

# **Surplus Labour, Social Structure and Rural to Urban Migration: Evidence from Indian Data**

**Amaresh Dubey**

North-Eastern Hill University,  
Shillong, India

[amareshd@yahoo.com](mailto:amareshd@yahoo.com)

**Richard Palmer-Jones**

University of East Anglia  
Norwich

[r.palmer-jones@uea.ac.uk](mailto:r.palmer-jones@uea.ac.uk)

**Kunal Sen**\*

University of East Anglia  
Norwich

[k.sen@uea.ac.uk](mailto:k.sen@uea.ac.uk)

**Paper presented at the Conference on the 50<sup>th</sup> anniversary of the Lewis Model, July 6-7, 2004**

\* Corresponding author. Address: School of Development Studies, University of East Anglia, Norwich NR4 7TJ, U.K.; tel: 01603 593376; FAX: 01603 451999.

**Acknowledgement:** This paper is a result of work that we are undertaking on poverty in India, funded in part by the Department for International Development (DFID), U.K. We would like to thank DFID for financial support.

# **Surplus Labour, Social Structure and Rural to Urban Migration: Evidence from Indian Data**

## **I. Introduction**

The empirical association between the degree of industrialisation and the level of economic development is one of the most well-established stylised facts in the literature on economic growth. Increases in per capita income are associated with a larger proportion of the population engaged in industry relative to agriculture. Lewis's 1954 paper provides the analytical underpinning to such a phenomenon. The Lewis model conceptualised the agricultural sector as being 'traditional' and characterised by a fixed supply of land, little capital, and a large pre-existing supply of labour. The industrial sector was taken to be 'modern' where land was not required as an input and where capital could be accumulated and labour absorbed as needed. The process of economic development was seen as an increase in industrial activity relative to that of agriculture, as with high rates of capital accumulation in the industrial sector, the surplus labour in agriculture is slowly absorbed in industry. Thus, a key prediction of the Lewis model was that rural-urban migration would be primarily driven by the existence of surplus labour in rural areas along with the expanding opportunities of employment for such labour in urban areas. As the modern sector expanded, it would attract underemployed workers from rural areas who would migrate to urban areas in the expectation of higher urban earnings relative to their earnings in rural areas.

Implicit in the Lewis Model was the assumption of a homogenous labour force in the rural sector and that rural-urban migration was not influenced by the prevailing socio cultural structure of the economy. This assumption was understandable in the context of Lewis's 1954 paper where the purpose was to create a stylised model of the dual economy, and to use it to present a theory of economic development that was a significant departure from existing models of economic growth that abstracted from agriculture-industry (or traditional sector-modern sector) interactions. However, both anthropological evidence accumulated over the past several decades and village studies on rural-urban migration suggest that in the South Asian context, social and cultural norms influence the patterns of migration from villages to cities and that households which find themselves in surplus labour situations may not necessarily

migrate first from a given rural setting (Connell et al. 1976, de Haan and Rogaly 2002).

This paper has two inter-related purposes. Firstly, unlike with much of the previous empirical work on the Lewis model that has been highly aggregative in nature, we use a micro-data set of individuals who migrate from rural to urban areas along with those who do not to test the Lewis prediction that rural-urban migration is primarily a movement of surplus labour to the cities. While the Lewis model has been subjected to extensive empirical investigation in the past few decades, most of the empirical studies have focused on agriculture-industry interactions at the country-level (Blunch and Verner 1999, Tiffin and Dawson 2003, Bhaduri, Parikh and Skarstein 2004). Our paper attempts to address a separate question from those commonly addressed in the literature: how likely is it that rural-urban migration will occur from regions with surplus labour? The site of our empirical investigation is India, a country which can be viewed in the Lewis' original framework as being one with significant surplus labour, given the high population densities and low rural labour productivities in the agricultural sector. An important advantage of studying the Indian phenomenon of rural-urban migration is that the surplus labour phenomenon differs widely across states in India – some states are agriculturally prosperous with low labour-land ratios, while others are agriculturally stagnant with high labour/land ratios. This across state variation in labour/land ratios or agricultural productivity allows us to examine whether rural-urban migration is more likely to occur from states with high labour/land ratios or low agricultural productivity than from states with low labour/land ratios or high labour productivity.

The second purpose of the paper is to explore in greater detail the determinants of rural-urban migration; in particular, the role of social and cultural factors along with the role of human capital in determining who is likely to migrate in a given region where there may be significant presence of surplus labour. Are the poorer or landless households more likely to migrate, as one would expect from a textbook interpretation of the Lewis Model? The Indian context is particularly instructive in this instance, with the rural society organised such that individuals from certain social groups (scheduled castes and scheduled tribes) are at the lower end of a social hierarchy that has remained remarkably stable over the years. To examine the role of social structure in the pattern of migration, we use a large nationally representative household survey of employment and unemployment collected by the

Indian National Sample Survey Organisation (NSSO) in 1999-2000. We conduct a probit analysis on individual level data to examine the likelihood of a individual residing in rural areas migrating to urban areas conditioning on household demographic characteristics, the level of education of the individual, the social group that s/he belongs to, and a measure of the surplus labour situation prevailing in the state that the individual comes from. We find that the key prediction of the Lewis Model is supported by the data – that rural-urban migration is more likely to be from surplus labour states. However, we also find that migration is caste selective – dominated by the upper castes in social hierarchy, and that the possession of human capital is an important determinant of the likelihood of rural-urban migration.

The rest of the paper is in four sections. In the next section, we revisit the Lewis model allowing for a heterogeneous labour force that is stratified along caste and ethnicity lines. Section III describes the data used in the paper, and discusses the characteristics of rural poverty, land ownership and landlessness, and labour-land ratios both by social group and by the major states in India. Section IV provides patterns of rural-urban migration as evident in the data and conducts the probit analysis. Section V concludes.

## **II. Revisiting the Lewis Model**

Consider the standard textbook version of the labour market in the agricultural sector as in Figure 1. The total labour force in the economy is given by OP. The total product of labour curve in the agricultural sector is given by OK. This curve is assumed to have a concave portion OJ showing a gradually diminishing marginal productivity of labour and a horizontal portion JK where marginal product vanishes (Ranis and Fei 1961). The agricultural labour force is measured from left to right, while the industrial labour force is measured from right to left on the horizontal axis. If we were to begin with a situation where *all* the labour force is employed in agriculture, in the process of economic development, as the industrial sector expands, the labour force employed in industry increases from zero to PA. Consequently, the agricultural labour force shrinks from OP to OA. In the diagram, we can see that in the process of workers moving from agriculture to industry, the surplus labour existing in the agricultural sector has reduced. Implicit in this formulation is the assumption that as the industrial sector expands, the workers who are most likely to

move to the industrial sector are those that are underemployed or disguised unemployed – that is, those workers in the flat section of the total product of labour curve.

