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India's Internal Labor Migration Paradox

The Statistical and the Real

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Abstract

Internal labor migration rates in India have been largely static and low in recent times compared with those in other countries. This is a cause for concern because internal migration for economic reasons can promote the agglomeration of economic activity in more productive locations and directly contribute to reducing poverty through remittances. New evidence based on the India Human Development Survey, which provides a more recent source of data compared with the Census and other household surveys, shows that labor mobility is higher than previously estimated—the stock of labor migrants increased from 16 million in 2004–05 to 60 million in 2011–12.

The absolute number of circular migrants, at more than 200 million in 2011–12, is also much higher than previously documented estimates. Tracking the same households between 2004–05 and 2011–12, empirical analysis based on the India Human Development Survey highlights several socioeconomic factors associated with the migration decision: household income, the availability of information, as well as community networks in source and destination areas. There is also a possible administrative dimension to interstate migration barriers, owing to domicile provisions for work and study, lack of portability of social benefits, and legal and other entitlements upon relocation.

India's Internal Labor Migration Paradox:
The Statistical and the Real

Gaurav Nayyar and Kyoung Yang Kim[1]

A. Introduction

Internal migration rates in India have been largely static and low in recent times compared to other countries. As per India's Census of 2001, the flow of internal migration in the five years preceding 2001 accounted for less than 3 percent of the population (Kone et al., 2016). In contrast, those who moved from one state to another in the United States during 2005 accounted for 12 percent of the population (Molloy et al., 2011). Furthermore, in a cross-country comparison of internal migration rates between 2000 and 2010, Bell et al. (2015) show that India ranks last in a sample of about 80 countries. The low level of migration in India relative to other emerging economies is also reflected in the country's relatively low urbanization rate. The urbanization rate in India was 28 percent in 2000, 15 percent less than in countries with comparable GNP levels (Deshingkar and Anderson, 2004). And this only marginally increased to 31 percent in 2011 (Sharma and Chandrasekhar, 2014).

Internal migration rates for those who moved for economic reasons are similarly low, although new evidence suggests that labor mobility is higher than previously estimated. The stated reasons for migration span a wide range, including employment, marriage, study and moving to join one's parents and/or the earning member of the family who has previously migrated. According to the 2011 Census, 3.5 million migrants who moved within the last one year stated economic reasons for migration. The corresponding numbers for the 2001 and 1991 Census, respectively, were 2.2 million and 1.4 million. A new Cohort-based Migration Metric (CMM) developed in the Government of India's recent Economic Survey shows that annual interstate labor mobility averaged 5 million to 6 million people between 2001 and 2011. It also includes the first-ever estimates of internal work-related migration, which using railway data for 2011–16, indicate an annual average flow of close to 9 million people between states. Both these estimates are significantly greater than the annual average number suggested by successive Censuses.

Internal migration for economic reasons can promote the agglomeration of economic activity in productive locations. India's five largest districts account for 18 percent of total employment, a share that has not moved appreciably over time – even though the composition of these top five changed substantially (Fernandes and Sharma, 2012). This suggests that more productive locations have not been successful in attracting additional resources at the expense of less productive locations. The evidence is indicative of "thick" district borders – the misallocation of resources between districts is considerably larger than within districts – indicating significant barriers to firms reaping the benefits of agglomeration (World Bank, 2016). Reducing factor market distortions, in particular, can improve the ability of more productive firms to access inputs. Empirical evidence suggests that a 1 percent decrease in the index of employment misallocation could raise output per worker in the manufacturing and service sector, respectively, by about 0.3 percent and 0.9 percent (Duranton et al., 2015).[2] Labor market integration should therefore be a priority, especially given India's size and diversity.

Internal migration for economic reasons can also directly contribute to reducing poverty and boosting shared prosperity through remittances. Consumption per capita of migrant households was, on average, higher than that of non-migrant households in 2011–12. This relates to the

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[2] This is because labor is a relatively more important input in services vis-à-vis manufacturing.

positive association between household consumption and migrant remittances (Figure 1), after controlling for access to subsidized food grain, benefits through other government schemes,[3] a range of household characteristics[4] and household fixed-effects (see Appendix Table 1).[5] Yet, the correlation does not imply causality, given the possibility that unobserved variables may affect both migrant remittances and household consumption. A series of experimental studies, including on India, present more credible evidence on the causal impact of remittances on household consumption (McKenzie and Yang, 2010). Migrant remittances are also quantitatively important in lower-income Indian states. In Bihar, for example, remittances accounted for 35.6 percent of gross state domestic product (GSDP) in 2011–12, up from 11.6 percent in 2004–05 (Figure 2).

Yet, much of the literature on internal migration in India provides very little in terms of explaining the low mobility of labor over time and across space. The persistent lack of mobility in India has been consistently documented from the early 1960s (Srivastava and McGee, 1998; Singh, 1998; Bhagat and Lusome, 2006; Sasikumar and Srivastava, 2003). Most studies on the topic, however, have been concerned with patterns of migration and the characteristics of migrants (Singh, 1998; Bhagat and Lusome, 2006; Hnatkovska and Lahiri, 2015; and Pandley, 2014). There has been very little attempt to provide empirical explanations as to why this is the case (Rajan and Mishra, 2011).

In light of the above, the objective of this paper is to shed light on the incidence and potential barriers to internal labor migration in India. In doing so, it carries out empirical analysis based on the India Human Development Survey (IHDS), which provides a more recent source of data compared to the Census and household surveys conducted by India's National Sample Survey Organization (NSSO). Further, unlike the NSSO and Census, the IHDS tracks the same households over time – 83 percent of the households in 2004–05 were re-surveyed in 2011–12. The IHDS also provides a more accurate assessment of the magnitude of circular or seasonal migration. In addition, the paper reviews the thin literature on the subject. The structure of the paper is the following. Section B describes the main migration definitions and associated trends based on several data sources. Section C explores socioeconomic determinants of internal migration. Section D reviews the role of administrative requirements in this regard. Section E analyzes patterns of circular or short-term migration. Section F presents conclusions.

