occupation (4.4.2);

(3) the composition of wealth owned by households in the group -- in particular, the share of land and other productive assets in total assets (4.4.3); and

(4) the debt burden of households (4.4.4).

4.4.1 Demographic Characteristics

These indicators related to the individual members of panel households. The relevant number of persons in each subgroup was 122 (132) for the hard-core poor, 61 (44) for the temporary poor of 1977, 46 (49) for the temporary poor of 1985 and 229 (222) for the non-poor in the year 1977 (1985) respectively.

Changes in the Panel

The average size of household in the panel was 5.5 persons in 1977 and 5.4 persons in 1985. In both years, the average number of persons per household was above the average for Tamil Nadu (4.7) and Madurai district (4.7) at the Census of 1981. In the panel, an additional reason for the large average size of household is a bias created by the presence of a relatively large number of landlord households, households that are likely to be large in size.[15]

TABLE 4.3: HOUSEHOLD WEALTH BY HOUSEHOLD SIZE, 1977

Wealth class	Household size									
	1	2	3	4	5	6	7	8	9+	All
1.	2	1	2	2	-	1	3	-	-	11
2.	1	2	3	3	9	4	3	2	-	27
3.	1	-	-	2	4	3	-	4	1	15
4.	-	1	3	-	3	3	2	3	1	16
5.	-	-	-	1	1	-	4	3	5	14
ALL	4	4	8	8	17	11	12	12	7	83

Note: The five wealth categories are Rs 0-1,000, Rs 1,000-5,000, Rs 5,000-10,000, Rs 10,000-50,000 and above Rs 50,000, at 1977 prices.

[15] The demographic variables have not been adjusted for village or population representativeness as our main objective is to identify characteristics of different mobility sub-groups and not to obtain village-level estimates.

The two-way tables (Tables 4.3 and 4.4) show that the relationship between household size and wealth was non-uniform. Rich households were, broadly speaking, bigger than poor households. The Pearson correlation coefficient between household size and household wealth was 0.39 in 1977 and 0.24 in 1985, and both were statistically significant.

TABLE 4.4: HOUSEHOLD WEALTH BY HOUSEHOLD SIZE, 1985

Wealth class	Household size									
	1	2	3	4	5	6	7	8	9+	All
1.	1	-	2	-	2	-	-	-	-	5
2.	4	1	-	3	1	-	3	1	2	15
3.	-	-	1	-	6	4	-	1	-	12
4.	-	2	3	4	6	4	6	-	3	12
5.	-	-	1	1	7	1	8	1	4	23
ALL	5	4	6	14	20	5	18	2	9	83

Note: The five wealth categories are the same as in Table 4.3.

The age distribution in 1977, with the shape of a pyramid with a large base, exhibited a clear upward shift in 1985 -- with the young members growing up, and a swelling of the adult population (Table 4.5). There was an associated fall in the dependency ratio, defined as the ratio of members of less than 14 years or more than 60 years to remaining household members. Interestingly, the rise in average age of all persons in the panel was four years. The population of the panel thus remained a relatively young one.

An advantage of the panel is the additional check it provides on the accuracy of age data. An age gap which deviates from the actual one of eight years indicates some reporting bias. A perusal of age data, household by household, revealed a frequent and large reporting bias, particularly among women whose ages tended to end with the digit zero or five. There was also a tendency for the bias to rise with age, e.g., while the age gap was often underreported for young women, it was over-estimated for older women. In general the reporting of age data was more accurate for men and children.

TABLE 4.5: DEMOGRAPHIC CHANGES IN THE PANEL, 1977-1985

Variable	1977	1985
Number of persons	458	447
Household size	5.5	5.4
Literacy (in per cent)		
Persons	64.5	58.2
Male	77.2	73.2
Female	51.4	45.3
Age structure (in per cent)		
Young (0-14 years)	40.6	30.4
Adult (15-59 years)	55.2	62.2
Old (60 years and above)	4.1	7.4
Dependency ratio	0.79	0.61
Mean age (median age)	23.65(19)	27.57(22)

Note: The dependency ratio is defined as the ratio of the young (0-14 years) and the old (over 60 years) to the working-age population (age 15-59 years). Literacy has been calculated for individuals above the age of five.

These are low rates of literacy, though they are higher than the state average. The low and unchanging level of female literacy is also notable. However, these figures do not capture the literacy levels of persons who were members of households in 1977 and have since emigrated from the village.

TABLE 4.6: DEMOGRAPHIC CHANGES AMONG THE HARD-CORE POOR, 1977-1985

Variable	1977	1985
Number of persons	122	132
Household size	5.1	5.5
Literacy (in per cent)		
Persons	49.0	40.8
Male	69.1	57.8
Female	25.5	25.0
Age structure (in per cent)		
Young (0-14 years)	47.5	35.6
Adult (15-59 years)	50.8	56.8
Old (60 years and above)	1.6	7.6
Dependency ratio	0.97	0.76
Mean age (median age)	20.9(15.5)	26.0(20)

Note: Same definitions as in Table 4.5.

The age distribution shifted towards an older population with the dependency ratio declining by a fifth. The mean age of all persons in the hard-core poverty group rose from 21 to 26 years, an aging of five years, which is greater than the average aging of all panel members. However, a third of the population remained young.

To conclude, hard-core poor households were characterized by a large number of persons per household. There was a rise in the average size of household among them, and there were demographic changes within these households over the eight years. Overall aging, as noted above, was above the panel average, with a 12 per cent decline in the proportion of children in the group.

The Transitory Poor

What characterizes households who were poor in either 1977 or 1985, the upwardly and downwardly mobile groups? Both groups are small in number (40 to 60 individuals) and the following section, which is kept short, only states some hypotheses suggested by the data.

(i) The Upwardly Mobile or Transitory Poor of 1977

Among the upwardly mobile households, there was a distinct fall in the average size of household over the eight years (see Table 4.7). Various factors could be responsible for this fall, such as migration or the creation of new households composed partly of members from the 1977 households. Literacy among persons above the age of five stood at 48 per cent over the period, which is lower than the panel average.

The age distribution shifted upward by eight years (the mean age rose from 23.7 to 32.1). So households in this upwardly mobile group displayed relatively greater aging. Consequently there was a sharp decline in the number of persons below the age of 14 in these households. The dependency ratio, however, did not drop significantly due to a rise in the number of old people. The ratio fell from 0.8 to 0.6.

TABLE 4.7: DEMOGRAPHIC CHANGES AMONG THE TEMPORARY POOR OF 1977, 1977-1985

Variable	1977	1985
Number of persons	61	44
Household size	5.5	4.0
Literacy (in per cent)		
Persons	48.1	48.8
Male	64.0	69.6
Female	31.4	25.0
Age structure (in per cent)		
Young (0-14 years)	41.0	25.0
Adult (15-59 years)	54.1	61.4
Old (above 60 years)	4.9	13.6
Dependency ratio	0.84	0.63
Mean age (median age)	23.7(19.0)	32.1(30.5)

Note: Same definitions as in Table 4.5.

Two circumstances associated with upward mobility can be discerned from the data. These are a smaller family and an aging of the population.

(ii) The Downwardly Mobile or Transitory Poor of 1985

The downwardly mobile households showed an increase in family size over the years 1977-85, though it remained below the average for the panel population in both years (Table 4.8). This is a straightforward reversal of the trend observed among households that were upwardly mobile (Table 4.7).

TABLE 4.8: DEMOGRAHPIC CHANGES AMONG THE TEMPORARY POOR OF 1985, 1977-1985

Variable	1977	1985
Number of persons	46	49
Household size	4.2	4.5
Literacy (in per cent)		
Persons	40.8	30.9
Male	50.0	38.9
Female	34.8	27.3
Age structure (in per cent)		
Young (0-14 years)	37.0	36.7
Adult (15-59 years)	60.9	55.1
Old (above 60 years)	2.2	8.2
Dependency ratio	0.64	0.81
Mean age (median age)	25.2(23)	25.1(19)

Note: Same definitions as in Table 4.5.

In literacy rates, there was an absolute decline from 39 to 26 per cent. Again since this does not refer to the same persons, one has to interpret it with caution. Some of the decline may be explained by a migration of literate persons.

The age structure continued to be weighted heavily towards the young, who formed an unchanging 37 per cent of the population. A striking feature of the data is the constancy of the mean age of the population (at 25 years) and a decline in the median age of the subgroup. The dependency ratio worsened, imposing a greater burden on the fewer members in the prime working-age group.

To conclude, downward mobility was associated with a rise in household size, and the persistence of a large number of dependents per household.

The Non-Poor households

TABLE 4.9 DEMOGRAPHIC CHANGES AMONG THE NON-POOR, 1977-1985

Variable	1977	1985
Number of persons	229	222
Household size	6.2	6.0
Literacy (in per cent)		
Persons	81.4	75.7
Male	89.7	73.2
Female	71.8	45.3
Age structure (%)		
Young (0-14 years)	37.6	27.0
Adult (15-59 years)	56.8	67.1
Old (above 60 years)	5.7	5.9
Dependency ratio	0.76	0.49
Mean age (median age)	24.7(19)	28.1(22)

Note: Same definitions as in Table 4.5.

Among households who did not belong to the bottom four deciles in *either* year, whom were termed the relatively non-poor,[19] the average size of household was greater than the panel average (Table 4.9). This supports the hypothesis that household size rises with wealth. Literacy was more or less constant though distinctly

[19] This is not to suggest that all households in this group are well off.

higher than the panel average in both years. Distribution by age indicates an aging that was similar to the panel average (average age increased by four years).

The relatively better-off group of households is characterized by a larger number of persons per household, and high levels of literacy.

4.4.2 Workforce Participation and Occupation

We begin by comparing the rate of work-force participation, i.e., workers as a percentage of total population, across the different mobility groups. For the panel in aggregate, rates of work participation remained constant over the eight years. Underlying this constancy were two contradictory trends -- a rise in *female* work participation and a fall in the male work participation rate (Table 4.10).[20] Among the hard-core poor households, work participation was relatively high compared to the panel average, remaining at 57 per cent over the duration of the study period. The relatively unchanged rate of work participation despite a larger adult population suggests that the worker-adult ratio has fallen.

[20] Evidence on the effects of technological change in agriculture on employment opportunities in Gokilapuram suggests that operations undertaken by women have, in general, shown a higher increase than those done by men (Ramachandran, 1986).

TABLE 4.10: CHANGES IN WORK PARTICIPATION RATES

(in per cent)

Category	Work participation rates					
	Persons		Male		Female	
	1977	1985	1977	1985	1977	1985
Hard-core poor	57.3	56.8	56.9	51.4	57.9	62.9
Upwardly mobile	55.7	68.2	60.0	66.7	51.6	70.0
Downwardly mobile	58.7	57.1	61.9	54.5	56.0	59.3
Non-poor	30.6	27.9	35.0	32.8	25.7	22.3
Panel aggregate	43.9	43.6	46.6	43.8	40.9	43.4

A disaggregation by gender shows that male work participation fell and that female work participation rates rose. This will, no doubt, have serious consequences for the level and composition of household earnings.

In Gokilapuram, at the time of the 1985 survey, there was a large differential in wages paid to men and women. For instance, daily wage rates in cash-paid, daily-rated operations were Rs 12 for men and Rs 5 for women.[21] It is therefore likely that the overall labour earnings from wage labour of a household with a relatively large number of women workers would be lower than that of a household with relatively large number of male workers, unless the former household was sufficiently compensated by a larger number of days of employment.[22] The association between

[21] This refers to tasks such as weeding for women and hoe-work for men. Only harvest wages which are paid in kind are distributed as equal shares to men and women.

[22] For instance, the 1977 survey results showed that a year's work at agricultural labour brought in, for men, an earning that was only 1.2 times that year's poverty line whereas for women, average earnings from agriculture were about 200 rupees below the poverty line (Ramachandran, 1986).

gender-specific work participation rates, low earnings and 'permanence' of poverty as defined by a criterion of wealth-immobility is a lead worth pursuing in future research.

Among the upwardly mobile households rates of work participation rose from 56 to 68 per cent. This was made possible, in part, by the increase in the population of adult members in these households. Gender differences in work participation persisted, with a smaller rise in male work participation compared to the rise in female work participation. In contrast to the upwardly mobile households, male work participation among households that were downwardly mobile declined from 62 to 54 per cent over the 8-year period. This was partially counterbalanced by a rise in female work participation. Not surprisingly, work participation rates were low among the non-poor, and declined further over the eight-year period.[23] This occurred among both males and females. The low work participation rates reflect a reliance on sources of income other than wage labour.

Although we lack data for 1977 on the occupation of each household member, a partial picture on occupational structure in 1985 can be put together (Table 4.11).

[23] The definition of a worker used in this analysis includes all wage-employed persons and those self-employed (e.g., peasants, persons engaged in business or services) but excludes the category of landlords, i.e., those who did not participate in the 'work force' in any sense.

TABLE 4.11: OCCUPATIONAL DISTRIBUTION OF MEMBERS BELONGING TO DIFFERENT MOBILITY GROUPS, 1985

(in per cent)

Occupation	Proportion of all workers				
	Hard-core poor	Temporary poor		Non-poor	All house-holds
		1977	1985		
Agricultural labour	58.6	70.9	75.0	11.8	47.0
Non-agri-cultural labour	14.6	12.9	7.1	8.8	11.4
Peasants	0.0	9.6	10.7	48.5	19.3
Business	8.0	3.2	0.0	8.8	6.4
Artisans and traditional services	16.0	0.0	0.0	10.3	9.4
Salaried employees	2.6	3.2	7.1	11.8	6.4
Aggregate	100	100	100	100	100

Note: Occupation here refers to the occupation of the individual.

First, among the hard-core poor, around 73 per cent of the workers were manual labourers, predominantly occupied at agricultural tasks. A few were in business activity and, artisan or traditional service occupations. The immobile households neither owned nor cultivated land.[24] Interestingly, the upwardly mobile group included some peasants; the primary occupation of households in the group, however, remained agricultural labour. The downwardly mobile households showed an even higher proportion of agricultural labourers in their midst. There were no

[24] As noted earlier, tenancy has been on the decline in Gokilapuram, see Appendix 3.

households involved primarily in business activity or artisans or households employed at traditional service tasks among the downwardly mobile.

It is of note that most upwardly mobile households had at least one relatively stable, year-round source of income. Examples of individual members of these households who had such incomes are a full-time male irrigation worker, an annual farm servant, an employee of the Milk Society, a farm-supervisor, and an accountant at the rice hand-pounding unit. Households that were upwardly mobile *and* other than manual labour earned year-round incomes from petty business activities. In short, upwardly mobile households were characterized by the prevalence of either a steady source of labour income or a greater diversification of income activities. In all likelihood, then, these households had a greater capacity to withstand risk. A hypothesis that a more *secure* income is conducive to asset accumulation is a plausible argument, and is one that should be tested on larger samples.

Households whose primary occupation was manual labour constituted 73 per cent of workers among the hard-core poor, 83 per cent of workers among the upwardly mobile and 82 per cent of workers among the downwardly mobile. As argued earlier, the class of manual labour could be viewed as an occupational cul-de-sac for workers in the village. Although some mobility is observed among households occupied at manual labour, the occupation could set the boundaries within which mobility is feasible. The majority of members from non-poor households did *not* participate in the work force. Among those who worked, there was a more than proportionate representation of all occupations other than manual labour.

Such data are at most a signpost to the processes affecting mobility among the panel households. Each of the broad occupational categories span a wide range of activity levels; for example, households whose major income comes from business

activity could include a trader who gains a regular and substantial profit as well as a shop-keeper whose establishment has a low turn-over.

4.4.3 Asset Characteristics

TABLE 4.12: CHANGES IN AVERAGE WEALTH FOR HOUSEHOLDS WITH DIFFERENT MOBILITY, 1977-1985

(in rupees)

Year	Hard-core poor	Temporary poor		Non-poor	All house-holds
		1977	1985		
Household wealth					
1977	1,774	2,468	6,612	174,019	79,290
1985	3,110	7,960	3,105	290,538	131,883
Per capita wealth					
1977	339	452	2,052	22,588	20,499
1985	571	2,062	738	41,453	19,015

Note: The 1985 values have been deflated. All figures have been rounded off.

Between 1977 and 1985, households in chronic poverty accumulated very little in terms of real household wealth; this is a major feature of the panel data on asset holdings (Table 4.12). In contrast, the downwardly mobile group incurred a steep decline in average *real* holdings; among these households there was a decline in average *nominal* asset holdings as well. Among the upwardly mobile households there was a rapid growth in the average asset holdings per household. The rate of growth was faster than the corresponding rate for the non-poor households. The non-poor group experienced a steady accumulation of wealth over time. The differences between groups were staggering: wealth owned by the non-poor households was

nearly a hundred times the average owned by the hard-core poor in both years. A similar pattern emerges from data on per capita wealth holdings (Table 4.12).

The Spearman and Kendall rank correlation coefficients for per capita wealth in the two years were estimated for each of the four subgroups (Table 4.13). A positive and significant rank correlation coefficient was obtained for households in the hard-core poor and non-poor categories only. The value of coefficients were in all cases lower than those obtained for the panel (see section 3.4). A regression of current wealth on past wealth showed a significant positive coefficient on past wealth for the non-poor, and a significant negative coefficient for both sets of transitory poor households (see Appendix 4).

TABLE 4.13: RANK CORRELATION COEFFICIENTS FOR PER CAPITA AND HOUSEHOLD WEALTH IN 1977 AND 1985 BY MOBILITY GROUP

Mobility group	Spearman (ρ)	Kendall (τ)
Hard-core poor	0.51*	0.39*
Upwardly mobile	0.52	0.40
Downwardly mobile	-0.39	-0.31
Non-poor	0.69*	0.53*

Note: Starred values are significant at the 5 per cent level.

With regard to the composition of assets (Table 4.14A), the chronically poor households owned practically no land in 1977; the average value of crop land per household was a mere Rs 71.[25] The transitory poor categories possessed slightly

[25] In quantitative terms, this would buy less than a hundredth of an acre of dryland, assuming an average price of Rs 5,000 per acre (see section 2.4).

more land, but all three groups owned small plots of relatively poor quality unirrigated land. The majority of households in these three groups were landless.

TABLE 4.14 A: ASSET COMPOSITION AMONG DIFFERENT MOBILITY GROUPS, 1977

(in rupees)

Asset category	Average per household				
	Hard-core poor	Temporary poor		Non-poor	All house-holds
		1977	1985		
Crop land	71	336	959	100,463	44,977
Thope	0	0	100	18,307	8,174
Planta-tion	0	0	0	10,946	4,879
All land	71	336	1,059	129,716	58,031
Other agri-cultural assets	4	11	17	5,493	2,454
Draught animals	77	273	162	770	423
Other live-stock	332	15	56	1,031	565
Other assets	1,290	1,832	5,317	36,453	17,570
All assets	1,774	2,468	6,612	174,019	79,290

In 1985, conditions had not improved substantially (Table 4.14B). The value of land assets rose slightly among the hard-core poor and among the upwardly mobile, but it declined sharply among the downwardly mobile. The households in the lowest 40 per cent had neither plantation land nor groves (*thope*) although some of them did have a tree near their homestead.