As a stylised account of rural-urban migration in developing countries, there is little doubt that such a story is compelling, and it is easy to see why such a view of rural-urban migration has been the dominant view in the literature. However, much of what we know of rural-urban migration in developing countries from anthropological evidence and village studies suggest that the phenomenon is more complex than conceptualised in the textbook version of the Lewis Model (see for example Connell et al. 1976). Firstly, while in the view of Lewis, much of the phenomenon of rural-urban migration is in the form of surplus *unskilled* labour<sup>1</sup>, it may be that even for unskilled labour migration, a minimum endowment of human capital will be necessary for an individual in rural areas to take advantage of the opportunity to migrate to the cities. This may be for two reasons. Firstly, employers in the industrial sector expect a minimum educational level on the part of their workers, so individuals who migrate to cities from villages are more likely to succeed in obtaining a job if s/he has a certain level of education. In a model of rural to urban migration, Lucas (2004) recently provides a formulation of the production processes in the agricultural sector and industrial sectors, where workers in rural areas with a minimum level of human capital find that this capital is useless in agricultural production but is essential to the production process in the industrial sector, so that human capital is complementary to physical capital in the industrial sector. Thus, individuals with a certain level of education who reside in rural areas are more likely to migrate to urban areas, as compared to those individuals without such educational attainment.

A second reason why educational levels may matter for rural-urban migration is that access to jobs in urban areas requires that the migrant can invest in job search activities when s/he arrives in the city, and the more educated the migrant is, the more successfully can the migrant embark on such job search activities (this could be the ability to access both formal and informal recruitment networks).

A second complicating factor in the simple Lewis formulation of the rural labour market is the existence of social and cultural norms that may guide migration decisions or impede the ability to migrate. In the Indian context, where rural society

has been organised in a tightly structured social hierarchy based on caste and ethnicity, the marginalised social groups of backward castes and the tribal population can be said to constitute the majority of workers in the Lewisian sense of surplus labour, as individuals from these social groups are predominantly agricultural labourers employed at subsistence or below subsistence wages, or small and marginal farmers cultivating the least fertile lands. However, it is possible that the rates of migration from these two social groups may be less than that observed in the majority of the population if there are social and cultural barriers to out-migration, or if these households are so poor that they do not possess the minimum amount of funds necessary to make the move from the village to the city.

Furthermore, caste may operate as a surrogate recruitment network for employers in the city. Panini (1996) documents the phenomenon of caste clustering in urban areas, including the unorganised sector, where higher castes predominate in many modern occupations in the industrial sector. One reason for the existence of such caste clusters is that employers are more likely to use their existing employees to find new recruits to the work-place, and existing employees would find suitable employees from individuals of their own caste background. Based on field-work conducted in Kolkata and Mumbai, Bagchi (1975) finds that many factory-owners use jobbers to find suitable employees, and that these jobbers use their caste links to persuade individuals from villages to migrate to cities for employment. Therefore, individuals who belong to the lower castes may not have access to the relevant networks that enable them to find jobs in cities, and are less likely to migrate in the absence of access to these networks.<sup>2</sup>

Returning to the diagrammatic exposition of the rural labour market in the Lewis model, if we were to assume that there are two types of workers in the agricultural sector, such that Type I workers are from the higher castes, and Type II workers are from lower castes. Then, we argue that Type I workers are likely to occupy the concave portion of the total product of labour curve, while Type II workers are likely to occupy the flat portion of the total product of labour curve. Thus, in Figure 2, the section OM measures the employment of higher castes in the

---

<sup>1</sup> Lewis argues that the unlimited supply of labour argument applies only to unskilled labour, as “skilled labour may be a bottleneck in expansion, just like labour or land” (Lewis 1954).

<sup>2</sup> The role of social networks in increasing the likelihood of obtaining employment for migrants in the cities that they migrate to has also been documented in the case of Mexican migrants to the United States (Munshi 2003).

agricultural sector and MP the employment of backward castes in the agricultural sector when industrial employment is zero. With the expansion of the industrial sector, NM amount of higher caste workers migrate to the industrial sector, and there is a corresponding decrease of the agricultural labour force from OP to OL (the distance LP should be the same as that of NM). One important implication of Figure 2 is that with sufficient migration from forward castes to the cities, lower caste workers may start occupying the concave portion of the total product of labour curve, possibly leading to an increase in their labour incomes. Thus, the out-migration of higher castes from the villages may have a beneficial effect on the living standards of lower castes (or the tribal population) in the villages they leave behind.

### **III. Social Structure, Rural Poverty and Surplus Labour in Indian States**

We first describe the data that we have used in this paper for empirical analysis. This is followed by a short discussion of the social structure of the Indian population. Finally, we present profiles of rural poverty, land ownership and labour/land ratios both by social group and major states in India to motivate the empirical analysis.

#### *Data*

In this paper we have used, primarily, employment and unemployment data collected by the Indian National Sample Survey Organisation (NSSO) during 1999-2000. The survey covers the period July 1999 to June 2000, also referred to as agricultural year. This round of survey is also known as 55<sup>th</sup> round quinquennial survey. In this paper we have also used data from Indian census as well as consumption expenditure and employment and unemployment surveys carried out by the NSSO during 1983 (January - December) and 1999-2000 (July to June). The households in these surveys are selected using a two stage stratified sampling design technique. Therefore, weights or multipliers are an integral part of the data.<sup>3</sup>

The survey covers almost entire geographical area in the Indian Union barring less than 0.001 percent which is not accessible either for natural reasons or security constraints. India is divided into 32 states and union territories for administrative purposes with states having population over 160 million to less than a million. However, in this paper we are using samples drawn from 15 major states of Indian

that account for over 96 percent of total Indian population and over 90 percent of sampled household and persons.<sup>4</sup> The states that we have included in our analysis are listed in Table 5 below.

The employment and unemployment data provides detailed information on socioeconomic and demographic characteristics of the surveyed households as well as members in the households besides their residence status, whether migrant or non-migrant. We utilise this information in the paper.

### *Structure of Indian Society*

Historically, the Indian society evolved around certain identities such as social origin, ethnicity or religion. It is now argued that ethnicity has resulted in the exclusion of groups, perceived as ‘others’ or ‘different’, by dominant groups. The concern about exclusion and discrimination in both developing and developed countries at the policy level is primarily because of its link with underdevelopment, inequality and deprivation that it brings to the excluded groups. The most important characteristics of exclusion are its multidimensionality involving exclusion in economic, social and political spheres.

In India, social exclusion is said to be an outcome of a social process, ***primarily Hindu Varna System***, which excluded, discriminated, and isolated groups of population on the basis of their caste, ethnicity and religion. This discrimination extended to labour participation as well. In effect, the ***Varna System*** once determined the nature of work for entire group, known as caste. There are several such groups that have been identified in the literature. Out of these, two are identified on the basis of their caste, the untouchables or ***Scheduled Castes*** (SCs) and ***Scheduled Tribes*** (STs).<sup>5</sup>

The SCs are the larger group between the two, accounting for nearly 17 percent of Indian population.<sup>6</sup> Table 1 provides distribution of population by social

---

<sup>3</sup> Weights or multipliers provide the number of households each one of the surveyed households represents in the data. For details on NSS sampling design and other related issues, see GOI (1983, 1999).