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[3] The possession of a ration card and a dummy variable for participation in government programs are therefore included in the regression.

[4] These include the level of household consumption, household size, household wage, and characteristics of the household head (age, age-squared, sex, marital status, occupation dummy variable, industry dummy variable, and education level dummy variable).

[5] This result holds true for the all-encompassing definition of migrants in the IHDS as well as when migrants refer to 'absent husbands' only. All nominal values for consumption and remittances are expressed in real terms.

Figure 1: Household consumption and migrant remittances, 2011-12
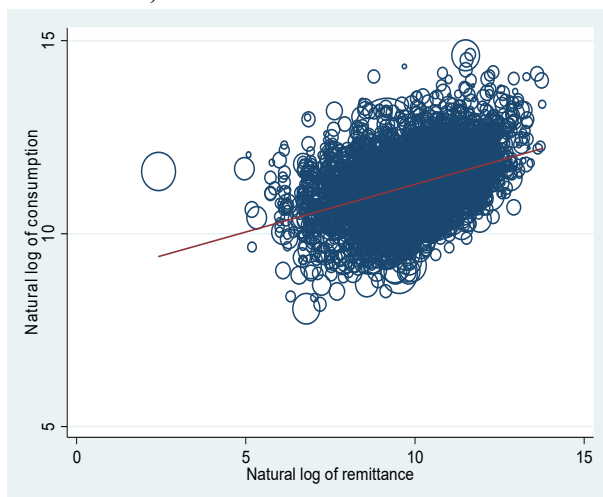
Source: Authors' calculation based on the IHDS

Figure 2: Share of migrant remittances in Bihar's GSDP, 2004-05 and 2011-12

Source: Authors' calculation based on the IHDS

B. Migration: Definitions and Trends

Data on internal migration in India have principally been drawn from the decennial population Census and the quinquennial household surveys carried out by the National Sample Survey Office (NSSO). The Census defines a migrant as a person residing in a place other than his or her place of bir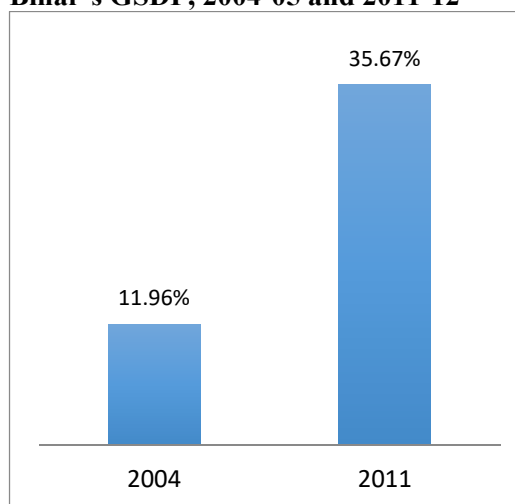th or one who has changed his or her usual place of residence to another place. A resident, in turn, is defined as one who has been staying in a location for six months or more – with the exception of newborn infants. The household surveys carried out by the NSSO use the change in usual place of residence definition. At present, however, the Census results for migration are publicly available only until 2001, whereas the NSS results are available until 2007–08.

Much of India's documented stock of internal migration, based on these two sources, relates to women migrating for marriage. In 2001, the stock of internal migrants – at 309 million – constituted 30 percent of India's population as per the Census. A closer inspection of the data, however, reveals that two-thirds of all internal migrants were women migrating primarily for marriage. Similarly, of the estimated 326 million migrants (which amounted to 28.5 percent of the population) in 2007-08 by the National Sample Survey Organization (NSSO), marriage-related migration of women alone constituted 68.5 percent. In fact, marriage-related migration, as a percentage of female migrants, has increased over the successive surveys in 1993, 1999–2000 and 2007–08 (Srivastava, 2012). According to the NSS 2007-08 survey, joining one's parents and/or the earning member of the family is the second most important reason for female and male migration.

Migration for economic reasons is less important overall but has increased over time and appears to drive the internal migration of men. According to the 2001 Census, 33 million people were migrants for economic reasons and over 80 percent of these migrants were male. Similarly, the NSSO estimated 32 million people who migrated primarily for employment-related reasons in 2007-08, of which 80 percent were male. The stock of economically-motivated migrants in India

has traditionally been low, but recent evidence from the 2011 Census suggests the annual rate of growth of labor migrants nearly doubled relative to the previous decade, rising to 4.5 percent per annum between 2001 and 2011, from 2.4 percent during the previous decade. Therefore, the stock of migrants stating economic reasons for migration increased to 51 million in 2011; over 80 percent of these migrants were male. The increasing importance of economic reasons for migration over time is also reflected in the NSSO household surveys. In 1992–93, 41.5 percent urban male migrants cited economic reasons for migration, compared to 51.9 percent in 1999–2000 and 55.7 percent in 2007–08.

The CMM, based on Census data, estimates a much larger stock of labor-related migrants compared to traditional estimates. This metric, developed in the Government of India's recent Economic Survey, considers net migration to be the percentage change in population between the 10-19-year-old cohort in an initial census period and the 20-29-year-old cohort in the same area (state or district) a decade later, after correcting for mortality effects. It is likely to capture labor migration, as other bilateral movements for reasons such as marriage are netted out. According to this metric, the stock of all the out-of-state net migrants in the 20-29 age cohort between 2001 and 2011 exceeded 11 million people, up from around 6 million people during the previous decade. And nearly 80 percent of these migrants were male in both periods. The 20-29 age cohort formed a fifth of all migrants who moved for economic reasons. Therefore, using a scaling factor of five, the number of out-of-state net (labor) migrants between 2001 and 2011 can be estimated at over 55 million people. The stock of all economically motivated inter-district migrants is similarly estimated at over 80 million.