TABLE 4.14 B: ASSET COMPOSITION AMONG DIFFERENT MOBILITY GROUPS, 1985

(in rupees)

Asset category	Average per household				
	Hard-core poor	Temporary poor		Non-poor	All house-holds
		1977	1985		
Crop land	274	976	215	126,220	56,504
Thope	70	0	72	83,770	37,373
Planta-tion	0	0	0	30,441	13,575
All land	344	976	287	240,431	107,452
Other agri-cultural assets	22	124	150	5,365	2,434
Draught animals	66	127	198	619	338
Other live-stock	401	326	320	895	601
Business assets	135	33	7	764	385
Gold	214	526	72	9,950	4,577
Other assets	1,928	5,847	2,069	32,514	16,100
All assets	3,110	7,960	3,105	290,538	131,883

Note: "Thope" refers to groves and other trees and "all land" refers to the sum of crop land, thope and plantation land. "Other agricultural assets" refers to agricultural tools and equipment, and "other assets" to all nonagricultural assets such as houses and consumer durables. This category includes gold in 1977. All values are at constant (1977) prices. Figures are rounded off.

In 1977, the ownership of non-land productive assets, e.g., livestock, draught animals, and other agricultural equipment, was also minimal among those in chronic poverty and those in transitory poverty. What types of assets, then, are owned by the

poor? The bulk of their assets were non-agricultural and non-productive, consisting of housing, consumer durables, and a small amount of gold.

In 1985, there was a distinct rise in non-land productive assets among the chronically and transitory poor households. There was an increase in livestock assets, a change associated with the Integrated Rural Development Programme (see section 5.4). Among households in the bottom four deciles, the growth in livestock assets was highest among the upwardly mobile households.

Gold was held in small amounts by the poor (see data for 1985 in Table 4.14B). Compared to other unproductive assets, gold has several advantages: it serves as collateral, it is a highly liquid asset, and it provides gains from a rapid appreciation in value.[26] In absolute terms, however, all households below the 40th percentile owned an extremely low quantity of gold. At a market price of Rs 2,000 per 10 grams of gold (December 1985), even the upwardly mobile households possessed an average of only 10 grams of gold per household.

To sum up, land constituted a tiny fraction of wealth among households belonging to both the chronic and transitory poor categories (see Table 4.15). While land accounted for 74 to 83 per cent of all assets owned by the non-poor (in 1977 and 1985), it ranged from 4 to 11 per cent for the hard-core poor. Only the downwardly mobile households incurred an absolute as well as a relative decline in land wealth.

The share of total productive assets was higher and in the range of 20 to 30 per cent for all the three poverty subgroups. This share was between 78 and 85 per

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[26] The average annual rate of inflation in gold prices over the period 1977-85 was 17 per cent (based on bullion prices at Bombay from RBI bulletins) as compared to a (compound) annual rate of inflation of 7 per cent in wholesale prices.

cent for the non-poor. It is interesting that despite a large fall in land ownership and an absolute decline in total wealth, the share of productive wealth increased among the downwardly mobile households, indicating a steep loss in non-productive assets. With such low levels of accumulation of productive wealth, both in absolute and relative terms, prospects for households in the bottom 40 per cent remained bleak.

TABLE 4.15: SHARE OF LAND AND PRODUCTIVE ASSETS HELD BY DIFFERENT MOBILITY GROUPS, 1977-1985

(in per cent)

Year	Hard-core poor	Temporary Poor		Non-poor	All house-holds
		1977	1985		
Share of land assets in total assets					
1977	3.9	13.6	16.0	74.5	73.4
1985	11.1	12.3	9.2	82.7	81.4
Share of productive assets in total assets					
1977	27.3	25.7	19.6	78.7	77.8
1985	31.1	19.9	31.0	85.4	84.3

4.4.4 Indebtedness and the Debt Burden

The preceding analysis was of total assets and ignored liabilities. What follows is a brief analysis of the extent of indebtedness among households, and the burden of debt; further details on credit will be taken up in chapter 6.

Average Debt per Household

Data on average borrowing per household (Table 4.16) show a significant rise in borrowing among all households over these eight years. Among the poor, the upwardly-mobile households borrowed most heavily in both years. The rate of

increase in their debt was also higher than that among the non-poor households. This reflects, in all likelihood, increased borrowing for productive purposes. This may have given momentum to asset accumulation and upward mobility.

TABLE 4.16: AVERAGE BORROWING PER HOUSEHOLD BY MOBILITY GROUP, 1977-1985

(in 1977 rupees)

Mobility group	Average amount borrowed	
	1977	1985
Hard core poor	493	1,605
Temporary poor of 1977	936	2,497
Temporary poor of 1985	749	1,112
Non-poor	10,866	15,303
All groups	5,210	7,764

Debt Burden

We have used a debt-asset ratio to measure the burden of debt. This is a stock-stock ratio, the ratio of total amount borrowed to total assets. Another useful indicator of the burden of debt is the ratio of annual interest payments to annual earnings, which is a sort of debt servicing ratio. Owing to limitations of the data set, we have used only the first ratio, that of household debt to household assets (Table 4.17).

There is a sharp demarcation between groups on the basis of the debt-asset ratio. In 1977, the debt-asset ratio for all panel households was 0.06. The hard-core poor and temporary poor of 1977 had a considerably heavier burden of debt; the debt-

asset ratios for these groups were 0.28 and 0.38. In 1985, the hard-core poor faced an even higher debt burden, a debt-asset ratio of 0.5. The downwardly mobile households also had a high debt-asset ratio. In other words, if the chronically poor households were to meet their debt obligations in full they would have to liquidate 50 per cent of their assets. Since many of these assets are non-marketable this may understate the true extent of debt burden. (It is to be noted, however, that we have not taken account of earnings and of the productivity of debt here; these would be important factors determining the capacity to service debt.)

TABLE 4.17: DEBT-ASSET RATIOS, BY MOBILITY GROUP, 1977 AND 1985

Mobility group	1977	1985
Hard core poor	0.28	0.52
Temporary poor of 1977	0.38	0.31
Temporary poor of 1985	0.11	0.36
Non-poor	0.01	0.05
All groups	0.06	0.06

4.5 Concluding Remarks

Given that this is a small case study, no definitive conclusions emerge but the analysis provides pointers towards factors associated with mobility and to hypotheses that need to be tested further. Two demographic variables that were associated with differences in upward mobility were household size and age composition. The chronically poor, for instance, tended to live in relatively large households with a population biased in favour of the young. The shifts in household size and

dependency ratios associated with the transitory poor categories (in opposite directions for the upwardly and downwardly mobile) suggest that these variables may influence the direction of mobility. Upwardly mobile households, for instance, witnessed a distinct fall in household size and the dependency ratio. However, households with large differences in their resource bases will clearly not be affected by demographic factors in identical ways. A purely demographic explanation for the lack of mobility or chronic poverty is therefore untenable.[27]

The absence of a specific association between literacy and mobility in the panel, in contrast to an *a priori* hypothesis that education expands opportunities for mobility, is worth commenting on. In the context of a poor agrarian economy, this finding is not surprising because the fact of literacy only indicates that an individual acquired at least a few years of formal school education. The majority of literate individuals were primary school leavers. For example, in 1977, only one person out of 458 was a college graduate. It could be argued that literacy *per se* does not account for improvements in human capital that are qualitatively or quantitatively significant enough to open up a new range of opportunities for upward mobility.

The relation between occupational change and education is a complex one. For certain types of occupational movement, such as the out-migration of workers to plantations in Kerala, education (or for that matter literacy) may not be a critical factor. For other types of occupational shifts, for example, a move to a salaried job, the critical level of education may be higher than primary school education. For example, the qualifications of the scheduled caste worker who obtained a job in a public sector transport corporation included a school-leaving certificate and vocational training (see Appendix 3). In addition, he obtained a job under a quota

[27] It should also be remembered that per capita wealth is very sensitive to changes in household size.

reserved for scheduled castes. Future research on economic mobility, particularly with respect to occupational changes, should examine types of education and the process of skill acquisition, rather than focussing on literacy alone.

A high rate of work participation and a steady source of income appear to be correlated with upward mobility. A big gap between male and female wage rates suggests that female-dependent households may be among the more destitute.[28]

The NCAER panel study attempted to identify some determinants of mobility. Their findings showed an inverse relationship between increase in household income and increase in household size; in other words, the highest rise in family size occured among the downwardly mobile while there was a sharp fall in household size among the upwardly mobile (NCAER, 1987a). These findings are similar to the findings from our data set that relate to changes in household size and to wealth-mobility. On participation rates, the NCAER study reported an increase in work participation among households that were poor in the base period and a decline in work participation rates among households that were non-poor in the base period. In other words, the rate of work participation increased among those who stayed poor (the hard-core poor) and among the upwardly mobile, while it fell among the downwardly mobile and among those who stayed non-poor.

The main drawback with this and similar explanations provided by the NCAER study is the inability to distinguish between those of the original poor who stayed poor (the hard-core in our terminology) and those who moved up and between those who stayed non-poor and those who moved down from among the original non-

28 However, figures on work participation alone are insufficient to examine the position of women-dependent households. The highest rates of female work participation, for instance, were noted among the upwardly mobile households.

poor.[29] If the difference between the two is one of degree and not substance then a logical conclusion of this argument is that all the originally poor would eventually move up and that all the orginally non-poor would move down. This finding implies a strong equalizing tendency, a success for the strategy of trickle-down, and high mobility. Given the problems with the NCAER study, these conclusions remain unconvincing (see Appendix 3, also Sundaram and Tendulkar, 1985b, on poverty and trickle-down).

The data were tested for statistical associations between demographic, occupational and wealth indicators on the one hand and mobility on the other. The regressions which have been reported in Appendix 4, did not perform well. Only lagged wealth variables were significant. The limitations of attempting a change-change regression on panel data with qualitative variables is also discussed in the appendix.

With regard to the level and composition of assets, the major feature of the analysis was the low level of accumulation of productive assets among all households that are poor. Households that were downwardly mobile suffered an absolute decline in real wealth as a consequence of a steep decline in land wealth. Despite a small increase in the ownership of livestock and draught animals, the share of productive assets in total assets actually declined among the upwardly mobile, increased among the downwardly mobile and stayed more or less unchanged among the chronically poor. Lastly, the condition of the relatively poor contrasted with that of the non-poor with respect to the debt-asset ratio. Households in relative poverty had borrowed

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[29] Another example of this inability to distinguish between immobile and upwardly mobile, and between the non-poor and downwardly mobile, is in relation to land ownership. Land ownership increased among both immobile and upwardly mobile households, i.e., all originally poor households and vice versa among the originally non-poor.

from a third to a half of the value of their total wealth. The chronically poor were the most heavily indebted group in 1985.

To conclude, this chapter was motivated by a concern for the long-run welfare of individuals which was reflected in the specific objective of distinguishing the hard-core poor from the transitory poor. The analysis in previous sections constitutes only the first step in this procedure, by attempting to clarify the distinctions between these two groups. The difference between households that were in chronic poverty and those that were in temporary poverty was marked in that the former had distinctly larger households in both years. With respect to other indicators of household economic status, such as the ownership of productive assets, there were no major dissimilarities between the three groups of households in poverty. The data set was not large enough to test for such differences successfully.

Appendix 4

Results of Regression Estimates of Dynamic Poverty

We report here the results of an econometric attempt to characterize the relation between mobility and other variables. We have observations on n = 1,...,83 households at two time-periods, t = 1,2. Two types of regression estimates are possible. The first is to pool all observations and run a common (level-level) regression. The second is to take the first-difference of variables in order to eliminate specification bias arising out of a systematic relation between coefficients across individuals ($b_i = b$), and estimate a single equation. If there is any correlation between explanatory variables and the error term, the first method gives biased and inconsistent estimates. The second method performs better: it makes full use of panel information, and it corrects for specification bias. The latter procedure is particularly apt in cases where we can assume that the effects of most explanatory variables do not vary with time, but only across individuals. The key advantage of panel data -- the potential for holding individual specific events constant -- is utilized in a change equation. However, we shall assume a serially uncorrelated error term, $u_{it} \sim$ iid $(0,\sigma^2)$, and neglect any bias from omission of other variables. With only two time-periods it is not possible to control for these by the use of an independent instrumental variable.

(1) First we estimated a change-change equation which was of the form:

$$dW = a + b_0 dSR + b_1 dWP + b_2 dHH + b_3 dLH + b_4 dDEP + e$$

where dW equals the difference in household wealth between 1977 and 1985, i.e., W(t) - W(t-1), and so on. The dependent variable W is household wealth, the independent variables are sex ratio (SR), work force participation (WP), household

size (HH), literacy of household head (LH), and dependency ratio (DEP). The error term (e) is assumed to be white noise.

None of the coefficients of this equation were significant and the equation did not prove to be a good fit. A major drawback of this approach is that the differencing operation loses a lot of interesting and valuable information. This is particularly relevant to our data set where: (i) many of the variables are qualitative and not numerical; and (ii) many of the values of the independent variables are numerically small. A differencing operation can thus result in a final equation that is devoid of interesting data. It also lowers the numbers of degrees of freedom and reduces variation in independent and dependent variables. Furthermore, with change-change equations it is not possible to estimate the effect of time-invariant variables that completely drop out of the equation. The differencing operation is also likely to introduce serial correlation into the error terms. For more efficient estimates, we require panel data over several years.

(2) A second equation estimated took the form of a simple level-level multivariate regression:

$$Wt = a + b_0W(t-1) + b_1H(t) + b_2H(t-1) + b_3OC(t) + b_4OC(t-1) + b_5CD + e(t).$$

All the variables are observed at two time-periods. The independent variables include lagged wealth, household size (H), lagged household size, occupation (OC), lagged occupation and a dummy for caste (CD) which takes a value of zero for scheduled caste households and one for others.

The results of this estimation were (t statistics in parentheses):

W (1985) = 2.79 W (1977) for household wealth

(8.32) and $R^2 = 0.60$.

W (1985) = 3.87 W (1977) for per capita wealth

(8.92) and $R^2 = 0.61$.

(The constant terms were not significant.) In this estimation only coefficients of the lagged wealth variables were significant. None of the demographic variables had significant values. However, the sign of the coefficients indicates that household size in both years had a negative association with wealth in 1985, current occupation had a positive coefficient (occupations were ranked in descending order), and the caste dummy had a positive coefficient.

(3) We re-estimated the level-level (second) equation for the three mobility subgroups: the hard-core poor, the transitory poor and the non-poor.

(i) For the hard-core group, no variable was significant. The strongest coefficient was for the variable OC(t-1), which had a negative value. In other words, an unfavourable (manual labour or artisanal occupation) occupation in 1977 had a negative association with current wealth.

(ii) For the transitory poor, the only important variable was lagged wealth ($b_0 = -0.21$, $t = -2.33$ but not significant), which not unexpectedly had a negative association with current wealth.

(iii) For the non-poor households too, lagged wealth was the only significant variable with a positive coefficient ($b_0 = 0.15$, $t = 4.3$, significant at a 1 per cent level of significance).

The combination of small numbers in each group, and the qualitative nature of independent variables is partly responsible for the weak results of regression analysis. We hope to have illustrated the methods that can be employed with larger data sets and well-specified variables.

5

IMPACT OF GOVERNMENT INTERVENTION ON MOBILITY: A CASE STUDY OF THE INTEGRATED RURAL DEVELOPMENT PROGRAMME

5.1 Introduction: State Intervention and IRDP

In the early seventies, it was clear that large-scale agrarian structural reform had not succeeded. No significant dent had been made on mass poverty; inequality in incomes and assets in the rural areas had generally widened; and the policy of trickle-down had failed. The emphasis of rural development policy shifted to measures that were specifically anti-poverty programmes, based on the identification of target groups. The Small Farmer Development Agency (SFDA) and the Marginal Farmers and Agricultural Labourers Development Programme (MFAL) were among the first of these schemes; they were later combined to form the Integrated Rural Development Programme (IRDP). IRDP, which is the major anti-poverty programme in the country today, was initiated in 1978-79 in 2,300 selected blocks; in October 1980 it was extended to all the 5,000 development blocks in rural India.

The Sixth Five-Year Plan set out the objective of IRDP as follows:

"The main objective of the IRDP will be to evolve an operationally integrated strategy for the purpose, on the one hand, of increased production and productivity in agriculture and allied sectors, and on the other, of the resource and income development of vulnerable sections of the population in all the blocks of the country. Any development strategy which aims at improving the lot of the rural poor must aim at creating *new productive assets* for them" (p. 170, *Sixth Five Year Plan*, italics added.)

The programme provides loans and subsidies to finance a variety of income-earning assets such as milch cattle, plough bullocks, other livestock, facilities for self-employment in small-scale production, services and trade. The essence of IRDP is the creation of productive income-bearing assets among the poor through the allocation of subsidized credit. Using data from the panel, we can investigate two aspects of the programme in some detail:

(i) whether the beneficiaries of the programme experienced an accumulation of real productive wealth over eight years; and

(ii) whether they attained a higher level of real wealth, and consequently greater upward mobility, as compared to households who did not receive IRDP benefits.

5.2 Scope of IRDP

In this section, we outline the scope of IRDP; its guidelines, coverage, and scale and the methods of operation of certain schemes.

Guidelines

The initial guidelines drawn up for IRDP attempted to integrate the scheme into plans for the overall development of a region. A five-year development profile was to be drawn up in each district, disaggregated into blocks. These profiles were to take account of the possibilities for expansion of agricultural and allied sectors, and also that of secondary and tertiary sectors. On the basis of the overall plan, special programmes of assistance to the poorest rural households were to be drawn up in order to raise the specific households, so identified, above the poverty line. At the same time, a credit plan for each district and block, one that worked out the detailed procedure for financing these schemes, was to be designed. The implementation of IRDP was to be undertaken by a single agency in each district, the District Rural

Development Agency. The agency was also to cater for support services that beneficiary households would require, such as health care.

Coverage

The Sixth Plan envisaged the selection of 600 households from the target group in each development block for IRDP assistance. Nationally, it implied assistance for about 3 million households annually. Recently, this was raised to 1,200 households per block (in 1985-86). (There are approximately 25,000 households per block and 5,000 blocks in the country.) The target group was defined as households with an annual family income less than Rs 3,500 (at 1979-80 prices for base year calculations). The minimum family income has been raised to Rs 6,400 for the base year of 1984-85 for the duration of the Seventh Plan. Within the target group, 50 per cent of allocations were earmarked for scheduled caste and scheduled tribe households, and 33 per cent for women beneficiaries.[1]

Scale and Expansion of IRDP

With an allocation of Rs 7,500 million in the Sixth Plan (for the plan period 1980-85), IRDP, in effect, became the major plank of rural poverty alleviation policy.[2] In the central government's budget for 1986-87, IRDP accounted for 28 per cent of all expenditure on rural development schemes (Table 5.1).

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[1] The plan did not indicate whether the latter referred to all women or to women-headed or women-dependent households.

[2] The central allocation for IRDP was Rs 12.7 million in the initial year of the Fifth Plan (1980-81) and grew steadily thereafter, e.g., to Rs 20.7 million in 1983-84.

TABLE 5.1: ALLOCATION FOR RURAL DEVELOPMENT IN THE CENTRAL BUDGET PLAN, 1986-87

(in million rupees)

Programme	Allocation		
	7th Plan	1985-86	1986-87
IRDP	18,640	2,870	4,280
NREP	12,510	3,370	4,430
RLEGP	17,440	6,060	6,330
Land Reform	370	40	40
Rural Development	49,020	12,340	15,090
Total			
IRDP as per cent of total	38.0	23.2	28.3

Source: Central Budget Papers, 1986-87.