<sup>4</sup> One of the most important considerations in leaving out smaller states and union territories is that several of these states are governed under specific provisions of Indian constitution that often restricts or discourages movement of population both ways, in as well as out migration.

<sup>5</sup> Both Scheduled Caste and Scheduled Tribes encompass innumerable sub-castes or tribes that vary across regions in India.

<sup>6</sup> This is as per the Indian population Census of 1991.

groups in India in 1999-2000.<sup>7</sup> Their exclusion is a direct consequence of the Hindu social order. The caste system as a form of social structure is based on the division of people into a distinct social group, or caste with unequal rights. This has been institutionalized so deeply that the nature of work a person will be doing was determined based on the caste (s)he was born. Among other exclusion, the caste system implied that several castes could not acquire and own any form of property. Traditionally, the exclusion also resulted in the exclusion of these groups from attending formal education system and acquiring human capital.<sup>8</sup>

The other social group that is excluded is the ST group (also called adivasis or tribals). Their share in the population is over 8 percent. Their exclusion is a consequence of geographical isolation and neglect as these groups are located in hills and forest areas that have been traditionally considered remote. There are hundreds of such groups scattered across the country with diverse socio-cultural and economic organizations. Unlike the SCs, STs were socially excluded because of their isolation but had control over the natural resources, land and forest, they were living in. Table 1 also shows location-wise distribution of the STs and SCs.

### *Disparities in Consumption and Rural Poverty*

Given the distinguishing features of the SC and ST social groups in India and associated exclusion that these groups have faced, it is easy to imagine that these population groups would be having disparities in their income and level of living. Figure 3 and 4 shows the distribution of population by social group in 1983 and 1999-2000. The three social groups are the SC, ST and the rest of the population, which we term as the 'others'. The figures clearly emphasize the point that these groups have on an average lower expenditure levels and the distribution also suggests first order stochastic dominance of the others. Tables 2 and 3 highlight the disparities in the consumption levels and its persistence in rural and urban sectors, respectively, for the years 1983 and 1999-2000. More importantly, while there is evidence of some convergence in rural standards of living for SC and ST groups to that of others over

---

<sup>7</sup> These figures have been estimated using the NSSO data described above. The Census figure also show similar proportion of these groups in Indian population.

<sup>8</sup> After adaptation of Indian constitution in 1951, the equality in all kinds of civil rights is guaranteed constitutionally including school enrolment of the children from the excluded groups. But in effect, this has not materialized. In fact, children from the excluded groups are still more likely to be out of school than any other group.

the period 1983/84-1999/2000 in the rural areas, there has been divergence of standards of living of these two groups to that of others in urban areas over the same period.

The rate of poverty among ST and SC households at 49.2 and 42.0 per cent, respectively, are significantly higher than other households at 28 per cent, according to the 1999-2000 household expenditure survey conducted by the NSSO (Table 4).<sup>9</sup> Poverty also seems to increase with household size, with the highest rates of poverty incidence seen among households with 7 or more members across all three social groups. There seems to be a non-linear relationship between household size and the age of the head of the household, with poverty first increasing with age, and then declining. Poverty rates decrease with an increasing educational level of the head of the household, though the rate of decline is more clearly evident with ST and other households than SC households. Among occupational types, agricultural labourers are more likely to be poor than those who are self-employed, whether in agriculture or non-agriculture, or other labourers.

There are significant differences in the incidence of poverty across major states in India. Orissa, Bihar and Assam are the states with the highest proportion of poor households, while Punjab and Haryana have the lowest poverty rates in the country in 1999-2000 (Table 5). The incidence of poverty among the SC and ST households is higher than that of other households across all major states in India (except for SC households in Assam and West Bengal). The regional differences in poverty rates are striking – the average rate of poverty in Orissa, Bihar and Assam is close to four times the rate of poverty in Punjab and Haryana. We will explore the implications of the regional variations in poverty rates for rural-urban migration in India in the empirical analysis.

*Land Ownership and Labour/Land Ratios* The extent of landlessness (measured by the ratio of landless households to total households) varies a great deal across Indian states (Table 6).<sup>10</sup> Tamil Nadu has the largest degree of landlessness among its households, followed by Andhra Pradesh and West Bengal. SC households tend to be

---

<sup>9</sup> The poverty ratios used in this paper have been calculated using expenditure distribution reported in the employment and unemployment data that we are using in this study. These are not to be compared with otherwise available poverty ratios for India in official sources as well as those worked out by researchers.

more in the landless category than other households. However, this is not necessarily true for ST households. With respect to labour/land ratios, Tamil Nadu seems to be the state with the highest degree of surplus labour, followed by West Bengal, Bihar and Kerala. States with low labour/land ratios are Rajasthan, Haryana and Punjab (in that order). A straightforward prediction of the Lewis Model would be that individuals from rural Tamil Nadu, West Bengal, and Kerala would be more likely to migrate to urban areas in search of employment than individuals from rural Rajasthan, Haryana and Punjab, controlling for relevant household and individual characteristics. We will test this prediction in the empirical analysis of Section V.

One feature of Indian data that distinguishes it from what may be observed in African countries, for example, is the degree of reliance of rural households on labour income as a means of livelihood, particularly in the states with high labour/land ratios such as Andhra Pradesh, Bihar and Tamil Nadu (Table 7). In contrast, in urban areas, labour income is not the major means of livelihood for households, with between 8 to 20 per cent of income derived from labour across all states.<sup>11</sup> As expected, SC and ST households derive much of their means of livelihood from labour income, relative to other households.

To summarise, the patterns of rural poverty and land ownership that have been described in this section suggest that SC and ST households are most likely to be the poorest households in any given state, and that these households have a lower degree of land ownership and a higher reliance on labour income than other households. This would imply that in the context of underemployment in rural areas, these households would be the most likely to exit from the situation they find themselves in rural areas to greater income earning opportunities in urban areas. We will address in the empirical analysis whether this implication is supported by the data.

#### **IV. Summary Statistics and Results**

##### *Defining Migrants and Non-Migrants*

Recall that we are using employment and unemployment data to study the implication of underemployment on migration of labour from the rural sector to the urban sector in Indian context. The employment and unemployment data collected by the NSSO

---

<sup>10</sup> We have considered landlessness with respect to cultivable land only, and not total land owned, which may include land available for construction of housing.

during surveys in 1999-2000 has collected information on the residence status of the households and also individual members within the households using a questionnaire called schedule 10.0. In other words, while household selected for the survey could have been staying at the same place but some members might have come in as migrants and are members of the household as defined by the NSSO.<sup>12</sup> This is a special feature of Indian patriarchal system where after marriage girls actually migrate permanently to live with her husband mostly along with in-laws. The definition of the household used by the NSSO, thus, effectively captures migrants even for the reasons other than migration of labour purely for economic reasons.

