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IDE DISCUSSION PAPER No. 448

Dimensions and Determinants of Upward Mobility: A Study based on Longitudinal Data from Delhi Slums

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March 2014

Abstract

This study based on two primary surveys of the same households in two different years (2007/08 and 2012) assesses the extent of inter-temporal change in income of the individual workers and makes an attempt to identify the factors which explain upward mobility in alternate econometric framework, envisaging endogeneity problem. It also encompasses a host of indicators of wellbeing and constructs the transition matrix to capture the extent of change over time at the household level. The findings are indicative of a rise in the income of workers across a sizeable percentage of households though many of them remained below the poverty line notwithstanding this increase. In fact, there is a wide spread deterioration in the

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wellbeing index constructed at the household level. Among several determinants of income rise two important policy prescriptions can be elicited. Inadequate education reduces the probability of upward mobility while education above a threshold level raises it. Savings are crucial for upward mobility impinging on the importance of asset creation. Views that entail neighbourhood spill-over effects also received validation. Besides, investment in housing and basic amenities turns out to be crucial for improvement in wellbeing levels.

Keywords: mobility, wellbeing, education, saving
JEL classification: I3, J6, R2

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Dimensions and Determinants of Upward Mobility: A Study Based on Longitudinal Data from Delhi Slums[1]

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1. Conceptual Framework

Growth and distribution, particularly, the poor's share in total growth in the developing countries, is an important concern. While there is an argument that the income of the poorest increases as much as the overall average income (Dollar and Kraay, 2002), the differential impact of economic growth on the poor has also been discussed extensively (e.g. Kakwani, 2000; Ravallion, 2003). In this regard, upward economic mobility, particularly of those who are located at the lower echelons of the socio-economic ladder, is an endemic part of the pro-poor growth and development process. In fact, it is a lot easier to experience growth benefiting only those who already have the financial and human capital endowment whereas it is a major challenge to distribute the effects of growth in favour of those who lack resources.

In response to globalization it has been noted that the rise in workers' insecurities concomitant with international market exposure may prompt them to demand more redistributive measures facilitating their upward mobility (Wibbels, 2006). However, globalization has led to contractualisation to a sizable extent, and the insecure workers with declining bargaining power may not be in an effective position to demand greater redistribution (Rudra, 2008). In fact, globalization is seen to have led to job-loss and a residual absorption in the low productivity informal sector activities on a large scale (Mitra 2013; Uchikawa, 2002).

Mobility can be conceptualized in terms of a large number of factors. For example, the Legatum Prosperity Index at the country level - an indicator of prosperity - considers not

[1] The second round of the survey was funded by the Japan Society for the Promotion of Science (Grant No. 22510281). The authors would also like to thank Rajan and his associates for helping us carrying out the surveys.

only GDP per capita but also the host of entrepreneurial opportunities and other factors including quality of life and wellbeing aspects. The inter-temporal changes in this index demonstrate whether overall accessibility improves or deteriorates. In terms of other indicators empirics also show that countries with greater inequality of incomes tend to be the ones where families pass on their economic advantages or disadvantages to the next generation: Krueger (2012) introduced the "Great Gatsby Curve" based on the data of Corak (2013) and demonstrated less mobility by taking inequality in the horizontal axis and generational earnings elasticity in the vertical axis.

Usually mobility is studied in terms of occupation and also in terms of income though the latter is more explicit. Mobility can cover a period ranging from one or two years to much longer period involving intergenerational change (Narayan and Petesch, 2012). Fox and Miller (1965) studied the intergenerational mobility across countries conceived in terms of occupational shift from manual to non-manual or vice versa on the basis of the determinants such as GDP per capita, education, urbanization, political stability and achievement motivation. McAllister (1995) talked about three forms of occupational mobility of the migrants: intergenerational mobility, career mobility and migratory mobility. Upon arrival several studies noted an overwhelmingly large proportion of migrants in low status jobs in the early years and later the job status improved significantly conforming to a u-shaped curve (Bagahna, 1991; Melendez 1994; Nguyen, 2005; Raijman and Semyonov, 1995). A shift from an occupation which bears more manual work to an occupation with less manual work can be treated as upward mobility though it is not necessarily a shift in terms of class defined in terms of hierarchy at work (Weber, 1968). [2]

What is mostly a neglected area of research is the inter-spatial variation in growth and the benefits of growth even within a given city. For example, the rural-urban distribution of growth can be highly unequal (see Mitra and Mehta, 2010) and within the urban context again certain regions can be identified as the major growth poles. The agglomeration effects are strong in large urban centres with a strong impact on total factor productivity growth, resulting in higher wages even for those who are located in petty activities compared to their counterparts in small towns. Even the scale of employment is large in large urban areas (Mitra and Sato, 2007) and thus, the magnitude

[2]Social class concept is grounded in the presumption that the social location of individuals is determined primarily by their employment status and job characteristics (Grusky and Kanbur, 2006).

of unemployment, underemployment and poverty can be presumed to be lower in large cities. Government investment tends to be concentrated in large cities which may provide better livelihood opportunities even to the poor. Hence, across space those located in large urban centres are likely to experience upward mobility at a faster pace. With similar endowments the locational advantages are supposed to translate into higher levels of economic gains.

The reasons of upward mobility, however, cannot be restricted to agglomeration effects only. The overall policy of the government towards the rural migrants is also an important issue. Mechanisms discouraging migration to the city can certainly restrict the possibilities of upward mobility even when the agglomeration effects exist sizably. As the fruits of growth are not geographically evenly distributed, not all parts of the city are equally potential in terms of growth, labour demand and a favorable attitude towards migrants from the rural areas. Dupont and Mitra (1995) noted significant variations in terms of socio-economic indicators across different zones within Delhi. The overlaps between the geographical characteristics and the socio-economic characteristics are suggestive of a process of segregation being in existence. That is the reason why certain areas are dominated by slums while certain others are not.

The transport network is not evenly spread out in all parts of the city to facilitate labour mobility irrespective of location. The transport system rather has a strong bias in favour of the well-off (Dayal et al., 2012). Nor are the transport costs too low to facilitate mobility of the low income households between their work place and residence. Hence, many slum dwellers have a strong preference to reside near the work place. Thus, there is enough reason to presume segmentation along the lines of jobs availability, accessibility to job market information and ability to participate in the jobs within a given city. Particularly for the well-off, geography does not matter, though, for the low income households it is indeed a significant factor restricting upward mobility.

Among various other factors the size and distribution of the local middle class is a significant determinant of upward mobility of the poor. It is observed that all else being equal, upward mobility tended to be higher in metropolitan areas where poor families are more dispersed among mixed income neighbourhoods (Leonhardt 2013 referring to the work of Chetty et.al. 2013). The middle income households often appear to be the role model for the low income households. Not only this, the middle income households are also seen to be more charitable in providing guidance to the low income households.

This argument can be further stretched to suggest that even within a metropolitan region slum clusters adjacent to the middle income households may show a greater drive in improving their economic conditions compared to the ones which are driven to the outskirts in the name of slum resettlement move.

The literature on social capital, network formation and accessing sources of livelihood through these networks is rich. The two key elements of social capital include the resource endowments of one's associates and the social relationship itself through which associates' resources can be accessed (Ioannides and Loury, 2004; Portes, 1998). Job search through informal channels such as friends, relatives and members of the same caste group, is generally said to be widely prevalent and productive (Ioannides and Loury, 2004). Elliot (1999) noted that workers from high-poverty neighbourhoods were substantially more likely to use informal job-search methods than those from low-poverty neighbourhoods, and through the informal networks mutual benefits are ensured (Mitra 2004; Stark, 1995).

However, a number of studies highlighted the negative aspect of informal networks. Firstly, the existence of networks - given the specialization of activities in different parts of the city leading to heterogeneity in the city's economic structure – leads to market information asymmetry resulting in physical segmentation of the labour market (Mitra, 2004). Further, excess supplies of labour in certain activities reduce the possibility of upward movement in incomes. Also, in the long run, the scope of experiencing upward income mobility remains quite modest as the contact persons and the new migrants both pursue their jobs in similar activities and in the same neighbourhoods, competing with each other unknowingly. Also, the social ties do not often release them from the close cohorts they have formed and do not allow them to diversify their job search across space. Hence, the trade-offs between social inter-mingling and economic gains may turn out to be substantive: Elliott (1999) noted that for less educated workers the use of informal contacts results in significantly lower wages.[3] Rather a diversification of networks can raise their payoffs (Kono, 2006), indicating possible gains associated with a shift from the informal to formal networks.

Fields (2000)[4] describes five basic approaches to conceiving income mobility: time

[3] For details, see Kono (2006), Luke and Munshi (2006), Montogomery (1991), and Munshi and Rosenzweig (2006).
[4] As summarized by Narayan and Petesch (2012).

dependence measures the extent of change in one's current position determined by the past position; positional movement gauges changes to an individual's position in the income distribution; share movement captures changes in the share of income; symmetric income movement identifies the magnitude but not the direction of movements and directional income movement weighs fraction of upward and downward movers; and the change in the average amount of the gainers and losers. Baulch and Hoddinott (2007) present studies using household longitudinal data ranging from 18 months to 18 years to examine poverty dynamics and economic mobility. In studying such movements households which move in and out of poverty over time can be identified and so also their vulnerability changes in relation to changes in their endowments and the returns to those assets.