The India Human Development Survey (IHDS) is another source of data that provides an appropriate sample to analyze internal migration for economic reasons. This is attributable to migrant husbands being the dominant stream. Based on the IHDS, nonresident household members are identified through household responses to the following questions: (a) Does any woman/man in the household have a husband/wife who lives outside the household? (b) Is there any household member who has children studying outside the household? and (c) Do any children under the age of 15 in the household have parents who live outside the household? Migrant husbands are the dominant category, accounting for almost half of all nonresident household members in 2011-12. Nonresident students were the other major category, with a share of almost 40 percent in 2011-12. Migrant parents and migrant wives each had small shares and this distribution of the "type" of migration was not very different in 2004-05 compared to 2011-12 (Figure 3).

Comparing estimates of internal migration based on the IHDS with those from other data sources, however, is far from straightforward. The IHDS, which defines migrants as the stock of nonresident household members, estimates that 11.5 percent of households (4,761 of a total 41,554 households) had at least one nonresident family member in 2004-05. This share doubled to 24 percent in 2011-12. As a share of the population, nonresident household members increased from 2.4 percent in 2004-05 to 6.5 percent in 2011-12. Comparing these estimates with internal migration rates from other data sources – 30.1 and 28.5 percent of the country's population, respectively, from the 2001 Census and the 2007-08 NSSO household survey – however, is a case of comparing apples and oranges. The IHDS does not capture (a) women who migrate primarily for marriage, (b) individuals who migrate to join the earning member of the family, and (c) entire households that move together.

A more appropriate subset of the population for a comparison across data sources, albeit far from perfect, is "men of working age who migrate." The 2001 Census reports the male migration rate as 17 percent (Srivastava, 2012). In the IHDS, working-age male migrants (15 years or older) constituted 4.6 percent of the population in 2011-12, up from 1.6 percent in 2004-05. Total male migrants constituted 5.1 percent of the population in 2011-12, up from 1.8 percent in 2004-05. The male migration rate from rural areas, at around 6 percent, approximates that in the 2007-08 NSSO survey. Table 1 provides a summary of labor migration stock estimates, based on the different data sources and related definitions. Further, Box 1 reviews the current main data sources and methods, highlighting potential gaps, suggestions for improvement in both questionnaire design and frequency, as well as potential "big data" sources.

Table 1: Internal Labor Migration in India, Definitions and Stock Estimates

Source	Definition of labor migrant	Stock of labor migrants (million)			
		2001	2004-05	2007-08	2011
Census	A labor migrant is one residing in a place other than his or her place of birth or one who has changed his or her usual place of residence (residence for six months or more), having moved primarily for economic reasons.	33			51
NSSO	A labor migrant is identified by the change in usual place of residence definition, as described above, with the principal reason for moving being employment-related.			32	
Cohort-based Migration Metric	Net labor migration is the percentage change in population between the 10-19-year-old cohort in an initial census period and the 20-29-year-old cohort in the same area (state or district) a decade later, after correcting for mortality effects.				80
IHDS	Labor migrants are non-resident household members who are identified through household responses to: "Does any woman in the household have a husband who lives outside the household"? (Working age male migrants)		16		60

Note: These numbers do not adequately capture circular migrants. In the case of the IHDS, the number of circular migrants was estimated at an additional 200 million in 2011-12.

**Figure 3: Migration classification, 2004-05 and 2011-12**
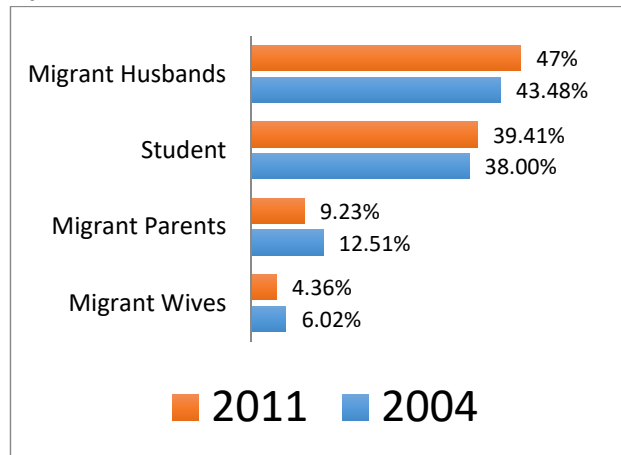
Source: Authors' calculation based on the IHDS

While stock and flow estimates of migrants vary based on the data source and definition used, the broad patterns based on the IHDS are largely consistent with others. This can be seen with regard to (a) migration within rural areas, within urban areas, and between rural and urban areas; (b) migration within and across state boundaries; and (c) less affluent states see more people migrating out while the most affluent states are the largest recipients of migrants.

The share of those moving within states was higher than those moving across states, but the latter has increased in importance over time. In 2011-12, the share of internal migration flows within and between Indian states was, respectively, 55 and 45 percent. The share of interstate migration increased from 40 percent in 2004-05 to 45 percent in 2011-12 (Figure 4). This conforms to trends based on Census data, which show that interstate migrants as a proportion of total migrants increased from 11.9 percent in 1991 to 13.31 percent in 2001.