In view of the above we had to closely scrutinise the category of migrants that could fit in the definition of migrants for economic reasons alone. The NSSO in Schedule 10 list 13 categories of migrants along with their origin (last place of residence, district in case migrant is from within the states and state if the migrant is from outside the state and country if migrant is from outside the country).<sup>13</sup> Out of the available information on category of migrants we consider only four categories, migration in search of employment, in search of better employment, to take up employment/better employment and proximity to place of work that fit into the definition of migration for work. These are selected from the response of the migrants to the question - reason for leaving last usual place of residence. In addition, we used another filter to consider only those migrants who have migrated from the rural areas only, either from within the states or from outside the state as opposed to migrants from one urban area to another.

Identifying the migrants in the manner described above, we estimated total number of rural to urban migrants in each state as sum of (i) migrants from the rural areas of same district, (ii) migrants from rural areas of other district within the state and (iii) migrants from rural areas of a state that migrated to other states. The rate of migration reported in table 8 has been calculated as sum of (i) to (iii) divided by the total rural population and sum of (i) to (iii). Another matter of detail is the age of the

---

<sup>11</sup> Labour income here implies income from casual labour that could be considered similar to agricultural labour in rural areas.

<sup>12</sup> A group of persons normally living together and taking food from a common kitchen will constitute a household. The members of a household may or may not be related by blood to one another.

<sup>13</sup> See Schedule 10.0, page 4 on the categorization of migrants as well as other details. However, the exact district or region from where the migrant originates is not possible to establish from the available information.

migrants. We have considered migrants in the age group of 15 to 65 years, both inclusive.

### Patterns of Migration

The migration rate by social group as well as distribution of migrants according to their social group is reported in table 8. Reflecting their share in total population, others out-number SC and ST individuals among migrants in all states. However, there are interesting cross-state variation in migrant stock, in particular, the high share of SC individuals among migrants in Andhra Pradesh, and the high share of ST individuals among migrants in Madhya Pradesh (as compared to national averages) (Table 8). Migration rates are higher for other individuals compared to SC and ST individuals across all states. The migration rate at the national level for others is 3 per cent, as compared to 1.58 per cent for SC and 0.87 per cent for ST individuals. Again, there are interesting across state and across social group variations in migration rates.

Irrespective of social group membership, migrants have a higher standard of living (as proxied by monthly per capita expenditure) than non-migrants both in rural and urban areas. It should be particularly noted that migrants in urban areas have a standard of living which is 60 to 100 per cent higher than non-migrants in rural areas (Table 9). Migrating to urban areas from rural areas seems to be make households close to two times better off on average. Thus, there is a strong incentive to migrate from villages to cities, irrespective of which social group the household belongs to. In this sense, there is indeed strong support to Lewis' formulation.

### Descriptive Statistics

The analysis of poverty, migration and differences in levels of living as captured by Table 9 clearly shows that migration is social group specific. We now investigate this phenomenon in a more rigorous manner. We use a probit model to investigate as to what are the factors that affects a persons' migration decision. In view of this, we define a variable migrant as binary variable. This variable takes the value 1 for those who migrated in search of jobs from the rural to urban areas and are living there. For all others, this variable takes the value 0.

Among the explanatory variable that we consider important in determining the migration decision and could define from the data are individual level characteristics of migrants as well as non migrants. These include age, sex, level of education, size of

the household and social group. While age and household size has been used as continuous variables, from other variables we have derived binary variables. For education level, five dummy variables were generated, illiterate (no education), literate only (informal or without a certificate if attended school), literate with formal education up to middle (formal education from 4 to 9 years of schooling) level, educated above middle but up to higher secondary (formal education from 10 to 12 years of schooling) and graduate and above (over 12 years of formal schooling). The binary for social group are ST, SC and Others. For sex of the person, binary variables are male and female.

In the Lewis formulation, the surplus labour situation could be captured by including labour/land ratio defined as total number of labour over total cultivable area. We have used two variants of this variable in our estimation, labour/land ratio in 1983 as well as in 1999-2000. Another measure of the surplus labour phenomenon in rural areas is the level of labour productivity.<sup>14</sup> We would expect that states with low labour productivity will witness higher rates of out-migration as compared to states with high labour productivity. These two variables have been used in alternative specification to check the robustness. To control for effects of the place of origin of migrants, we have also used binary variables corresponding to the place of origin of migrants.

The summary statistics - mean and standard deviation - of the variables used in the probit analysis are reported in table 10. The overall migration rate is 3 per cent in our sample. ST and SC individuals constitute 13 per cent and 16 per cent of our sample, respectively. These proportions were derived from a sample size of 296,159 individuals out of over 596,000 surveyed by the NSSO during 55<sup>th</sup> round of survey.

### Probit Results

The probit models take migration as a function of age, household size, social group of the migrants, education level, sex and two measures of surplus labour – the labour/land ratio and labour productivity in agriculture. Others for social group, illiterate for education, and male for sex of the individual are the control groups. We introduce state dummies to capture intrinsic variation in state-level factors that may

---

<sup>14</sup> We define labour productivity as the ratio of value added from 35 major crops in India to number of male labour used. We obtain the data from Bhalla and Singh (2001), using total male labour as a proxy for total labour (as estimates of total female labour used were unavailable).

influence migration (for example, the degree of urbanisation across states). The estimated equation is reported in table 11. We have reported only the coefficients, z-value and pseudo  $R^2$  in this table. The estimated coefficients in all cases are significant at 1 percent.

Column 2 presents the results without our measures of surplus labour. These estimates suggest that a person is more likely to migrate if the person belongs to the younger age group, is from a smaller household, is female, is educated, and is not from the SC or ST social groups. Interestingly, both the square terms of household size and age are negative and significant, suggesting that beyond a certain household size, migration is more likely to occur, with the exact opposite inference for age. We see that ST individuals are less likely to migrate than SC households. Increasing levels of education increase the likelihood of migration. We now introduce the labour-land ratios at the state level for 1999/2000 in Column 4, and find that the coefficient on labour-land ratios is positive and significant. Thus, states with higher labour-land ratios tend to see higher rates of out-migration from rural to urban areas.

One potential econometric problem with the estimates presented in Columns 2 and 4 is the possibility of reverse causality from migration status to the existence of surplus labour in a particular state. If there are implicit barriers to migrate out of rural areas, then low levels of out-migration in a given state may lead to the presence of significant surplus labour in that state. To take into account the possibility of endogeneity of the current labour-land ratio, we use the labour-land ratio calculated from the 1983 employment surveys. Introducing labour-land ratios from 1983 in the regression model, we find very little difference in absolute values of estimated coefficients discussed above – the labour-land ratio is positive and significant when we control for state-level effects. Finally, we introduce labour productivity in place of labour-land ratios, and observe that labour productivity has the expected negative effect on rural-urban migration (Table 11, column 8).