In the context of the urban slums dominated by the low income households the upward mobility cannot be visualized unless one is able to take a long time horizon of at least a decade or so. [5] Those who are already in relatively high income strata are less likely to undergo further increase within a short time frame. Similarly those with higher levels education are likely to have been placed in jobs of desirable status and thus for them upward mobility actually can be expected to be sluggish within a few years. With increase in educational levels, wage differentials increase, with which the probability of formal sector employment again rises (Gong and Soest, 2002; Gong et al., 2004). However, if such differentials already existed in the base year further increase in the income of the educated ones is less probable to occur. Chetty et al. (2013) also noted in the context of USA that the children from smaller towns showed a strong association with upward mobility in later life. Following some of these views we argue that the poorest would rather have a greater expectation and a stronger drive to experience greater mobility in a region that is characterized by strong forces of dynamism and growth. They have moved to such cities compromising on living conditions in their rural place of origin or in small towns to which they could have migrated, primarily with the motivation that agglomeration effects would result in better outcomes for a given level of initial endowment. While assessing the standard literature on upward mobility we need to be careful enough to allow for significant deviations that may possibly arise across countries pertaining to social, cultural and familial practices. Particularly in India the differences pertaining to gender, caste and inter-regional inequalities, manifested in terms of agglomeration effects, impinge on migration decision and expected income of

[5] See Rosenzweig (2003) suggesting that household-level panel surveys that cover time periods of a decade or more have the potential for studying economic mobility.

the low income households.

We are not in a position to study the inter-generational mobility in this paper – we cover only the mobility (or its absence) of individuals who have been working earlier and now, with a time gap of around five years. Though five years constitute an extremely short period in the time scale to be used for this kind of a study, Delhi being a high growth centre and also the national capital we presume that this time frame can be treated sufficiently large to decipher mobility, if any. Further, in our analysis we are not able to assess the impact of the macro policies such as globalization since both the survey years belong to the reform period.

Keeping in view some of the determinants of mobility suggested above this study tries and explains the income mobility and changes in overall wellbeing overtime. However, before delving into the econometric estimation, the data collection methodology and the profile of sample population followed by certain broad patterns are presented below.

2. Data Collection and Profile of Households

India is one of the fast growing economies and Delhi, the national capital, attracted sizeable investment in infrastructure and business both from domestic and foreign firms and hence, witnessed higher economic growth. The compound annual growth rate between 2007/08 and 2012/13 in Delhi was 9.73% in terms of net state domestic product (NSDP) and 7.66% in per capita NSDP, which are much higher than the corresponding figures for India as a whole (6.81% and 5.25%, respectively).The population below poverty line, however, is still substantial, being estimated at 1.7 million, 9.9% of the population (Government of India, 2013).

The 2011 census shows that the slum population in Delhi was approximately 1.8 million, which is approximately 10.6% of the total population in the city. The literacy rate in Delhi slum was 65.5%, however, far less than that in Greater Mumbai slum areas (78.0%), and the proportion of the scheduled caste (SC) population in Delhi slums (16.8%) was much larger than that of the Greater Mumbai slums (9.2%). There has been a sharp increase in the number of in-migrants to Delhi since the 1990s, and among them nearly 78% were from Uttar Pradesh and Bihar in the recent years (Government of Delhi, 2013), two of the least developed and educationally backward states in India. Delhi slums can be characterized in terms of a concentration of population from the lower socio-economic strata of the society.

Given this background we were motivated to carry out our survey of population with least development and located in one of the high growth centres in India. This study is based on data collected from two rounds of slum household survey in Delhi; the first round between November 2007 and March 2008 and the second round from March to September 2012. Residence based sampling rules as Rosenzweig (2003) suggests, affect estimates of economic mobility in the presence of nonrandom household division. We have, therefore, pursued a three-stage stratified random sampling technique for our first survey. In the first stage, using the *Jhuggi-Jhompadi* (rudimentary dwellings) list prepared by the Delhi Government, slum clusters with 200 or more households in all the nine revenue districts were considered. Since the sample was confined to a total of 50 clusters, due to time and financial constraints, the population of the number of clusters in each district to the total number was used as weight in deciding the number of clusters to be selected from each district. Once the number of clusters to be selected from a particular district was determined, specific clusters were randomly selected. In the second stage, the proportion of the number of households in each of the sample clusters to the total number of households in the 50 clusters was used as weight to determine the distribution of 417 sample households across the city. In the final stage, after interviews with the slum chief or informal leaders in the selected clusters on various socio-economic aspects of the slums and the residents, households were randomly selected for interviews. For the second round of survey, we tried to revisit the same 417 households. However, out of 50 slums, 4 slums were demolished by the time the second round was carried out. In that case, we opted for a slum in the same district in the list which has the similar number of households. Out of 417 households in the second round, 279 households (66.9%) in 46 slums were revisited, and the rest were taken from the same slum clusters as considered in the first round.

Table 1 presents the socio-economic overview of the sample households and individuals aged 15 and above. As we consider only revisited households and individuals, the sample size is 279 households with 918 persons. The data show that the composition of Muslims and lower castes, such as Other Backward Classes (OBCs), and Scheduled Castes and Tribes (SC/STs) tend to be concentrated in slums. The incidence of poverty, defined as the percentage of the population below the poverty line in terms of monthly per capita expenditure (MPCE),[6] tends to be high in both the years, although poverty in

[6] The poverty line of INR 56.54 per capita per month in 1973/74 prices has been adjusted to take into account price changes, as per Government of India (1993).

the second year declined marginally.

Table 1 Socio-economic background of sample households and individuals

3. Broad Patterns

Some of the broad characteristics of the sample indicated in Table 2 suggests that there is an increase in the average lowest income per month, average highest income per month, average income in the month preceding the survey, and also the average MPCE computed across clusters based on the individual data in real terms over 2007/08 through 2012. This increase in the average figures is evident for the set of same households surveyed in both the years and also for all sample households in both the years. Quite compatible with this pattern is the decline in the incidence of poverty, nominal though.

Based on the cluster level figures the coefficient of variation for the average lowest income, the average highest income and also the average previous month income have increased implying increasing gap between the best performer and the worst performer over time. However, in terms of mean consumption expenditure there is an indication of convergence as the coefficient of variation has declined between the two survey years. Yet, the correlation pertaining to the cluster level income or consumption in 2007/08 and 2012 is very high indicating that better-off clusters in the base year were also better-off in the terminal year. One may argue that the sample is not representative at the cluster level, and hence, any analysis of the data may not be acceptable at such a disaggregated level. We have, therefore, collapsed the cluster averages to work out the district averages, which again confirm that the coefficient of variation pertaining to the highest, lowest and previous month income increased over time. In addition, the coefficient of variation of MPCE also increased in 2012 at the district level though at the cluster level it declined. This means that within districts the cluster level inequality in terms of MPCE tends to converge while the inter district inequality is on the rise. Since the districts show wide variability in terms of various socio-economic indicators (Dupont and Mitra, 1995), it is understandable that clusters across districts tend to experience mobility differently whereas within a given district different clusters tend to become similar. This highlights the role of geography as a determinant of mobility. However in terms of cluster level average income the divergence even with a district is evident though the correlation between the initial and the terminal year values is highly significant. This means that the better-off clusters are getting better at a greater speed compared to the others.

Table 2 Inter-spatial variability in average income and consumption at 2001 prices (INR)

Turning to occupational mobility we note from Table 3 that an overwhelmingly large proportion of workers are located in the same occupation category in both the years though in some of the occupations like semi-professional, sales and trade, services, manufacturing, and transport and freight handling, the change in occupation is not negligible (See Appendix 1 for workers' occupation in 2012 by category based on the National Classification of Occupations – 2004). This is suggestive of the fact that the income mobility which we noted from Table 2 in terms of average figures across clusters/districts has mostly taken place within the broad range of a given occupational category. However, it does not mean that an individual is pursuing the same activity over time. The change in the nature of job (e.g., from regular wage employment to self-employment) may have taken place or within a given activity the status of occupation may have changed (e.g. construction labour to mason). Also each of the occupational categories constitutes a wide range of activities and hence, intra-occupational mobility may also have taken place (e.g. peon in gym to maid servant, chicken meat seller to running general shop, helper in clip making factory to shoe factory, and so on).

Table 3 Percentage distribution of occupational changes (%)

Conforming to the income increase we observed at the aggregate level from Table 2, Table 4 presents mobility at the individual to a considerable extent. The cross-tabulation of workers in terms of quintiles of present and past monthly income (taken as lowest, second lowest, middle, second highest and highest percentages) shows that inter-group mobility has taken place notwithstanding a large chunk remaining in the same category. Also, we note that this mobility is not restricted to upward direction only. A sizable number has moved in the downward direction in relative sense. In other words, though in absolute terms some of the individual workers received an increase in income their relative position seems to have deteriorated.

Table 4 Percentage distribution of workers' income changes (%)

It is indeed important to assess if the workers who experienced income mobility had acquired higher level of education relative to those who did not. As per Table 5, a sizable percentage of workers did undergo upward mobility across various educational

categories. Even the lowest proportion turns out to be nearly half. In fact, there seems to be a non-linear relationship between educational level and the percentage of workers who reported an increase in income. Workers with less educational background had the possibility of enhancing the income possibly by changing jobs and/or learning the trade secrets of the jobs they pursued. Given that they are mostly engaged in menial jobs with a high labour turn over, the phenomenon of mobility is certainly noteworthy. However, as observed from Table 6, the daily wage labour and workers in entertainment sector and in transport and freight handling activities experienced the maximum decline in income compared to other activities.