In terms of spatial movements, rural-urban migration expectedly dominates migration for economic reasons. Migration from rural to urban areas accounted for more than half of internal migration flows in both 2004-05 and 2011-12 (Figure 5). This trend fits in with the pattern of urbanization and structural transformation expected in a developing economy. It is also in line with the 2001 Census numbers, where among employment-related migrants, rural-urban dominated the other streams, i.e., rural-rural, urban-urban and urban-rural (Srivastava, 2012). Rural-rural migration flows also remain important and even increased from 27 percent in 2004-05 to 29 percent in 2011-12 (Figure 6). The precise destination of the migrant is not covered in the IHDS, but the data allow us to surmise that 20 percent of migrants in 2011-12 traveled to a metro city.

Figure 4: Internal migrants across and between states, 2004-05 and 2011-12
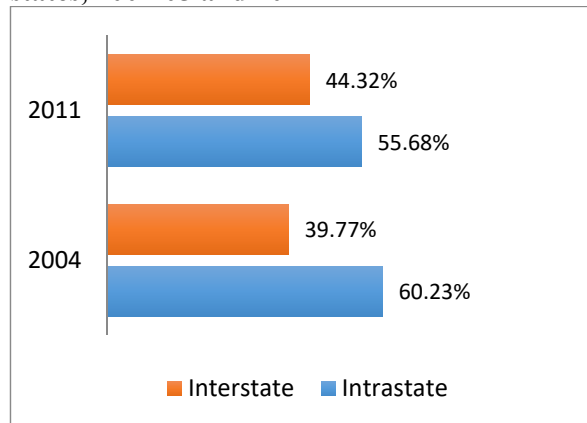
Source: Authors' calculation based on the IHDS

Figure 5: Internal migrants in the rural-urban space, 2004-05 and 2011-12
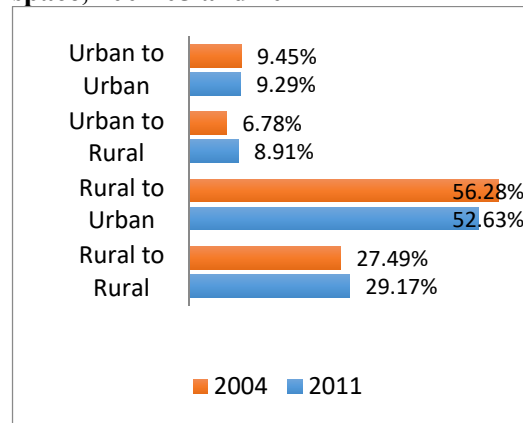
Source: Authors' calculation based on the IHDS

Further, migration from rural to urban areas appears to be correlated with migration over longer distances. When considering the movement of people across states, about three-fourths was accounted for by rural-urban migration flows in 2011-12. Within states, the share of rural-rural migration flows, at 45 percent in 2011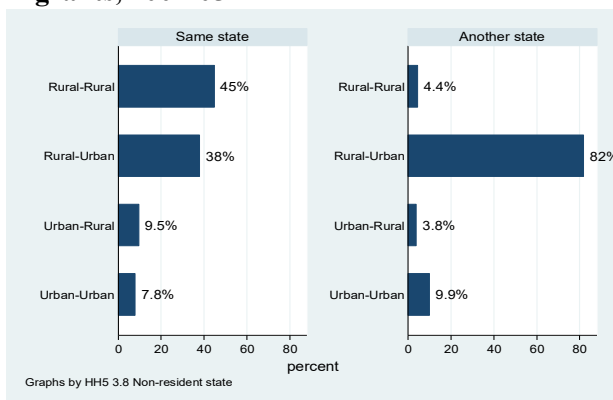-12, was higher than the share of rural-urban migration flows, at 34 percent (Figure 7). The numbers are not very different in 2004-05 (Figure 6). The NSSO survey also shows that the percentage of interstate migrants in the rural-urban stream increased from 19.6 to 25.2 percent between 1999–2000 and 2007–08.

Figure 6: Spatial distribution of internal migrants, 2004-05

Source: Authors' calculation based on the IHDS

Figure 7: Spatial distribution of internal migrants, 2011-12
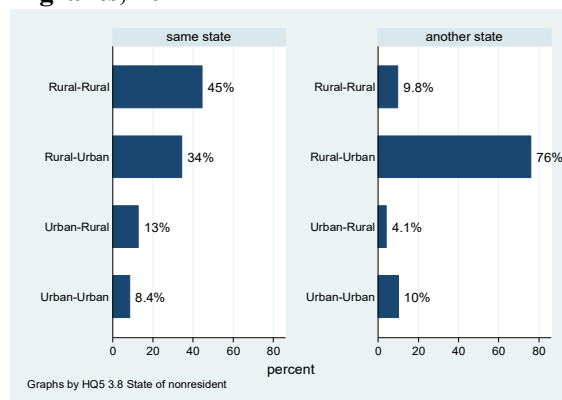
Source: Authors' calculation based on the IHDS

The stock of "interstate" migrants is negatively correlated with per capita state NSDP. This should come as no surprise, as it suggests that richer states are less likely to have individuals migrating to other states. It can be seen that Bihar and Uttar Pradesh are outliers in that although they have the lowest levels of per capita income, their stock of interstate migrants is disproportionately high (Figure 8). These two states accounted for about 60 percent of the migrants who moved between states in 2004-05 (Figure 10). And that remained much the same in 2011-12. The stock of "rural-urban" migrants is also negatively correlated with per capita state NSDP and its pattern across

states mirrors "interstate" migration flows, with Bihar and Uttar Pradesh characterized by a disproportionately high stock of rural-urban migrants.