## **V. Conclusions**

This paper examines the empirical implications of the Lewis Model with respect to the relationship between the phenomenon of surplus labour in rural areas and out-migration from these areas to urban areas. It does so by using a unique micro-data set of migrants and non-migrants obtained from the large nationally representative employment and unemployment survey of the Indian National Sample Survey

Organisation. India is a particularly relevant country to study the empirical implications of the Lewis Model, given the wide variation in the phenomenon of surplus labour across Indian states. We find strong empirical support for the key prediction of the Lewis Model that rural-urban migration will be influenced by the existence of surplus labour in the rural areas from where the migrants originate. States with high rural labour-land ratios and/or low labour agricultural productivity are likely to see more out-migration to urban areas from rural areas, controlling for relevant household and individual characteristics.

We also find that the phenomenon of rural-urban migration is more complex than viewed within a simple Lewis framework. Social structure and the possession of human capital are important determinants of rural-urban migration - individuals from scheduled castes and scheduled tribes and those with little or no education are less likely to migrate to urban areas. Given that scheduled castes and scheduled tribe households along with households with low levels of educational attainment are more likely to be poor, our findings suggest that the poorer households from the surplus labour regions do not seem to migrate to the same extent as the richer ones. This has important policy implications – we should not expect rural to urban migration to be an important contributing factor to the decline of the high rates of rural poverty observed in the surplus labour regions. It could be argued, however, that as forward castes migrate from rural to urban areas, scheduled castes and scheduled tribe individuals are able to occupy the spaces left by the migrating individuals in terms of better paid employment or more fertile land (see Figure 2). While we cannot test for this possibility explicitly, it should be noted that the rate of convergence of rural living standards between SC and ST households on one hand, and non SC/ST households on the other, has been weak over two decades of reasonably robust growth in rural areas (see Table 2 for the lack of convergence). If such an adjustment mechanism has been at work in the rural areas, then it can be said that this type of adjustment in the rural labour market has worked imperfectly, if at all.

**References:**

Bagchi, A. (1975), *Private Investment in India, 1900-1939*, London:Orient Longman.

Bhaduri, A., A. Parikh, and R. Skarstein (2004), “The Dual Role of the Terms of Trade: The Indian Experience of Agriculture-Industry Interaction, 1950-2001”, mimeo.

Bhalla, G. S. and G. Singh (2001), *Indian Agriculture: Four Decades of Development*, New Delhi: Sage.

Connell, J. et al. (1976), *Migration from Rural Areas: The Evidence from Village Studies*, Oxford: Oxford University Press.

Blunch, N-H. and D. Verner (1999), “Sector Growth and the Dual Economy Model: Evidence from Côte d'Ivoire, Ghana, and Zimbabwe”, World Bank Working Paper No. 2175.

de Haan and B. Rogaly, eds. (2002), *Labour Mobility And Rural Society*, London: Frank Cass.

Government of India (1983), NSSO, 38th Round: Note on Sample Design and Estimation Procedure, SDRD, August.

Government of India (1997), “Estimates of Poverty”, Press Information Bureau, March 11.

Government of India (1999a), NSSO, 55<sup>th</sup> Round: Note on Sample Design and Estimation Procedure, SDRD, SDRD.

Government of India (1999b), NSSO, 55<sup>th</sup> Round: Household Schedule 10: Employment and Unemployment, SDRD.

Government of India (2001), “Estimates of Poverty”, Press Information Bureau.

Lewis, W.A. (1954), "Economic Development with Unlimited Supplies of Labour", *The Manchester School*.

Lucas, R.E. Jr. (2004), "Life Earnings and Rural-Urban Migration", *Journal of Political Economy*, Vol. 112, No. 1.

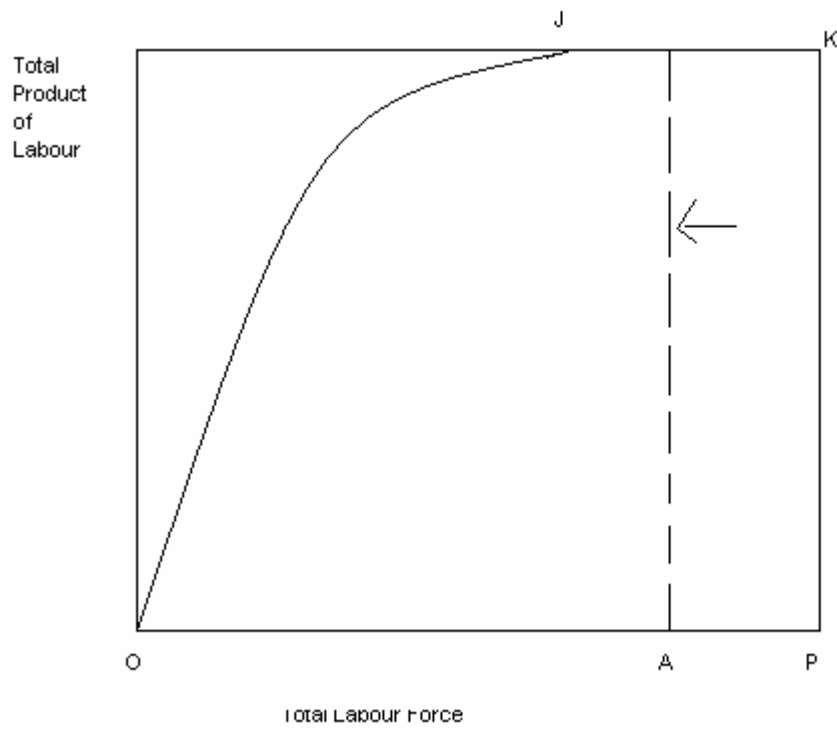
Munshi, K. (2003), "Networks in the Modern Economy: Mexican Migrants in the U.S. Labour Market", *Quarterly Journal of Economics*, May.

Panini, M.N. (1996), "The Political Economy of Caste", in M.N. Srinivas (ed.), *Caste: Its Twentieth Century Avatar*, Penguin India.