Table 5 Education and mobility
Table 6 Reported income by occupational category (INR, 2001 prices)

4. Econometric Analysis

4.1. Framework

In order to identify the importance of some of the variables such as education, geographical differences and past income in determining the upward mobility we have estimated a binomial probit model. The sample is confined to those who worked in both the survey years. The possibility of collinearity between education and past income cannot be ruled out. Besides, the time difference is only of five years which may not bring in any substantial increase in the income of those who were already better-off, relatively speaking. Rather those without education or in lower income brackets are likely to have put in efforts to maximize their income. A number of other variables have been controlled for. They include ethnic background, age, gender, migration status etc. With age the possibility of mobility declines as at higher age brackets workers are less likely to change jobs or job status. And in the informal sector in which these workers are mostly employed the concept of income increments does not apply. The labour market again holds less prospects for women workers as far as the upward mobility is concerned. Women's job search is severely constrained by the domestic activities they are required to pursue. Besides, their inability to remain outside home for long hours or travel long distances reduces their bargaining strength considerably. Even with similar levels of human capital women receive less pay compared to the males (Mitra, 2005).

The literature on migration usually suggests that the natives are usually better endowed in the labor market compared to the migrants (Papola, 1981). However, there is a competing body of literature which suggests that the migrants collect a great deal of

information about the job market through their contact persons prior to migration (Banerjee, 1986). And hence, the migrants' job status need not necessarily be inferior to the natives. Ethnic background is important because not all migrants from different places of origin hold the similar quality of job information or information about similar jobs. In fact, there is ample evidence to show that different jobs are held by workers of different ethnic backgrounds. While those from Bihar mostly work as contract labour, the migrants from the adjoining states in Delhi are engaged in trading and hotels etc. (Mitra, 2004). When their relatives and friends migrate from the respective states they are expected to land up in similar jobs with equally strong heterogeneity.

4.2. Probit Model Representing Mobility

Mobility has been considered mainly in terms of workers' income-increase though the set of explanatory variables includes both past income and consumption alternately. Considering 'workers' directly can involve the problem of endogeneity as the chosen unit in the survey was 'household', and not worker. This problem has been dealt with at a later stage in the text, though. The results from the probit model are still presented below because it addresses the issue of upward mobility directly.

Binomial probit model taking 1 for upward mobility and 0 for none has been estimated in terms of certain regressors which are included keeping in view the studies and the reasoning presented in the preceding sections: gender dummy (Male, representing 1 for males and 0 for females), age (Age), caste cum religion dummies (Scheduled castes and tribes: SCST, other backward castes excluding Muslim: OBC and Muslims irrespective of caste: MUS, with non-Muslim general castes as the reference category), dummy making a distinction the natives (those born in Delhi) from the migrants (BORNDEL), dummy representing whether the worker's household encountered any crisis between the two survey years (CRISIS), past average income, i.e., income in the base year (PASTINC), household's saving amount in the base year (SAV), education dummies (representing one for those who acquired education below primary level: BPRIM, primary: PRIM, middle: MID, secondary: SEC, higher secondary: HSEC and graduates: GRAD with those who have never attended school as the reference category), dummy if the worker used any formal network in accessing the current job but not the past job(s) (FNET), dummy if the worker changed his/her job or occupation (CHJOB), dummy if accessed a public sector job in 2012 (PUBSEC), dummy representing clusters located in south Delhi[7] (SOUTHDEL) since this part of the city is more developed than the rest in

[7] South Delhi dummy is constructed to represent a region and not just a district. South Delhi

terms of various socio-economic indicators (Dupont and Mitra, 1995), dummy indicating if the worker got married between the two survey years (MAR), dummy if the worker had fallen ill for more than 7 consecutive days during the previous one year of the first survey (ILL), and the household size in the base year (HHSZ). Table 7 presents a summary of descriptive statistics.

Table 7 A summary of descriptive statistics of sample data

Table 8 presents the results of the probit regression. Several of these variables/dummies turn out to be significant. In equation 1, males show a higher probability of experiencing upward mobility compared to the females. Among the caste cum religion dummies OBCs seem to have a higher probability while the other categories do not have higher probability than that of the reference category. The education dummies suggest that those with higher secondary qualification were more likely to undergo a rise in income. Accessing a public sector job (largely manual work such as sweeper, gardener, etc.) resulted in income increase due to pay hike in recent years. Households in clusters located in south Delhi were more probable to experience upward mobility. What is a bit surprising is that the income in the base year takes a negative coefficient and is statistically significant. But this can be rationalized by arguing that those who already were in higher income slabs had realized their expected income, whereas those with lower incomes had the scope and motivation to maximize it further. The negative sign of the past income is acceptable particularly if we keep in view the sign of the coefficient of saving included in the model which is positive and significant. Those who could generate savings could improve their incomes possibly by making investment in the occupation they were engaged in or being able to undertake greater risk in their job which helped them realize income mobility. Given the positive impact of saving on income mobility the negative effect of the past income on the same does not appear implausible. Though poor health conditions (measured in terms of whether the person fell ill) did not turn out to be significant, the occurrence of any kind of crisis/exigency seems to have a negative impact on mobility. The individual health effect is possibly captured by the crisis at the household level.

The most startling result is in relation to the dummy which makes a distinction between the natives and migrants. The literature usually argues that the natives are better-off compared with the migrants because they have better access to the job market

region comprises four districts of south Delhi, New Delhi, South west Delhi and central Delhi.

information. Also, the natives do not seem to have the immediate problems related to housing and other amenities as their parents are likely to have worked out at least a quasi-stable solution. Moreover, they are expected to be aware of the education and health facilities available for the low income households in the cities and may have utilized them on their need. Higher productivity and higher earnings are usually, therefore, some of the positive pay-offs that are associated with the natives vis-à-vis the migrants. However, the negative coefficient of the native dummy or the positive coefficient of the dummy representing born outside Delhi taken in an alternative specification is indicative of a lower probability of mobility for the natives, possibly urging that there is a need to revisit the thinking prevailing in the migration literature. As Stark (1995) pointed out migration decision is often taken rationally by the entire household: the most potential one is sent to the urban areas from the rural areas who could earn in the urban labour market and send remittances regularly facilitating the household consumption, repayment of loans, investment in agricultural land and so on. This is in fact an effective strategy against exigency adopted by the households not having adequate sources of livelihood within the rural areas. Also, as Banerjee (1986) pointed out, the rural migrants are well informed about the urban job market and are able to pursue an effective job search process through their contact persons. Hence, it could be rather faulty to assume that the migrants are worse-off in the urban labour market. Our findings support this strand of argument.

We have tried to make a distinction among the migrants of different origin (The results are not shown for brevity). Those who were born in places other than Bihar and Uttar Pradesh performed better, indicating that not all the migrants hold the same potentiality to improve their earnings. Since the place of destination is the same for all the slum dwellers, opportunities and hindrances are supposed to impact on them equally. Hence, the differences in the outcome variable may be attributed to ethnic/cultural background that the migrants represent. Possibly the job search methods, the networking styles, the initiatives to undertake investment and the responses to facilities available which have not been captured through our survey very rigorously vary along the lines of cultural background.

In an alternative specification (equation 2), the past income has been replaced by the past monthly per capita consumption expenditure (MPCE). Though the age of the worker was not found to influence mobility in the earlier specification, now it turns out to be significant with a negative coefficient. Since in the low income households job search

begins relatively early, the age factor could have taken a positive coefficient. However, the negative coefficient is suggestive of the lack of better job opportunities for the older workers. In contrast to the standard labour demand model for the educated workers where age is taken as a proxy for experience that raises the income, in the informal sector the younger workers are better-off in terms of employability than the older ones. Several strenuous activities pursued manually require younger workers who are physically strong rather than work experience which is believed to create greater mental capabilities. This could explain why the low income households prefer to join the labour market early instead of spending time on education. It is not only a loss in terms of present income but also reduces the probability of securing a better paying job through experience.

In equation 2, the coefficient of past MPCE again turns out to be negative after controlling for saving. Some of the educational dummies, representing primary and middle level schooling show a positive and significant effect on mobility which possibly because of multicollinearity between education and past income did not turn out to be significant in the earlier specification except the dummy for higher secondary education. In terms of marginal effect, in fact, this variable showed the largest impact on mobility (0.38) in equation 1. Accessing public sector job is also seen to have an almost equally strong effect (0.37) in equation 1. These findings have strong policy implications. Interventions in terms of educational support for the slum children can be an effective way of enabling them to experience mobility in the long run. On the other hand, keeping in view the downsizing of the public sector the government need to contemplate upon the possibility of introducing a national level employment guarantee programme in the urban areas which can be treated at par with the ongoing public work called Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA).[8] Males in the labour market are better-off compared to the females as the gender dummy gives a marginal effect of almost 0.18 in equation 1. In other words, the probability of mobility goes up by 0.18 if the worker happens to be a male. This suggests for probable moves towards job creation, specifically for females.