The stock of "intrastate" migrants is also negatively correlated with per capita state NSDP. While some richer states, such as Maharashtra and Gujarat, had sizeable stocks of intrastate migrants (presumably individuals moving from less to more prosperous regions within the state), poorer states on average had a larger number of individuals migrating within states. For example, in 2011-12, Uttar Pradesh and Madhya Pradesh, which are large low-income states, constituted around 30 percent of the migrants who moved within states (Figure 9). The stock of "rural-rural" migrants is also negatively correlated with per capita state NSDP, and its pattern across states mirrors "intrastate" migration flows, with Uttar Pradesh and Madhya Pradesh characterized by a disproportionately high stock of rural-rural migrants.

The large stocks of migrants in Uttar Pradesh and Bihar are explained, in part, by their large populations, but the inverse relationship with per capita income levels remains intact. Except for one state, Bihar and Uttar Pradesh had the highest number of internal migrants as a share of the state population in 2011-12, at approximately one-third. The exception was Uttarakhand, which had relatively high levels of per capita income, and a share of internal migrants that exceeded 60 percent. When considering intrastate migrants as a share of the state population, low-income states such as Chhattisgarh and Madhya Pradesh were at the top of the list at 50.7 and 35 percent, respectively. Higher-income states, including Karnataka, Uttarakhand and Himachal Pradesh, were next in the pecking order. In general, India's low-income states had a much higher share of internal out-migrants than the richer states, such as Maharashtra, Gujarat and Tamil Nadu. This trend of relatively less developed states such as Bihar and Uttar Pradesh having high net out-migration is shared by the CMM, which was developed to capture labor migration. This metric also shows that the relatively more developed states, including Goa, Delhi, Maharashtra, Gujarat, Tamil Nadu, Kerala and Karnataka, have the highest net in-migration.

Figure 8: "Inter-state" migrants and per capita income, by state, 2011-12
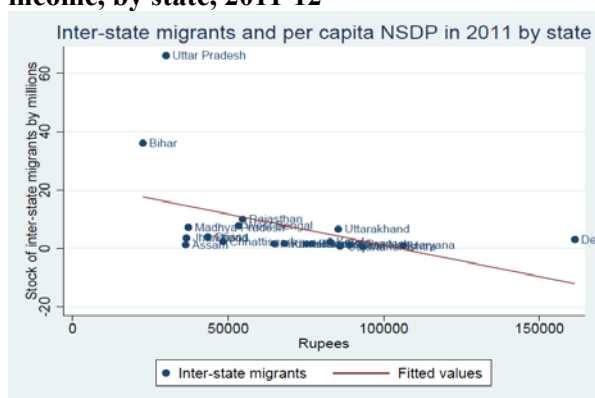
Source: Authors' calculation based on the IHDS

Figure 9: "Intra-state" migrants and per capita income, by state, 2011-12
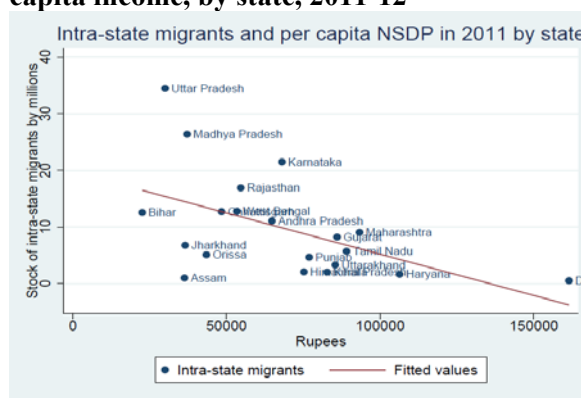
Source: Authors' calculation based on the IHDS

Figure 10: Distribution of migrant flows across states, 2011-12

Migration Flows by State - In Order of Inter-State Frequencies
% frequencies within categories

Intra-State   Inter-State

Source: Authors' calculation based on the IHDS

C. Socioeconomic Characteristics That Influence Migration

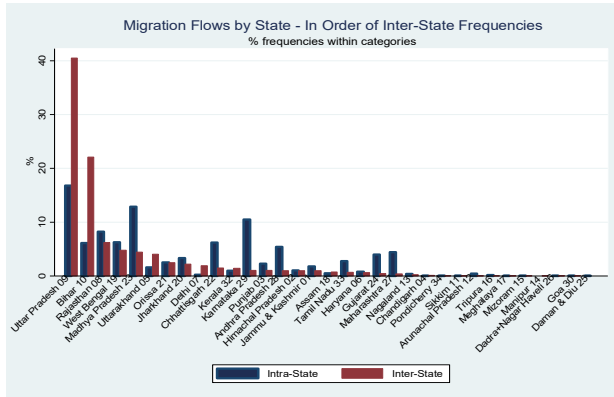The decision to migrate for economic reasons is typically driven by the spatial earnings gap, although the ability to migrate is influenced by a range of individual and household characteristics. The evidence on rural-urban migration consistently highlights differences in earning opportunities between rural and urban areas as the predominant factor driving relocation. Much of this evidence on the spatial gap is about differences in wages or rates of pay, although the likelihood of finding employment is also represented. At the same time, internal migrants may have widely varying degrees of education and income levels, as well as varying profiles in terms of caste, religion, family composition, age, and other characteristics.

Analysis based on the IHDS shows that young, married men with lower secondary school education constituted an overwhelming majority of all nonresident household members. In 2011-12, more than 80 percent of all nonresident household members were male (Figure 11). Of these, 57 percent were married in 2004-05, but the share of married men in the stock of nonresidents declined to 33 percent in 2011-12 (Figure 12). On average, male migrants were around 30 years of age (Figure 13) with nine years of schooling (Figure 14). In Uttar Pradesh, the average years of schooling for migrants was higher compared to the resident household head as well as the state average (Figure 15). The same pattern held true in Bihar (Figure 16).