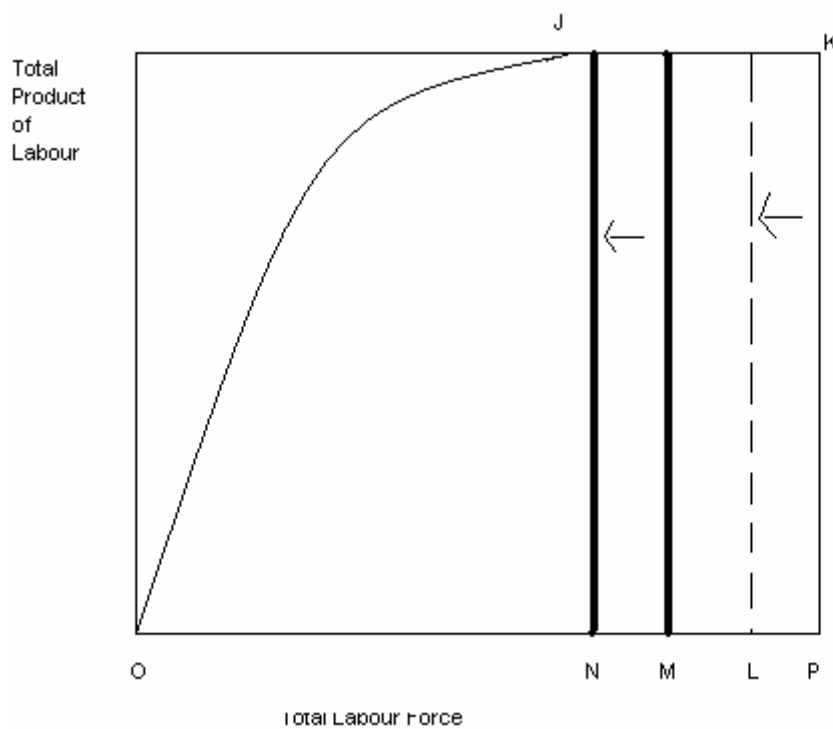
Ranis, G. and J. Fei (1961), "A Theory of Economic Development", *American Economic Review*, Vol. 51, No. 4.

Tiffin, R. and P. Dawson (2003), "Shock Persistence in a Dual Economy Model of India", *Journal of Development Studies*, October.

**Figure 1: The Textbook Version of the Rural Labour Market in the Lewis Model**



**Figure 2: The Rural Labour Market in the Lewis Model Allowing for Two Types of Labour**



**Table 1: Distribution of Population by Social Group**

	ST	SC	OTHERS
<b>1983</b>			
<b>Rural</b>	10.28	17.96	71.76
<b>Urban</b>	2.75	12.08	85.17
<b>Total</b>	8.59	16.63	74.78
<b>1999-00</b>			
<b>Rural</b>	10.49	20.42	69.09
<b>Urban</b>	3.40	14.35	82.25
<b>Total</b>	8.71	18.90	72.40

**Note:** Estimates for this table and all subsequent tables are from the Employment and Unemployment Surveys of the National Sample Survey.

**Source:** Tabulated by the authors using the 1983 and 1999-2000 household surveys on employment and unemployment conducted by the NSSO.

**Table 2: Average Per Capita Expenditure (APCTE), Average Annual Growth of APCTE and Ratio of APCTE of ST and SC with Others in the Rural Sector**

All India	ST	SC	OTH
<b>1983</b>	197.14	217.26	277.74
<b>1999-00</b>	241.60	263.32	327.57
<b>Growth (Annual)</b>	1.41%	1.33%	1.12%
<b>Ratio of Exp</b>			
	<b>ST/Other</b>		<b>SC/Other</b>
<b>1983</b>	71%		78%
<b>1999-00</b>	74%		80%

**Note:** APCTE is calculated at constant (1993-94) prices.

**Source:** as in Table 1.

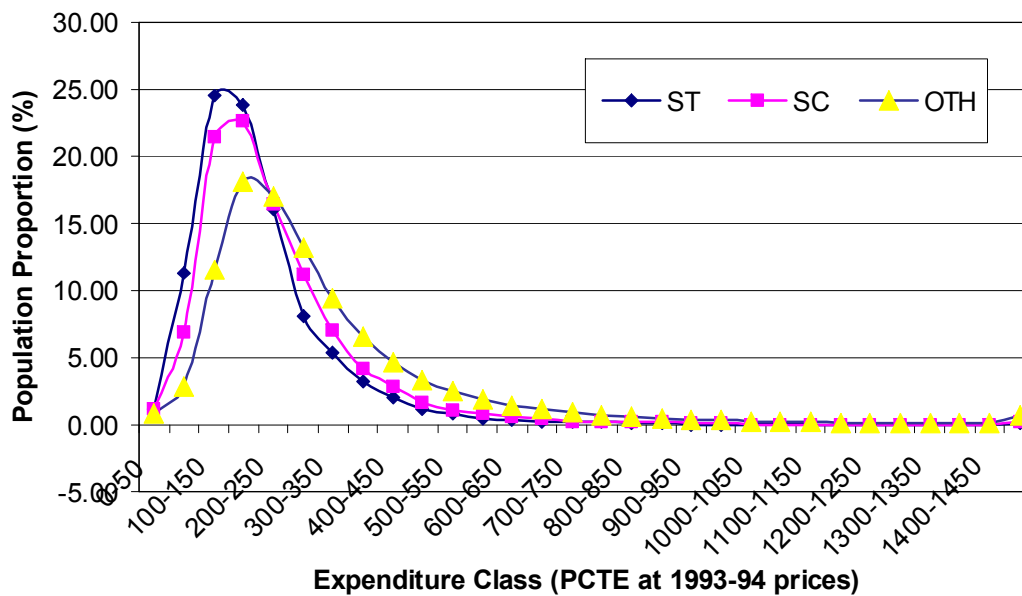
**Table 3: Average Per Capita Expenditure (APCTE), Average Annual Growth of APCTE and Ratio of APCTE of ST and SC with Other in the Urban Sector**

Year	ST	SC	OTH
1983	331.25	311.08	415.62
1999-00	428.40	376.50	557.33
Growth (Annual)	1.83	1.31	2.13
Ratio of Exp	ST-OTH	SC-OTH	
1983	80%	75%	
1999-00	77%	68%	

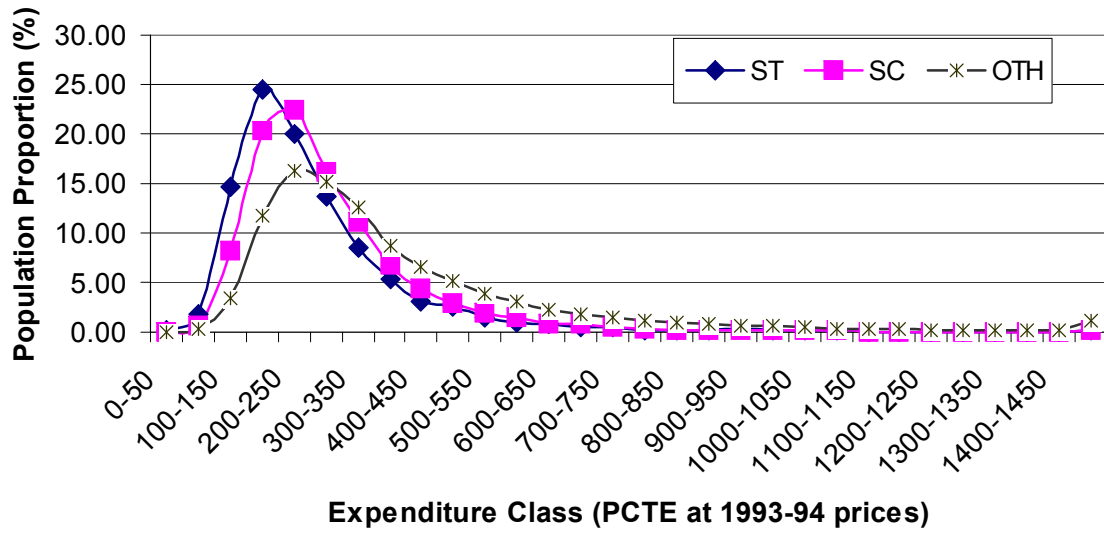
**Note:** APCTE is calculated at constant (1993-94) prices.