The district dummies do not turn out to be significant (the results are not shown for brevity). However, the south Delhi region dummy is positively associated with mobility, showing a marginal effect of almost 0.14 (equation 1). Our qualitative observations also

[8] MGNREGA aims to improve the livelihoods of the adult rural population by providing unskilled manual work for 100 days per household per year.

confirm this that some of the clusters in south Delhi are not only better-off in terms of housing structures and availability of basic amenities but also their awareness about education, health and job market.

Geography seems to have a significant effect in the context of mobility. Similar types of households are able to perform better in certain regions compared to certain others. Across different types of urban settlements these patterns are very much prevalent: large cities are characterized by better indicators relative to their small counterparts (Mitra, 2010). Now, we are able to observe that even within a given city behavioural differences and outcome variables tend to vary considerably across space, which can provide greater insight to developing policy strategies relating to city planning and slum rehabilitation. We pursue this point later in the text as we focus on wellbeing index constructed for each of the slum households located in different parts of the city.

Since the empirical exercise has been carried out in the probit framework treating those who experienced a downward mobility at par with those who did not experience any mobility between the two survey years, the estimates may be biased. However, the relative size of the workers with no mobility has been only 0.25% while that of those witnessing a downward mobility is around 38.15%, leaving nearly 61.60% in the set of upward mobility. Nevertheless, it may be worthwhile to verify if the presence of certain factors explained upward mobility, their absence entails downward mobility. Taking those who experienced upward mobility as the reference category (0), we have tried to explain the downward mobility with the same set of variables. The results corroborate our findings (though not shown for brevity). For example, the males are less likely to undergo downward mobility compared to the women. Among the caste categories OBCs are less prone to a decline in income. Higher is the past income lower is the possibility of further increase, and the higher is the saving the lower is the probability of downward mobility and so on.

In the probit framework, the actual magnitudes of increase in income across individuals are treated at par while the tobit model treats them differently. [9] However the results from the tobit model (equations 3 and 4 in Table 8) are quite similar to our findings already stated. Those with higher secondary level of education show a higher probability

[9] In fact to begin with, all changes (both positive and negative) in incomes across individual workers have been modelled in an ordinary classical regression framework and the overall pattern of the results is by and large similar to the probit estimates though the findings from the latter have been presented in the text as they bear sharpness.

of income mobility than others.

Table 8 Estimations of upward mobility

4.3. Income Variation at Individual Level: A Panel Data Analysis

Since the basic unit of sample selection on a random basis was the household, and not worker, the direct estimation of workers' income function may involve endogeniety as mentioned above. The first method followed to overcome the problem of endogeneity adopts a two-stage procedure: first a probit model is estimated distinguishing between workers and non-workers from each of the households. The derived probabilities are then used as instruments in the workers' income function which is estimated in a panel data framework, pooling the figures from the base and the terminal years.

In the first step, the probit model designating workers as 1 and non-workers as 0 tries to examine if the probability of being a worker increases or decreases in response to the following variables: the gender dummy, age and age square, marital status, caste status, native (non-migrant) dummy, illness dummy, number of children (below 14 years) per household, household head dummy, the male-female composition of the household, father's education (years), education level of the individual (years), and the region dummy (i.e. South Delhi dummy) (see Table 9 for a summary of the descriptive statistics). The results in (Table 10) indicate that a male is more probable of being a worker than a female and with age the probability of being a worker increases till a threshold limit after which it starts tapering off. The non-migrants are more likely to be workers than the migrants possibly because the migrants have to spend longer time in searching jobs. The number of children reduces the probability of working mainly because of the increase in domestic responsibilities of women. This is, however, significant only for the base year. Besides, if the individual happens to be the household head, the probability of working goes up. On the other hand, the south Delhi region dummy lowers it possibly because households in this part of the city are able to send their children to educational institutions rather than having the compulsion of engaging them in remunerative jobs. However, this dummy is not found significant in the terminal year.

In addition to these observations the results for the terminal year also indicate a decline in the probability of working if the individual happens to be married, which is again a gender specific phenomenon. As the composition of the household changes in favour of

males the probability declines precisely because in female headed households women tend to be the sole earners. The most striking part is in relation to the number of years spent on education which actually reduces the probability of taking up jobs: education not only reduces the probability of child labour but also empowers the individual to seek a suitable job, spending longer time on job search.

Table 9 A summary of descriptive statistics
Table 10 Probit estimates of employment

In the second step as we estimate the workers' income function, pooling the data for both the years, the coefficient of the estimated probability, derived from the first equation and used as an instrument in the second, turns out to be statistically significant (Table 11). This suggests that the endogeneity bias was strong in the model and its correction was warranted. However, this corrected model does not address the mobility issue directly and hence, the upward mobility function estimated in the probit framework in spite of its limitation has been presented in the first part of the analysis.

Among all the four versions of the model (pooled OLS, classical OLS, fixed effect, and random effect) tried in the exercise, the fixed effect could not estimate a number of parameters because of the multicollinearity between some of the dummies and two constant terms representing two different survey years. The OLS model and the random effect model present almost similar results in terms of significance and sign of the variables (Table 11). Males tend to receive a higher income compared to the females and with age and education, income increases. Accessing jobs through formal networks or through self-initiative raises income per worker. Besides, public sector employment results in higher earnings. Higher income for married individuals results from the fact that individuals with higher incomes get married, or due to family responsibilities married workers pursue their effort to earn higher incomes. Finally, the south Delhi region dummy is associated with higher incomes.[10] These results are by and large similar to our first set of results on upward mobility presented in the probit framework despite the endogeneity problem it encountered.

Table 11 Regression results for workers' income

[10] Instead of pooling the data if we do two separate regressions for two survey years the results are almost similar except for the insignificance of some of the variables in the year 2007-08.

In order to capture the mobility aspect we have regressed the terminal year income on the estimated base year income along with other control variables. The base year income function is estimated using the estimated probability of working as the instrument. The results for the terminal year income function are mostly insignificant because of the multicollienearity problem.

4.4. Income Variation at Household Level

In the second alternative exercise pursued to overcome the problem of endogeneity, a household per capita income function, considering only the earned income, for both the years has been estimated (see Table 12 for explanatory variables).[11] The findings (Table 13) lend support to what we have already observed at the individual level. Employment ratio defined as the proportion of workers in a household, savings per capita, and household head's education are some of the positive determinants as seen for both the years. In addition, the per capita income from other sources (such as house rent income) also shows a positive effect (though in the terminal year only) possibly because it helps create asset or avoid paying rent and contributes to the increase in income from perusal of economic activity.

This exercise can still be criticized on the ground that it does not address the issue of upward mobility: it only explains the variations in household income per capita in the base and the terminal years. In order to overcome this problem we have, therefore, included the base year income as an explanatory variable in the equation for the terminal year income (equation 3 in Table 13). The estimated values instead of the observed values of the base year income have been used keeping in view that this variable is endogenous. The results by and large remain unchanged.

Table 12 A Summary of descriptive statistics
Table 13 Determinants of household income

5. Wellbeing index for households: average across clusters and districts (zones) and inter temporal changes

Usually the consumption poverty is taken to reflect on living standards. However, an enormous amount of literature has appeared in the past to indicate that sufficient overlaps do not exist between various aspects of wellbeing. Several households above

[11] In order to overcome the problem of heteroscedasticity the OLS estimates of the standard errors have been replaced by their robust estimates.

the monetary poverty line can still be poor in terms of housing or access to health and education. It may be, therefore, useful to construct an index which can encompass a large number of indicators (see Mitra and Tsujita, 2008).

Since these variables are heterogeneous, it is not easy to combine all of them into a wellbeing index. For this, the factor analysis more specifically, the maximum likelihood factor analysis, was conducted. In this process, some variables were discarded in order to avoid the Heywood cases. Only select variables were thus combined to generate a composite index of wellbeing:

$$WELLINDEX(i) = \sum_{j=1}^{n} FLj(i)\,Xj$$

Where FL is the factor loading j=1…n corresponding to the number of variables, and *i* represents the *i*th significant factor.

In the second stage the composite indices generated on the basis of factor loadings for each of the significant factors are combined using the proportion of eigenvalues as weights:

$$WELLINDEX = \sum_{i=1}^{k}\left[\frac{EV(i)}{\sum EV(i)}\right] \quad WELLINDEX(i) \;\; k < n$$

where, *i* ranges from 1 to k, the number of significant factors.

The following variables are combined through a factorial analysis to form the wellbeing index at the household level: household size, proportion of household members employed, average per capita monthly income in constant (2001) prices, MPCE, average education level of the household members aged 15 and above (in terms of years), proportion of household members not debilitated by sickness for more than 7 consecutive days during previous 12 months, and the proportion of male members in the household. Using varimax rotation to obtain statistically independent factors, the results of the factor analysis suggest only one significant factor in each year (Table 14). While household size is expected to reduce the wellbeing, the other indices are supposed to contribute positively, which has been empirically confirmed. [12] Table 15 gives the mean

[12] Though the factor loading for the proportion of members not fallen ill takes a negative sign for

and standard deviation of each of the constituents of the wellbeing index.