Figure 11: Male-female distribution of migrants, 2004-05 and 2011-12

Figure 12: Share of married male migrants, 2004-05 and 2011-12

10

Sex

2004	2011
18.56%	16.62%
81.44%	83.38%

57%

33%

2004	2011
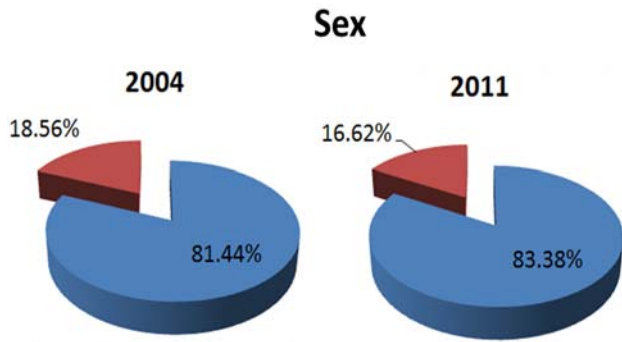
Figure 13: Average age of male migrants, 2004-05 and 2011-12
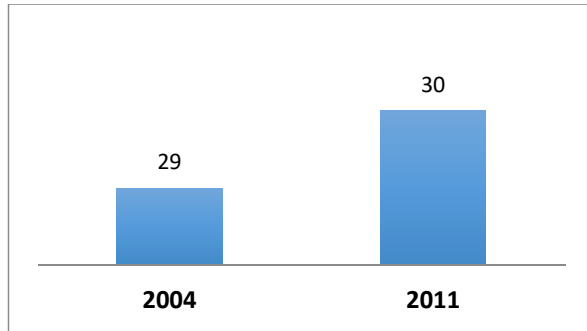
29

30

2004	2011
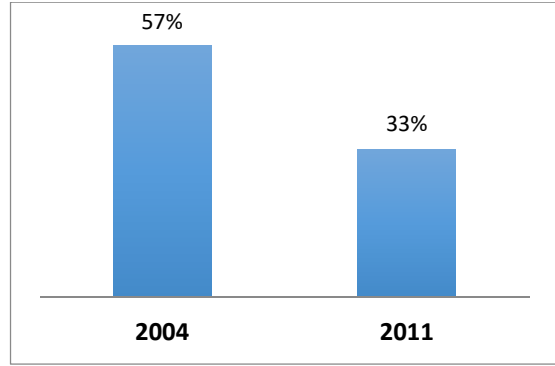
Figure 14: Average years of schooling for male migrants, 2004-05 and 2011-12

9

8.1

2004	2011
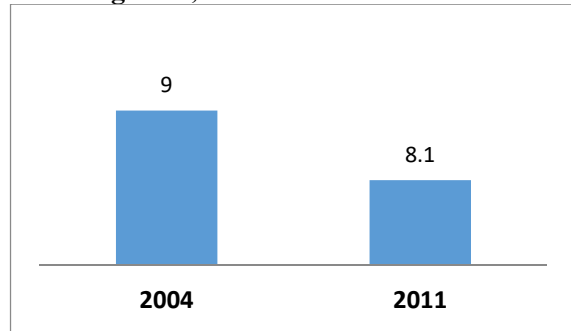
Figure 15: Average years of schooling, Uttar Pradesh, 2004-05 and 2011-12

■ 2004 ■ 2011

	2004	2011
Household Head Average	6.6	1.94
Nonresident Average	8.89	7.92
State Average	3.62	6.63
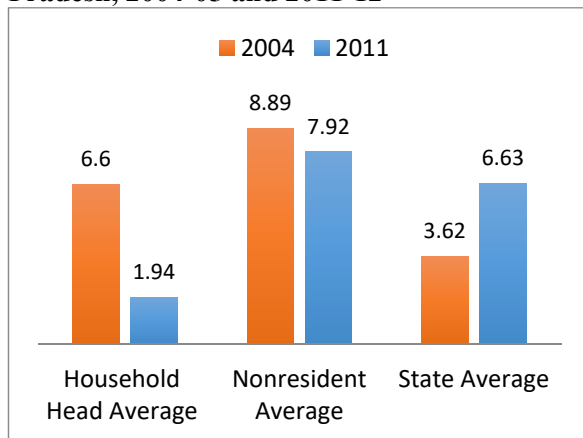
Figure 16: Average years of schooling, Bihar, 2004-05 and 2011-12

■ 2004 ■ 2011

	2004	2011
Household Head Average	7.5	2.59
Nonresident Average	8.79	6.97
State Average	3.41	6.28
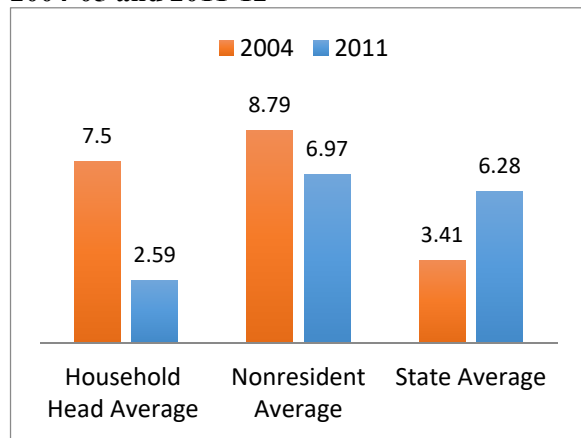
The relevance of these individual characteristics for the decision to migrate is consistent with the literature on India. The discussion typically begins with the effect of migrants' age. Parida and

Madheswaran (2011) show that age and age-squared are, respectively, positively and negatively related to the migration decision. This may be explained by the fact that age, which provides a proxy for work experience, is indicative of an individual's earning potential but subject to diminishing returns. This quadratic formulation of age may also reflect several demographic considerations. For example, younger men may wish to use their home as a base while searching for work, while older men may be close to retirement or may choose to live at home to look after elderly parents. Marital status is also a relevant factor, as the recently married are more likely to migrate than their unmarried counterparts. Completion of below primary education, which corresponds to a minimal level of literacy, positively affects the likelihood of migration. And as the level of education increases, the tendency to migrate intensifies. The completion of secondary schooling has a particularly strong effect.

