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**How Close Does the Apple Fall to the Tree? Some Evidence on Intergenerational
Occupational Mobility from India**

Abstract

Using data from the India Human Development Survey (IHDS) 2005, we examine intergenerational occupational mobility in India, an issue on which very few systematic and rigorous studies exist. We group individuals into classes and document patterns of mobility at the rural, urban and all-India levels, and for different caste groups. We find substantial intergenerational persistence, particularly in the case of low-skilled and low-paying occupations, e.g. almost half the children of agricultural labourers end up becoming agricultural labourers. We also document differences across caste groups. Overall, our results suggest considerable inequality of opportunity in India.

Keywords: intergenerational occupational mobility, inequality, agricultural labourers, India, India Human Development Survey, IHDS

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A fundamental issue that can be studied about any society is its transformation from one generation to another. Do children live in a world that is very different from the one in which their parents lived? Are they involved in better occupations? Are they better educated? Is this process of transformation “fair”, providing equal chances to everyone? Given the phenomenal growth that India has been experiencing since mid-1980s and the perception that it is heralding a new world order, much has been written about India in recent times. However, relatively little rigorous work has focused on the above questions. In this article, we use data from the India Human Development Survey (IHDS) 2005 to address this gap.

Indian inequality, in its many dimensions, is a topic of enormous interest today, both within India and abroad, and among academics and intelligent lay people. This is partly due to the concern that the rapid growth that India has been experiencing could be inequitable, but also due to the fear that high and/or rising inequality could derail growth. In fact, one prominent writer and scholar (Guha 2011) has argued that inequality today (along with corruption and environmental degradation) constitutes a “materialist and mundane” challenge to a plural and inclusive “idea of India”. Also, there is considerable debate on the economic reforms that India has been implementing since 1990-91, and inequality has emerged as an important issue in this debate. As a result, quite a few studies on Indian inequality (e.g. Jayadev et al. 2007; Vakulabharanam 2010; Sarkar and Mehta 2010; Krishna and Setupathy 2011; Motiram and Sarma 2011; Motiram and Vakulabharanam 2011; Weisskopf 2011)

have appeared in recent times. However, most of these studies have focused upon a particular “outcome” variable (e.g. consumption expenditure, wages, or wealth) and explored how inequality in this variable has changed over time. In contrast to this, there are only a few studies that have focused on the issue of intergenerational mobility, which is really concerned with the extent to which the outcomes for the present generation depend upon, or are influenced by the characteristics of the previous generation.

Why study mobility (intergenerational or interpersonal)? Differences in mobility, through various channels, could lead to different consequences, particularly different growth rates. Given that talents can be assumed to be equally distributed across various socioeconomic groups, a highly mobile society may be able to grow faster by making better use of the talents of its members (Weil 2009: 432). The same result could arise through motivation for work – in a society where *ex-ante* the poor and the rich (and their children) are equally likely to succeed or fail, people belonging to either group may have a higher incentive to work hard (Bourguignon et al. 2007). Also, high mobility (real or perceived) may mute social conflict and pressures for redistributive policies, both of which have implications for economic growth. Finally, mobility is closely tied to inequality of opportunity. The literature on inequality of opportunity is vast and straddles across several disciplines including economics, ethics and political philosophy, so this is not the place to go into it. However, an influential and (in our opinion) reasonable perspective on inequality of opportunity (Roemer 1998, 2006) holds that, broadly speaking, what people are able to achieve in their lives depends upon two sets of factors – those that are within their control (“efforts”) and those that are not (“circumstances,” e.g. gender, race, caste etc.), and people should be held responsible for the former, but not for the latter. In societies with low levels of intergenerational mobility, a person’s family background, (e.g. education of parents, occupation of parents) plays a huge role in his/her life chances. From the above perspective (since one does not choose one’s family) such societies are characterized by a high degree of inequality of opportunity.

In light of the above, we focus on intergenerational *occupational* mobility. The main motivation for this focus is that occupations determine the lives that people live. This is a point that has been forcefully made by sociologists:

... occupation is the most critical factor in an individual’s social standing, life chances and level of material comfort... individuals in the same occupation tend to experience similar degrees of social advantage or disadvantage, maintain comparable lifestyles, and share similar opportunities in life ... (Giddens 2009: 443)

This point has also been appreciated by many economists - recent economics literature, drawing upon experimental evidence, has argued that our occupations affect our beliefs, values and preferences, and thereby our choices. Moreover, in countries like India where poverty reduction is closely linked to the transformation of the occupational structure (Chakravarty 1987), the study of occupational mobility can aid policy makers and planners since it can give insights into the constraints that limit the ability of individuals to move from low-skilled/low-paying occupations to better occupations. The study of occupational mobility complements the study of other kinds of mobility (e.g. income, wages, education). As we describe below, the data that we use is well-suited for analysing educational and occupational mobility, and educational mobility has been studied using this data (see below). But, more importantly, education is at least partly a “means” to a job and since factors like state policies, labour market conditions, social norms, discrimination, access to networks etc. have an independent (i.e. of educational qualifications) influence on the ability of an individual to obtain a job, it is important to study occupational mobility separately. Given all of the above, we believe that great significance is attached to questions like: is a farmer’s son likely to become a farmer?