Table 14 Factor analysis results
Table 15 Details of the Constituents of the Wellbeing index

The wellbeing index across districts is shown in Table 16. Though the district specific average values are not significantly different from each other as seen from the coefficient of variation of the mean values, within some of the districts large variations exist across clusters. This means that within a given district some of the clusters are much better off compared to the others. In other words the districts are large areal units and socio-economic variations exist even within a given district. Some of the slum clusters are possibly closer to the neighbourhood of the middle class households or some of the clusters because of their locational advantages are able to access better services for its residents while others cannot. What is quite prominent from our analysis is that such better-off clusters and worse-off clusters are present across many districts. Besides, there is a decline in 2012 in the mean value of the wellbeing index in most of the districts - across-district-variations have declined too. However, within-district-variations continue to be high and have rather increased over time in at least five of the districts, indicating the rising distance between the good performers and the bad performers.

Table 16 Average across districts, and inter temporal changes

The correlation between the monthly per capita consumption expenditure (MPCE) and the wellbeing index though appears to be reasonably high (0.84) in the base year, the terminal year gives only a moderate figure of 0.52. Table 17 gives the transition matrix of households in poverty and above poverty in 2007/08 and 2012. The households are divided into five size classes of MPCE in each of the two years: below 50% of the poverty line, 50 to 75% of the poverty line, above 75% of the poverty line but below poverty line, above poverty line to 25 % above the poverty line, and more than 25 % above the poverty line. A very large percentage of households (58.1%) have remained below or up to the poverty line in both the years. Only 11.1% of the households which were poor in the earlier year moved above the poverty line in the terminal year. Within the poor households in both the years, however, upward mobility in terms of per capita consumption expenditure is discernible. While 47.5% of the households below the poverty line remained stagnant, around 30.9% registered an improvement though they

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the terminal year, its absolute value is highly negligible.

were still not able to escape poverty. On the other hand, a sizeable number (21.6%) witnessed deterioration within the set of poverty-stricken households. On the whole, it implies that significant number of slum households experienced fluctuation in expenditures even when they were below the poverty line, and some households moved below and above poverty line over time.

Table 17 MPCE based poverty: cross tabulation

The transition matrix constructed on the basis of the wellbeing index size classes in the base and the terminal years shows a significant deterioration over time (Table 18). Several households slid down in 2012. This comes as a great surprise because at the national level the country witnessed a significant decline in the incidence of poverty during 2004/05 to 2009/10. Delhi being one of the high-growth regions in the country, the beneficial effects of growth should have been sizeable. This deterioration in the overall wellbeing happened despite a decline in the incidence of consumption poverty seen at the national level. First of all in our survey the consumption poverty did not decline significantly. Moreover, the index of wellbeing encompasses not only income and consumption aspects but also other indicators. The deterioration in those indicators in spite of a rise in income for many workers is reflected in the adverse changes in the wellbeing index. We also need to consider the fact that poverty does not refer to a fixed set of households: as Krishna (2012) argues "people are falling into poverty in the developing world even as other people escape poverty" (p.187).

Table 18 Cross tabulation of wellbeing index in 2007/08 and 2012(%)

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Conforming to the low variations observed across districts the regression results again show statistical insignificance of the district dummies in the equation for wellbeing index. [13] Reconstructing the spatial dummies on the basis of region and not just districts the south Delhi region dummy is associated positively with wellbeing levels in the terminal year. We may recall that the same dummy in the income mobility function had a positive effect as well (Table 19).

The dummies representing social categories are again mostly insignificant suggesting equal vulnerability of households in the slum clusters. Though the political networks

[13] Since the OLS estimation involves heteroscedasticity the model was re-estimated after obtaining the robust estimates of the standard errors.

exist in the slums operating along the lines of caste/religion (Edelman and Mitra, 2006), they do not seem to have resulted in differential outcomes disproving the thesis that those who have such networks are better off compared to those who do not have.

What is most striking and also pertinent from policy point of view is the positive association between the wellbeing index and the better quality housing or access to basic amenities. Based on the results for the year 2007/08 households living in semi-*pucca* (constructed by permanent and temporary materials) and *pucca* houses (constructed by permanent materials) in comparison with *kuchcha* houses (constructed by temporary materials) show a higher wellbeing index and for the year 2012 households with own water supply and access to sanitation again turn out to be better off. Investment in living conditions and basic amenities can result in better outcomes in terms of various indicators of wellbeing. Since individual savings are not adequate to undertake investment on housing and basic amenities the government intervention is called for.

Table 19 Regression results for wellbeing index.

6. Conclusion

This study is based on household level longitudinal data collected from Delhi slums with a focus on income mobility. It begins by reviewing select studies on upward mobility and revisits some of the important hypotheses. How the past income, saving and education level of the workers impinge on mobility is a pertinent line of enquiry. The broad patterns are not indicative of significant mobility across occupations though within a given broad category of occupation movements are discernible. This has been further accompanied by upward income mobility of around 62% of the workers between 2007/08 and 2012. Several alternate specifications such as classical regression taking income changes (both positive and negative) as the dependent variable, a probit model distinguishing the cases of upward mobility from those with no mobility and downward mobility, and a tobit model considering the extent of positive changes in income have been estimated. Also, to overcome the problem of endogeneity involved in estimating an income function for the workers, the panel data model for the workers' income using the probability of working as an instrument, and the per capita income function at the household level have been estimated. The results with their policy implications are broadly summarized below.

Since education is a strong determinant of rise in income it can provide important policy

directives. Accessing a public sector job is also positively associated with income mobility. Perhaps it is time to contemplate upon the possibility of introducing a national level employment guarantee programme in the urban areas which can be treated at par with the ongoing MGNREGA. The findings tend to confirm gender and a somewhat caste bias in upward mobility. Males in the labour market are better-off compared to the females. This suggests for probable moves towards job creation, specifically for females.

Geography does play an important role providing validation to some of the hypotheses on locational advantages. These findings can provide inputs to city planning and developing cost effective slum relocation policies. The relationship between the base year and the terminal year income is negative implying that those who already were in higher income slabs had realized their expected income whereas those with lower incomes had the scope and motivation to enhance it further. Saving shows a positive and significant effect on mobility from which policy lessons can be drawn in terms of asset creation and provisions for productive investment for developing long terms strategies towards poverty reduction. The occurrence of any kind of crisis/exigency seems to have a negative impact on mobility, reinforcing the importance of health support measures for the low income households. That migrants show a higher probability of experiencing upward mobility compared to the natives confirms the positive gains associated with rural to urban migration, and thus opposes the creation of barriers that hinder the entry of the rural job seekers to the cities.

The findings also bring out the importance of cultural factors as migrants of certain specific origins are more probable than others to experience an income rise. The lack of better job opportunities for the older workers makes a case for strengthening the support system in favour of the elderly. The negative relationship between age and upward mobility explains why the low income households prefer to join the labour market early instead of spending time on education, which is not only a loss in terms of present income but also reduces the probability of securing a better paying job. If this perception has to change, quality education with provision for skill formation has to be introduced.

The wellbeing index derived on the basis of a number of indicators, and not just consumption/income, shows deterioration for a sizeable percentage of the households over time. The positive association between the wellbeing index and the better quality housing or access to basic amenities brings out the efficacy of the programs which aim at

improving the living conditions and basic amenities for the low income households.

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Table 1 Socio-economic background of sample households and individuals

Household (279)	2007/08	2012
Caste and religion		
General caste	46	(16.49%)
OBCs	69	(24.73%)
SC/STs	102	(36.55%)
Muslim	62	(22.22%)
Household size	5.34	5.25
	(1.73)	(1.70)
MPCE (INR in 2001 prices)	500.38	571.21
	(289.11)	(295.22)
Household below poverty line (%)	73.48	69.18
Lowest monthly income (INR in 2001 prices)	2719.02	3237.67
	(1850.82)	(2291.89)
Highest monthly income (INR in 2001 prices)	3765.88	4093.46
	(2986.23)	(2568.99)
Individuals (918)	2007/08	2012
Caste and religion		
General caste	141	(15.36%)
OBC	240	(26.14%)
SC/STs	318	(34.64%)
Muslim	219	(23.86%)
Male	539	(58.71%)
Age	28.76	32.92
	(13.24)	(13.32)
Born in Delhi	382	(41.61%)
Work participation	0.48	0.56
	(0.50)	(0.50)

Note: Standard deviations for the means are in parentheses.