Household characteristics matter too and are perhaps more important than individual ones, according to the relevant literature on India. While a migration decision at the individual level is driven by the wage differential between the destination and the origin, other household considerations are also likely to matter for a family to decide who and how many should migrate to increase overall household welfare. Bhattacharyya (1983) finds that migration flows are governed by decisions at the family level rather than the individual level in the case of India.

The paper uses a panel data regression framework to explore the association between the decision to migrate and a range of household characteristics in the IHDS.[6] The sample under consideration includes households with no nonresident members in 2004-05 and the same households either with or without nonresident members in 2011-12. Therefore, the dependent variable is always zero in 2004-05 and binary in 2011-12, with a value of one if a household had at least one nonresident member in 2011-12 and zero otherwise. Following the literature on the subject, the decision to migrate at the household level is regressed on a range of potentially relevant variables in the IHDS. This includes household consumption, household size, social group, exposure to mass media, local trust and conflict, and a rural/urban dummy variable. It also includes household head characteristics (age, age-squared, sex, marital status, occupation dummy variable, industry dummy variable, and education level dummy variable) that may influence the migration decision. Last, but not least, to control for any unobserved time-invariant household characteristics, household fixed-effects are also included (see Appendix Table 2).[7]

This analysis based on the IHDS shows that household income has a strong association with the probability of having a migrant member, and this conforms to the broader migration literature. The coefficient on the household consumption variable is positively and statistically significant, which suggests that household consumption (which is a proxy for household income) is positively associated with migration. The fact that additional income can induce migration is borne out by randomized experiments, for example, in rural Bangladesh. Bryan et al. (2013) show that an incentive of US$8.50 to migrate out of rural areas during the lean agricultural season offered to a random set of families induced 22 percent of the households to send a seasonal migrant, and their consumption increased significantly. In the context of international migration, some studies

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[6] The association need not be indicative of causality because some of the determinants of migration, in turn, might also be impacted by the migration decision.

[7] Some of these household head characteristics, while highly correlated between the two periods, are not entirely time-invariant and therefore do not drop out of the equation upon the inclusion of household-fixed effects.

document a humped-shape relationship – emigration may increase with rising incomes in poor countries as households acquire the means to finance moving; but beyond some threshold level, the need to move declines (Martin and Taylor, 1996; Lucas, 2015). This nonlinear relationship can have different patterns; some micro studies of Indian villages suggest it was the very poor and the relatively well-off who moved; the former have little choice and nothing to lose, while the latter can afford to move (Connell et al., 1976; Mahapatro, 2014).

The empirical analysis based on the IHDS also shows that household size shares a nonlinear relationship with the migration decision. Analysis based on the IHDS shows that a smaller household is more likely to have a nonresident household member; but beyond a certain household size, migration is more likely to occur with an increase in the household size. The latter may be explained by the fact that beyond a threshold household size, smaller land holdings per capita mean that households find it difficult to continue to depend solely on agriculture (and have the greatest need for additional income) and are therefore more likely to send migrants to urban areas. The studies by Hay (1980), Nabi (1984) and Singh (1988) provide empirical support for this hypothesis.

Social group, which is another factor that is often alluded to in the literature on India, does not appear to have a statistically significant association with the migration decision in the analysis based on the IHDS. In the 2011-12 round of the IHDS, around one-fourth of the households with at least one nonresident member is classified as Scheduled Caste (SC) / Scheduled Tribe (ST). The regression analysis, however, does not show a statistically significant relationship between household social group and the presence of nonresident household members. This contrasts with the literature which argues that members of SC/ST households are less likely to migrate but may be explained by the fact that its effect is subsumed in the household consumption (income) variable. Dubey et al. (2004) outline two distinct groups of internal migrants in India – members of the higher caste households who generally migrate to attain a better standard of living and those from lower castes for whom migration often represents a struggle for survival.

The deterrent effect of distance upon migration is well established. The reasons underlying the observed negative correlation can range from transport costs to cultural alienation. The IHDS does not contain information on the destination of migrants; hence, a variable that captures distance could not be incorporated in the regression analysis. But the literature on India suggests that physical geographical distance has a robust negative association with internal migration across Indian districts and states (Kone et al., 2016; Government of India, 2017). While more distant locations would entail higher transport costs, these tend to be low in India – especially when lower-class train fares are subsidized and riding on a bus roof without a ticket is not uncommon (Parida and Madheswaran, 2011). Evidence suggests that linguistic overlap between the destination and origin districts of migrants is positively associated with migration flows (Kone et al., 2016), where distant locations are less likely to possess the same language, religion and ethnicity (Lucas, 2015). The findings of the Government of India's recent Economic Survey reinforce the importance of cultural similarities through a strong contiguity effect; controlling for distance, states that share common borders see about 65 percent more migration between them than states that do not share such a border. At the same time, the survey finds little evidence of language being a demonstrable barrier to the flow of people.

The availability of information is another relevant factor to explain the inverse relationship between physical distance and migration. The analysis based on the IHDS explores the role of mass media in this regard. While some migrants move in search of a job, others remain at home hoping that they will hear about a job opportunity. The chances of identifying such opportunities from home often depend on contacts in the destination areas, which in turn may diminish with distance from that destination. In examining the potential role of mass media in diminishing this distance, the regression analysis based on the IHDS shows that household exposure to watching television and reading newspapers is positively and significantly associated with households having migrant members. Similarly, there is the question of access to ICT, which can help households' access to information. The causal importance of such mechanisms is outlined, for example, in a randomized experiment in Niger, where households that received cell phones and were able to keep in immediate contact with friends and family experienced a significant increase in their migration into urban areas (Aker et al., 2011).