Occupational mobility has been studied extensively by sociologists (e.g. Erikson and Goldthorpe 1992; Ganzeboom and Treiman 1996; see Björklund and Jantti 2000 for a detailed survey), who drawing upon ideas from Marx and Weber, have used occupations to conceptualize “social classes” or “status/prestige groups.” Occupational mobility has received relatively lesser attention from economists, and to the extent that they have studied it, many of them have used classifications (e.g. “white-collar”, “blue collar”, combinations of occupational codes drawn from household surveys) that are not particularly theoretically grounded. This is despite Roemer (1982) and other economists who have built upon his work (by incorporating credit constraints, see Bowles 2006, Chapter 10) and have shown how occupational groupings/classes arise endogenously within the context of a

microeconomic model. We take this issue seriously, given the evidence suggesting that class (in the myriad ways in which it can be conceived) is of enormous analytical importance in understanding modern societies. So, we group individuals into categories that can be interpreted as social classes or status groups. Using these categories, we examine intergenerational mobility by constructing transition matrices and computing measures of mobility.

There are a few recent nation-wide studies on intergenerational occupational mobility in India and our article is related to them. Because our data, methodology and focus are quite different, our article complements these studies. Two of these (Majumdar 2010; Hnatkovska et al. 2011) have used data from the National Sample Surveys (NSS). The NSS surveys (and so the studies based on them) have certain advantages, but also suffer from some disadvantages when used to study intergenerational, particularly occupational, mobility. We discuss these limitations in the following section.

Our article also complements Kumar et al. (2002a, 2002b) who use electorate data from the Center for the Study of Developing Societies (CSDS). This data, based upon random sampling of the Indian electorate, is somewhat old (1971 and 1996). Moreover, the sample sizes are relatively small and the analysis is based upon one question each about the main occupation of the respondent and the father of the respondent, which leads to certain limitations (e.g. lack of a description of the occupation; difficulty in distinguishing between occupation and occupational status).

Our article is related to a few studies that have examined intergenerational transmission of education in India (Jalan and Murgai 2008; Maitra and Sharma 2009), particularly to Maitra and Sharma (2009), who use IHDS (2005) data to analyse schooling and intergenerational transmission of human capital in India, separately for rural and urban sectors and for males and females. Overall, their results are mixed in terms of mobility. Our article is also related to the sparse literature on inequality of opportunity in India (e.g. Asadullah and Yalonetzky 2012; Singh 2011); especially Singh (2011) who deploys the framework of Roemer (1998, 2006) referred to above. He uses data from IHDS 2005 to document considerable inequality of opportunity in India - a large share of inequality in adult male wages and consumption expenditure is explained by parental characteristics.

Before going into the details of our analysis, it is worth presenting our main findings. We find considerable intergenerational occupational persistence – across all occupational categories, the father's category is the most likely one that a son could find himself in (e.g. a likelihood of almost half for agricultural labourers). But, there are differences across occupational categories – the probability that a son would fall in the father's category is higher for the low-skilled/low-paying occupations. There are also differences across sectors. As expected, mobility is higher in urban areas as compared to rural areas. Comparison of mobility for Scheduled Castes and Tribes (SC/STs) and non-SC/STs gives ambiguous results. However, we document considerable downward mobility for the SC/STs and show that this is higher than the same for non-SC/STs. For SC/STs, we also observe higher persistence (as compared to the same for non-SC/STs) in low-skilled/low-paying occupations. Overall, our results show that, as expressed by the popular German proverb, the apple does fall close to the tree. Broadly speaking, we believe that our results suggest considerable rigidity in class positions, particularly for the lower classes. Overall, we interpret our findings as suggesting that considerable inequality of opportunity exists in India. Given that the rich and wealthy are likely to be underrepresented in the IHDS (as in other surveys, including NSS) and since the children of the rich seem to be doing quite well (at least going by media reports), we believe that inequality of opportunity is higher than what we have documented.

The remaining part of the paper is organised into three sections. The next section presents the contextual background, some issues pertinent to the study of intergenerational occupational mobility and a description of the IHDS data. The third section presents our analysis and results, and the final section concludes with a discussion of our findings.

2 Context, Issues and Data

How children do relative to their parents, depends upon both factors within the household (e.g. parental background, family size, family composition, caste etc.) and factors outside the household (e.g. availability of educational opportunities, credit markets, labor market conditions, discrimination). Hence, a rigorous study of intergenerational mobility requires specially and carefully designed surveys. The Indian context poses particular challenges

because (as is well known) considerable occupational, demographic, regional and cultural diversity exists within India. For researchers working on India on issues pertaining to poverty, inequality, employment/unemployment and living conditions (e.g. housing), the most widely used surveys are those conducted by the National Sample Survey Organisation (NSSO). Particularly important are the surveys on monthly consumption expenditure and employment/unemployment, which have some advantages. These are large, nationally representative surveys that are well known. Although they are cross-sectional (not panel) surveys, since they are conducted regularly, they allow for some comparability of outcomes of interest over time. However, they are not designed for the study of intergenerational mobility and hence suffer from some distinct disadvantages when used for this purpose.