Note: Seventh Plan allocations are at 1984-85 prices, 1985-86 estimates are revised estimates, while the 1986-87 figures are budget estimates. NREP and RLEGP are the National Rural Employment Programme and Rural Landless Employment Guarantee Programme, respectively.

However, the emphasis on poverty alleviation in relation to the vast numbers in poverty remained weak; the expenditure on IRDP constituted only 1.9 per cent of total budget expenditures in 1986-87.[3] At the state-level, IRDP funds constituted a significantly larger proportion of total development expenditure. In the Tamil Nadu budget for 1986-87, IRDP allocations were 56.5 per cent of expenditure on all special development programmes (Table 5.2).

[3] An illustration of the low priority attached to poverty-alleviation schemes comes from the central budget allocations for 1988-89: subsidies on fertilisers increased from Rs 20,500 million in 1987-88 to Rs 27,500 million in 1988-89 while expenditure on IRDP rose from Rs 2,770 million to Rs 3,460 million. The sub-total of three major anti-poverty programmes, the IRDP, NREP and RLEGP, actually declined (Ghosh, 1988).

TABLE 5.2: EXPENDITURE ON RURAL DEVELOPMENT IN TAMIL NADU, 1984-85 TO 1986-87

(in million rupees)

Programme	Allocation		
	1984-85	1985-86	1986-87
IRDP	151.1	175.5	146.1
Special area programmes: total	251.6	300.8	258.6
IRDP as per cent of total	60.0	58.3	56.5

Source: Tamil Nadu Budget Papers, 1986-87.

Note: 1984-85 figures are actual values, 1985-86 estimates are revised estimates, while the 1986-87 figures are budget estimates. The Special Area Programme covers IRDP, Drought-Prone Areas Programme, Command-Area Development and some smaller schemes.

A brief account of IRDP allocations in Madurai district, Uthamapalayam block, and Gokilapuram village bring out the scope of the programme at the grass roots level. District-level allocations are documented in the District Credit Plan (DCP);[4] more than Rs 100 million were allocated to IRDP in Madurai district over the period 1983-85 (Table 5.3). It is interesting to note that credit for purposes of IRDP accounted for a sixth of total commercial bank credit to rural areas in the district. The DCP also provides information on block-level allocations. In Uthamapalayam block, an expenditure of Rs 1.2 million was planned for a single year 1984-85 (Table 5.4).

[4] The District Credit Plan is a three-year plan prepared by the lead bank in each district, the Canara bank in the case of Madurai district. Annual plans are prepared alongside.

TABLE 5.3: ABSTRACT OF DISTRICT CREDIT PLAN, MADURAI DISTRICT, 1983-85

(in million rupees)

Sector	Number of Accounts	Credit allocation	
		Total	IRDP
Agriculture and allied activities	1,4649.5	449.4	96.1
Small-scale industries	929.2	56.5	5.7
Tertiary sector	1,603.4	143.3	5.4
Rural housing, education and consumption loans to "weaker sections"	277.5	6.7	-
Grand total	17,459.6	656.0	107.4

Source: District Credit Plan, Madurai District, 1983-85.

IRDP credit represents a significant flow of funds into the study village. Gokilapuram was selected as a "cluster" village for intensive disbursal of IRDP credit in 1983-84. Around 137 beneficiary households were selected from the village between 1980-81 and 1983-84, and another 121 in the following two years. A conservative estimate of the flow of funds into the village in the period 1983-85 is about Rs 400,000. This constituted 16 per cent of the allocation for the block. In the past five years (1980-85) expenditure on milch cattle schemes alone accounted for Rs 400,000 (over 180 beneficiary households), undoubtedly an investment that is expected to change the structure of asset ownership in the village.

Sectoral Allocation

The sectoral allocation of IRDP has been heavily biased towards animal husbandry: "agriculture and allied sectors", the expenditure heading under which

animal husbandry funds are disbursed, received 90 per cent of finance disbursed through the programme in Madurai district during the period 1983-85.

TABLE 5.4: SCHEME-WISE BREAKDOWN OF DISTRICT CREDIT PLAN UTHAMAPALAYAM BLOCK, 1984

(in million rupees)

Scheme	Credit allocation	
	total	IRDP
1. Agriculture		
a) Crop loans	7.2	-
b) Horticulture	0.5	0.03
c) Plantation	1.3	-
d) Land development	0.3	0.06
e) Pumpsets	0.8	-
f) Agricultural implements	0.4	0.03
Sub-total	10.4	0.1
2. Animal Husbandry		
a) Dairying	0.9	0.5
b) Sheep rearing	0.3	0.3
c) Calf rearing	0.2	-
3. Industry		
a) Small scale industry	0.3	-
b) Cottage industry	0.05	0.01
c) Artisans	0.1	0.1
4. Other		
a) Road transport	0.8	-
b) Retail trade	0.1	0.03
c) Professional jobs	0.3	0.2
Total	13.8	1.28

Source: Annual Action Plan, Canara Bank, Madurai, 1984.

Milch animals, sheep and bullock schemes accounted for 71.5 per cent of total IRDP allocations in Uthamapalayam block in 1984-85 (Table 5.4). Among people in the village, the programme has been nicknamed 'four animals and a bird', because cows, buffalo, sheep, goats and chickens are the most frequently disbursed assets in the scheme. At the block level, the asset most commonly selected under the scheme were milch animals. Loans to purchase milch animals accounted for 28 per cent of

the total allocation under IRDP in Uthamapalayam block in 1984-85. Around 10 per cent of the total allocation went to loans to support cottage industries, and another 16 per cent to retail trade and service occupations.

However, actual and planned expenditure often diverge. A progress report on IRDP in Uthamapalayam block (Table 5.5) illustrates the discrepancy. It discloses an under-allocation of resources, relative to the targets set, on agriculture and animal husbandry, and over-spending on Industry and Small Business Schemes (ISB). The schemes under ISB encompass activities in the tertiary sector such as cycle shops, "petty shops" (which are small stores selling consumer goods), barber shops, and laundry units. Excess expenditure on these is often the result of last minute allocations -- an attempt to clear a backlog of funds in the last month of the financial year. This is illustrated by the financing of 97 "petty shops" in the course of a single year in a single block. (Of course, some of these could well be fictitious allocations!)

TABLE 5.5: TARGETS VERSUS ACHIEVEMENTS OF IRDP, UTHAMAPALAYAM BLOCK, 1984-85

(in physical units)

Sector	Target	Achievement
1. Agriculture	120	83
2. Animal husbandry	776	733
a) Milch animal	616	650
b) Sheep units	160	83
3. Industry and small business	154	170
a) "Petty shops"	14	97
b) Cycle shops	14	21
c) Advances to barbers, carpenters, cobblers and blacksmiths	90	16
d) Others	46	36

Source: Progress Report, Block Development Office, Uthamapalayam, 1985.

Components of a Typical Scheme

On a typical loan under IRDP, the subsidy element forms 25 per cent of the loan value for small farmers (those operating less than 2 hectares of unirrigated land or its equivalent);[5] 33.3 per cent for marginal farmers (those operating less than 1 hectare of unirrigated land), agricultural labourers and artisans; and 50 per cent for households belonging to scheduled castes and scheduled tribes. The subsidy is shared equally by the central and state governments while the credit component is provided by commercial banks. IRDP loans disbursed by commercial banks are refinanced under a special scheme by the National Bank for Agriculture and Rural Development (NABARD). The ceiling on the subsidy on a single loan was Rs 3,000 during our survey, but has since been raised to Rs 6,000 per household. The rate of interest on IRDP loans was 10 per cent per annum.

How is a typical scheme meant to work? Take the case of a loan-cum-subsidy for the purchase of milch cattle where a loan of Rs 2,500 (at 1984-85 prices) with a 25 to 50 per cent subsidy has been allocated for the purchase of a single buffalo or cow. The newly created asset is hypothecated to the bank in lieu of collateral. As disbursement is in kind, members of a purchase committee, bank and block officials and a veterinarian, are to accompany the loanee and certify the purchase of a high quality cross-bred animal in lactation. The economics of the scheme is based on a standard assumption. This is that with a lactation period of nine months a year, and a yield close to 6 litres a day, a gross monthly income of Rs 200-300 can be generated. This allows easy repayment of the loan in instalments over 36 months. Similarly, for the goat scheme, a loan of Rs 4,000 is provided for the purchase of 20 goats and an ewe. Income from culling, penning (for manure on fields) and from sale of lambs is estimated to equal at least Rs 200 per month. For this scheme, the Sixth Plan assumed

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[5] The equivalence is determined on the basis of definitions of a standard acre that are arrived at for revenue purposes.

an incremental gross capital-annual income ratio of 1.5. In the light of evidence from evaluation studies, it has been revised upward to what was to be a more realistic number of 2.7 in the Seventh Plan. Loans are scheduled to be repaid within three to five years by which time the original stock is expected to multiply several times to add to a household's livestock assets.[6] The Industry and Small Business (ISB) loans are often used to finance working capital, though in some cases they can be utilized to purchase equipment as well (e.g, a sewing machine for a tailor).

5.3 Summary of Previous Evaluation Studies

In this section we first discuss the methodology and findings of some large-scale evaluation studies (section 5.3.1) and then turn to evidence from smaller village-level reports for Tamil Nadu (section 5.3.2).

5.3.1 Large-scale Evaluation Studies

Since its nationwide inception in 1980 there have been a number of evaluation studies of IRDP at the national, regional and village levels by government and banking agencies and by academics. The two major evaluations at an all India level were conducted by the National Bank for Agriculture and Rural Development (NABARD) and the Planning and Evaluation Organisation (PEO) of the Planning Commission. A third large-scale study was undertaken by the Institute for Financial Management and Research (IFMR). The IFMR study assessed the position as of February 1982 while the NABARD and PEO studies were carried out during 1983-84, i.e., two years after the programme was initiated.

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[6] For estimates of alternative cash flow returns on milch cattle and sheep schemes, based on different assumptions, see Copestake (1987).

The approach to evaluation adopted in all three studies is to appraise conditions 'before and after' IRDP. This method is sensitive to the reference period chosen for evaluation. In the NABARD and PEO reports, the base year, 1982-83, was a drought year. This would have depressed initial incomes, a factor that needs to be taken into consideration in any assessment. Another important requirement of such evaluations is a control group to account for other changes in the economy over the same period. A serious shortcoming of the NABARD and PEO studies is the absence of a control group of non-beneficiary households. The IFMR study does better on this count but its major weakness is that the evaluation was conducted 15 months after the inception of the programme. While this may have picked up a large number of teething problems of the programme, it would at the same time miss out on the longer-run impact of the scheme on beneficiary households. Another inherent problem with a 'before and after' method is the reliablity of income estimates at the two points in time. The collection of income data in rural areas is beset with problems, and survey data that require recall over a year and more are prone to error. If estimates of income at the two points contain large measurement errors then the comparison of the two may not be very reliable.

The primary evaluative criterion of these reports has been the success of IRDP-assisted households in crossing the poverty line. Other performance indicators include the extent of leakages from the target group, and the actual gross capital-income ratio versus the desired ratio. Since scheduled castes and scheduled tribes constitute some of the poorest households, the proportion of such households among beneficiaries is another indicator of the coverage of the poorest households by the programme.

All three studies and other official and unofficial evaluations conducted in different parts of the country concur to a large extent in pinpointing the drawbacks of the programme.[7] Their main findings can be summarized as follows.

(1) At a general level, it was noted that a uniform strategy was pursued throughout the country with emphasis on a few schemes (such as milch cattle schemes) that reduced the scope of local-level initiative. The overall effectiveness of the programme was lowered because it "disregarded differences in the level of infrastructural development and institutional structures, and in the incidence of poverty" (Subbarao, 1985). The allocation of fixed funds per block resulted in a mismatch between the share of a state in total beneficiaries and share of the same state in all India poverty.[8]

(2) With regard to specific failings, the studies indicate the following.

(a) The number of persons who crossed the poverty line did not exceed 40 per cent of those assisted. Of course, there were large inter-state and inter-district variations, for example between agriculturally advanced and backward regions.[9] The studies reported that additional incomes accrued to between 55 and 90 per cent of beneficiary households. In satisfying the primary objective of the programme, namely crossing the poverty line, the impact has been highly unsatisfactory. Furthermore, the coverage of the programme was thin; the number of beneficiaries assisted in relation to the

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[7] In this section we draw upon Bagchee (1987), Bandyopadhyay (1985 and 1987), Guhan (1986), MIDS (1980), Subbarao (1985), Sundaram and Tendulkar (1985a), and Swaminathan (1986).

[8] For example, while Punjab and West Bengal accounted for 0.5 and 8.7 per cent of households below the poverty line (in all India), their share in resource flows under IRDP was 2.9 and 1.3 per cent of the total. Tamil Nadu accounted for 8.3 per cent of poor households and received 9.7 per cent of IRDP resources (see Table 2, p. 224 in Sundaram and Tendulkar, 1985a). The states differ significantly in their utilization ratio as well, i.e., the ratio of plan funds utilized to funds allocated for the programme.

[9] The PEO identified seven regions for the selection of states and districts. They are: (a) tribal areas; (b) hill areas; (c) agriculturally developed areas; (d) agriculturally less developed areas; (e) desert areas; and (f) areas with good administration. Since these regions are not mutually exclusive, some problems arise in interpretation.

number of households below the poverty line was small. In the first three years of the programme, even if it is assumed that all beneficiaries were drawn from the poor, only 19 per cent of the total poverty population had been covered by the programme (Sundaram and Tendulkar, 1985a).

(b) Incorrect identification of beneficiaries resulted in a significant leakage of funds or 'trickle-up' to households outside the target group. The NABARD and PEO studies place the extent of non-eligibility at an average of 15-26 per cent of beneficiaries. This figure rose to 40-50 per cent in certain areas.

(c) There was insufficient concern for viability in the selection of productive activities, and little consideration was given to infrastructural support, resource requirements, compatibility with local ecological conditions, etc.

(d) The IRDP guideline of assisting the "poorest first" was not put into practice. The PEO study, for instance, states that 40 per cent of beneficiaries were located in the top 30 per cent of the income range,[10] i.e., with an income of Rs 2,500-3,500 per household. Evidence that scheduled caste and scheduled tribe households received a lower than average loan per beneficiary is another indicator of the neglect of the poorest households.

(e) While the Planning Commission assumed an incremental capital-income ratio (ICOR) of 1.5 for most schemes, the IFMR study reported a value of 2 to 3 in most districts, with only a few better-developed districts attaining an ICOR of 1.5.

(f) The credit delivery system was unsound in many cases. For example, despite clear instructions to the contrary, banks at local levels often insisted on additional security

[10] This refers to the income range among the poor, i.e., all households with family income less than Rs 3,500.

from beneficiaries. The financial intermediaries were also constrained by limited technical, organizational and managerial capabilities in carrying out their developmental functions. As banks adjust to their new role and pass through the learning phase, the delivery system was expected to improve.

(g) Lastly, flaws in the planning procedure, and organizational and administrative weaknesses that make implementation less effective, were noted. The heavy work load -- in identification, in working out schemes, and monitoring -- of each Village Level Worker is one example of an administrative bottleneck. The burden on the administration also stems from the fact that an organizational structure created during the 1950s to handle an annual expenditure of Rs 100,000 is now dealing with an expenditure of over Rs 2 million per year (Bandyopadhyay, 1985).

5.3.2 Village-level Evaluations in Tamil Nadu

There are some village-level evaluation exercises that highlight the varied local-level determinants and elaborate on the drawbacks in implementation of IRDP. In the following section we summarize the issues raised by selected studies of rural Tamil Nadu, drawing primarily on results from my fieldwork in two villages of Madurai district (Swaminathan, 1986). The first village was Konur, a relatively backward village and the second was Gokilapuram, which is, of course, a relatively advanced village. In addition, we refer to the Madras Institute of Development Studies (MIDS) report of a survey conducted in Dharmapuri and Ramanathapuram districts (MIDS, 1980),[11] and to Copestake (1987), a study also based in Madurai district.[12] The emphasis will be on what we considered to be the core elements of the IRDP strategy, namely:

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[11] Although MIDS (1980) was an early evaluation, it raised many important questions and forms a good basis for comparison with more recent reports.

[12] Swaminathan (1986) and Copestake (1987) were both undertaken as part of a research project, "Credit for Rural Development in Southern Tamil Nadu".

(1) reaching households in the *target group*;

(2) creating, by means of a loan-cum-subsidy, a *permanent productive* asset for the beneficiary household; and

(3) generating income from the asset on a *sustainable* basis in order that the household be raised above the poverty line.

Planning Procedures

IRDP scarcely satisfied the requirement of *integrated* rural development. The guidelines envisage a detailed survey-based identification of households in the target group (e.g., small farmers, marginal farmers, agricultural labourers). While the register (with the Block Development Officer) in Dharmapuri and Ramanathapuram districts in 1980 was incomplete and unreliable, changes were indeed evident in 1985. In both Konur and Gokilapuram, a house-to-house survey had been conducted to identify potential beneficiaries. At the same time, however, there were lacunae and inaccuracies in the data collected by these surveys. For example, they excluded households that were needy of assistance, and at times incorrectly included ineligible households. These problems arose from slipshod methods of data collection. The actual process of identifying beneficiaries was often guided by the action of intermediaries such as the president of the village cooperative society, rather than by the survey results.

Planning failed to take local resource availability into account in determining sectoral priorities and scheme-wise targets. In short, there was an absence of decentralized planning: projects were not tailored to locally available resources, to the infrastructure available, or to the specific needs of target households.

Awareness of Loan Schemes

In the 1980 evaluation (MIDS, 1980), a substantial proportion of non-beneficiaries did not know of the schemes at all. Field notes from 1984-85 indicate a greater public awareness of the loan-cum-subsidy schemes, especially in the relatively advanced village of Gokilapuram compared to Konur.

Identification of Beneficiaries

Have loan-cum-subsidies reached the target group or have there been leakages? In Dharmapuri (MIDS, 1980), 17 per cent of beneficiary households were not eligible for IRDP assistance. In Gokilapuram, where the sample was smaller, 10 per cent of the beneficiaries of the major scheme, milch cattle loans, 14 per cent of sheep loan beneficiaries and 50 per cent of industry and small business loan beneficiaries were outside the target group. In Konur, 27 per cent of milch cattle loan recipients did not belong to the target group. While leakages tend to be lower in Gokilapuram in animal husbandry schemes which are targeted mainly at agricultural labourer households, they still occurred in significant proportions.

Initial Costs

The procedures associated with the acquisition of an IRDP loan were expensive and time-consuming. The initial costs involved in the acquisition of a loan-cum-subsidy were very high. These costs included cooperative membership fees, payment for certificates, livestock insurance premia, search costs in going out of the village to buy assets,[13] bribes and other expenses.

[13] For example, in Gokilapuram, sheep loanees spent a full 12 days in the search process.

The available statistics on initial costs illustrate how burdensome they can be. In the MIDS (1980) evaluation, in the case of a Rs 2,000 loan-cum-subsidy scheme, initial costs were estimated to average no less than 65 per cent of the value of the subsidy for small farmers and 49 per cent of the subsidy for marginal farmers and agricultural labourers. In Konur, initial costs in the acquisition of milch cattle were estimated at 54 per cent of the subsidy and in Gokilapuram, at over 50 per cent of the subsidy. In Gokilapuram, the initial costs of acquiring sheep were estimated to be 35 per cent of the subsidy. Copestake (1987) reports lower figures for initial costs, averaging at about 10 per cent of the subsidy amount.