**Source:** as in Table 1.

**Figure 3: Distribution of Social Groups by Expenditure Classes in 1983**



**Figure 4: Distribution of Social Groups by Expenditure Classes in 1999-00**



**Table 4: Poverty Rate in Rural India in 1999-2000**

<b>Category</b>	<b>Scheduled Tribes</b>	<b>Scheduled Castes</b>	<b>Others</b>	<b>All</b>
Share in Population	10.6	21.3	68.1	100
Poverty incidence	49.2	42.0	28.0	33.3
Share in Poor	15.7	26.9	57.4	100
<b>Poverty incidence by age group of Head</b>				
20-29	50.93	37.75	27.67	33.27
30-39	55.37	50.02	32.84	39.49
40-49	47.79	40.72	28.37	33.23
50-59	43.34	37.97	24.84	29.31
60-69	47.73	36.92	25.24	29.16
70 plus	35.18	39.62	24.67	27.73
<b>Poverty incidence by Household Size</b>				
1	22.08	15.47	9.10	12.12
2	17.56	15.77	8.85	11.60
3	30.71	22.03	12.94	17.03
4	41.85	28.93	17.69	22.84
5	48.60	40.92	25.19	31.28
6	54.21	49.83	31.62	38.37
7-plus	59.39	54.13	36.88	42.30
<b>Poverty incidence by education level of Household Head</b>				
Illiterate	55.41	45.78	35.75	41.08
Lit, below primary	46.31	42.66	29.26	33.39
Lit, up to middle	38.29	36.01	22.23	25.73
lit, up to higher secondary	23.63	25.36	15.12	16.94
Lit, graduate and above	9.94	22.17	8.77	10.70
<b>Poverty incidence by means of livelihood of household</b>				
Self-employed in non-agriculture	43.41	34.56	27.94	29.83
Agricultural labour	62.63	50.24	45.18	49.33
Other labour	41.63	38.02	29.76	33.61
Self-employed in agriculture	42.97	35.60	21.78	25.70
Multiple source	26.11	24.69	17.55	19.33

**Note:** Poverty ratios have been calculated from expenditure distribution reported in unit record data file of employment and unemployment data collected by the NSSO during 55<sup>th</sup> round of survey. Official poverty lines proposed by the Expert Group on poverty used for the calculation.

**Source:** as in Table 1.

**Table 5: Rural Poverty across States in India in 1999-2000**  
(Head count ratio, %)

State	ST	SC	Others	All
<b>Andhra Pradesh</b>	31.33	16.57	10.24	13.29
<b>Assam</b>	50.60	45.41	48.10	48.25
<b>Bihar</b>	64.81	63.33	46.74	51.45
<b>Gujarat</b>	31.11	21.01	12.81	17.69
<b>Haryana</b>	14.93	34.31	6.26	12.71
<b>Karnataka</b>	43.64	40.90	24.03	29.37
<b>Kerala</b>	20.60	26.62	16.54	17.72
<b>Madhya Pradesh</b>	59.29	48.91	34.34	43.84
<b>Maharashtra</b>	51.50	41.48	25.75	32.40
<b>Orissa</b>	74.67	58.37	41.71	53.90
<b>Punjab</b>	19.76	19.30	5.41	11.50
<b>Rajasthan</b>	26.56	25.70	12.22	17.34
<b>Tamil Nadu</b>	53.54	44.89	24.02	31.04
<b>Uttar Pradesh</b>	40.07	49.75	30.08	35.17
<b>West Bengal</b>	59.32	39.85	43.00	43.05

**Note:** Poverty ratios have been calculated from expenditure distribution reported in unit record data file of employment and unemployment data collected by the NSSO during 55<sup>th</sup> round of survey. Official poverty lines proposed by the Expert Group on poverty used for the calculation.

**Source:** as in Table 1.

**Table 6: Landlessness and Labour Land Ratio: India and Major States**

State	Landless Households (%)				Labour Land Ratio (per/ha)			
	ST	SC	Others	All	ST	SC	Others	All
Andhra Pradesh	43	64	49	52	263	662	195	247
Assam	12	39	40	36	128	206	210	186
Bihar	17	66	36	42	222	1275	232	292
Gujarat	36	68	41	44	334	539	123	166
Haryana	70	82	38	49	229	587	61	76
Karnataka	47	53	38	42	299	383	146	181
Kerala	35	54	34	36	417	1831	218	274
Madhya Pradesh	28	38	26	29	195	210	107	139
Maharashtra	55	63	40	46	270	385	144	177
Orissa	28	52	38	38	289	357	186	240
Punjab	93	90	38	61	859	823	67	99
Rajasthan	11	34	22	22	170	105	57	73
Tamil Nadu	56	82	60	67	435	1678	309	449
Uttar Pradesh	31	33	23	26	96	360	144	171
West Bengal	44	55	48	50	496	454	264	324
<i>Total</i>	<i>33</i>	<i>56</i>	<i>37</i>	<i>41</i>	<i>231</i>	<i>414</i>	<i>144</i>	<i>180</i>

**Note:** all ratios multiplied by 100.

**Source:** as in Table 1.

**Table 7: Proportion of Households Having Principal Means of Livelihood from labour income in 1999-2000**

State	Means of Livelihood (Rural)				Means of Livelihood (Urban)			
	ST	SC	OTHERS	ALL	ST	SC	OTHERS	ALL
<b>Andhra Pradesh</b>	46.21	74.64	40.83	49.01	20.61	32.70	16.68	19.04
<b>Assam</b>	21.44	33.95	36.46	33.76	5.19	18.59	6.66	8.48
<b>Bihar</b>	34.74	73.11	33.46	42.41	18.32	25.81	9.02	11.78
<b>Gujarat</b>	57.24	68.47	33.66	43.46	43.26	33.44	16.48	19.78
<b>Haryana</b>	76.92	56.74	16.67	27.45	0.64	32.27	6.77	11.39
<b>Karnataka</b>	54.93	73.19	37.67	46.88	36.36	38.02	12.82	16.80
<b>Kerala</b>	50.96	83.89	42.06	46.65	41.67	44.50	23.25	24.78
<b>Madhya Pradesh</b>	51.12	52.71	32.27	41.30	33.60	33.11	10.62	16.31
<b>Maharashtra</b>	59.92	70.23	41.57	49.11	19.85	16.95	9.79	11.11
<b>Orissa</b>	61.17	57.46	36.80	47.96	39.32	35.19	10.09	17.19
<b>Punjab</b>	47.74	61.74	13.26	34.75	14.42	23.12	5.89	10.96
<b>Rajasthan</b>	40.86	38.04	13.40	23.47	19.90	26.39	7.54	11.88
<b>Tamil Nadu</b>	58.52	82.35	48.37	59.03	42.64	36.75	15.15	18.16
<b>Uttar Pradesh</b>	24.36	48.47	15.91	24.83	0.87	23.27	7.81	10.04
<b>West Bengal</b>	62.86	52.56	37.93	43.81	28.73	18.75	8.75	10.97
<b>Total</b>	50.55	61.77	32.19	40.80	27.52	27.10	11.63	14.46

**Note:** In rural areas labour income households are agricultural labourers and other labourers. In the urban areas, the households reported in the table are those having casual labour as main source of income.