First, in the NSS surveys, we have data on an individual and his/her relationship to the head of the household. Using these two pieces of information, we can attempt to map the individual's occupation vis-à-vis the occupation of his/her parent(s). However, it is obvious that this can be done only if both the individual and his/her parent(s) live in the same household. This would imply that single member households, two-member households (husband and wife) and nuclear households (husband, wife and young children) are excluded from the analysis. Moreover, household heads will be included in the analysis (as children) only if they live in the same household as their parent(s) *and* a parent is not enumerated as the head. To the extent that certain geographical regions or socioeconomic groups may have a high share of such excluded households (e.g. urban middle classes and the elite, who are more likely to live in nuclear families), they will be systematically underrepresented in the analysis. Similarly, regions or groups that have a low share are systematically overrepresented. Second, what is relevant for mobility, particularly from the perspective of inequality of opportunity (an important motivation for studying intergenerational mobility) is the usual/lifetime occupation of the previous generation. What one has in the NSS surveys is the *current* occupation of the previous generation. To the extent that the current occupation may be different (due to migration, transitory shocks, promotions, retirement etc.) this would pose a problem. This is the reason surveys that are carefully designed for the purpose of studying intergenerational mobility collect data on the employment history of the parent(s) (see Björklund and Jantti (2000) for examples).

We do not know the extent of bias that is introduced on account of the above considerations, but we do believe that these shortcomings are important. This is particularly the case if one is using several rounds of NSS surveys, since we do not know whether this bias is increasing, decreasing or stable over time. The Indian national Census, which is widely used to make inferences on demographic matters suggests that the above considerations may be important: (a) a sizeable proportion (about 43%) of households in India are small households (4 members or less) in 2001 and this proportion has increased from 1981 (about 40%), (b) the average household size has decreased during the period 1981 to 2001 in rural areas (5.6 to 5.4), urban areas (5.4 to 5.1) and at the all-India level (5.5 to 5.3), a phenomenon that several observers (e.g. Census 2001a) have seen as a sign of growing nuclearisation, particularly in the urban areas (c) there are differences across socioeconomic groups and geographical regions in terms of both the size distribution of households and the average household size, e.g. the percentage of two-member households at the all-India level for SCs, STs and the whole population are 8.2%, 8.8% and 9.1%, respectively (Census 2001a); for differences across states, see Census (2001b), and for average household sizes for SCs, STs and the entire population, see Census (2001a).

The data that we are using offers certain unique advantages in exploring intergenerational mobility, although it suffers from its own limitations. This is the reason why we are claiming that our study *complements* studies based upon other sources of data (including NSS). We would like to make two additional points. First, given that different sources of data have their own methodologies, advantages and limitations, it is important to analyse and examine the same issue using these different sources of data and compare the inferences. Second, and more importantly, the study of mobility (both intergenerational and interpersonal) is a serious and important exercise, which requires surveys that are specially designed and carefully administered. In this regard, researchers working on India are severely hampered by the lack of availability of such surveys. To the best of our knowledge, there is no publicly available, large and nationally (both rural and urban) representative survey that is ideally suited for this purpose. It is our hope that our paper along with previous studies provides an impetus for the collection of such data. We take this opportunity to implore the Central Statistical Organization (CSO) (in our opinion, the

organization that is best equipped, and that carries the most legitimacy in the Indian context) to conduct special surveys on this issue, or to at least introduce a module on mobility in their regular surveys.

We now describe the data that we are using, viz. the IHDS, whose important details (including methodology of the survey) are presented in Desai et al. (2010); we present only a summary here. The IHDS is a nationally representative survey that was conducted during the period November 2004 to October 2005 under the supervision of the National Council for Applied Economic Research (NCAER) in collaboration with the University of Maryland. The survey was conducted in all the states and union territories of India except the Andaman and Nicobar and the Lakshadweep and covered totally 382 districts out of the 612 districts in the 2001 national census. A two-stage stratified sampling design was followed to draw a sample consisting of 27,010 rural households (in 1503 villages) and 13,126 urban households (in 971 urban blocks).

The IHDS is unique in the sense that it was designed to measure different dimensions of human development with modules on education, health, occupation, economic status, marriage, fertility, gender relations, and social capital. What is most relevant for the purposes of this paper is the information on parental occupation. For every individual who is the head of the household, the survey gives details of his/her father's occupation (e.g. farmer, agricultural labourer, scientist, village official) for *most of his life*. For an individual who is not the head of a household, there is an indirect way in which we could obtain his/her father's occupation. For every individual, the survey gives his/her relationship to the head of the household, so for an individual who is the son or daughter of the head of the household, his/her father's occupation is nothing but the occupation of the head of the household.

Unfortunately, the survey cannot give information on the father's occupation for married women, who constitute the bulk of women. As is well known, in India, married women live either in nuclear families or in joint families with their husband and his parents, implying that the indirect method cannot be used – they are either wives or daughters-in-law of the head of the household. Further, for women who are household heads, the survey reports their husbands' occupations in place of their fathers' occupations. The survey cannot also give us information on the mother's occupation for many adult individuals. Moreover, there is no historical information on parental income or assets (e.g. landholdings) due to which we cannot construct elaborate class schemes (e.g. large farmer, small farmer etc.) or status/prestige-groups (e.g. by combining education, income and occupation) and analyse mobility using these. Despite these limitations, as we will show below, we can draw meaningful and insightful inferences on the intergenerational occupational mobility in India. Furthermore, some of the above limitations are quite common, many studies on intergenerational mobility (e.g. see the ones that we cited above) lack data on women and therefore restrict themselves to men (i.e. sons and fathers).