All the surveys noted that the prices of the assets acquired were often higher than the ceiling allowed by the scheme. (Some of the inflation in asset prices may be attributed to the demand created by the programme itself.) Beneficiaries either met the additional cost themselves, often by borrowing, or settled for substandard assets. In a sample of 221 households from six blocks of Madurai district, 17 per cent were found to take a supplementary loan in the informal credit market to supplement the IRDP loan (Copestake, 1987).

Yields from Milch Cattle

Although milch cattle loans are a major component of IRDP there has been no systematic concurrent attempt to upgrade cattle breeds, and IRDP has often represented an intra-district reallocation of existing cattle resources. Low milk yields and short lactation periods are not surprising given inferior cattle breeds, improper feeding (not a single household in Konur used concentrate feeds), and poor veterinary care.

In Dharmapuri (MIDS,1980), the average lactation period for an IRDP buffalo was 6 months, as against a normal period of 9 months for a well-maintained animal.

Average milk-yield per day was 4 litres against a desired rate of 6 litres. In Konur, the situation was worse: the lactation period was seven months with an average yield of 3.4 litres per day in the first month and 1.8 litres per day in the seventh month, a decline of 52 per cent over six months. However, there was considerable variation among beneficiaries. In Gokilapuram, where the milk cooperative is of longer standing, lactation was, on average, longer at 9 months, yielding 3.7 litres per day in the first month and 3.3 litres per day in the ninth month.

Income Generation

The gap between the earnings from agricultural labour (for an average landless agricultural labourer household) and the poverty line income was estimated to equal Rs 2,917 per annum in Konur and to equal Rs 2,489 in Gokilapuram.[14] How far has IRDP managed to bridge this gap? The test of the scheme rests on the income that it is able to generate in the hands of the poor. On this score, the IRDP record is depressing. In Konur, all the beneficiaries, if they can be so called, of the milch cattle scheme had *negative* returns, averaging a deficit of Rs 679 in the first lactation.[15] The sheep loan beneficiaries earned Rs 1,500 per annum. The large negative returns on the most widespread scheme, that of milch cattle, undermines the primary objective of income-generation through IRDP. In Gokilapuram, earnings over a year averaged Rs 640 from milch animals, Rs 1,147 from sheep-rearing, and Rs 1,308 from bullock-cart hiring. The income was still insufficient to raise the average labourer household above the poverty line.

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[14] This estimate assumes an average landless labourer household size, an average distribution of male and female workers in the household, and an average number of days of employment at normal wage rates (as estimated from survey data). The poverty line used throughout is the officially defined minimum income at 1983-84 prices, i.e., Rs 1,280 per person per year (Government of Tamil Nadu).

[15] This is calculated as the difference between total income, from milk production, sale of manure, and sale of calves and costs of fodder and maintenance net of loan repayment, i.e., a simple net cash flow.

The incremental capital-annual income ratio equalled 3.9, 3.5 and 3.8 in Gokilapuram for the milch cattle, sheep, and bullock cart schemes, respectively. The cost of income generation is substantially higher than assumed by the planners of the programme.

Interestingly, households where IRDP made a positive contribution were, first, those which had an existing productive asset base; secondly, those which made IRDP-linked activity a full-time enterprise; and thirldy, those that used the ISB loans as working capital for existing enterprises. Case studies of the succesful use of IRDP loans for setting up new business ventures have been documented in Appendix 3A.

Temporariness of IRDP Assets

For how long do beneficiary households stay in possession of the newly created asset? In Konur, 9 per cent of milch cattle beneficiaries did not own the asset nine months after acquiring it, and many others were on the verge of disposing of the asset that had brought no positive benefit. The situation was worse in Gokilapuram, where 25 per cent of milch loan beneficiaries, and 57 per cent of sheep loan beneficiaries were without the IRDP asset which was lost through sale or death. For Madurai district as a whole, Copestake (1987) reports that 54 per cent of milch cattle beneficiaries sold their assets within a year of acquisition.

Indebtedness

The MIDS (1980) survey stated that, as an immediate result of the IRDP loan, indebtedness of a beneficiary household from the poor increased. In 1985, in a majority of milch cattle cases (54 per cent in Konur and 70 per cent in Gokilapuram), debt-to-asset ratios had increased after taking an IRDP loan. Although only a partial

measure, as steady income over a long-term can offset the effect of a short-run rise in the debt-asset ratio, it does indicate the possibility of a growing debt-service burden.

Follow-up Measures

Lastly, follow-up measures and monitoring of the scheme were grossly inadequate. All the evaluations noted the poor quality of infrastructural facilities, particularly in respect of animal health care, quality cattle feed at reasonable prices, fodder and pasture development and livestock insurance. For example, in Gokilapuram, the high cost of insurance procedures (Rs 25 per head of sheep as doctors' fees for certification of death), and the delay in settling a claim, have kept people from claiming insurance.[16]

As currently implemented, the IRDP seems beset with inefficiencies and fails to achieve its objectives satisfactorily. Considerable modification is required to turn it into an effective programme.

5.4 A Dynamic Evaluation Criterion

Another method of evaluating IRDP is to observe the impact of IRDP on households relative to their previous standard of living, and to assess the degree of upward mobility subsequent on obtaining IRDP assistance.

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16 The one person in the sample who had filed an application had not received compensation even though more than 6 months had passed.

5.4.1 An Income Mobility Approach

A dynamic approach to evaluation was considered by Subbarao (1985). Subbarao's method is based on an income mobility approach and examines: (a) whether IRDP-assisted families earned a higher income than households that were not assisted; (b) whether assisted households climbed to a higher income bracket compared to their pre-programme level; and (c) at what cost (capital-income ratio) these objectives were realized.

Using data from the IFMR study, Subbarao constructed an income-mobility matrix for the poorest (assisted and unassisted) households. All IRDP beneficiary and non-beneficiary households were then classified into two income categories, namely those earning below Rs 1,500 and those earning more than Rs 1,500 per annum. Subbarao classified households into these income brackets both before and after IRDP, and checked the numbers of households who moved from one income bracket to the other. He concluded that the performance of beneficiary households was decidedly superior to that of unassisted households,[17] and that 60 to 100 per cent (a figure that showed regional variation) of assisted households exhibited upward income mobility. The results also emphasized the role of initial income of the selected households: the lower the proportion of very poor households among beneficiaries, the greater was the success or degree of upward income mobility. Finally, the incremental capital-income ratio was estimated to be in the range 1.4 to 2.8. Using the income mobility criterion, Subbarao concluded that IRDP benefitted poor households by imparting some upward mobility even where it failed to push them above the poverty line.

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[17] For instance, the IFMR data for Madurai district show that 100 per cent (10 households) of beneficiaries moved from below Rs 1,500 to above Rs 1,500 while only 66 per cent of unassisted households made the same move.

This method suffers from two important drawbacks. First, if income mobility is being measured in absolute values rather than in relative terms, then it is essential that *nominal income* be deflated and mobility be assessed in terms of changes in *real income*. In practice, this is feasible, since either the Consumer Price Index for Agricultural Labourers (CPIAL) or an index of food prices could be used as appropriate deflators for post-IRDP nominal incomes. Subbarao's analysis is based on nominal income mobility and his yardstick of income mobility is simply whether households were below Rs 1,500 before IRDP and moved to the higher bracket after initiation of the scheme. In nominal terms such a move could have arisen from pure inflation: the documented gains could thus be illusory. The reported positive gain of upward real income mobility may be an incorrect conclusion.

Secondly, the appropriateness of the time-interval used to measure income mobility must be assessed. The IFMR study interviewed households not later than 15 months after the initiation of the programme. The previous section documented cases where a large proportion of IRDP assets were sold or disposed of within two years of acquisition. The income stream generated by IRDP in the first fifteen months may not be sustained, and a large part of the observed mobility may relate to a *temporary* gain.

In addition, some account of the debt burden and extent of repayment obligations in the future needs to be taken into account in a measure of upward income mobility. While IRDP may provide temporary relief to poor housholds (which is, of course, desirable in itself), this *current* income mobility measure leaves the question of long-run welfare unanswered.

5.4.2 A Wealth Creation Criterion

Methods of evaluation of IRDP that apply conventional income or earnings criteria appear incomplete. First, they are based on a static norm, that of crossing the poverty line defined in terms of current income. A less stringent and more feasible criterion is whether IRDP has provided households with the means for some upward mobility among households receiving IRDP assistance. This criterion is an alternative, weaker criterion for evaluation. Secondly, most evaluations focus on a single variable, the income generated by the scheme, and do not take into consideration the long-run objective of creating a permanent source of supplementary income. The latter can be achieved by a process of productive asset accumulation (though high income generation undoubtedly accelerates the speed of accumulation).

In the pages that follow, IRDP is evaluated in terms of an additional criterion; this is the permanent accretion to household *wealth* among beneficiaries of the programme. As argued earlier, wealth is a stable indicator of a household's economic position and an increase in wealth can be taken as a measure of decisive upward mobility. This criterion has been tested on our panel data on beneficiaries and non-beneficiaries in order to arrive at an assessment of the long-run impact of IRDP.

5.5 Results from the Panel Data Set

Using panel data we examine the change in total real wealth over eight years to assess whether the assets created by IRDP provide sources of income generation over the long run. Given the small size of the panel, this exercise cannot be taken as the final word on IRDP but it does provide some insight into the impact of the scheme on incomes of the poor over a relatively long period. The baseline survey conducted in 1977 offers a good starting point since it was conducted before IRDP was initiated (although some loan schemes targeted at the poor did exist even in

1977). The follow-up interviews, which were conducted in the latter half of 1985, surveyed households a good six years after the inception of IRDP. This eight-year interval provides a reasonable approximation to changes in long-run economic status.

Mobility is measured by changes in gross and net wealth (net wealth is wealth net of indebtedness). All wealth values in 1985 are deflated by an index of wholesale prices to obtain real values at 1977 prices. This remains an approximate measure of real asset accumulation; evidence of price movements indicates that this deflator may result in an over-estimation of increase in real wealth (see section 2.4).

5.5.1 Description of IRDP Beneficiary Households

In the previous chapter we characterized households as relatively poor if they belonged to the bottom 40 per cent on a per capita wealth ranking. We retain the same division here, and contrast households receiving IRDP loans who belonged to the bottom 40 per cent with non-IRDP households in the same category.

Twenty-six per cent of all panel households received at least one IRDP loan between 1982 and 1985. In fact, 77 per cent of these households had received two or more loans in the period between the surveys, 1977-85. Of all beneficiary households, 73 per cent belonged to the bottom 40 per cent in either 1977 or 1985. Among them, 41 per cent belonged to the hard-core poor category, 18 per cent to the upwardly mobile group, and 14 per cent to the downwardly mobile category. The remaining 27 per cent of households who received assistance under IRDP belonged to the non-poor group. While the majority of IRDP beneficiaries belonged to the worst off section of

the panel (in terms of wealth),[18] the programme itself, we shall argue, has not resulted in a uniform improvement for all those assisted.

TABLE 5.6: WEALTH CHARACTERISTICS OF IRDP HOUSEHOLDS, GOKILAPURAM, 1977-1985

(in rupees)

Category	Average wealth per household				
	Hard-core poor	Temporary Poor 1977	1985	Non-Poor	All
Household wealth					
1977	2,852	2,313	6,353	32,167	11,226
1985	4,500	6,184	3,763	14,903	7,543
Per capita wealth					
1977	515	360	1,313	4,032	1,555
1985	720	1,880	940	3,686	1,770
Net wealth					
1977	2,254	2,001	5,714	29,601	10,138
1985	2,626	3,666	2,349	12,108	5,363

Note: All values are in terms of 1977 prices.

What have been the changes in total wealth and net wealth for IRDP-assisted households over the period? Figures in Table 5.6 reveal the period to be one of relative stagnation. In aggregate, IRDP beneficiaries showed a *decline* in real household wealth, gross and net of liabilities, and a small rise in real per capita

[18] Data on household income, however, suggest that these beneficiaries are not selected from among the 'poorest of the poor'. In 1977, on average, household income totalled Rs 2,425 for beneficiaries as compared to Rs 1,711 for non-beneficiaries. A breakdown into agricultural and non-agricultural wage income indicates that both were higher, on average, among IRDP beneficiaries. The annual average of agricultural wage and non-agricultural wage income was found to be Rs 832 and Rs 762 for beneficiaries, and Rs 668 and Rs 510 for non-beneficiaries, respectively (source: 1977 survey data). Unfortunately, we do not have similar data on incomes for 1985.

wealth. Disaggregating further, the assisted households who belonged to the chronically poor and upwardly mobile groups gained slightly, while the others faced losses. Several observations, in fact, of negative values for net wealth were obtained; there were households for which the value of outstanding debt was greater than the value of their stock of assets. There was a process of dissaving among these households, one that would lead them into further decline.

The debt-asset ratio is another useful indicator of the economic status of a household. It is noteworthy that the increased level of borrowing in 1985 was often incommensurate with the levels of asset accumulation. An appraisal of the change in assets and change in debt associated with IRDP brings this point home sharply. Let *d* and *a* stand for the change in debts and assets subsequent to IRDP assistance. The direction of asset accumulation can be inferred from the debt-asset ratio as outlined below.

Type of Asset Accumulation	Number of Households
1. Positive gain d=0,a>0	1
2. Stagnation d=0,a=0	4
3. Deterioration d>0,a=0	4
4. Ambiguous conditions	
i) d/a>1	3
ii) d/a=1	1
iii) d/a<1	9

The conclusion is a sobering one; net wealth among IRDP households has risen, on average, very slowly over the years 1977-85. Even where IRDP provided supplementary income, the limited net accretion to wealth establishes that such gains

were temporary. It must be remembered, in this context, that many of these households received two or more IRDP loans in this period.

5.5.2 IRDP versus Non-IRDP Households: A Mobility Approach

TABLE 5.7: AVERAGE VALUE OF ASSETS AMONG IRDP AND NON-IRDP HOUSEHOLDS IN THE BOTTOM 40 PERCENT

(in 1977 rupees)

Type of Asset	IRDP Households		Non-IRDP Households	
	1977	1985	1977	1985
Land	406	263	351	598
Livestock	347	731	106	167
Draught animal	59	0	189	171
Other productive assets	10	164	8	153
Subtotal	823	1,159	655	1,091
Non-productive	2,550	3,623	2,293	2,902
Total	3,374	4,782	2,948	3,994

Note: Other productive assets includes all other productive assets, such as agricultural machinery, artisanal tools.

We now attempt to map wealth mobility among IRDP-assisted households and non-beneficiary households that belonged to the bottom 40 per cent of a wealth ranking in either 1977 or 1985. (The number of households in the two categories are 16 and 30 for beneficiaries and non-beneficaries, respectively). Mobility is measured by changes in *household* wealth, since the primary objective of IRDP has been the creation of productive assets for poor *households*. If it can be assumed that other

factors would not affect the two groups differentially, then the variation in mobility can be assigned to the disbursal of IRDP assistance.[19]

To begin with, the average value of wealth was higher among IRDP households (Table 5.7); the advantage, however, was not statistically significant in terms of either per capita or total household wealth in both years.[20] In terms of asset composition, livestock constituted the largest element of productive assets among IRDP households in contrast to unassisted households (Table 5.8). However, while the average value of livestock assets increased from Rs 347 to Rs 731 in real terms among IRDP households, productive wealth as a whole remained in the neighbourhood of 24 per cent of total wealth in both years. So despite the positive contribution of IRDP by means of the creation of livestock assets, overall improvements in wealth were stemmed by the decline in other productive assets, especially of land. Of course, it could be argued that in the absence of IRDP these households would have suffered a still worse fate, but they have clearly not shown a consistent improvement. Livestock accounted for a noticeably smaller share of total wealth among non-beneficiary households, although productive wealth rose from 22 per cent to 27 per cent of total wealth.

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19 Since by 1985 the coverage of IRDP in Gokilapuram was widespread, there is no reason to assume that households who received IRDP loans were specially selected.

20 A t-test on the null hypothesis of no difference between wealth of beneficiary and non-beneficiary households shows that the hypothesis can not be rejected. The t-value was 0.57 and 0.56 for differences in per capita wealth in 1977 and 1985, respectively.

TABLE 5.8: ASSET COMPOSITION OF IRDP AND NON-IRDP POOR HOUSEHOLDS, GOKILAPURAM, 1977-1985

(in per cent)

Type of Asset	Share of total assets			
	IRDP Households		Non-IRDP Households	
	1977	1985	1977	1985
Crop land	11.1	3.4	11.2	14.2
Thope	0.9	2.1	0.7	0.7
All land	12.9	5.5	11.9	14.9
Livestock	10.2	15.3	3.6	4.2
Draught animals	1.7	0	6.4	4.3
Other productive assets	0.3	7.0	0.3	3.7
All productive assets	24.4	24.2	22.2	27.3
Gold	-	7.0	-	5.3
Non agricultural assets	75.5	68.7	77.7	67.4
Aggregate	100.0	100.0	100.0	100.0

Note: Thope covers orchards and trees. All land refers to the sum of crop land and thope. Other productive includes machinery and non-agricultural productive assets.

Wealth Mobility

Wealth mobility matrices for beneficiary (B) and non-beneficiary (N) households are constructed in Tables 5.9 and 5.10. They differ from the approach used in the previous chapter in one important way. They are based on absolute real wealth, divided into four class intervals of Rs 0-1,000, Rs 1,000-2,500, Rs 2,500-5,000, and more than Rs 5,000, all at 1977 prices. This is distinct from methods used in earlier chapters where we relied solely on a wealth ranking, an ordinal measure. Application of a ranking within the poor, a small set of households, is inappropriate as even a tiny change in wealth can result in a large rank alteration. In addition, in the context of assessing IRDP, the extent of absolute change is of interest.

TABLE 5.9: CHANGES IN ABSOLUTE REAL WEALTH AMONG IRDP AND NON-IRDP HOUSEHOLDS, GOKILAPURAM, 1977-1985

(number of households)

Size Class in 1977	Position in 1985 Unchanged	Downwardly mobile	Upwardly mobile	All
IRDP households				
0-1,000	1	0	1	2
1,000-2,500	1	0	5	6
2,500-5,000	2	0	2	4
5,000 +	0	4	0	4
All	4	4	8	16
NON-IRDP households				
0-1,000	3	0	6	9
1,000-2,500	2	2	3	7
2,500-5,000	1	1	5	7
5,000 +	1	5	1	7
All	7	8	15	30

Note: The wealth size class is defined at constant (1977) prices.

Table 5.9 draws attention to the remarkable similarity in mobility between IRDP and non-IRDP households. Exactly 50 per cent of households were upwardly mobile in both subgroups, about a quarter were downwardly mobile, and the remaining 25 per cent remained in the same wealth bracket. This inevitably leads to scepticism about the performance of IRDP. First, while there was upward mobility among IRDP households, it only affected 50 per cent of all households. Secondly, non-IRDP households exhibited as much upward mobility as households which received IRDP loans. With a non-parametric (χ^2) test we cannot reject the hypothesis

that mobility is independent of IRDP assistance. In this case study, IRDP did not provide a measurable extra advantage to loan-receiving households compared to the rest.