**Source:** as in Table 1.

**Table 8: Distribution of Migrants and Migration Rate by Social Group**

State	Distribution of Migrants			Migration rate		
	ST	SC	OTHERS	ST	SC	OTHERS
<b>Andhra Pradesh</b>	10.9	39.1	50.0	1.78	2.32	1.01
<b>Assam</b>	1.5	3.5	95.1	0.05	0.19	0.73
<b>Bihar</b>	3.4	14.4	82.2	0.88	1.33	2.13
<b>Gujarat</b>	6.7	5.4	87.8	1.00	1.31	4.13
<b>Haryana</b>	1.7	16.8	81.5	2.22	1.01	1.49
<b>Himachal Pradesh</b>	0.5	10.7	88.8	0.30	0.92	2.40
<b>Karnataka</b>	4.0	5.5	90.4	1.39	0.85	4.17
<b>Kerala</b>	2.0	2.1	95.9	2.62	0.52	3.20
<b>Madhya Pradesh</b>	11.8	13.4	74.9	0.49	1.01	1.71
<b>Maharashtra</b>	4.8	16.9	78.3	1.45	6.15	5.77
<b>Orissa</b>	5.3	12.6	82.1	0.29	0.92	2.44
<b>Punjab</b>	0.1	14.4	85.5	0.20	0.57	2.73
<b>Rajasthan</b>	4.3	14.7	80.9	0.71	2.63	4.02
<b>Tamil Nadu</b>	1.8	10.5	87.7	5.13	1.52	5.97
<b>Uttar Pradesh</b>	1.3	12.2	86.5	2.98	1.37	3.35
<b>West Bengal</b>	0.7	21.1	78.2	0.19	1.16	1.79
<b>Total</b>	3.7	13.7	82.5	0.87	1.58	3.00

**Note:** Migrants are defined to be economic migrants. The Migration rate of the ratio of individuals migrating from rural to urban areas for economic reasons to the sum of such migrants plus individuals in rural areas who have not migrated.

**Source:** as in Table 1.

**Table 9: Per Capita Expenditures (Rupees), by Social Group and by Migration Status (1999-2000)**

Type	Scheduled Tribes	Scheduled Castes	Others	All
<b>Rural</b>				
Migrants	390	421	522	489
Non-Migrants	359	382	457	430
All	366	391	473	444
<b>Urban</b>				
Migrants	816	642	902	864
Non-Migrants	595	550	750	714
All	672	578	802	764
<b>Total</b>				
Migrants	464	471	657	608
Non-Migrants	381	411	535	495
All	399	427	568	526

**Source:** as in Table 1.

**Table 10: Summary Statistics of the variables Used in Probit Analysis**

<b>Variables</b>	<b>Mean</b>	<b>SD</b>
<b>Migrants</b>	0.0302	0.1711
<b>Age</b>	23.05	18.94
<b>Household size</b>	6.41	3.30
<b>Scheduled tribe</b>	0.1329	0.3395
<b>Scheduled caste</b>	0.1630	0.3694
<b>Others</b>	0.7040	0.4565
<b>Illiterate</b>	0.3940	0.4886
<b>Literate</b>	0.1976	0.3982
<b>Education, primary + Middle</b>	0.2513	0.4337
<b>Education, higher secondary</b>	0.1177	0.3223
<b>Education, graduate and above</b>	0.0394	0.1945
<b>Female</b>	0.4257	0.4944
<b>Labour land ratio (1983)</b>	1.59	0.6194
<b>Labour land ratio (1999-2000)</b>	2.17	0.9058
<b>Labour Productivity</b>	8.84	4.62
<b>Number of Observations</b>		296,159

**Table 11: Probit Results**

<b>Variables</b> <b>1</b>	<b>Coefficients</b> <b>2</b>	<b>z</b> <b>3</b>	<b>Coefficients</b> <b>4</b>	<b>z</b> <b>5</b>	<b>Coefficients*</b> <b>6</b>	<b>z</b> <b>7</b>	<b>Coefficients</b> <b>8</b>	<b>z</b> <b>9</b>
<b>Household Size</b>	-0.2328	-46.81	-0.2262	-45.16	-0.2227	-44.17	-0.2275	-45.64
<b>Household Size squared</b>	0.0063	29.60	0.0061	29.00	0.0060	28.44	0.0061	28.64
<b>Age of the migrant</b>	0.0868	41.70	0.0857	40.70	0.0851	40.22	0.0865	41.20
<b>Age squared</b>	-0.0009	-32.31	-0.0009	-31.51	-0.0009	-31.10	-0.0009	-31.86
<b>Scheduled Tribe</b>	-0.5423	-17.99	-0.5270	-17.40	-0.5215	-17.17	-0.5522	-18.30
<b>Scheduled Caste</b>	-0.1743	-9.55	-0.1707	-9.29	-0.1671	-9.05	-0.1749	-9.47
<b>Literate</b>	0.1431	6.45	0.1403	6.29	0.1422	6.34	0.1412	6.32
<b>Education, primary + Middle</b>	0.2331	12.63	0.2327	12.53	0.2365	12.69	0.2358	12.71
<b>Education, higher secondary</b>	0.4084	19.80	0.4098	19.71	0.4133	19.79	0.4224	20.38
<b>Education, graduate and above</b>	0.5998	20.76	0.5811	19.91	0.5771	19.70	0.6090	21.13
<b>Female</b>	-0.4289	-19.97	-0.4412	-20.52	-0.4375	-20.40	-0.4280	-19.88
<b>Labour land ratio</b>			0.7292	17.24	1.1793	22.68		
<b>Labour Productivity</b>							-0.0762	-16.28
<b>Intercept</b>	-3.6820	-66.11	-5.2711	-53.74	-5.6516	-60.73	-2.9447	-39.26
<b>Pseudo R-square</b>		0.37		0.38		0.39		0.37

**Notes:** \* denotes the land labour ratio of 1983 is included in the estimation  
 All the coefficients reported in this table are significant at 1 percent