Given the above, we will focus on adult males in this paper and look at their occupation vis-a-vis the occupation of their fathers. We will focus on the age group of 20 to 65 years. For individuals (i.e. sons), we know the number of days and hours per day that they: work for others, and if so the nature of work (e.g. agricultural labourer, teacher); work on their household farm; and work on their household business (or businesses). We use this information to group occupations, classify individuals and map intergenerational transmission. This analysis is described in greater detail in the next section.

3 Analysis and Results

We will first focus on individuals living in rural areas and classify them into different occupational categories. In arriving at this classification, our attempt is to organise individuals into various broad social classes or status groups, while also being conscious of the nature of the tasks they perform. We classify individuals as: farmers (i.e. self-employed in agriculture, who predominantly work on the household farm); self-employed in non-agriculture (who predominantly work on household business) and workers (who predominantly work for others). Of the workers, an important category is agricultural labourers, so we classify workers into agricultural labourers and other workers. Given the non-negligible share of other workers, we classify them further using the Indian National Classification of Occupations (NCO 2004).

The NCO is based upon a classification scheme adopted by the International Labour Organization (ILO), suitably modified for the Indian conditions. It divides workers into various categories, going down to four-digit codes, with the broadest classification being ten

single-digit codes: (1) Legislators, Senior Officials and Managers; (2) Professionals; (3) Technicians and Associate Professionals; (4) Clerks; (5) Service Workers and Shop & Market Sales Workers; (6) Skilled Agricultural and Fishery Workers; (7) Craft and Related Trades Workers; (8) Plant and Machine Operators and Assemblers; (9) Elementary Occupations (e.g. sweepers, street vendors, loaders etc.); (X) Workers not classified by occupations. Note that this scheme tries to group workers based on the similarity of tasks they perform, but can also be interpreted as organising workers into broad skill or status groups, e.g. professionals occupy a status higher than the associate professionals, who themselves occupy a status higher than the unskilled labourers. We could use all these ten categories, but this would mean too many groups which could also lead to intergenerational transitions in only a few cases, i.e. transition matrices (discussed below) with many zero entries. So, to simplify matters, we further divide other workers into four categories: (a) Professionals, Officials and Technicians; (b) Clerks, Service Workers, Skilled Agriculture and Fisheries Workers; (c) Craft, Trade, Plant and Machine Operators; (d) Elementary Occupations and Others. For the father's occupation, we can use a typology similar to the above, using the NCO codes in the manner described.

There seems to be no consensus on the classificatory schemes in the literature on mobility and different authors have used different schemes, even when they have examined the same country (e.g. Long and Ferrie 2005; Erikson and Goldthorpe 1992). Our scheme shares some categories (e.g. Farmers and Agricultural labourers) with existing schemes (e.g. Erikson and Goldthorpe 1992). More importantly, our scheme also shares some similarities with the existing theoretically grounded schemes from India (Vakulabharanam 2010). A further point to note is that although there is a sense of hierarchy in our scheme, it is difficult to rank all the categories e.g. farmers and individuals self-employed in non-agriculture; farmers and clerks. What we can safely say is that agricultural labourers and people involved in elementary occupations occupy the lowest rungs since they are at the bottom when we consider either agricultural or non-agricultural occupations.

It would have been useful if we could further classify the farmers into different groups based upon landholdings (such as large, medium etc.). But, unfortunately this is not possible because (as we discussed above) we do not have information on the landholdings of many fathers. The IHDS is not unique in lacking this information – such information is not available in other surveys, even those from developed countries (e.g. Gibbons 2010). Also, the NSS data would be misleading in this regard – since the father and son(s) live in the same household, they would all own the same amount of land.

Table 1 presents the proportions of the population that are involved in these various categories for rural, urban and all-India levels. **[Insert Table 1 here]**

As is expected, we can observe that a substantial proportion (58.3%) of the individuals (sons) in rural areas (column (iv)) are either farmers (32.7%) or agricultural labourers (25.6%). The corresponding figure for all-India (column (ii)) is 44.3%. Table 1 also presents the proportions of fathers who belong to various occupational categories at rural, urban and all-India levels. For example, we can observe that 81.1% of the fathers in rural areas are either farmers or agricultural labourers (55.2% and 25.9%, respectively).

Table 2 presents a “transition” or “mobility” matrix that gives the percentages of individuals who belong to the various occupational categories corresponding to their fathers' occupational category. As is standard in this literature, these percentages can be interpreted as conditional probabilities, i.e. the probability that an individual belongs to a certain category *given the condition that* his father belongs to a particular category. Note that the entries in each row add up to one. **[Insert Table 2 here]**

It is clear from the above table that there is a considerable persistence in occupations over generations. In all the occupational categories except one (Professionals, Officials and Technicians), the diagonal entries are the largest. Even in this case (i.e. Professionals etc.), the entry in the diagonal is the second largest one and close to the largest. This reflects that among all occupations, the father's occupation is the most likely one for an individual. Of particular importance are the two categories of farmers and agricultural labourers. Almost half the children of farmers end up as farmers and more than half the children of agricultural labourers (roughly 56%) end up as agricultural labourers.

We will now turn to the analysis of urban areas. From Table 1 (columns (v) and (vi)), we can see that (as expected) a small percentage of individuals are involved in agriculture (farmers or labourers). The percentage of fathers involved in agriculture is somewhat higher (as compared to the corresponding percentage of sons) due to two factors: first, decline over

time in agriculture in general and urban agriculture in particular and second, rural-urban migration - some of these fathers were farmers/labourers in rural areas, whereas the sons are living in urban areas, where the role of agriculture is less.