TABLE 5.10: WEALTH MOBILITY MATRICES FOR IRDP BENEFICIARY (B) AND NON-BENEFICIARY (N) HOUSEHOLDS

$$B = \begin{bmatrix} \mathbf{0.5} & 0.5 & 0 & 0 \\ 0 & \mathbf{0.17} & 0.3 & 0.5 \\ 0 & 0 & \mathbf{0.5} & 0.5 \\ 0.25 & 0.75 & 0 & \mathbf{0} \end{bmatrix} \qquad N = \begin{bmatrix} \mathbf{0.33} & 0.5 & 0.0 & 0.11 \\ 0.28 & \mathbf{0.28} & 0.28 & 0.14 \\ 0.0 & 0.14 & \mathbf{0.14} & 0.71 \\ 0.14 & 0.42 & 0.14 & \mathbf{0.14} \end{bmatrix}$$

Note: The matrices are derived from changes in wealth in Table 5.9. The rows and columns refer to the four wealth classes: Rs 0 to 1,000, Rs 1,000 to 2,500, Rs 2,500 to 5,000 and above Rs 5,000 (at 1977 prices). Diagonal coeffcients are in bold type. The values in the ij^{th} cell gives the proportion of households who moved from the i^{th} class in 1977 to the j^{th} class in 1985.

Further disaggregation shows that in all size classes of wealth, the proportion of IRDP beneficiaries who improved their position ranged from 50 to 83 per cent, except for the highest wealth interval where all households were unambiguously worse off in 1985. The proportions were similar among non-IRDP households.

From the viewpoint of long-run welfare, this indicates that households with two or more subsidized IRDP loans were no better off than those without. This would imply that IRDP failed to provide a significant stimulus towards asset accumulation. Another noteworthy point is that the degree of mobility of IRDP beneficiary households showed no direct relation to their initial wealth holding. A higher initial level of wealth did not necessarily lead to a better performance of the IRDP loan.[21]

[21] This contrasts with Subbarao's results where those with a higher initial income were observed to do better with IRDP.

Mobility Measures

To compare the degree of mobility between the two matrices formally, we estimated the following measures.

(i) The average time spent in a class [$t_i = 1/(1-m_{ii})$] takes on low values, falling between 1 and 2 (Table 5.11). By this measure, mobility is not uniformly higher among IRDP beneficiary households.

TABLE 5.11: INDEX OF AVERAGE TIME SPENT IN A CLASS BY TOTAL WEALTH CRITERION, GOKILAPURAM, 1977-1985

Wealth Class (in rupees)	$t_i = 1/(1-m_{ii})$ B	N
0-1,000	2.0	1.5
1,000-2,500	1.2	1.4
2,500-5,000	2.0	1.2
5,000+	1.0	1.2

Note: B and N refer to the wealth matrices for beneficiary and non-beneficiary households (see Table 5.10).

(ii) The trace measure [n-trace/(n-1)] is relatively high with values of 0.94 and 1.03 for IRDP beneficiary and non-beneficiary households, respectively. Both groups show considerable mobility.

(iii) The Szal distance measure was equal to 0.38 and 0.33 for beneficiaries and non-beneficiaries, respectively. The distance moved was less than 40 per cent of the feasible maximum.[22]

These measures suggest that the rates of mobility were not dissimilar as between beneficiary and non-beneficary households. However, these indices do not differentiate between upward and downward mobility and hence do not contribute directly to an evaluation of IRDP.

Net Wealth Mobility

We constructed two similar mobility matrices (B′ and N′) based on net wealth, i.e., net of outstanding debt (Table 5.12). The overall conclusions remained unaltered.

TABLE 5.12: NET WEALTH MATRICES FOR IRDP BENEFICIARY (B′) AND NON-BENEFICIARY (N′) HOUSEHOLDS

$$B' = \begin{bmatrix} \mathbf{0} & 0 & 0.25 & 0.75 \\ 0.2 & \mathbf{0.2} & 0.2 & 0.4 \\ 0 & 0 & \mathbf{0.75} & 0.25 \\ 0 & 1.0 & 0 & \mathbf{0} \end{bmatrix} \qquad N' = \begin{bmatrix} \mathbf{0.3} & 0.4 & 0.2 & 0.1 \\ 0.18 & \mathbf{0.09} & 0.18 & 0.54 \\ 0 & 0.5 & \mathbf{0} & 0.5 \\ 0.28 & 0.28 & 0 & \mathbf{0.42} \end{bmatrix}$$

Note: The four rows refer to the categories: less than Rs 1,000 (including negative values); Rs 1,000-2,500; Rs 2,500-5,000; and above Rs 5,000. Diagonal coefficients are in bold type.

Again mobility measures confirmed the prevalence of a similar pattern of movement among IRDP beneficiary and non-beneficiary households. The average time spent in a wealth class (Table 5.13) was quite similar among the two groups of

[22] The distance moved is, however, signficantly greater than in the case of wealth matrices discussed in chapter 3. This difference could stem from a smaller size of the matrix, and measurement of absolute versus relative movements.

households. The trace measures (1.35 and 1.1 for beneficiary and non-beneficiary households, respectively) were higher than estimates based on gross wealth, as were the Szal distance measures (0.64 and 0.43, respectively). In aggregate, the measured mobility in the sample was higher in terms of net wealth as compared to mobility in terms of gross wealth.

TABLE 5.13 INDEX OF AVERAGE TIME SPENT IN A CLASS BY NET WEALTH CRITERION

Net Wealth	$t_i = 1/(1-m_{ii})$	
(in rupees)	B′	N′
Upto 1,000	1	1.4
1,000-2,500	1.25	1.1
2,500-5,000	4	1
5,000+	1	1.7

Note: B′ and N′ refer to the net wealth matrices for beneficiary and non-beneficiary households (see Table 5.13).

An interesting new feature of these matrices is the presence of negative values in the first wealth bracket, because of dissaving by households. The contrast between beneficiary and non-beneficiary households in this poorest category is also striking. While 33 per cent of non-beneficiary households remained in this lowest range over the eight years, all beneficiary households which belonged there in 1977 moved out of it by 1985. This suggests that IRDP did in fact assist very poor beneficiary households in improving their status.[23] We need evidence from larger data sets to confirm these hypotheses.

[23] For example, refer to the case study of the artisan household which returned to its traditional occupation with the help of an IRDP loan (Appendix 3. .).

5.6 Concluding Remarks

IRDP and a Wealth Mobility Criterion

The use of a mobility criterion that is on the one hand weaker than earlier poverty-line based measures and on the other hand concerned with the long-run impact of IRDP, indicates an unsatisfactory performance of the programme in Gokilapuram. There was no significant difference in the pattern of wealth-mobility as between households with IRDP loans and household without assisance under IRDP. The approach used in this chapter highlights the impermanence of supplementary earnings generated by the schemes associated with IRDP. The long time-interval between pre- and post-IRDP situations in the panel minimizes transitory effects; concurrently, the dynamics of the village economy add a complexity to the analysis. This analysis remains partial in that it assumes a *ceteris paribus* condition to hold for all other factors influencing change in the village. To conclude, on grounds of short-run relief the programme, as it is currently implemented, may have some merit. In terms of creating permanent income-bearing assets, however, the programme has not been succesful.

Socioeconomic Mobility and Government Intervention

A wider implication of this case study of the IRDP is a recognition of the role of mobility in the planning and evaluation of economic policy. Consider, for instance, a policy objective of improving the living standards of agricultural labourers. This can be achieved by a combination of two approaches. First, there are policies that directly raise the average income or wealth of agricultural workers. A second type of policy is one which promotes upward occupational mobility. In other words, a change in the share of income or wealth accruing to a particular group in the economy can be effected by: (a) movements between groups, or mobility; (b) changes in the rate of

growth of group mean income or wealth; and (c) a combination of the two (interaction terms).[24] These distinctions are easier to make when the groups are not defined in terms of the endogenous variable, in this case, wealth. If a mobility matrix is defined with respect to wealth (as in Table 5.10) then the two effects are not separable, i.e., upward mobility is coterminous with a higher level of wealth.

Any policy directed towards poverty alleviation cannot act independently of the structure of the economy and the existing distribution of resources; it is both affected by and affects the distribution of resources. While IRDP has created livestock assets for beneficiaries, it has not stemmed the process of land dispossession and landlessness which have contemporaneously lowered the ownership of productive assets among beneficiary households. Without access to land for grazing, and for fodder cultivation, the utilization of livestock assets has been constrained. For effective policy intervention, coordination is required between policies affecting mobility by means of structural change, and policies that directly alter the mean income or wealth of individuals.

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24 For a mathematical decomposition, see Robinson and Dervis (1977). The change in the share of wealth of a group can be written as:

$dS = S(t+1) - S(t) = (y^* r M' x / y' r M' x) - (y^* x / y' x)$.

where x is a column vector of population in period t and y is a vector of group mean per capita wealth (y' is the transpose and y^* is a diagonalized matrix). Population of each group changes over time depending on inter group mobility, i.e., $x(t+1) = M' x(t)$ where M' is the mobility matrix. Lastly, wealth grows at the rate r, i.e., $y(t+1) = ry(t)$. The share of wealth can be decomposed as follows:

$dS = dS' + dS'' + dS^*$

where dS' is the change due to inter-group movements, i.e., with no growth in per capita wealth, only mobility; dS'' is the contribution of changes in mean wealth of the group under an assumption of immobility, or M=I; and dS^* is the interaction term. The latter term applies to those households who move between groups in the given time-interval. If the per capita wealth of all groups is growing at the same rate, then $dS'' = 0$, $dS^* = 0$, and $dS = dS'$.

6

INTERVENTION IN THE RURAL CREDIT MARKET AND ACCUMULATION OF WEALTH

6.1 Introduction to Rural Banking

This chapter investigates the effects of the government's rural banking and credit policy on conditions in the village credit market. The effects of changes in the structure of the agrarian credit market on the well-being of the worst-off households in the panel are also examined.

Since the nationalization of 14 major commercial banks in 1969, government policy, implemented by the Reserve Bank of India (RBI), has promoted the growth of rural banking. Conventional banking objectives have been altered significantly to incorporate the aims of rural development, and the policy measures designed to implement the new objectives have come to be known as "social and development banking". The major objectives of this policy have been:[1]

(1) to provide banking services in previously unbanked or under-banked rural areas;
(2) to provide substantial credit to specific activities, such as agriculture, cottage industries, etc.; and
(3) to provide credit to certain disadvantaged social groups as, for example, households from scheduled castes and scheduled tribes.

An assumption underlying this emphasis on rural banking had been the prevalence of undesirable practices in village or informal credit markets. The *All India Rural Credit Survey Report* (RBI, 1954) pointed out that the supply of rural

[1] See Wiggins and Rajendran (1987).

credit was affected by the virtual monopoly of moneylenders. For instance, it was argued that moneylenders could charge a rate of interest that was very high, out of proportion to the risk involved, and above the legally prescribed maximum rate. A major feature of bank lending prior to the nationalization of banks in 1969 was that the formal sector had little to do with the rural poor.[2] The widening network of rural banks was, undoubtedly, expected to alter conditions in the village credit market.

To attain these objectives, the RBI and National Bank for Agriculture and Rural Development (NABARD) adopted a combination of policies.[3] First, detailed guidelines and directives were provided to commercial banks. These specified the required loan portfolio of banks, targets for expansion of branches, ceilings on interest rates and so on. By 1985, 40 per cent of total lending by commercial banks was to be channeled to 'priority sectors', namely, agriculture and allied activities, small-scale industries and cottage industries. Furthermore, 50 per cent of advances to agriculture and allied activities was to be allocated to persons from the "weaker sections".[4] Another guideline suggested a desirable banking intensity: a bank branch for every 15,000 persons in rural areas.[5] Interest-rate guidelines in 1985-86 stipulated that medium-term loans in agriculture should be provided at a rate no higher than 10 per cent per annum to small farmers, and no higher than 12.5 per cent per annum to other farmers (RBI, 1986). The achievement of these targets is closely monitored by the RBI and NABARD. The annual *Report on Trends and Progress of Banking in*

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[2] Circumstantial evidence for this comes from the Rural Labour Enquiry for 1964-65. In that year, the share of the formal sector in the amount borrowed by agricultural labourers was a miniscule 0.4 per cent. In the Rural Labour Enquiry 1974-75, the corresponding figure was only 5 per cent.

[3] In 1972 the RBI established a subsidiary, the Agricultural Refinance and Development Corporation, which was elevated to the National Bank for Agriculture and Rural Development (NABARD) in 1982. NABARD has general responsibility for overseeing the growth of rural banking.

[4] A term commonly used in official documents is credit to the "weaker sections" which includes scheduled caste and scheduled tribe households, rural labourers, small and marginal farmers, and artisan households.

[5] For further details of RBI and NABARD directives, see Wiggins and Rajendran (1987).

India, for instance, notes that "scheduled commercial banks achieved the stipulated target of 40 per cent for their priority sector advances" (RBI, 1986).

Secondly, specific schemes that provided credit to the poor, such as IRDP, were initiated. Thirdly, on the recommendation of a banking commission set up to evaluate rural credit policy, a decision was taken in 1972 to introduce regional rural banks that would specialize in "social and development banking". Since there is no regional rural bank in our study area, we shall not comment on this policy.

On the whole, rural credit policy has attempted to spread banking in rural areas,[6] and to provide credit at controlled and subsidized rates to rural borrowers. The new policy is associated with relatively easy terms for poor borrowers; for example, the condition of providing collateral requirements for borrowing have been waived in many cases.

The success of government policy in increasing the rural orientation of the banking system can be illustrated with evidence from Tamil Nadu. From a base of 113 bank branches in 1969, the number of rural commercial banks jumped to 770 in 1977 and had further risen to 1,683 by 1985 (Table 6.1). The volume of credit also grew rapidly, expanding from Rs 45 million in 1969 to Rs 1,051 million in 1977 and to Rs 5,844 million in 1985 (or Rs 3,076 million at 1977 prices). While there has been no major shift in banking policy between 1977 and 1985, measures such as the introduction of IRDP in 1979, the establishment of regional rural banks, and the setting of new targets for specialized lending, e.g., to priority sectors, have sustained and strengthened government intervention in the sphere of rural banking. The share of credit going to priority sectors increased from 27 per cent in 1978 to 40 per cent in 1985.

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[6] Banks here refer to commercial banks, cooperative banks, land development banks and the regional rural banks.

TABLE 6.1: GROWTH OF RURAL COMMERCIAL BANKS IN TAMIL NADU, 1969-1985

(in rupees million)

Year	Number of branches	Total Advances	Total Deposits
1969	113	44.8	71.5
1977	770	1,050.6	1,041.8
1985	1,683	5,843.7	6,113.2

Source: *Tamil Nadu: An Economic Appraisal*, different issues.

In this context of a government-directed expansion of formal banking institutions in rural areas, an investigation of changes in the structure of the agrarian credit market takes on particular relevance. In section 6.2, I have used data from Gokilapuram to attempt to answer the following questions: Has the expansion of rural banks displaced informal lenders? Has it resulted in improved credit availability to relatively disadvantaged households? Has the growth of formal credit affected the terms on which informal credit is available, such as the rate of interest? The relevance of these changes to the process of wealth-accumulation among the hard-core poor is taken up in the following section.

Advantages of Panel Data

The empirical analysis in the following sections benefits from an advantage that panel data provide in a study of informal credit. A distinguishing characteristic of loans taken in the informal sector is the personal nature of each transaction. In each transaction, the status of the borrower and of the lender and the relationship between them play an important role in determining the terms of the transaction. By tracing

changes in credit among the same set of borrowers, an automatic adjustment is made for variations caused by individual differences. In short, we can be more confident of observed changes in credit transactions.[7]

All estimates of credit refer to *real values* deflated by the Index Number of Wholesale Prices for Tamil Nadu. It is difficult to identify the demand and supply schedules for credit separately as all borrower-specific variables affect both curves. In this chapter, the variable that is considered is the "outcome" variable, namely, the amount borrowed.

6.2 Changes in the Agrarian Credit Market of Gokilapuram, 1977-1985

Trends observed at the State level with respect to the expansion of rural banking can also be observed at the district and block level (see Swaminathan, 1986).[8] Turning to Gokilapuram village, evidence from our panel indicates a massive *expansion* of credit in both the formal and informal sectors. In both sectors, the volume of borrowing increased by fifty per cent in real terms (Table 6.2). In short, the expansion of credit in the two sectors have kept pace with one another over this 8-year period. The persistence of a large, active, and growing informal credit market suggests that rising demand for credit has also played an important role in determining the overall structure of the market.

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7 If change was measured over a different set of borrowers, some of the observed variation could stem from differences in the characteristics of borrowers.

8 The pace of expansion of cooperative banks and land development banks has been slower than that of commercial banks in Madurai district (and in Tamil Nadu as a whole).

TABLE 6.2: GROWTH OF RURAL CREDIT, GOKILAPURAM, 1977-1985

(in 1977 rupees)

Year	Amount borrowed from: Formal sector N	Formal sector Amount	Informal sector N	Informal sector Amount	Both sectors N	Both sectors Amount
1977	37	197,800	171	218,732	208	432,432
%	7.8	47.5	82.2	52.5	100	100
1985	76	307,542	106	334,284	183	644,458
%	41.8	47.9	58.2	52.1	100	100

Source: Panel data.

Note: N is the number of loans. Figures in the rows marked "%" are the percentages to the respective row totals.

Formal and informal sectors of credit are conventionally distinguished by the form of the credit transaction, namely the impersonality of formal institutions versus the personal nature of transactions in the informal sector. The category of informal lenders is diverse and includes a variety of persons who lend in the village. For simplicity, informal lenders are grouped into five categories: landlords, traders, moneylenders, friends and relatives, and others.[9] The most amorphous category is that of friends and relatives; friends are drawn from many occupations and income levels, and do not necessarily provide low-interest loans.[10]

[9] For detailed definitions and descriptions of these categories, see Swaminathan (1986).

[10] A few definitional clarifications are called for. The first response of many borrowers to a question on the identity of the lender was, "I borrowed from a friend or person known to me." To the extent that lenders and borrowers interact in village life, this is obviously true. An attempt was made to probe further into the characteristics of the lender. Often the response remained the same. This is one reason for the large category of 'friends and relatives' among lenders.

The composition of lenders in the informal market has changed considerably over the 8-year study period (Table 6.3). The role of moneylenders declined. The amount borrowed from them as a proportion of credit obtained from the informal sector fell from 59 per cent in 1977 to 11 per cent in 1985. The share of loans obtained from traders, landlords and 'friends' grew in importance. The expansion of lending by the business community reflects the growing commercialization of the region, while that by the category of 'friends' indicates the plurality of lenders. Moneylending was not the monopoly of a particular group.[11] It is also worth noting that while landlords provided 12 to 15 per cent of total informal credit in the two years, they did not dominate transactions in the informal market. No case of debt bondage was reported during our survey in 1985.