Table 2 Inter-spatial variability in average income and consumption at 2001 prices (INR)

	Household monthly income						Monthly per capita consumption expenditure	
	2007/08			2012				
	Highest month	Lowest month	Last month	Highest month	Lowest month	Last month	2007/08	2012
Cluster average: Common sample								
Mean	2891.28	3897.74	3442.13	3493.78	4388.51	3851.34	508.72	557.87
Standard deviation	1225.81	1462.78	1389.85	1649.08	1714.51	1636.90	149.42	126.51
Coefficient of variation	42.40	37.53	40.38	47.20	39.07	42.50	29.37	22.68
Cluster average: All sample								
Mean	2777.43	3764.66	3363.61	3489.61	4249.70	3804.87	499.68	549.64
Standard deviation	941.80	1229.05	1145.71	1561.15	1576.03	1545.49	147.75	104.88
Coefficient of variation	33.91	32.65	34.06	44.74	37.09	40.62	29.57	19.08
District average: Common sample								
Mean	2837.20	3739.61	3373.32	3570.00	4656.87	3853.25	520.08	604.68
Standard deviation	769.55	788.90	793.34	1267.46	1055.87	1084.58	88.63	122.22
Coefficient of variation	27.12	21.10	23.52	35.50	22.67	28.15	17.04	20.21
District average: All sample								
Mean	2779.50	3679.58	3333.56	3568.11	4476.18	3794.76	502.32	591.96
Standard deviation	430.50	417.29	352.41	918.53	687.03	602.27	73.21	115.87
Coefficient of variation	15.49	11.34	10.57	25.74	15.35	15.87	14.58	19.57

Table 3 Percentage distribution of occupational changes (%)

		Occupation in 2012										
		Semi-professional	Daily wage labour	Technical & maintainance	Entertaiment	Sales & trade	Services	Mining & building labour	Manufacturing	Transport & freight handling	Total	No of observations
Occupation in 2007/08	Semi-professional	66.67	0.00	0.00	0.00	22.22	0.00	0.00	0.00	11.11	100.00	9
	Daily wage labour	0.00	33.33	0.00	33.33	0.00	0.00	0.00	0.00	33.33	100.00	3
	Technical & maintainance	0.00	0.00	70.83	4.17	0.00	0.00	0.00	12.50	12.50	100.00	24
	Entertaiment	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	100.00	6
	Sales & trade	0.00	1.10	0.00	0.00	79.12	7.69	0.00	6.59	5.49	100.00	91
	Services	2.67	0.00	0.00	0.00	4.00	85.33	4.00	2.67	1.33	100.00	75
	Mining & building labour	1.96	0.00	0.00	0.00	9.80	9.80	76.47	1.96	0.00	100.00	51
	Manufacturing	2.13	0.00	0.00	0.00	5.32	5.32	1.06	79.79	6.38	100.00	94
	Transport & freight handling	0.00	0.00	2.33	0.00	4.65	2.33	0.00	0.00	90.70	100.00	43
	Total	2.78	0.51	4.55	2.02	22.47	20.71	10.86	21.97	14.14	100.00	396

Note: Five person's occupational changes are missing.

Table 4 Percentage distribution of works' income changes (%)

			Average income in 2012						
			Lowest 20% INR 0-1255	Second lowest 20% INR 1308-1569	Middle 20% INR 1621-2039	Second highest 20% INR 2092-2510	Highest 20% INR 2615-11245	Total	No. of observation
Average income in 2007/08	Lowest 20%	INR 0-906	54.43	29.11	6.33	2.53	7.59	100.00	79
	Second lowest 20%	INR 943-1472	28.13	39.06	20.31	9.38	3.13	100.00	64
	Middle 20%	INR 1509-1925	7.45	25.53	21.28	36.17	9.57	100.00	94
	Second highest 20%	INR 1962-2566	1.30	12.99	23.38	29.87	32.47	100.00	77
	Highest 20%	INR 2642-16981	4.60	5.75	6.90	21.84	60.92	100.00	87
		Total	18.20	21.70	15.46	20.95	23.69	100.00	401

Note: Average income is calculated based on the highest and lowest incomes per month in respective years.

Table 5 Education and Mobility

	Downward mobility or no change		Upward mobility		Total	
Completed schooling level	No.	%	No.	%	No.	%
Never-attending school	53	31.36	116	68.64	169	100.00
Below primary	24	40.00	36	60.00	60	100.00
Primary	38	41.76	53	58.24	91	100.00
Middle	23	48.94	24	51.06	47	100.00
Secondary	13	50.00	13	50.00	26	100.00
Higher secondary	1	33.33	2	66.67	3	100.00
Graduate and above	2	40.00	3	60.00	5	100.00
Total	154	38.40	247	61.60	401	100.00

Table 6 Reported income by occupational category (INR, 2001 prices)

	Sample	Lowest income		Highest income	
Occupational category in 2012	size	2007/08	2012	2007/08	2012
Semi-professional	11	2854.2	3380.56	3746.14	4707.11
Daily wage labour	2	1320.76	1359.83	2641.51	2615.06
Technical & maintainance	18	2052.41	2504.65	2536.69	3085.77
Entertaiment	8	1841.51	588.39	3698.11	2889.64
Sales & trade	89	1406.19	1661.59	2099.64	2292.44
Services	82	1549.47	1854.14	1753.80	2096.52
Mining & building labour	43	1386.57	1640.80	2243.09	2351.12
Manufacturing	89	1412.85	1640.44	1837.61	1900.18
Transport & freight handling	58	2028.63	2000.07	2783.34	2419.38
Total	400	1598.75	1801.59	2180.12	2300.93

Note: Occupational categories of four persons in 2007/08 and one person in 2012 are missing.

Table 7 A summary of descriptive statistics of sample data

Variable	Obs	Mean	Std. Dev.	Min	Max
Upward mobility	401	0.62	0.49	0	1
MALE	401	0.86	0.35	0	1
AGE	401	37.07	10.74	16	65
SCST	401	0.37	0.48	0	1
OBC	401	0.25	0.43	0	1
MUSLIM	401	0.23	0.42	0	1
BORNDEL	401	0.31	0.46	0	1
CRISIS	401	0.21	0.41	0	1
PASTINC	401	1889.43	1405.69	0	16981.13
SAV	399	319.11	577.03	0	5000
BPRIM	401	0.15	0.36	0	1
PRIM	401	0.23	0.42	0	1
MID	401	0.12	0.32	0	1
SEC	401	0.06	0.25	0	1
HSEC	401	0.01	0.09	0	1
GRAD	401	0.01	0.11	0	1
FNET	401	0.10	0.30	0	1
CHJOB	401	0.27	0.44	0	1
PUBSEC	401	0.01	0.11	0	1
SOUTHDEL	401	0.40	0.49	0	1
MAR	401	0.04	0.21	0	1
ILL	401	0.09	0.28	0	1
HHSZ	401	5.59	1.78	1	10

Table 8 Estimations of upward mobility

	Equation (1) Probit		Equation (2) Probit		Equation (3) Tobit	Equation (4) Tobit
Dependent variable= upward mobility	Coefficient	Marginal effect	Coefficient	Marginal effect	Coefficient	Coefficient
MALE	0.4563 *	0.1777 *	-0.1583	-0.0591	178.3749	-171.5945
	(0.2487)	(0.0979)	(0.2038)	(0.0743)	(153.2933)	(150.1854)
AGE	-0.0135	-0.0051	-0.0248 ***	-0.0094 ***	0.3087	-8.1628
	(0.0086)	(0.0032)	(0.0076)	(0.0029)	(5.5856)	(5.7106)
SCST	0.2239	0.0833	0.1801	0.0679	121.4410	119.6656
	(0.2117)	(0.0778)	(0.2083)	(0.0777)	(165.6923)	(171.1046)
OBC	0.3974 *	0.1433 *	0.3769 *	0.1380 *	184.5160	181.1510
	(0.2265)	(0.0773)	(0.2190)	(0.0764)	(170.9081)	(176.5281)
MUSLIM	0.2525	0.0925	0.2365	0.0879	252.8617	256.1866
	(0.2356)	(0.0838)	(0.2295)	(0.0829)	(179.4190)	(185.6341)
BORNDEL	-0.3623 **	-0.1386 **	-0.3515 **	-0.1356 *	-304.5989 **	-309.0930 **
	(0.1765)	(0.0683)	(0.1692)	(0.0656)	(128.8099)	(133.4038)
CRISIS	-0.2772 *	-0.1066 *	-0.1393	-0.0536	-222.3867	-124.0062
	(0.1666)	(0.0648)	(0.1693)	(0.0657)	(128.8099)	(131.2722)
PASTINC	-0.0007 ***	-0.0003 ***			-0.3986 ***	
	(0.0001)	(0.0001)			(0.0599)	
MPCE			-0.0005 *	-0.0002 *		-0.1072
			(0.0003)	(0.0001)		(0.2066)
SAV	0.0003 *	0.0001 *	0.0000	0.0000	0.1293	-0.7950
	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.1002)	(0.1001)
BPRIM	-0.3974 *	-0.1544 *	-0.2826	-0.1099	-7.0771	23.1497
	(0.2087)	(0.0822)	(0.2075)	(0.0819)	(151.9918)	(158.9638)
PRIM	-0.2654	-0.1019	-0.3261 *	-0.1265 *	27.0322	-22.9886
	(0.1937)	(0.0753)	(0.1828)	(0.0716)	(138.9869)	(144.6981)
MID	-0.3018	-0.1170	-0.4283 *	-0.1678 *	12.3880	-83.6753
	(0.2299)	(0.0908)	(0.2257)	(0.0892)	(172.2866)	(178.6491)
SEC	-0.0063	-0.0024	-0.4182	-0.1643	190.8879	-98.2997
	(0.2963)	(0.1118)	(0.2967)	(0.1175)	(233.2054)	(242.0439)
HSEC	5.4354 ***	0.3828 ***	0.0800	0.0301	4000.2120 ***	2191.7420 ***
	-1.1876	-0.0264	-0.7409	-0.2742	-638.4862	-580.7890
GRAD	-0.1510	-0.0581	-0.6055	-0.2379	66.2029	-522.7511
	(1.2994)	(0.5091)	(0.7202)	(0.2754)	(542.8117)	(592.6732)
FNET	0.2065	0.0752	0.1079	0.0405	37.1275	-59.5867
	(0.2673)	(0.0938)	(0.2325)	(0.0858)	(174.6510)	(181.3107)
CHJOB	-0.0503	-0.0190	-0.0450	-0.0172	46.8769	70.0197
	(0.1631)	(0.0619)	(0.1569)	(0.0601)	(117.1940)	(121.4879)
PUBSEC	2.4421 **	0.3759 ***	0.7930	0.2452 *	2579.3930 ***	1654.8960 ***
	(1.1621)	(0.0286)	(0.6522)	(0.1450)	(463.9793)	(464.9282)
SOUTHDEL	0.3857 ***	0.1426 ***	0.2106	0.0795	175.1443 *	116.1963
	(0.1499)	(0.0541)	(0.1398)	(0.0522)	(105.2487)	(108.1999)
MAR	0.0124	0.0047	0.0800	0.0301	397.0266	455.2701 *
	(0.3447)	(0.1293)	(0.3489)	(0.1294)	(248.2244)	(187.2931)