Table 3 presents the mobility matrix for urban areas. As we can observe from the table, there is considerable persistence in urban areas too. If we ignore farmers (who, as mentioned above, occupy a small percentage), the diagonal entries are the largest. It is worth pointing out here that close to half (47.2%) of the sons of those involved in elementary occupations end up in the same category and more than half (54.4%) of the sons of agricultural labourers end up either as agricultural labourers or in elementary occupations.

[Insert Table 3 here]

Given the rural-urban migration that we discussed above, it is best to look at the mobility by taking an all-India perspective. Table 4 presents the all-India transition matrix. The diagonal element is by far the largest one in all the categories. There are a few findings worthwhile to note: more than half of the sons of the agricultural labourers remain as agricultural labourers; about 48% of the sons of the individuals involved in elementary occupations remain in elementary occupations. In other words, those at the bottom of the occupational ladder display the least mobility. **[Insert Table 4 here]**

What are the reasons behind these trends? First, as has been suggested in the literature on occupational choice and wealth constraints (Banerjee and Newman 1993; Bardhan et al. 2000 and the references therein), imperfections in financial markets and lack of wealth/collateral prevent the poor from moving to better occupations. Second, one of the routes for upward mobility is education. It has been reasonably well documented by now (e.g. Dreze and Sen 2002; Motiram and Osberg 2010; The Probe Team 1999) that the quality of public education in India is quite poor, particularly in rural areas, with rampant absenteeism of teachers. Private education is costly and less accessible to the poorer sections of the population. This could be an important factor reducing mobility. Third, a factor that has been highlighted as contributing to immobility is assortative mating (Weil 2007), i.e. marriage between individuals of similar socioeconomic standing or background. There is substantial evidence (e.g. Munshi and Rosenzweig 2009) to argue that assortative mating is high in India, particularly since marriages are mediated through caste and religious networks.

An issue of considerable interest in the Indian context is the implications of caste for mobility. We therefore separately look at the mobility of the “Scheduled Groups” (SCs and STs) and the “non-Scheduled Groups” (non-SC/STs). The transition matrices for the SC/STs and the non-SC/STs are presented in Tables 5 and 6, respectively. We can observe as earlier (from the entries in the diagonal) that there is considerable persistence in both these cases. However, some differences are worth noting. The persistence in high-status occupations is lower for the SC/STs than for the non-SC/STs; for example, for professionals the difference is of 4.4 percentage points. On the contrary, persistence in occupations that are at the bottom of the occupational hierarchy (viz. agricultural labourers and elementary occupations) is much higher for the SC/STs, as compared to the non-SC/STs; e.g. for agricultural labourers, a difference of 14.4 percentage points. **[Insert Tables 5 and 6 here]**

Another important issue which could be of interest in the Indian context (and that has received attention in developed countries) is “downward mobility” – in the intergenerational (interpersonal) context, it reflects sons (individuals) moving to a lower socioeconomic position compared to their fathers (their past). Considerable downward mobility has been documented in the developed countries, especially US and UK and it has been argued that downward mobility is on the rise in these countries (Acs 2011; Giddens 2009: 466). It has also been found that marital status, gender and race are important influences on downward mobility, e.g. black men are more likely to be downwardly mobile than white men (Acs 2011).

In light of the above, we examine the percentage of sons who “slip down” to become involved in agricultural labour or in elementary occupations for both SC/STs and non-SC/STs. We can observe (by comparing columns (3) and (7) in Tables 5 and 6) that for SC/STs from every occupational category of fathers, a substantial and considerably higher (compared to non-SC/STs) percentage of sons become involved in agricultural labour or in elementary occupations. One interesting case is that of farmers whose sons become agricultural labourers (this could be due to shocks, such as crop loss or illness in the family) – SC/STs are 9.5 percentage points more likely to experience this intergenerational transition

are also 7.7 percentage points more likely to become involved in elementary occupations.

In the discussion so far, we have relied on the diagonal entries in the transition matrices to make inferences, while also informally relying on the notion of persistence. We can try to explore this more rigorously by dividing the sample into two groups – those who are in the same occupation as their fathers and those who are in a different occupation. We can then regress the likelihood that a son will be in a different occupation on various relevant explanatory variables (e.g. own education, household size, caste etc.), father’s occupation and father’s education. However, in implementing such a “switching” regression, one faces several problems given data limitations (not only with IHDS data, but also data that does not contain historical information, e.g. NSS). Briefly put, the problems and limitations have to do with inadequate or misleading proxies for relevant variables. Like in many regressions, there is also potential endogeneity of explanatory variables and omitted variable bias. Also, this regression would be unable to distinguish between sons’ occupations that are “close” to the father’s occupation and those that are “distant” from the father’s occupation. Moreover, although persistence has an intuitive appeal in understanding mobility, it is only one of the relevant criteria, e.g. one could also include “convergence” (Geweke et al. 1986) for understanding mobility. In the literature on the measurement of mobility, authors have considered several criteria and have developed measures of mobility based upon these criteria.

In light of the above, rather than using regression analysis, we use measures developed in the literature to understand mobility, which do not suffer from the above-mentioned limitations. Since this is a large and evolving literature, a thorough review is beyond the scope of the present paper. Instead, we present a brief description (based particularly upon Formby et al. 2004; Shorrocks 1978; Sommers and Conlisk 1979; Van De Gaer et al. 2000) of some of the commonly used measures.