TABLE 6.3: STRUCTURE OF THE INFORMAL CREDIT MARKET, GOKILAPURAM, 1977-1985

(in per cent)

Source	1977		1985	
	Number of loans	Amount borrowed	Number of loans	Amount borrowed
Landlord	8.2	11.8	16.0	14.5
Trader	14.6	8.9	17.9	23.0
Moneylender	26.9	59.2	16.9	11.0
Friend	44.4	19.0	43.3	47.5
Other	5.8	1.4	5.6	3.7

Two indicators of changes in the credit market in Gokilapuram have been analyzed here. They are the degree of segmentation of the credit market betweeen its

[11] Historically, unlike certain other regions, moneylending has not been the prerogative of a particular caste or community in Gokilapuram.

formal and informal sectors and the rates of interest in different segments of the market. Changes in these two indicators provide a summary picture of structural shifts in the credit market.

Degree of Segmentation

Segmentation refers to the division of the market into distinct submarkets, and of borrowers into two categories -- those with access to formal credit and others with no such access, who can obtain credit only from informal sources.

The presence of segmentation can be measured by simple probit and logit procedures which estimate the relationship between initial household wealth and the probability of receiving credit from the formal sector. This can test for segregation between sectors on the basis of initial household wealth. Access to formal credit is defined in two ways:

(i) as a binary variable with a value of one if a single bank loan is received by the household, and zero otherwise; and

(ii) as a multinomial variable taking different values for the proportion of loans taken from the formal sector.

Probit and logit procedures have been applied to the Gokilapuram data. The details of the procedure and the results are presented in Appendix 6A to this chapter.

The estimates (see tables in Appendix 6A) indicate a significant positive relation between initial household wealth and the probability of receiving a loan from the formal sector in 1977. In contrast, the equations give a poor fit for 1985 (no significant coefficients), signalling the absence of a relationship between household wealth of a borrower and access to banks. This substantiates the hypothesis that the relatively poor households *improved their access* to loans from financial institutions

over the period 1977-85.[12] The assumption that only the rich receive bank credit and the poor only borrow from village lenders is no longer valid in Gokilapuram.

Another indicator of the degree of segmentation between the two sectors is the proportionate share (relative to wealth) of formal credit accruing to households in different economic categories. This measure also provides an indication of whether the distribution of formal credit resources perpetuates or weakens existing inequalities in the distribution of wealth. To identify economic status, all households in the panel are divided into four broad wealth brackets.

TABLE 6.4: PROPORTIONATE SHARE (p) OF FORMAL CREDIT ACCRUING TO HOUSEHOLDS WITH DIFFERING LEVELS OF REAL WEALTH, 1977-1985

Wealth (in rupees)	1977			1985		
	Share of credit		p	Share of credit		p
		wealth			wealth	
0<5,000	16.2	1.1	14.7	9.9	0.6	16.5
5,000<10,000	18.9	1.7	11.1	9.1	1.1	8.3
10,000<50,000	10.8	6.0	1.7	13.7	5.1	2.7
50,000+	54.0	91.2	0.6	67.1	93.2	0.7
Total	100	100	1	100	100	1

Note: Rupees are 1977 rupees. Shares are in per cent. The ratio "p" is defined as the ratio of the percentage share of amount borrowed to percentage share of wealth.

Results reported in Table 6.4 are striking. The first unambiguous conclusion from the evidence is that the distribution of formal credit resources was more equal

[12] Access here refers only to the probability of getting a bank loan, it does not take the magnitude of bank credit into consideration.

than the distribution of wealth in 1977 and in 1985. The poorest households (wealth less than Rs 5,000) received a share of credit that was significantly higher than their share of total wealth.[13] Secondly, in terms of credit availability the situation improved for households in the lowest wealth bracket: the ratio of the share of formal credit to the share of wealth increased from 14.7 in 1977 to 16.5 in 1985. By this measure too, segmentation has weakened.

To put this in perspective, the absolute levels of borrowing should be taken into account. In real terms the average borrowing per household from the banking sector increased among all four wealth brackets in the period 1977-85. The largest increase occurred among the poorest households (Table 6.5). Nevertheless, the absolute amount borrowed by the rich remained much larger than the amount borrowed by others. The share of the rich (households with wealth greater than Rs 50,000) in the total amount borrowed increased from 54 per cent in 1977 to 67 per cent in 1985.

TABLE 6.5: AMOUNT BORROWED FROM THE FORMAL SECTOR, 1977-1985

(in 1977 rupees)

Wealth class	Average amount borrowed		Change (in per cent)
	1977	1985	
0 < 5,000	88	229	+160
5,000 < 10,000	503	1,546	+207
10,000 < 50,000	344	1,998	+481
50,000+	12,957	17,708	+37

[13] These households accounted for 46 per cent and 37 per cent of all households in 1977 and 1985, respectively.

The dampening of segmentation between the two sectors also had a great deal to do with the spread of information; the availability of cheap loans from banks was known widely among the village population. However, the new-found access to banks among the poor is often indirect, i.e., through an intermediary (perhaps a patron), and in such cases represents a limited kind of access.[14] To sum up, there are strong signs of a weakening of segmentation, while at the same time, inequality in access to banks persists. The market for loanable funds retains a fragmented character in the sense that it is characterized by differential access to credit from the formal sector.

Rates of Interest

Has the interest rate gap between the two sectors narrowed? The coefficient of variation indicates the degree of homogeneity in interest rates on loans taken by rural borrowers. Estimates of the coefficient of variation (Table 6.6) reveal a sharp fall in dispersion within the formal market, a slight rise in variation within the informal market, and an *overall rise in variability*. The high value of the coefficient in both years indicates the non-uniformity of rural interest rates.

TABLE 6.6: VARIATION IN NOMINAL INTEREST RATES

	Coefficient of variation	
	1977	1985
Formal sector loans	93.0	27.1
Informal sector loans	82.2	85.3
All loans	94.7	109.9

[14] For example, applications for IRDP milch-cattle loans were routed through the President of the Milk Society, a rich Maravar landlord of Gokilapuram (Swaminathan, 1986).

We have data on patterns of change in real interest rates in the two sectors. Estimates of the real interest rate were obtained by calculating the weighted-average nominal rate of interest, with amount borrowed as the weight. Adjustments were made for inflation (see Appendix 6B on details of the procedure used).

There has been a *decline* in the average real rate of interest on all informal loans (Table 6.7). Given the constancy of interest rates in the banking sector, this implies, on average, an *unambiguous narrowing of the difference between interest rates in the formal and informal credit markets.*

TABLE 6.7: WEIGHTED AVERAGE REAL RATE OF INTEREST BY SOURCE, 1977-1985

(in per cent per annum)

Source	Real rate of interest	
	1977	1985
All formal sector sources	4.7	4.7
All informal sector sources	25.0	21.3
Landlords	29.8	11.2
Traders	28.3	9.7
Moneylenders	25.5	38.0
Friends & relatives	18.5	30.8
Other informal sector sources	-	19.2

The informal sector, however, is amorphous and closer scrutiny discloses a more complex and diverse pattern of change. Taking the major sources of loans, there

was a steep decline in the interest rates charged by landlords and traders and a *rise* in the interest rates charged by moneylenders and 'friends'. In 1985, moneylenders charged the highest rate -- 38 per cent per annum in real terms. (The highest unweighted nominal rate of interest in this year was 120 per cent per annum.) Perhaps it is the role of a moneylender as lender of last resort that provides the basis for the continued high real interest rate (see section 6.4). Since the amount borrowed from moneylenders and friends accounted for 58 per cent of the total amount borrowed in 1985 (see Table 6.3), the disaggregated data indicate that the lowering of interest rate was not a uniform phenomenon.

A factor that has an important effect on the interest-rate differential between the two sectors is the interest-cost of loans secured by different forms of collateral (Table 6.8). I have data on interest costs for 1985; there is no data on collateral in the 1977 survey. Two assets that are easily accepted as collateral in both sectors, namely land and gold, are not subject to a high interest rate differential. Banks charged 6 per cent per annum on loans with gold as collateral while similar loans cost 15 per cent in the informal market, resulting in an interest gap of 9 percentage points.[15] Even with a relatively standardized asset such as gold, there remain variations in quality[16] and, more generally, in access to different lenders. There are differences in the cost of access and the availability of information to different sections of borrowers. These factors help explain the persistence of an interest rate gap between the two sectors on similar types of loans. The big gap, however, arises in the case of loans *without* collateral, where the differential between the two sectors is about 28 percentage points. The persistence of this difference can be attributed, in large part, to the flexibility of informal lenders in terms of the assets they accept as collateral.

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[15] Loans against gold as collateral are disbursed under the jewel-loan scheme, a scheme that is very popular in rural Tamil Nadu. Gold jewellery is deposited at the bank, and the associated loan received by a household is determined by a fixed norm, i.e. an amount per unit of gold.

[16] For example if a poor household has a small gold trinket with stone inlay, it may not be acceptable to a bank while a village moneylender would accept it readily.

TABLE 6.8: AVERAGE REAL RATE OF INTEREST ON LOANS BY TYPE OF COLLATERAL, 1985

(in per cent per annum)

Type of Collateral	Real rate of interest		
	Formal Sector	Informal Sector	All
Immovable property	4.6	14.4	9.8
Gold	6.1	15.2	9.1
Movable assets	-	64.0	64.0
Legal paper	5.3*	28.9	23.6
No collateral	4.0	32.5	28.5

Note: * denotes estimates based on less than 5 observations. Immovable property refers to land and buildings (particularly, the latter), movable assets refers to household goods, e.g., utensils, and legal paper refers to the use of a promissory note.

By estimating the weighted average real interest cost of a portfolio of loans held by different households, it is possible to isolate the relation between economic status and the interest cost of a credit portfolio. Table 6.9 shows the real interest rate paid by borrowers from different wealth classes. The change in interest rates over the study period is impressive. For households with assets worth less than Rs 5,000, the interest rate declined by 15 percentage points on average. Households from all the other wealth classes also experienced a drop in interest rate but the fall was steepest for the poorest households.

TABLE 6.9: AVERAGE REAL RATE OF INTEREST BY WEALTH OF BORROWER, 1977-1985

(in per cent per annum)

Wealth class (in 1977 rupees)	Real rate of interest	
	1977	1985
0 < 5,000	32.3	16.9
5,000 < 10,000	18.0	12.9
10,000 < 50,000	24.5	19.7
50,000+	12.2	11.6

TABLE 6.10: AVERAGE REAL RATE OF INTEREST BY WEALTH OF BORROWER AND SECTOR OF CREDIT, 1977-1985

(in per cent per annum)

Wealth class (in 1977 rupees)	Real rate of interest			
	Formal Sector		Informal Sector	
	1977	1985	1977	1985
0<5,000	1.5	2.8	37.7	60.2
5,000<10,000	-0.1	3.2	30.2	35.5
10,000<50,000	-1.5*	4.7	27.9	31.3
50,000+	5.2	5.1	22.2	16.9

Note: * denotes estimates based on less than 5 observations.

Further disaggregation, however, indicates that the interest cost of a portfolio of informal loans did not decline, except among the richest category (Table 6.10). In

fact, the annual interest charged rose from 38 per cent to 60 per cent for households with assets less than Rs 5,000. On informal sector loans, real interest rates declined only for households in the top wealth class.

The overall improvement in interest cost of a loan for the relatively poor is, therefore, not the result of an absolute decline in the cost of credit from the informal sector but a consequence of the shifting sectoral distribution of their credit portfolio. The shift away from the informal sector is pronounced among poorer households (see Table 6.11). Among the poorest wealth category, the proportion of total credit that was obtained from the formal sector increased from 15 per cent to 75 per cent over the 8-year period. If the receipt of cheap bank loans is a temporary phenomenon, then these estimates of current weighted interest rate underestimate the true cost of credit in the future.

TABLE 6.11: SHARE OF FORMAL CREDIT IN TOTAL CREDIT AMONG DIFFERENT WEALTH CLASSES, 1977-1985

(in per cent)

Wealth class (in 1977 rupees)	Share of formal credit in total credit of each wealth class	
	1977	1985
0 < 5,000	15.0	75.5
5,000 < 10,000	40.5	70.2
10,000 < 50,000	11.4	40.9
50,000+	55.4	44.8
All	47.5	47.8

6.3 Structural Change in the Credit Market and Welfare of the Poor

We now turn to a specific group -- households in chronic or hard-core poverty -- and examine the effects on their well-being of changes in the agrarian credit market.[17] The objective of this exercise is to assess the effectiveness of credit policy in a context where other major redistributive policies are absent. The exercise assumes that more credit from the banking sector, which carries a subsidy element (a lump-sum component and a low interest component) results in at least a transitory welfare-improvement for the borrower. In the context of mass poverty and high indebtedness, it is also assumed that a decline in interest rates in the informal market is a gain for a borrower-household.

Magnitude and Share of Formal Credit

For households in chronic poverty the real value of credit from the formal sector increased 607 per cent over the 8-year period (Table 6.12), a remarkable absolute increase in the magnitude of credit from the banking sector. This absolute increase is reflected in the changing composition of their credit portfolio, in which the share of informal credit declined considerably. Credit from the formal sector, which equalled Rs 167 per household in 1977, increased nearly seven-fold in real terms to Rs 1,117 in 1985. If we assume that a quarter of each bank loan represents a subsidy element, this embodies a direct transfer of about Rs 300 per household in 1985.[18] It is

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[17] An important issue is whether credit is the most efficient or desirable means of transferring resources. This requires a comprehensive assessment of development policy and is beyond the scope of this chapter.

[18] This estimate is based on the lump-sum subsidy component which varied from 25 per cent for small farmers to 33 per cent for marginal farmers and agricultural labourers, and to 50 per cent for members of scheduled castes and scheduled tribes. However, as argued in section 5.3, a significant proportion of the subsidy element may be dissipated in transactions costs associated with a bank loan.

also noteworthy that one in every two households in hard-core poverty received a bank loan in 1985 as compared to one in every twelve households in 1977.

TABLE 6.12: AMOUNT BORROWED BY HARD CORE POOR, 1977-1985

(in 1977 rupees)

Sector	Amount borrowed	
	1977	1985
Formal sector	4,000 (35.3)	26,805 (69.5)
Informal sector	7,342 (64.7)	11,729 (30.5)
Total amount borrowed	11,842 (100)	38,534 (100)
Amount borrowed per household	167	1,117

Note: Figures in parentheses refer to the percentage share of total credit in each year.

In addition to the absolute rise in credit from the formal sector, the share of formal credit received by chronically poor households (as a proportion of total formal credit) increased from 2.7 per cent in 1977 to 5.9 per cent in 1985. However, their share of total wealth remained very low, with a slight increase over the period (from 0.6 per cent in 1977 to 0.7 per cent in 1985). It follows that the immobile households had a higher proportionate share (relative to wealth) of formal credit in 1985 as compared to 1977. (The ratio of share of formal credit to share of wealth increased from 4.2 to 8.6.) Thus the distribution of formal credit resources was more equitable than the distribution of wealth in both years, and shifted in favour of the chronically poor over the 8-year period.

Rates of Interest

On a portfolio of loans held by housholds in the hard-core poverty group, the overall weighted real rate of interest increased slightly from 20 per cent per annum in 1977 to 22 per cent in 1985. On further disggregation a big *rise* in average real interest rate paid on informal sector loans was observed, from 28 per cent per annum to 65 per cent (see Table 6.13). Except for traders, all informal lenders charged an interest rate above 40 per cent per annum in 1985.[19] In addition, there was a significant rise (of over 30 percentage points) in interest rates charged by moneylenders and 'friends', who together accounted for three-quarters of the total informal debt in 1985.[20] It is noteworthy that *the households in chronic poverty were the only group in the panel to face a higher overall interest rate in 1985*. All others experienced a decline.

How is this phenomenon to be explained? One clue is provided by details of collateral offered against loans in the informal sector. Data from 1985 show that informal sector interest rates were particularly high for loans secured through movable assets (55 per cent), promissory notes (65 per cent), and loans with no collateral (75 per cent). The lack of collateral among immobile households provides an explanation for the continued high cost of credit.

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19 The decline in interest rate in the trader category is partly due to changes in definition, i.e., composition of the group. Traders referred to merchants, millers and commission agents in 1977 while it included several petty shopkeepers and traders in 1985. Also borrowing from traders and landlords could have other costs that are being neglected here, e.g. tying with contracts in other markets.

20 Moneylenders accounted for 31 per cent and 25 per cent of informal credit in 1977 and 1985, respectively; friends accounted for 60 per cent and 50 per cent, respectively. In 1977 there was no credit from landlords; in 1985 their share was nearly 16 per cent.

TABLE 6.13: WEIGHTED REAL RATE OF INTEREST BY SOURCE, HARD-CORE POOR, 1977-1985

(in per cent per annum)

Source	Rate of interest	
	1977	1985
All loans	19.6	21.8
Formal sector	4.3*	3.2
Informal sector	28.0	64.8
Moneylender	42.8	99.0
Landlord	-	68.2
Trader	40.8*	5.3*
Friends & relatives	18.4	53.4
Other private source	40.8*	48.4*

Note: * denotes estimates based on less than 5 observations.

6.4 Concluding Remarks

To sum up, it is evident that the effects of changes in the structure of rural credit on chronically poor households have been complex and multi-directional. On the one hand, they received more credit from the formal sector in both absolute and relative terms, credit that embodied a direct transfer of resources and hence at least a transitory welfare-improvement. On the other hand, the terms on which informal credit was available, namely rates of interest, have remained high, and in certain cases, have increased. The terms and conditions of loans in the informal sector were wide-ranging and closely linked to the economic status of the borrower. The negative

association between interest rate and household wealth suggests that collateral is an important attribute of a loan transaction.[21] The contradictory tendencies observed in relation to the two segments of the credit market make it difficult to make an unambiguous statement on welfare change.

The rapid rural expansion of banking has left an indelible mark on the village credit system. However, the improved distribution of cheap credit has not resulted in long-run improvement in the form of a decline in inequality in the distribution of wealth. Better access to cheap credit did not lead to greater accumulation of wealth among the relatively poor households.[22] This shifts attention from credit to profitable investment opportunities which would enable a fruitful utilization of credit, i.e., ways of converting the transitory gain into a permanent improvement. If the long-run welfare of those in the hard-core of poverty is our concern, then existing credit-based interventions appear inadequate unless a higher productivity of credit is ensured.

A paradoxical feature of rural credit in Gokilapuram that requires explanation is the persistence of high interest rate charges on loans from moneylenders (and 'friends') in a period when real interest rates declined sharply among other informal lenders, e.g., landlords and traders. An explanation may be found in inter-temporal linkages and the role of moneylender as lender of last resort. The long-run nature of relations between lender and borrower in the informal market provides the lender the power to threaten termination of future credit. This threat has implications for interest payments, for default, and for the type of credit transaction and can be an important

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21 This is on the assumption that household wealth is a good collateral substitute. This observation supports the new theories of agrarian credit markets which give a central role to collateral in a credit transaction, e.g., Bhaduri (1983).

22 If we assume that some gains did accrue then the stagnation in terms of wealth implies that the benefits were temporary, e.g., went into immediate consumption.

variable in a loan transaction.[23] A moneylender can use threat of termination of future credit to enforce a high rate of interest on a loan transaction. Borrowers are forced to accept a high rate of interest in order to keep the option of future credit open from this source. If, for instance, loans from the formal sector are viewed as temporary or as a one-off phenomenon then a borrower is not assured of a future flow of credit from the formal sector. To insure against future need for credit in times of indigence or crisis, borrowing households may find it worthwhile to build up a reputation of good repayment with a moneylender, the lender of last resort, even at an exorbitant price. A similar argument could be made for the category of 'friends', who are often persons who can be relied on to provide credit in times of need.