Table 8 (continued)

ILL	-0.0012	-0.0004	0.0256	0.0097	-14.1480 *	-0.5117
	(0.2589)	(0.0975)	(0.2285)	(0.0863)	(179.6418)	(187.2931)
HHSZ	-0.0003	-0.0001	-0.0250	-0.0095	57.7359	53.9119 *
	(0.0423)	(0.0159)	(0.0407)	(0.0155)	(29.4849)	(31.6852)
Constant	1.5726 ***		1.7611 ***		129.7357	231.8381
	(0.5065)		(0.4731)		(322.0884)	(353.7059)
Pseudo R^2	0.1948		0.0592		0.0219	0.0058
No. of observations	399		399		399	399
Left-censored observations					154	154
Uncensored observations					234	245

Note: Figures in parentheses are standard errors. To calculate marginal effects, the mean value was used for the continuous variable and a value of zero was used for the dummy variables. ***, **, and * represents statistical significance at 1%, 5% and 10%, respectively.

Table 9 A summary of descriptive statistics

	2007/08		2012	
	Mean	Standard deviation	Mean	Standard deviation
Paid employment	0.5680	0.4957	0.5556	0.4972
Male	0.5676	0.4957	0.5871	0.4926
Age	32.3604	11.8949	32.9172	13.3108
Age square	1188.4930	850.4382	1260.5270	975.4657
Married	0.7247	0.4469	0.6133	0.4873
OBC	0.2706	0.4445	0.2614	0.4397
SC/ST	0.3462	0.4761	0.3464	0.4761
Muslim	0.2294	0.4208	0.2386	0.4264
Born in Delhi	0.3289	0.4701	0.4161	0.4932
One week illness	0.1034	0.3047	0.1784	0.3830
Children below 14	2.0665	1.4079	1.6950	1.3489
Household head	0.3391	0.4737	0.3028	0.4597
Male ratio	0.4288	0.1723	0.5867	0.1610
Father's education (years)	1.4137	3.0074	1.7744	3.2930
Education (years)	3.4027	3.8579	4.1852	4.1419
South Delhi	0.4257	0.4948	0.4303	0.4954

Table 10 Probit estimates of employment

	Eq (1) 2007/08			Eq (2) 2012		
	Coefficient	Robust Std. Err.		Coefficient	Robust Std. Err.	
Male	1.9176	0.1969	***	1.7049	0.1782	***
Age	0.2512	0.0446	***	0.3092	0.0432	***
Age square	-0.0032	0.0006	***	-0.0043	0.0005	***
Married	0.0150	0.2184		-0.6163	0.2204	***
OBC	-0.1773	0.1862		0.0394	0.1697	
SC/ST	0.1072	0.1804		0.0851	0.1587	
Muslim	0.0402	0.1967		0.0138	0.1806	
Born in Delhi	0.2467	0.1499	*	0.0302	0.1426	
One week illness	-0.0915	0.1995		-0.1046	0.1627	
Children below 14	-0.1041	0.0453	**	-0.0602	0.0471	
Household head	0.7572	0.2322	***	1.3557	0.2879	***
Male ratio	0.4343	0.3832		-1.2712	0.3925	***
Father's education	-0.0097	0.0227		-0.0171	0.0180	
Education (years)	-0.0227	0.0196		-0.0408	0.0192	**
South Delhi	-0.2153	0.1220	*	-0.0662	0.1140	
Constant	-5.1141	0.7951	***	-4.4755	0.7742	***
N	734			811		
Pseudo R^2	0.4245			0.4135		

Note: ***, **, and * represent statistical significance at 1%, 5% and 10%, respectively.

Table 11 Regression results for workers' income

Variables	Dependent variables = Average monthly income at constant prices								
	Eq (1)			Eq (2)			Eq (3)		
	Coefficient	Standard error		Coefficient	Standard error		Coefficient	Standard error	
Male	465.6264	127.5297	***	380.8845	129.5493	***	372.3701	121.6546	***
Age	11.7855	4.3188	***	7.6572	4.2203	*	7.5752	4.4224	*
SC/STs	19.4412	103.7446		10.6339	104.5818		8.6512	79.3513	
OBCs	96.8582	108.1693		123.0000	109.5973		123.9300	120.4934	
Muslim	1.4516	111.9171		30.6829	112.7936		33.0317	98.8431	
Born in Delhi	37.2862	88.7427		7.3355	90.3750		5.5089	77.7772	
Crisis in 5 years	-50.8267	97.5829		-112.4524	89.8978		-113.0731	75.5590	
Education in years	57.9147	9.8236	***	69.1802	9.9416	***	69.9426	16.7823	***
Formal institution	146.2684	93.9492		182.3120	100.5348	*	181.1028	121.7795	
Self network	390.6987	96.7171	***	341.7698	82.2075	***	331.2709	78.7108	***
Public sector employment	3896.2440	513.6144	***	2794.1610	497.4223	***	2844.0530	751.6871	***
South Delhi	163.6851	72.7676	**	158.9723	74.6992	**	157.3736	79.4700	**
Married	361.3757	111.9290	***	380.4359	108.5692	***	377.6229	88.5448	***
One week illness	-158.8070	115.5865		-22.9552	100.4355		-27.5000	94.3358	
Household size	20.2947	20.5247		20.0752	20.0231		20.4263	18.8700	
Sample bias correction term	-669.8490	93.8556	***	-762.2013	95.4031	***	-771.8971	96.4904	***
Constant	231.7579	246.9057		493.1221	246.6818		514.2153	237.7461	**
Estimation method	Pooled OLS			Random effect			OLS		
No of observations	1010			1010			1010		
Breusch and Pagan LM test				37.08 [χ^2 (1)]					
R-sq	0.4008			0.4068			0.4068		

Note: ***, ** and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

Table 12 A Summary of descriptive statistics

	2007/08		2012	
	Mean	Standard deviation	Mean	Standard deviation
Head's age	41.5233	10.1934	44.9319	9.3173
Head's eduaction level (years)	3.4660	4.0114	2.2437	1.5023
Head born in Delhi	0.1505	0.3582	0.1362	0.3436
Household size	5.3441	1.7268	5.2509	1.7053
Female headed household	0.0287	0.1672	0.0251	0.1567
Female ratio	0.4315	0.1705	0.4113	0.1734
Employment ratio	0.3505	0.2095	0.3857	0.2227
per capita saving (INR)	57.0141	146.3134	45.9225	130.9600
per capita other income INR)	10.9968	41.6814	11.8065	49.2002
Predicted household income in 2007/08 at 2001 prices (INR)			663.7766	405.3719
Average household income at 2001 prices (INR)	664.7567	521.3227	14017.1300	8977.5260
No of observations	278		279	

Table 13 Determinants of per capita household monthly income

	Eq (1) 2007/08		Eq (2) 2012		Eq (3) 2012	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Head's age	3.1213	1.35	0.9060	0.23	0.6254	0.15
Head's eduaction level	26.7967	4.01 ***	105.4130	2.31 **	100.5743	2.03 **
Head born in Delhi	-53.3960	-1.25	-4.2265	-0.07	-1.1482	-0.02
Household Size	-19.9454	-1.79 *	-1.4777	-0.09	1.8239	0.09
Female headed household	2.4015	0.03	-124.1223	-0.79	-115.5154	-0.72
Female ratio	-55.9674	-0.37	-244.9739	-1.63 a	-237.9711	-1.6
Employment ratio	759.6686	4.22 ***	1424.6960	5.23 ***	1402.7700	4.91 ***
per capita saving	1.8732	2.78 ***	1.6135	2.92 ***	1.5971	2.9 ***
per capita other income	0.3678	0.64	1.9284	1.87 *	1.9746	1.89 *
Predicted household income in 2007/08					0.0527	0.64
Constant	202.8643	1.74 *	-48.0908	-0.16	-71.8032	-0.25
No of observations	278		279		279	
R^2	0.6058		0.569		0.5697	

Note: ***, **, and * represent statistical significance at 1%, 5% and 10%, respectively.