Let p_{ij} ($i, j=1, \dots, m$) be the entry in the i^{th} row and j^{th} column of the transition matrix (T), i.e. it is the probability that the son’s occupational category is j given that his father’s occupational category is i . m is the number of occupational categories. The first measure,

$$M_1 = \frac{1}{m} \tag{1}$$

is the probability that a son (or the expected proportion of sons) will leave the father’s occupational category. It can also be interpreted as the normalized distance between the transition matrix and the identity matrix of order m . Note that the identity matrix (which comprises of a leading diagonal of 1’s and the rest of the entries as 0’s) represents perfect immobility since whatever the occupational category of the father be, the son falls in the same category (i.e. with probability one). This measure has a limitation that we have already discussed (in the context of regression analysis) - it only looks at whether the son leaves the father’s occupation or not without taking into account the “distance” between the occupations of the father and son. This limitation is taken care of by the next measure:

$$M_2 = \frac{1}{m(m-1)} \tag{2}$$

Note that there are a total of $m(m-1)$ transitions possible between a father’s occupation and a son’s occupation. Also, for a given occupation of the father (i), the expected distance

between the occupations of the father and son is $\sum_j p_{ij} |i - j|$.

Several measures based upon eigenvalues of the transition matrix have been proposed, eigenvalues being linked to the speed of convergence to the steady state for a Markov process. The speed of convergence can be interpreted as an indication of the mobility – the faster convergence occurs, the higher is the mobility. Let λ_i ($i=1, \dots, m$) denote the i^{th} eigenvalue of the transition matrix in non-increasing order. It is worthwhile to mention that the largest eigenvalue is 1 since T is a matrix whose entries in each row add up to 1. One measure based on eigenvalues is:

$$M_3 = 1 - |\lambda_2| \tag{3}$$

where $|\lambda_2|$ is the absolute value of the second largest eigenvalue. We can also consider the

average of l_2, l_3, \dots, l_m . Considering the geometric mean would give us:

$$M_4 = 1 - \left(\prod_{i=2}^m l_i \right)^{\frac{1}{m-1}} \quad (4)$$

where “det(T)” is the determinant of T . Considering the arithmetic mean would again give us a different measure:

$$M_5 = 1 - \frac{l_2}{m-1} \quad (5)$$

Note that we are subtracting from 1 so that we can obtain a measure of mobility, rather than immobility.

In Table 7, we present the above-mentioned mobility measures for rural and urban areas as well as for all-India. Since M_5 is similar to M_1 and would give similar results (in comparison), we skip it and present only the estimates of the first four measures. From Table 7, we can observe that according to all the measures described above, mobility in rural areas is lower than the same in urban areas. This is not surprising, since compared to rural areas there is considerable occupational diversity in urban areas. Moreover, factors that could contribute to mobility (e.g. availability of educational opportunities and credit; weakening of social norms that bind caste or religious groups to certain occupations) are likely to be stronger in urban areas. The comparison of mobility for SC/ST and non-SC/ST individuals is ambiguous since some measures suggest that mobility is higher for non-SC/ST individuals whereas other measures suggest the opposite. On further reflection, this makes sense in light of the earlier discussion based upon the transition matrices for SC/ST and non-SC/ST individuals. As we have already noted, for SC/ST individuals, the downward mobility (i.e. to agricultural labour and elementary occupations) is higher and the persistence in certain higher-level occupations (e.g. professionals) is lower. Another issue of interest is the difference between poorer states and those states that are relatively well-off. We therefore present these measures for the group of states that are generally considered poor and underdeveloped (Bihar, Jharkhand, Chattisgarh, Madhya Pradesh, Rajasthan, Uttarakhand, Uttar Pradesh and Orissa) and the other states - the comparison is ambiguous.

[Insert Table 7 here]

Since we have focused on men in the age group 20-65 years, our sample includes individuals born over a long period of time – from the 1940s to the 1980s (the survey is for 2004-05). So, we take sons falling into different age-based cohorts: 20-30 years, 30-40 years, 40-50 years, and 50-65 years (born in 1970s-1980s, 1960s-1970s, 1950s-1960s and 1940s-1950s, respectively) and separately look at the mobility of each cohort. In the interests of space, we have not presented the transition matrices for these cohorts, but we present the mobility measures in Table 7. We can observe that those born in the 1970s-1980s display higher mobility (according to all the measures of mobility) compared to those born earlier; a similar result holds for those born in 1960s-1970s. This may be interpreted as suggesting a general improvement in occupational and other (e.g. credit) opportunities over time, although, it is not possible to detect exactly when this process began, i.e. when the major break occurred. Also, persistence in low-level occupations has not shown a steady decline over time – for these cohorts, the percentages of children involved in elementary occupations, whose fathers were also involved in elementary occupations is 56%, 51%, 45% and 44%, respectively; the corresponding figures for agricultural labourers is 45%, 52%, 51% and 50%, respectively.

4 Discussion and Conclusions

In the present study, we have used the IHDS data to document and analyse occupational mobility in India. We have used both transition matrices and mobility measures for this purpose. Our findings suggest considerable occupational immobility, particularly among the low-skilled and low-paying occupations. Our findings also show that mobility in rural areas is less than the same in urban areas. The comparison of SC/ST and non-SC/ST caste groups seems ambiguous, i.e. we cannot say whether the mobility of one group is higher than the other. However, we document considerable (and higher) downward mobility among the SC/STs. The substantial level of immobility particularly among the low-skilled and low-paying occupations indicates that there is considerable inequality of opportunity in India.