To conclude, the growth of rural banking and special credit policies have improved access to the formal sector among the relatively poor. While inequality in the distribution of formal (cheap) credit has been reduced, the long-term impact has been mixed, witness, for instance, the concurrent rise in inequality in the ownership of wealth. The implications of these changes in the rural credit market for a cheap credit policy will be taken up in the concluding chapter.

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[23] The effects of the threat of termination on a credit contract have been elegantly modelled by Stiglitz and Weiss (1983).

Appendix 6A

On Probit and Logit Analysis

The probit and logit procedures are useful tools to assess the extent of discrimination in the credit market when there is a qualitative dependent variable. We use it to support our observations on the relationship between access to formal credit and initial level of wealth. If a strong positive association is established then it indicates that the credit market helps to perpetuate existing inequalities in the distribution of resources.

Method and Application to Panel Data

The probit model assumes a linear relationship between the underlying response variable and explanatory factors, which can be represented as:

$$y_i^* = b' x_i + u_i$$

To represent y_i^* which is unobserved, a dummy variable y is defined, such that

$$y = \begin{cases} 1 \text{ if } y_i^* > 0 \text{ or the event occurs} \\ 0 \text{ otherwise.} \end{cases}$$

So $b' x_i$ is the conditional expectation or the probability that the event will occur given x_i.

$$\text{Prob}\,(y_i = 1) = \text{Prob}\,(u_i > b' x_i) = 1 - F(b' x_i)$$

where F is the cumulative distribution function for u. The functional form for F will depend on the assumption made about u_i. In the probit model u_i is assumed to be disributed normally ($u_i \sim IN\ (0, \sigma^2)$) whereas the cumulative distribution of u_i is assumed to be logistic in the logit model.

Unless samples are large, the logit and probit method are unlikely to give very different results since the cumulative normal distribution and logistic distribution are close to each other except at the tails. It must however be noted that estimates of b from the two methods are not directly comparable (see Maddala, 1986). Also, with a binary dependent variable, low values of R^2 need not symbolize a poor fit since they are predicting a probability.

With panel data one can estimate a lagged index model of the type:

$$y_{it}^* = ay^*_{it-1} + b'x_{it} + u_{it}$$

There is a choice here between using a lagged dummy variable (y_{it-1}) and a lagged index (y^*_{it-1}). In the latter case it is the actual probability of an event that is used as an independent variable and not the realized value.[1]

When there are fixed effects (i.e., individual specific factors that are time invariant) it has been shown that with small T and large N, estimates of equations with a qualitative dependent variable are likely be inconsistent (see Maddala, 1987).

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[1] This type of distinction is often made in unemployment theory where the propensity to be unemployed in the previous period is seen as distinct from the fact of actually being unemployed in the last period. This also highlighted the importance of considering the duration of unemployment as a key variable.

One way of correcting for this is to use changes in x_i as an explanatory variable. So the equation takes the form:

$$y^*_{it} = ay^*_{it-1} + b'(x_{it} - x_{it-1}) + u_{it}$$

The problem of inconsistent estimates is likely to be severe in autoregressive logit equations. If data were available for several time periods then conditional logit estimates could be used to correct for this (Maddala, 1987).

Before interpreting our results a few qualifications associated with the panel data set need to be pointed out. First, the sample is relatively small and subdivision can result in cells with very few numbers. In fact, we rejected any estimation with the dependent variable taking more than three values because of the problem of small numbers in certain cells. In the lagged index case, the number of observations is further reduced (since we require $y_{it}>0$ and $y_{it-1}>0$). Secondly, the analysis is based on the proportion or number of bank loans received rather than on their value. All loans, irrespective of size, get the same weight in the analysis. This procedure therefore ignores the magnitude of formal credit received by different households.

Results

The estimation was undertaken in two stages. First, the dependent variable was characterized as a binomial variable with a value of 1 if a household received even a single bank loan and zero otherwise. On this basis, probit and logit functions were estimated for both years (see Tables 6A to 6D). Secondly, a multinomial variable was created by defining p, the proportion of loans received from the formal or banking sector by each household and defining the dependent variable y as:

$$y = \begin{cases} 0 \text{ if } p = 0 \\ 1 \text{ if } 0 < p \leq 0.5 \\ 2 \text{ if } 0.5 < p \leq 1 \end{cases}$$

An ordered probit and multinomial logit were estimated for both years using the second specification, the results are reported in Tables 6E to 6G.

Beginning chronologically with 1977, the probit functions performed reasonably well (Tables 6A and 6E). With the ordinary least squares estimate significant positive values were obtained for current wealth, current indebtedness and current land wealth. With a maximum-likelihood estimator, the results were slightly weaker. (Land wealth and indebtedness were significant at a 10 per cent level of significance, wealth was only significant at the 15 per cent level of significance.) In the multinomial case, estimates from an ordered probit equation (in Table 6E) show significant positive coefficients for household wealth and land wealth though not for indebtedness.

In other words a higher level of initial household wealth, greater land wealth, and larger initial indebtedness increase the probability of gaining access to bank credit. An alternative logistic estimation (Table 6C) does not perform as well; only the coefficient of land wealth was significant in the binomial logit. (There are, however, some interesting indicators in the multinomial logit (Table 6G). While the wealth variable was negative but not significant for the first event, y_1 or the probability of getting some bank loans, the coefficient was positive and stronger (significant at the 15 per cent level) for the second event, y_2. While a bank loan may be available to households irrespective of their wealth, households with more than half of their portfolio of loans earmarked to the formal sector tend to be those with higher levels of wealth.)

To sum up, a discrimination based on wealth resulted in an unequal access to credit from financial institutions in 1977.2

The situation was remarkably different in 1985; none of the variables was significant in any of the probit estimates (Tables 6B and 6F). In the binomial estimate, the coefficients of current wealth and land were positive while lagged wealth, caste and occupation took on negative values (i.e., lower caste and lower status occupation increased the probability of a bank loan). The negative coefficients on caste and occupation concur with the interventionist credit policies that are targeted towards the weaker sections of the population, in particular landless households and those from the scheduled castes.

The poor fit of the probit equations has two implications: either the estimated relationship is non-linear or there is no strong relation between the dependent variables and explanatory variables in this model. A logit equation did not perform any better; there were no significant variables in the binomial logit (Table 6D).

Using the panel, two simple lagged index logit equations for access to banks in 1985 were estimated:

(i) with the probability of receiving a bank loan in 1977 as an explanatory variable; and

(ii) with the change in wealth (1977-85) as an additional explanatory variable.

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2 In a similar exercise Binswanger and Rosenzweig (1986) estimate a probit function for borrowing from different sources based on data for 104 households in 3 villages of South India over the period 1975-76 to 1984-85. They show that wealth increases the probability of obtaining loans from moneylenders and commercial banks, but not from other informal lenders and government agencies. Initial liabilities, on the other hand, tend to decrease the probability of obtaining a loan from commercial banks while increasing the chances of credit from cooperatives and other informal lenders. Unfortunately, the analysis does not attempt to map changes over and within the 9 year period.

The results were not significant. Estimates of the lagged index model were based on only 56 households, those with bank loans in both years. This makes the sample even smaller and may be partially responsible for the very poor results (these have not been reported).

To conclude, the weak estimates from the probit and logit equations in 1985 demonstrate the absence of a positive relation between wealth and access to banks in contrast to a segregation based on wealth in 1977.

TABLES ON PROBIT AND LOGIT ANALYSIS

TABLE 6A: PROBABILITY OF BORROWING A LOAN FROM THE FORMAL SECTOR, GOKILAPURAM, 1977

I. ORDINARY LEAST SQUARES ESTIMATES

Explanatory variables	Regressions			
	1	2	3	4
Constant	0.25*	0.25*	0.23*	0.24*
Wealth (1977)	0.74E-06* (3.96)	-	-	0.41E-06 (1.69)
Occupation	-	-	-	0.77E-04 (0.01)
Caste	-	-	-	-0.19E-01 (-0.55)
Debt ('77)	-	0.14E-04 (4.1)*	-	0.96E-05 (2.04)
Land assets	-	-	0.10E-05 (3.9)*	-
R^2	0.15	0.16	0.15	0.16
χ^2	14.7	16.0	14.7	19.1

II. MAXIMUM LIKELIHOOD ESTIMATES

Constant	-0.9*	-0.9*	-0.9*	-0.7*
Wealth ('77)	0.13E-04 (2.52)***	-	-	0.82E-05 (1.1)
Occupation	-	-	-	-0.99E-03 (-0.05)
Caste	-	-	-	-0.36 (-1.0)
Debt ('77)	-	-	0.12E-03 (3.0)*	0.85E-04 (1.42)
Land assets	-	0.2E-04 (2.6)**	-	-
Log-likelihood	-39.8	-39.5	41.0	-38.2
χ^2	23.5	24.1	21.0	26.7

Note: Wealth refers to total household wealth, and land assets to the value of land only. Occupation has been coded into three groups in ascending order of economic status. Caste takes a value of zero for scheduled caste households and one otherwise, and debt is the outstanding debt of households. Levels of significance:*values are significant at the 5% level, ** at 10% and *** at 15%, respectively. t-values are given in parentheses.

TABLE 6B: PROBABILITY OF BORROWING A LOAN FROM THE FORMAL SECTOR GOKILAPURAM, 1985

I. ORDINARY LEAST SQUARES ESTIMATES

Explanatory variables	Regressions			
	1	2	3	4
Constant	0.55*	0.56*	0.56*	0.65*
Wealth ('85)	0.13E-06 (1.25)	0.25E-06 (1.52)	-	0.24E-06 (1.1)
Wealth ('77)	-	-0.31E-06 (-0.9)	-	-0.27E-06 (-0.7)
Occupation	-	-	-	-0.32E-01 (-0.4)
Caste	-	-	-	-0.49E-01 (-1.2)
Debt ('85)	-	-	-	0.36E-06 (0.1)
Land assets	-	-	0.85E-07 (1.3)	-
R^2	0.006	0.005	0.008	0.011
χ^2	1.58	2.4	1.7	4.1

II. MAXIMUM LIKELIHOOD ESTIMATES

	1	2	3	4
Constant	0.13	0.11	0.43	0.45
Wealth ('85)	0.56E-06 (1.1)	-	-0.49E-05 (0.5)	0.24E-05 (1.2)
Wealth('77)	-	-	-	-0.18E-05 (-1.1)
Occupation	-	-	-0.7E-01 (-0.4)	-0.11 (-0.5)
Caste	-	-	-0.17 (0.19)	-0.18 (-0.9)
Debt ('85)	-	-	-	-0.74E-06 (-0.1)
Land assets	-	0.38E-06 (1.1)	0.37 (0.6)	-
Log-likelihood	-55.4	-55.3	-53.9	-53.3
χ^2	2.1	2.3	5.0	6.3

Note:Total land acreage was introduced in these equations but showed no significant coefficient. Other variables are defined as in Table A.

TABLE 6C: BINOMIAL LOGIT ESTIMATE OF ACCESS TO BANKS IN 1977,GOKILAPURAM: MAXIMUM LIKELIHOOD ESTIMATES

Variable/Regression	1	2	3
Constant	-1.5*	-1.5*	-1.26*
Wealth ('77)	0.22E-04***	-	0.14E-04
	(2.48)		(1.18)
Occupation	-	-	-0.3E-02
			(1.3)
Caste	-	-	-0.64
			(-1.0)
Debt ('77)	-	-	0.13E-03
			(1.3)
Land assets	-	0.34E-04**	-
		(2.5)	
Log-likelihood	-39.8	-39.6	-38.2
χ^2	23.4	24.1	26.6

Note: Definitions same as in Table A.

TABLE 6D: BINOMIAL LOGIT ESTIMATE OF ACCESS TO BANKS IN 1985, GOKILAPURAM: MAXIMUM LIKELIHOOD ESTIMATES

Variable/Regression	1	2	3
Constant	0.22	0.24	0.72
Wealth ('85)	0.91E-06	0.31E-05	-0.55E-05
	(1.0)	(1.2)	(-0.2)
Wealth ('77)	-	-0.29E-05	-0.26E-05
		(-1.0)	(-0.8)
Occupation	-	-	-0.13
			(-0.4)
Caste	-	-	-0.28
			(-0.9)
Debt ('85)	-	-	0.22E-05
			(0.15)
Land assets	-	-	0.60E-05
			(0.4)
Log-likelihood	-55.4	-54.5	-53.3
χ^2	2.0	3.9	6.4

Note: Definitions same as in Table A.

TABLE 6E: PROBABILITY OF RECEIVING A LOAN FROM THE FORMAL SECTOR IN 1977 (MULTINOMIAL OR ORDERED PROBIT): ORDINARY LEAST SQUARES ESTIMATES

Variable/Regression	1	2	3
Constant	0.35*	0.32*	0.35*
Wealth ('77)	0.64E-06*	-	0.4E-06
	(3.1)		(1.5)
Occupation	-	-	-0.25E-02
			(-0.4)
Caste	-	-	-0.25E-01
			(-0.6)
Debt ('77)	-	-	0.72E-05
			(1.4)
Land assets	-	0.9E-06*	-
		(3.1)	
R^2	0.12	0.12	0.11
χ^2	9.2	9.3	11.7

Note: Maximum likelihood estimates were also obtained but they did not display any significant results. However, all the coefficients were of the same sign.A regression with both wealth and land assets gives a poorer fit and reverses the sign on land wealth. Since land is a large component of total wealth, it is not desirable to use both in the same equation.

TABLE 6F: PROBABILITY OF RECEIVING A LOAN FROM THE FORMAL SECTOR IN 1985 (MULTINOMIAL OR ORDERED PROBIT): ORDINARY LEAST SQUARES ESTIMATES

Variable/Regression	1	2	3	4
Constant	0.65*	0.66*	0.65*	0.80*
Wealth ('85)	0.1E-06	-	0.27E-07	0.2E-06
	(1.1)		(0.11)	(1.1)
Wealth ('77)	-	-	0.23E-06	-
			(0.36)	
Occupation	-	-	-	-0.4E-01
				(-0.5)
Caste	-	-	-	-0.68E-01
				(-1.7)
Debt ('85)	-	-	-	-0.2E-05
				(-0.7)
Land assets	-	0.7E-07	-	-
		(1.1)		
Land acreage	-	-	-	-0.38E-03
				(-0.04)
R^2	0.016	0.01	0.01	0.07
χ^2	1.1	1.2	1.2	5.6

Note: The maximum likelihood estimates were weaker, all variables including the constant term were not significant. The signs of the coefficients were similar.

TABLE 6G: MULTINOMIAL LOGIT ESTIMATE OF ACCESS TO BANKS IN 1977, GOKILAPURAM: MAXIMUM LIKELIHOOD ESTIMATES

Variable/Regression	1		2	
	y1	y2	y1	y2
Constant	-1.2*	-3.0*	-0.7*	-2.9*
Wealth '77	0.19E-04	0.24E-04	0.2E-04	0.2E-04
	(1.96)	(2.4)***	(1.24)	(1.58)
Occupation	-	-	-0.1E-01	-0.4E-01
			(-0.3)	(-0.4)
Caste	-	-	-0.79	0.31
			(-1.1)	(0.1)
Debt('77)	-	-	0.4E-04	0.2E-04
			(0.4)	(0.2)
Log-likelihood	-44.3		-43.0	
χ^2	27.7		30.3	

Note: Since there are three outcomes, the first is normalized to zero and y1 refers to the event of a positive proportion of bank loans, but less than half, and y2 to the event of more than half of total loans, coming from the formal sector.

Appendix 6B

Estimation of the Real Rate of Interest

To estimate the real rate of interest, the expected rate of inflation needs to be subtracted from the nominal rates of interest. The task of estimating inflation is not simple. The first question is the period over which the rate of inflation is to be estimated. Since we do not have full information on the period and duration of each loan, we have chosen the time period that is most appropriate on the basis of the available information.

From the follow-up survey in 1985 we have information on the date on which a loan was received but these particulars are not available for 1977. In the 1985 study it was observed that 72.5 per cent of loans in the formal sector and 84 per cent of loans in the informal sector were taken within two years (24 months) prior to the survey. The bulk of loans is thus less than two years old. In the banking sector, the duration of a loan is fixed at one year for crop loans and upto three years for medium-term loans which are the most frequent type in our panel. There are a few long-term loans, stretching over ten years or more, given for purposes such as land improvement. Many of the medium-term loans are repaid before the term of the loan expires, i.e., within 1 to 2 years. In the informal market, the term of a loan is on the whole specified less rigidly. Some loans are continually rescheduled for years, whereas others are repaid within a year. From impressionistic evidence, it appears that a large proportion of loans in the informal market tend to be of short duration, often repaid after the first crop harvest.

Putting together this information, we suggest that the expected rate of inflation be estimated over a three-year period: two years prior to the survey and one year after. This would probably cover the period when the majority of loans were obtained and

repaid and would thus be the relevant time period. Ideally, if the date and duration of each loan were known, a different rate of inflation could be applied to each case. Having selected a three-year period on the basis of evidence from 1984-85, the same is applied somewhat arbitrarily to the earlier period. Since there is no information on date or duration of loans, we cannot arrive at any other suitable time period.

So the rate of inflation for the first period is estimated on the basis of price movements between the calendar years 1976 and 1978. For the second period, since price information is only available until 1985 we use two years prior to the survey and estimate inflation between 1983 and 1985. Unfortunately, monthly data were only available until 1982-83 (from *Season and Crop Reports*), and we are thus restricted to the use of annual figures.

The rate of inflation was estimated using a log-linear regression of prices on time. The estimates based on the Wholesale Price Index for Tamil Nadu show an annual inflation of 4.2 per cent in the first period and a slightly higher rate of 6.6 per cent in the second period.

A similar exercise was undertaken using monthly price data from the All India series on Wholesale Prices. The results are not very different. For the first period (i.e., May 1976 to April 1978) the rate of inflation was estimated to be 4.4. per cent per annum, while for the second period (October 1983-September 1986) the annual rate of inflation equalled 5.6 per,cent. Using more information (monthly price data) the estimates turn out to be roughly of the same order of magnitude though the rise in inflation is a little lower with the all India figures. Hence our estimates of the real rate of interest are not very sensitive to the use of a particular price series. Of course, a major drawback of the official series is the absence of price data disaggregated by wealth classes.

7

SUMMARY AND CONCLUSIONS

Before drawing substantive conclusions from this study we shall re-state some of its limitations. First, errors in data collection and biases created by methods of estimation should be kept in mind when interpreting specific results on Gokilapuram. Secondly, the problems of generalising from a panel study must be recognized. The objectives of this thesis have been two fold: (i) to set out a methodological framework for the analysis of panel data and economic mobility among rural households and (ii) to apply this to the case of a village in Tamil Nadu. The conclusions of this thesis are also presented in two parts: first, the results of the empirical application to Gokilapuram and their implications for policy; and secondly, certain methodological issues with respect to panel data.

7.1 Inequality, Mobility, and Structural Change

This thesis attempted an investigation of dynamic aspects of poverty and inequality. Analyses of aspects of poverty and inequality, of the nature of economic mobility among different sections of the population and of the characteristics of households that were chronically poor, were developed by means of an illustrative case study. The case study examined panel data collected in Gokilapuram, a village in Tamil Nadu, south India.