Table 14 Factor analysis results

	2007/08		
Variable	Factor 1	Factor 2	Factor 3
Household size	-0.2910	-0.4465	0.1911
Employment ratio	0.3583	-0.2185	0.0608
per capita income	0.7346	-0.0519	0.6964
MPCE	0.7791	0.3328	0.1173
Average education	0.4422	0.7272	-0.0448
Illness	0.0141	0.2235	-0.0825
Male ratio	0.2462	0.3385	0.1575
Eigen value	2.1783	0.62809	0.43609
Proportion	0.6718	0.1936	0.1345
	2012		
	Factor 1	Factor 2	Factor 3
Household size	-0.4228	0.1101	0.5531
Employment ratio	0.8516	0.7323	0.0163
per capita income	0.6871	0.399	0.2719
MPCE	0.3098	0.3673	-0.1263
Average education	0.0431	-0.0671	-0.1375
Illness	-0.0382	0.276	-0.4019
Male ratio	0.3508	0.0759	-0.0277
Eigen value	1.89653	0.90461	0.30335
Proportion	0.6109	0.2914	0.0977

Note: N=279.

Table 15 Composition of wellbeing index

Variable	Definition	2007/08		2012	
		Mean	Std.Dev.	Mean	Std.Dev.
Household size	Number of household members	5.34	1.73	5.25	1.7
Employment ratio	Proportion of household members employed in previous 12 months	0.35	0.21	0.39	0.22
per capita income	Average per capita monthly income at 2001 prices (average of lowest and highest monthly income)	662.37	521.9	763.58	643.29
MPCE	Household monthly per capita consumption expenditure at 2001 prices	500.38	289.11	555.95	288.11
Average education	Average education level among household members aged 15 and above (years)	3.23	2.86	3.92	2.94
Illness	Proportion of household members not debilitated by sickness for more than 7 days during previous 12 months	0.91	0.18	0.81	0.22
Male ratio	Proportion of male household members	0.57	0.17	0.59	0.17

Note: N=279.

Table 16 Average of wellbeing index across districts, and inter temporal changes

		2007/08		2012	
District	No. of observations	Sample mean	Coefficient of variation (within district variation)	Sample Mean	Coefficient of variation (within district variation)
Central	3	705.77	42.90	922.67	4.56
East	14	708.58	41.01	674.55	72.99
New	10	1100.55	58.83	762.21	59.38
North	11	986.81	36.89	732.36	67.85
North east	23	722.42	36.57	704.87	39.30
North west	71	952.90	84.96	636.25	56.80
South	86	849.16	44.50	713.94	73.36
South west	41	914.76	68.28	761.19	93.62
West	20	793.05	39.39	605.89	53.12
Total	279	875.57	63.35	695.34	53.12

Note: Coefficient of variation across district is16.24 % in 2007/08 and 12.64 % in 2012, respectively.

Table 17 Cross-tabulation of MPCE in 2007/08 and 2012

		MPCE in 2012					
		less than 0.5Z	0.5Z to 0.75Z	0.75Z to Z	Z to 1.25Z	more than 1.25Z	Total
MPCE in 2007/08	less than 0.5Z	7	12	4	4	1	28
		25.00	42.86	14.29	14.29	3.57	100.00
		46.67	12.63	4.82	22.22	1.47	10.04
	0.5Z to 0.75Z	7	44	34	2	12	101
		6.93	43.56	33.66	1.98	13.86	100.00
		46.67	46.32	40.96	11.11	17.65	36.20
	0.75Z to Z	1	27	26	4	8	76
		1.32	35.53	34.21	5.26	23.68	100.00
		6.67	28.42	31.33	22.22	11.76	27.24
	Z to 1.25Z	0	8	10	3	14	35
		0.00	22.86	28.57	8.57	40.00	100.00
		0.00	8.42	12.05	16.67	20.59	12.54
	more than 1.25Z	0	4	9	5	21	39
		0.00	10.26	23.08	12.82	53.85	100.00
		0.00	4.21	10.84	27.78	30.88	13.98
	Total	15	95	83	18	68	279
		5.38	34.05	29.75	6.45	24.37	100.00
		100.00	100.00	100.00	100.00	100.00	100.00

Notes: Z stands for the poverty lines in each year. The two figures below each number of households refer to frequency by percentage in terms of both rows and columns.

Table 18 Cross-tabulation of wellbeing index in 2007/08 and 2012

		Wellbeing index in 2012						
		less than 0.5Z	0.5Z to 0.75Z	0.75Z to Z	Z to 1.25Z	1.25Z to 1.5Z	More than 1.5 Z	Total
Wellbeing index in 2007/08	less than 0.5Z	10	9	4	3	1	0	27
		37.04	33.33	14.81	11.11	3.70	0.00	100.00
		43.48	9.89	5.26	8.33	5.88	0.00	9.68
	0.5Z to 0.75Z	9	41	20	4	2	4	80
		11.25	51.25	25.00	5.00	2.50	5.00	100.00
		39.13	45.05	26.32	11.11	11.76	11.11	28.67
	0.75Z to Z	2	29	28	14	5	5	83
		2.41	34.94	33.73	16.87	6.02	6.02	100.00
		8.70	31.87	36.84	38.89	29.41	13.89	29.75
	Z to 1.25Z	2	7	7	8	3	5	32
		6.25	21.88	21.88	25.00	9.38	15.63	100.00
		8.70	7.69	9.21	22.22	17.65	13.89	11.47
	1.25Z to 1.5Z	0	2	9	3	2	6	22
		0.00	9.09	40.91	13.64	9.09	27.27	100.00
		0.00	2.20	11.84	8.33	11.76	16.67	7.89
	More than 1.5 Z	0	3	8	4	4	16	35
		0.00	8.57	22.86	11.43	11.43	45.71	100.00
		0.00	3.30	10.53	11.11	23.53	44.44	12.54
	Total	23	91	76	36	17	36	279
		8.24	32.62	27.24	12.90	6.09	12.90	100.00
		100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: Z stands for mean value of wellbeing index. The two figures below each number of households refer to frequency by percentage in terms of both rows and columns.

Table 19 Regression results for wellbeing index

	2007/08			2012		
	Coefficient	t-ratio		Coefficient	t-ratio	
OBCs	67.8807	0.57		12.1600	0.14	
SC/STs	-66.9320	-0.88		-11.3043	-0.15	
Muslim	-187.4364	-66.93	**	-86.6703	-1.14	
Head born in Delhi	-109.8716	-1.97	**	-116.8184	-1.59	
South Delhi	-11.1105	-0.17		105.7108	1.73	*
Semi *pucca* house	236.7179	2.53	**	-79.3940	-0.34	
Pucca house	405.3874	4.47	***	-95.6938	-0.40	
Own water sources	21.7773	0.27		197.2103	2.78	***
Toilet	122.3744	1.18		184.8920	1.93	*
Legal electricity connection	-9.7075	-0.13		60.5217	1.02	
Constant	592.8514	5.86	***	606.2211	2.48	**
N	275			274		
R^2	0.0694			0.0997		

Note: ***, **, and * represent statistical significance at 1%, 5% and 10%, respectively.

Appendix I: Workers' occupation by category (occupation in 2012)

1. *Semi-professional*: unqualified doctor (*quack*), supervisor in factory, Quran teacher, accountant in company, administration officer in government, worker in private company, compounder, computer operator, personal tutor, house construction contractor, mini truck owner, poet, private banker, supervisor in construction company, worker in property agent, worker in chartered accountant office.

2. *Daily-wage labour*: miscellaneous worker who does any available work.

3.*Technical and maintenance*: lineman in Delhi Jal Board (Delhi Water Board), electricity board technical staff, electrician, mobile repairer, electric repairer, cycle repairer, electric item repairer, fitter, vehicle mechanic, motor mechanic, plumber, welder.

4. *Entertainment*: DJ, drummer, magician.

5. *Sales and trade:* shop, sales, demonstration and assistant in small grocer, butcher, telephone kiosk, milkman, wholesale market, vegetable market, mobile showroom, electrical goods shop, petrol station, marble shop furniture shop, FCI godown, greengrocer, timber shop, shoe shop, tobacconist. Street vending and related work: herb plant seller, vegetable vender, buying and selling second-hand clothes, buying and selling wire, artificial jewelry seller, *chaat* seller, *mattah* seller, cloth vendor, bagged milk seller, *paan* and *bidi* seller, potato seller, ice cream seller, pork seller, chicken meant seller, cold drink seller, spice seller, cucumber seller.

6. *Services (other than entertainer)*: barber, helper in *anganwadi*, beautician, guard (*chowkidar*), tea stall worker, cook, maid servant, cleaner, sweeper, sewage pipeline cleaner, shoe polisher, gardener, housekeeper in hotel, worker in hotel, waiter, clothes ironing person (*dhobi*), catering person, office handyperson (*peon*), waiter, refuse seller.

7. *Mining and building labour*: painter, mason, carpenter, construction labourer, drilling worker, plaster of Paris worker.

8. *Manufacturing labour*: dying, polishing packing in factory, tailor, clothes designer, embroidery, pattern master, cutting thread in clothes factory, chick maker, worker in dye-making factory, worker in tool-making factory, worker in clothes-dyeing factory, worker in iron factory, worker in nail-polish factory, cooler and trunk making paring wire, furniture making, making *bindi*, labour in fibre plate factory, helper in plastic manufacturing factory, helper in steel factory, labour in medicine factory, motor binder, making iron tools, ragdoll maker, helper in tyre factory, cutting bottles, cutting plastic bags.

9. T*ransport and freight handling*: three-wheel driver, *tempo* drive, tractor driver, taxi driver, school van driver, mini-truck driver, bus driver, truck driver, drive in a company, private-house chauffer, rickshaw puller, cart puller, loading and unloading goods.