Given that the rich and the wealthy are likely to be underrepresented in the IHDS survey

(as in the case of other national surveys, including the NSS), we believe that the actual immobility and inequality of opportunity is higher than what we have documented. Given limitations of the data that we have used, we want to be cautious in our assertions. We view this analysis as our first attempt at understanding the issue of class and occupational mobility in India.

It would be interesting to compare our findings with those from other studies on occupational mobility in India. However, as we have mentioned, there is a shortage of such studies. The one relevant and recent study (Hnatkowska et al. 2011) is based upon NSS data since the 1980s and focuses largely upon the issue of caste by looking at intergenerational education, income and occupational mobility. Our focus, methodology and data are different from their study. Their broad conclusion is that changes in the past two decades have led to the breaking down of caste barriers to mobility. Given the limitations of NSS data in the context of intergenerational mobility studies and their regression-based methodology, their findings seem suggestive and too optimistic to us. The transition matrices presented in their study use only three occupational categories, so comparison with our analysis and findings is problematic. But, if we ignore this and examine their estimates for 2004-05 (which is the relevant comparison), we can observe that their diagonal entries are quite high, particularly for the lowest occupational category – 77% and 79% for non-SC/STs and SC/STs, respectively. Moreover, even their estimates show higher downward mobility (in terms of sons moving to the lowest category) for SC/STs, as compared to the non-SC/STs.

Comparing to studies from other countries (particularly in the developed world) could be problematic given the existence of significant socioeconomic and institutional differences between India and these countries. However, to put our findings in perspective, we present results from some other countries. Cogneau and Mesple-Soms (2008, Table 5) analyse occupational mobility for selected African countries by dividing individuals into farmers, non-farmers and inactive people (e.g. students). The shares of farmers whose sons end up as farmers in these countries are higher than the same for India (71% for Uganda as compared to 43.25% for India). When we look at developed countries (for U.S. and U.K., see Long and Ferrie (2005, Table 1) although this presents older data), we observe that the shares of farmers whose sons are farmers is much lower than the same for India (20.9%). A similar result can be observed for unskilled labourers. One could probably argue that the occupational mobility in India lies somewhere between the same for poor underdeveloped countries (of Africa) and the advanced capitalist countries.

We believe that the analysis of interpersonal and intergenerational mobility is an important exercise. We also believe that the paucity of rigorous work on India on this issue is mainly due to the shortage of high quality data. We hope that our study has provided enough motivation for the collection of high quality panel data that tracks individuals over time or data that tracks generations, so that we can see more studies on mobility in the future.

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Table 1. Distribution (percentage) of Individuals by Occupational Categories: All-India, Rural and Urban Areas

	All-India		Rural		Urban	
	Fathers (i)	Sons (ii)	Fathers (iii)	Sons (iv)	Fathers (v)	Sons (vi)
Farmers (1)	47.19	24.45	55.19	32.70	25.62	2.16
Self-employed in non-agriculture (2)	3.79	14.47	1.75	10.88	9.29	24.15
Agriculture Labourers (3)	22.57	19.83	25.87	25.64	13.66	4.15
Professionals, officials and related (4)	6.22	6.01	3.93	3.46	12.42	12.88
Clerks, service workers, skilled agriculture and fisheries workers and related (5)	6.42	8.33	3.47	4.56	14.36	18.50
Craftsmen, plant operators and related (6)	7.62	8.83	5.31	5.56	13.86	17.64
Elementary occupations and others (7)	6.18	18.10	4.47	17.20	10.79	20.53

Note: The number of individuals at the rural, urban and all-India levels are 18,679, 9,591 and 28,270, respectively.

Source: Authors’ computation based upon IHDS (2004-05)

Table 2. Occupational Transition Matrix: Rural India

Occupational Categories of Fathers	Occupational Categories of Sons (Percentage)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	49.52	8.55	16.85	3.36	3.95	3.22	14.55
(2)	9.76	62.4	7.00	3.51	4.24	4.29	8.80
(3)	10.44	5.95	55.87	1.51	2.69	4.12	19.43
(4)	26.55	17.49	10.25	18.19	10.25	7.15	10.13
(5)	15.62	18.93	11.00	6.64	21.27	6.84	19.7
(6)	10.64	23.94	8.07	2.75	5.35	35.27	13.98
(7)	7.93	20.46	12.36	1.25	4.05	5.64	48.31

Note: (1) – Farmers; (2) – Self-employed in non-agriculture; (3) – Agriculture Labourers; (4) – Professionals, officials and related; (5) – Clerks, service workers, skilled agriculture and fisheries workers and related; (6) – Craftsmen, plant operators and related; (7) – Elementary occupations and others.

Table 3. Occupational Transition Matrix: Urban India

Occupational Categories of Fathers	Occupational Categories of Sons (Percentage)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	6.78	19.52	2.52	15.06	20.50	16.99	18.62
(2)	0.30	59.60	0.40	10.16	14.85	7.99	6.71
(3)	1.13	11.12	22.05	5.75	13.38	14.27	32.31
(4)	0.53	21.72	0.77	31.56	22.46	11.95	11.02
(5)	0.91	22.19	0.56	14.15	30.74	15.72	15.74
(6)	0.08	26.85	1.06	6.14	12.39	39.03	14.45
(7)	0.28	23.00	1.21	4.58	10.36	13.36	47.21

Note: (1) – Farmers; (2) – Self-employed in non-agriculture; (3) – Agriculture Labourers; (4) – Professionals, officials and related; (5) – Clerks, service workers, skilled agriculture and fisheries workers and related; (6) – Craftsmen, plant operators and related; (7) – Elementary occupations and others.