A major conclusion of the empirical study was the extreme disparity in the ownership of wealth in both years of the study, 1977 and 1985, in Gokilapuram village. Building on a highly unequal base in 1977, inequalities worsened over the

eight years among panel households.[1] When household assets were disaggregated into land and non-land components and productive and non-productive components, the data showed that the major contribution to rising inequality came from increasing concentration in the ownership of land and productive assets. When inequality indices were decomposed by occupational categories, the data showed substantial disparities between households that pursued different occupations; the major contribution to inequality was made by the between-group component.

A high degree of inequality was also observed for Tamil Nadu in the years 1971-72 and 1981-82. The tendency towards increasing inequality cannot be confirmed for Tamil Nadu with currently available aggregate data.

An important contributor to widening inequalities in the ownership of wealth is a differential savings rate between rich and poor. There is evidence at the national level (e.g. NCAER, 1972) to indicate a rise in savings-income ratio with income.[2] Using our data on assets and liabilities, a simple measure of savings per household (change in assets minus change in liabilities) can be estimated. This shows an increase in savings per household with a rise in wealth (except for households in the sixth decile). However, a comparison of the two extremes establishes a significant divergence in the level of household savings.[3] The persistence of inequality can be explained by several structural factors, among others, the failure of land reform, the

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[1] This holds for the village as well if we assume that the socio-economic structure of the village remained unchanged.

[2] The NCAER (1972) study shows net savings, and the savings-income ratio to be a positive function of income and education among rural households. An earlier study showed a substantive difference in the savings ratio as between landed and landless households (NCAER, 1964).

[3] In real terms, savings per household equalled Rs 3,151 and Rs 4,447,134 for the bottom and top deciles, respectively.

absence of a progressive agricultural income tax, differential access to external resources such as credit, public infrastructure, and so on.

The growth process in Gokilapuram, a relatively modern and commercialized village, located in a region with an advanced level of agricultural production, did not exhibit any tendency towards equalization in the ownership of productive resources. It has been argued that a concentration of productive wealth, especially land, creates conditions in favour of immiserising growth (Griffin, 1981), a process of growth where poorer households become worse off over time. On average, households in the bottom four deciles experienced a rise in real wealth between 1977 and 1985.[4] Thus while poorer households became *relatively* worse off (due to a rise in inequality), evidence from Gokilapuram does not substantiate a theory of absolute impoverishment in terms of household asset holdings.

Were these inequalities moderated by a high degree of mobility? If the persons in the lowest decile, for example, were there only temporarily, the perpetuation of inequality may be viewed less harshly. The picture of the economy that emerged from the estimates of mobility was neither one of a stratified economy that was totally rigid nor one of a highly mobile, open society. While households in all rungs of the economic ladder experienced some mobility, the overall impression was one of low movement. Mobility was limited both in terms of the small number of households who moved across wealth deciles in the eight-year period, and in terms of the short distances they moved. Mobility was least in the upper wealth deciles where households consolidated their economic position. Mobility was also relatively low in the lower deciles of household wealth and landholdings. When per capita household wealth was used as the classificatory variable, the data indicated greater mobility between groups than when aggregate household wealth was used as the classificatory

[4] Some individual households may have experienced an absolute impoverishment.

variable. With respect to occupational mobility, the dominant image was one of stability. It can be argued that mobility was bounded by constraints inherent in the existing economic structure. If we assume total mobility to be composed of structural and exchange components, the case study suggests it was the lack of structural movement that constrained overall mobility.[5] Large-scale changes in the structure of the village, in the ownership of and control over resources, are needed to catalyse mobility.

The combination of persistently high levels of inequality and relatively low economic mobility in the Gokilapuram panel suggest that structural change is a precondition for a process of growth that is more egalitarian, and affords greater opportunities for mobility.

7.2 Chronic versus Transitory Poverty: Implications for Theory and Policy

This thesis attempted to distinguish between households that were in chronic poverty and those that were in temporary poverty. This classification was based on the position of households in a wealth-ranking in 1977 and in 1985. When classified in this way, the differences between households in chronic poverty and those in transitory poverty were such as to suggest that the distinction between them could be relevant to the formulation of anti-poverty policy. The following paragraphs attempt to describe how the distinction between the hard-core poor and the transitory poor *in our panel* may be relevant to formulating anti-poverty policy. The suggestions here are, of course, very tentative. Whether or not anti-poverty policy will benefit by differentiating between transitory poverty and chronic poverty, and, if so, how the

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5 This distinction is not relevant to a decile-based classification, as marginal distributions remain unchanged, but the limited change in land ownership and occupational structure imposes a constraint on mobility.

distinction between them is to be incorporated into policy, requires large-scale reasearch in different regions, and must be based on the analysis of a wider range of variables.

This thesis attempted to take up issues raised in the literature on the identification of target groups for poverty alleviation programmes. A standard definition of such a target group is "a group of people who are not only all poor but also relatively homogeneous with respect to the effect that a given set of policy instruments might have upon them" (Bell and Duloy, 1974). Bell and Duloy have pointed out, "this approach requires that the definition of a target group should, as far as possible, reflect causes rather than symptoms of poverty"(ibid.:91). Most discussions of target groups for poverty alleviation in developing countries have ignored the time dimension of poverty, the distinction between long-term or chronic poverty and short-term or transitory poverty. A static measure of poverty, say x percent in year t, encompasses households in two types of poverty status: (a) those who were in poverty only in year t, the transitory poor; and (b) those who remained in poverty over a longer-term, people in chronic poverty. The panel data showed that 28.9 percent of panel households remained poor (in the bottom 40 percent) in the years 1977 and 1985 while 26.5 percent of households were poor in one of the years. Of the households in the panel, in other words, 55.4 percent were poor in at least one of the two years.

These two poverty groups, i.e., those in chronic poverty and those who were poor in one of the two study years, can be expected to differ in terms of the factors underlying their condition of poverty. A chronically poor household may have a persistently low earnings potential if it is headed by a disabled person, while another household may experience a transitory dip into poverty, for example, due to the illness of a working member. Both would be classified as poor by a simple static

measure but the strategies to alleviate poverty should differ considerably between the two.

Recognition of this dynamic aspect of poverty can affect the choice of definition for measurement of poverty. It could, for instance, affect the choice of variable with respect to which chronic and transitory poverty are to be measured. If variables differ in the degree of volatility, for example, income may have a larger transitory component than wealth or food expenditure,[6] then the degree of persistence of poverty will also vary with the choice of variable.

The distinction between chronic and transitory poverty has important implications for public policy. First, it demands the setting of new priorities. If chronic poverty is accepted to be the more distressful of the two types of poverty, then the emphasis of anti-poverty policies should shift towards the identification of households in long-run poverty and to assisting them first. Secondly, to operationalize the distinction, it is necessary to identify the socioeconomic characteristics of households in chronic poverty (see below). Thirdly, on account of dissimilarities between households in the two groups, different sets of policies will have to be designed to meet the specific needs of each group.[7]

A preliminary attempt was made to build profiles of poverty, and to identify characteristics of households with differing poverty conditions over time. While no firm conclusions can be stated on the basis of a small case study, the analysis provided several testable hypotheses. For instance, it was argued that upward

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6 The extent of variability in different indicators of long-run welfare is examined by Anand and Hariss (1986). For example, they note that short-run per capita income is a noisy indicator of long-run welfare or long-run average income.

7 It could even be argued that policies to improve the status of the chronically disadvantaged will need to incorporate a measure of structural reform.

(downward) mobility may be associated with a rise (fall) in rates of work participation. The chronically poor were found to live in larger households with relatively young members as compared to groups in transitory poverty. Manual workers were predominant among both the transitory and hard-core poor. Such hypotheses on the demographic and occupational characteristics of households in chronic poverty and on the pattern of asset holdings among them need further investigation. The identification of features of households in persistent poverty will help to identify target groups and will help to formulate suitable poverty alleviation strategies.

7.3 Mobility, Government Intervention and the Design of Policy

The thesis examined specific types of government intervention that are aimed at increasing economic mobility among poor households. The evaluation of the Integrated Rural Development Programme (IRDP), which is the government's major anti-poverty programme, used a wealth-based indicator to assess the impact of the programme (Chapter 5). A comparison of households who received assistance under the IRDP with those who did not led to some interesting findings. It was a feature of the programme that the beneficiaries were, for the most part, drawn from among the relatively poor. However, the assistance provided by IRDP did not significantly raise the level of the productive resource base of beneficiary households or serve to significantly diversify their resource base. While some gains accrued to beneficiary households in the form of direct transfers (particularly on account of subsidy elements), the long-run contribution of the project to poverty alleviation was limited in Gokilapuram. Furthermore, the patterns of asset accumulation and of mobility were very similar as between households receiving assistance and households that were poor but unassisted. In other words, the data did not indicate any major difference in the pattern of wealth accumulation as between IRDP beneficiary and non-beneficiary

households. The evaluation of IRDP in this thesis has focussed on one major aspect of the programme, namely the creation of assets. As households are identified for assistance on the basis of income and the programme has also been evaluated in terms of income generation, the present exercise is an incomplete assessment of IRDP as such. Furthermore it is difficult to control for all factors other than IRDP that could have affected beneficiary and non-beneficiary households in the period between the two surveys. IRDP assistance cannot be pinpointed as the only characteristic demarcating the beneficiary from the non-beneficiary household. We can only conclude from the results of this study that, contrary to an a priori expectation, wealth mobility was not higher among households that received assistance under IRDP.

If the transitory poor were to be demarcated from the hard-core poor, anti-poverty policies such as IRDP would have to be suitably modified. For instance, if chronic poverty were found to occur in households with relatively high rates of dependency and low rates of work-participation, then labour-intensive projects such as livestock schemes may not be appropriate methods of poverty-alleviation. Among such households, the introduction of schemes that involve, for instance, agro-processing may be more suitable. It may also be the case that the appropriate policy in such cases would be to provide social security benefits to the households. One reason for the poor performance of IRDP is that the selected schemes are inappropriate choices for particular beneficiary households. Prior identification of the economic characteristics of households can improve the effectiveness of IRDP as a policy aimed at the alleviation of poverty.

The thesis also examined the impact of the expansion of rural banking on the structure of the agrarian credit market and on households in chronic poverty (Chapter 6). The analysis proceeded on the assumption that access to external resources can speed up the process of accumulation. On the one hand, households in chronic

poverty showed both an absolute and a relative rise in real borrowing from the formal financial market over the eight-year period. The distribution of formal credit was more equitable than the distribution of wealth. On the other hand, a sharp rise in real interest rates for informal loans constituted an unambiguous welfare loss for households in chronic poverty.

In general, income transfers via a negative or low real interest rate, default on loans, and returns from new investment tend to be greater the larger the size of the loan. Nevertheless, poor households gained access to cheap credit and benefitted from the subsidy element as well as from income generation in some instances. *At the same time*, these gains were limited because of the low productivity of many of the new investments. The expansion of cheap credit had a favourable impact on the informal credit market as a whole, in that there was a decline in some interest rates. The expansion of cheap credit also weakened the traditional segmentation of the credit market.

The panel data showed that the distribution of formal credit resources among households became more equal over the eight years between 1977 and 1985, while the distribution of wealth became more unequal over the same period. This suggests that the improved access to formal credit did not result in a long-term improvement for the relatively poor households. If the gains from improved access to credit were temporary, the sustainability of the current strategy is open to serious doubt. A continuous injection of funds would be required to maintain transitory gains. Without modifications in the scale, design, and implementation of development and credit policies, a long-term improvement in the accumulation of wealth among the poor will be hard to achieve.

Can the planning process incorporate issues of income distribution and mobility? The role of static income distribution analysis in planning models has been recognized; Ahluwalia and Chenery (1974), for instance, attach specific weights to income growth of different sections of the population. The role of economic mobility in planning models, however, has been relatively neglected. An exception is in a paper by Robinson and Dervis (1977), who construct a planning model on the basis of a matrix of occupational mobility. The model is then used to examine the effect of alternative growth paths and mobility patterns on the share of income of different groups. Robinson and Dervis showed that the income share of a group could be dramatically altered by changes in mobility and the structure of growth (rather than by rates of growth *per se*). They argued that "a careful distinction ought to be made between changes in income distribution due to mobility and changes due to the structure of mean income growth of various groups"(ibid.:362). Our observations on the central role of structural change in affecting the degree and direction of mobility is wholly in line with this approach. Panel data, with the help of which mobility indices can be incorporated into a model of growth and distribution, can be of great help to planners.

7.4 Methodological Issues

The thesis attempted to study the use of panel data in developing countries in the context of the expanding literature in economics on panel studies. The thesis attempted to link issues in the literature such as the choice of an appropriate unit for the study of mobility to issues involved in the application of mobility analyses to an agrarian economy. While the scope of the specific empirical application to Gokilapuram was limited by data availability, some general implications for research methodology in this field are outlined below.

(1) For mobility studies, a critical issue is the selection of the unit. The rural household may be considered a suitable unit for purposes of production but for purposes of income generation or occupational structure, an individual is the preferred unit. While our concern is for the welfare of individuals, in a rural economy the household continues to play a decisive role. Land and assets, for instance, are generally held jointly by members of a household. Although it may complicate the analysis, panel studies in developing countries should monitor a combination of individual-related and household-related variables.

(2) Another problematic issue, particularly for comparative research on mobility, relates to the standardization of the length of time period over which mobility is to be measured. While no universally acceptable prescription can be made, it was suggested that in order to incorporate fully the effects of structural change on mobility, a period of about 10 years can usefully be adopted as a norm. A decade as a minimum time-interval is suitable when changes in long-run economic status (for instance, in wealth) are being monitored. In the case of the NCAER panel study of 1968-69 to 1970-71, it was difficult to establish whether observed changes were transitory, due to random factors, or whether they represented structural shifts. Adopting a decade as a norm could help to standardize research methodology.

(3) The choice of variable for measurement of mobility will naturally vary with the objectives of the study. Nevertheless, of the major economic variables -- consumption, saving, income, assets and occupation -- we argued the case for assets and occupation in this thesis. Both were assumed to be characterized by relatively few transitory components. The big advantage of monitoring wealth as compared to income or expenditure is that it can be measured with greater ease and accuracy in a rural survey. At the same time, wealth encapsulates the long-run economic status of a household. In an agrarian economy, there is a wide gulf in the growth potential of

households with and without access to land. The occupational features of a household can also provide a preliminary indication of its socioeconomic status. While the relevance of income or expenditure studies is not in question, we argue that occupation and wealth variables can be useful supplementary variables in the measurement of economic mobility. Their special attraction derives from cost-effectiveness and accuracy in data collection.

(4) The econometric application of panel data is an important new field of research. A fuller utilization of econometric methods is, however, only feasible with data for several time periods.[8] We indicated the desirability of using probabilistic models with panel data to explore the relation between qualitative variables in two periods. Poverty in 1985 was found to be strongly associated with the probability of being poor in 1977, but we could not take the next step and identify the role of state-dependence versus individual characteristics (or heterogeneity) because of data being limited to only two time periods. Since many panel studies are likely to be limited to two periods, only a small subset of available techniques can be employed. However, this provides a good motivation for collecting panel data over several time periods.

Nonetheless, we can build on the special advantage of panel data, namely the ability to correct for variations due to individual heterogeneity. This feature of panel data, it was argued, was very useful when analysing village-level economic transactions that are highly personalised, such as transactions in the informal credit market.

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8 For example, a minimum of four periods is required to correct for autocorrelated errors in an autoregressive model.

The matrix-based approach was found to be the most useful of the different ways of measuring the degree and pattern of mobility in our panel. The full range of mobility can be mapped into a mobility matrix from which summary measures can then be derived. However, an entire class of procedures based on stable or equilibrium transition matrices was discarded as not being very useful when studying conditions in a developing economy. Furthermore, it was argued that greater weight should be placed on mobility among the poor and that new measures should be developed to this end. The thesis proposed a a progressive weighted distance measure for data analysis.

Mean-independent measures possess an advantage in comparative research. At the same time, a complete analysis of inequality and mobility must also take account of absolute changes in economic position. For example, while it is useful to rank wealth by deciles, changes in the absolute levels of real wealth should also be taken into consideration. To obtain a meaningful comparison of absolute movements over time a greater effort has to go into developing price deflators for different economic groups.

Most of these methodological issues can only be sorted out when panel data become more readily available, and span a larger number of households, regions, and time periods. Panel studies need not be more expensive than multi-round sample surveys; thay can also enrich our understanding of economic change.

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In conclusion, I would like to re-emphasize the relevance of mobility studies to economic theory and policy. When studying long-run welfare, an investigation of mobility adds a dynamic facet to the comparative statics of inequality. With reference

to the case study in this thesis, the analysis of household economic mobility attempted to add a new dimension to the study of inequality in the village. The data showed that the degree of inequality was very high in both survey years *and* that 69 per cent of households in the panel remained in the bottom four deciles of a wealth ranking in both years. A study concerned with changes in welfare over time must take account of the (observed) limited opportunities for mobility in evaluating overall long-run welfare.

Studies of economic mobility can make a useful contribution to appraisals of the growth process itself. The stagnation in occupational mobility, for instance, highlights the paucity of new opportunities created by existing growth mechanisms. The incorporation of analyses of economic mobility into planning models can help to correct for imbalances in the growth process.

More longitudinal studies will help to clarify the specific characteristics of households that are, over the long run, in different kinds of poverty. The identification of differences between the 'transitory' poor and the 'hard-core' poor can help to define target groups more carefully and can contribute to the design of new strategies for the alleviation of poverty.

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GLOSSARY

Block	The area covered by a block development office: a unit of rural development administration; coincides with the Panchayat Union in Tamil Nadu. Typically a block in Tamil Nadu contains about 100,000 people or 20,000 households.
Chit fund	A rotating saving and credit association. Members contribute monthly savings and can borrow from the common fund once every n months.
Cholam	Tamil word for Sorghum
Cumbu	Tamil word for Bulrush millet
Nanjai	Land irrigated by surface irrigation, generally by canals,rivers or a system of tanks; also called wet-land.
Punjai	Unirrigated or dry land.
Ragi	A kind of millet
Samai	Tamil word for Little millet.
Taluk	An administrative unit of the revenue administration, comprising a number of revenue villages.
Thope	Land given to cultivation of tree crops, a cluster of trees or an orchard.
Thottam	Land irrigated by groundwater sources, also called garden-land.
Varagu	Tamil word for Kodo millet.

ABBREVIATIONS

AIDIS	ALL INDIA DEBT AND INVESTMENT SURVEY
DCP	DISTRICT CREDIT PLAN
IFMR	INSTITUTE FOR FINANCIAL MANAGEMENT AND RESEARCH
IRDP	INTEGRATED RURAL DEVELOPMENT PROGRAMME
ISB	INDUSTRY AND SMALL BUSINESS (LOANS)
MDCCB	MADURAI DISTRICT CENTRAL CO-OPERATIVE BANK
NABARD	NATIONAL BANK FOR AGRICULTURE AND RURAL DEVELOPMENT
NCAER	NATIONAL COUNCIL OF APPLIED ECONOMIC RESEARCH
PACS	PRIMARY AGRICULTURAL CO-OPERATIVE SOCIETY
PEO	PLANNING AND EVALUATION ORGANISATION
PSID	PANEL STUDY OF INCOME DYNAMICS
RBI	RESERVE BANK OF INDIA
SC/ST	SCHEDULED CASTES/SCHEDULED TRIBES
WPI	INDEX NUMBER OF WHOLESALE PRICES FOR TAMIL NADU