Source: Authors' computations based upon IHDS (2004-05)

Table 4. Occupational Transition Matrix: All-India

Occupational Categories of Fathers	Occupational Categories of Sons (Percentage)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	43.25	10.16	14.75	5.08	6.38	5.24	15.14
(2)	3.49	60.54	2.63	7.92	11.27	6.74	7.41
(3)	8.91	6.79	50.33	2.21	4.44	5.78	21.54
(4)	12.51	19.77	5.14	25.4	16.83	9.74	10.61
(5)	6.72	20.90	4.68	11.18	27.00	12.21	17.30
(6)	5.45	25.37	4.63	4.42	8.81	37.11	14.21
(7)	4.32	21.66	7.10	2.82	7.03	9.28	47.79

Note: (1) – Farmers; (2) – Self-employed in non-agriculture; (3) – Agriculture Labourers; (4) – Professionals, officials and related; (5) – Clerks, service workers, skilled agriculture and fisheries workers and related; (6) – Craftsmen, plant operators and related; (7) – Elementary occupations and others.

Source: Authors' computations based upon IHDS (2004-05)

Table 5. Occupational Transition Matrix: SC/ST individuals, All-India

Occupational Categories of Fathers	Occupational Categories of Sons (Percentage)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	36.31	6.92	21.76	3.96	5.49	4.77	20.79

(2)	1.10	56.85	4.30	7.81	9.33	7.33	13.28
(3)	7.06	3.70	57.25	1.92	3.11	4.83	22.13
(4)	9.09	10.8	13.14	21.73	15.72	9.71	19.82
(5)	4.54	13.79	9.00	6.25	27.56	11.92	26.95
(6)	3.81	20.02	8.84	5.07	8.86	27.76	25.64
(7)	3.68	14.18	7.73	3.12	6.17	9.65	55.47

*Notes:*1. (1) – Farmers; (2) – Self-employed in non-agriculture; (3) – Agriculture Labourers; (4) – Professionals, officials and related; (5) – Clerks, service workers, skilled agriculture and fisheries workers and related; (6) – Craftsmen, plant operators and related; (7) – Elementary occupations and others.

2. SC/ST – Scheduled Castes and Schedule Tribes.

3. The percentages of SC/STs (sons) involved in occupations (1)-(7) are 18.38, 7.94, 32.52, 3.95, 6.18, 6.94 and 24.08, respectively.

Source: Authors' computations based upon IHDS (2004-05)

Table 6. Occupational Transition Matrix: Non-SC/ST individuals, All-India

Occupational Categories of Fathers	Occupational Categories of Sons (Percentage)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	45.74	11.32	12.23	5.48	6.7	5.41	13.12
(2)	3.74	60.92	2.45	7.93	11.47	6.68	6.81
(3)	10.91	10.13	42.87	2.51	5.87	6.81	20.9
(4)	13.22	21.63	3.48	26.16	17.06	9.74	8.70
(5)	7.29	22.77	3.54	12.48	26.86	12.29	14.77
(6)	5.94	26.96	3.37	4.22	8.8	39.89	10.82
(7)	4.65	25.50	6.78	2.67	7.47	9.09	43.85

*Notes:*1. (1) – Farmers; (2) – Self-employed in non-agriculture; (3) – Agriculture Labourers; (4) – Professionals, officials and related; (5) – Clerks, service workers, skilled agriculture and fisheries workers and related; (6) – Craftsmen, plant operators and related; (7) – Elementary occupations and others.

2. SC/ST – Scheduled Castes and Schedule Tribes.

3. The percentages of Non-SC/STs (sons) involved in occupations (1)-(7) are 27.14, 17.37, 14.19, 6.92, 9.28, 9.66 and 15.44, respectively.

Source: Authors' computations based upon IHDS (2004-05)

Table 7. Scalar Indicators of Mobility for Inter-occupational Categories Transition Matrices

	M ₁	M ₂	M ₃	M ₄
<i>Sector</i>				
Rural	0.585	0.281	0.506	0.716
Urban	0.661	0.304	0.651	0.806
<i>Caste</i>				
Non-SC/ST	0.591	0.274	0.524	0.715
SC/ST	0.596	0.271	0.455	0.724
<i>States</i>				
Poorer States	0.609	0.296	0.462	0.747
Other States	0.572	0.255	0.480	0.692
<i>Age Cohort</i>				
20-30 years	0.624	0.291	0.501	0.783
31-40 years	0.613	0.281	0.527	0.746
41-50 years	0.587	0.270	0.450	0.713
51-65 years	0.547	0.259	0.452	0.661
<i>All-India</i>	0.584	0.270	0.483	0.708

Notes: 1. For a description of these measures, see pp. 14-15.

2. SC/ST – Scheduled Castes and Schedule Tribes.

3. Poorer States – Bihar, Jharkhand, Chattisgarh, Madhya Pradesh, Rajasthan, Uttarakhand, Uttar Pradesh, Orissa.

Source: Authors' computations based upon IHDS (2004-05)