Access to information is often linked to established community networks, which increases the likelihood of an individual moving to the same destination. Having an established network of people from one's own community in a particular destination can help new (or potential) migrants with finding an initial job and housing. They can also offer more familiar surroundings and diminish the sense of alienation in a new setting. In a sense, the existence of such a network is not a separate driver of migration; what matters is the earlier drivers of the migrants who set up the network. However, the lack of a network can certainly act as a constraint on today's migrants.

The literature on India, however, suggests that the existence of a social network in source areas may generate an impediment for rural-to-urban migration. Focusing on male migrants, Munshi and Rosenzweig (2016) emphasize the importance of mutual insurance provided by rural networks at origin. Because migration reduces access to caste-based insurance networks for family members of the migrants who are left behind, the decision to migrate involves weighing the trade-off between an income gain from migrating, versus the lower risk from staying at home. The estimates in this study suggest that even a small increase in formal insurance in a village setting in India would greatly increase rural-urban migration. Wealthier individuals rely less on networks to insure them and hence are more likely to migrate.

At the same time, empirical analysis based on the IHDS shows that weaker "community bonds" and greater crime in origin areas may reduce the likelihood of "husbands" migrating away from the household. At first glance, this may appear to be inconsistent with the results of Munshi and Rosenzweig (2016), in that stronger community bonds or networks are associated with a higher probability of internal migration. But here the variable in question asks whether people get together to solve a community problem, such as the lack of water supply, or take care of their own families individually. This negative association between weaker "community bonds" and the probability of households having a migrant is statistically significant only for the sample of "absent husbands." It is not surprising that the working age male (husband) is less likely to leave his household if communities do not collectively address common issues. The same holds true for the negative coefficient on the crime variable, which measures whether anyone illegally entered a family's physical household.

D. The Role of Administrative Requirements

Low levels of internal migration in India cannot be directly attributed to restrictive federal government policies. Unlike in China, where federal government policies constrain migration through measures such as the *hukou* system, anyone in India is legally free to move from one location to another. Migrant workers in India are even protected from exploitation by federal laws. One such provision is the Inter State Migrant Workmen Act, 1979, which requires that migrants are paid timely wages equal to or higher than the minimum.[8] Other legal provisions that migrants can benefit from are the Minimum Wage Act, 1948; Contract Labor Act, 1970; Equal Remuneration Act, 1976; and Building and Other Construction Workers Act, 1996 (Sasikumar and Srivastava, 2003).

The literature suggests that internal migration in India could be constrained by the fact that moving across different spatial boundaries is costly. After accounting for physical distance, linguistic differences and other economic and social barriers in origin and destination regions,[9] Kone et al. (2016) find that state borders remain an important impediment. The authors estimate that migration between neighboring districts in the same state is around 50 percent larger than migration between districts that are on different sides of a state border.[10] This border effect is also emphasized in the Government of India's recent Economic Survey; controlling for distance, labor migrant flows within states were four times the labor migrant flows across states. The role of state boundaries in India aligns with similar analysis from other large countries. Poncet (2006) finds that there is more intraprovince migration in comparison to interprovince migration in China. In an earlier study, Helliwel (1997) estimated that interprovincial migration in Canadian provinces is almost 100 times as likely as migration to Canadian provinces from the United States.[11]

There are policies, implemented at the state level, which can act as inhibitors, either explicitly or implicitly, on the mobility of labor across state boundaries. Kone et al. (2016) use the recent creation of three new Indian states in 2000 to provide additional evidence that these state borders are not natural barriers. Instead, they argue that state borders impose administrative restrictions on internal mobility. They also outline three key inhibitors of interstate migration: inadequate portability of social welfare benefits as well as a significant home bias in access to education and public employment, which is, in part, attributable to reservations for scheduled castes and scheduled tribes.

The de facto identification document for most Indian households to access social welfare entitlements is the ration card issued by state governments. The basic purpose of this card is to enable access to the Public Distribution System (PDS), which provides subsidized food to poor households. In the absence of a national identity documentation system, the ration card, which covers a majority of the population, also serves as the proof of identity needed for access to a wide

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[8] The effectiveness and implementation of this provision, however, is questionable (Menon, 2011).

[9] Through district-fixed effects

[10] This gap varies by education level, age and reason for migration, but is always large and significant.

[11] This evidence of border cost in the case of migration is based on the work of McCallum, who showed that Canadian provinces adjacent to the United States undertook much higher levels of trade with their neighboring provinces than with the United States.

range of social protection schemes and public services[12] (Srivastava, 2012). It is also requested as a proof of identity for a variety of other purposes, such as initiating telephone service or opening a bank account (Zelazny, 2012; Abbas and Varma, 2014).

Ration cards, however, are not portable across states and this is primarily attributable to the design of the PDS system for which these cards were designed. Even though most of the PDS subsidy cost is borne by the central government, the program is administered by state governments that sometimes provide additional price subsidies. Some states also have a more inclusive subsidy entitlement policy than the central government. In Tamil Nadu, for example, every person is entitled to receive subsidized food. In Andhra Pradesh and Chhattisgarh, more than 70 percent of the population is entitled to subsidized rations. As a result, state governments generally do not extend PDS benefits to migrants who hold ration cards from other states (Srivastava, 2012).

Individuals moving across state boundaries therefore risk losing access to the PDS and a host of public services. According to household survey data, 27 percent of all rural households and 15 percent of all urban households were fully dependent on PDS grain, and most households in India were eligible in 2004-05 (Kumar et al., 2014). The PDS subsidy is a particularly important source of calories for poor households (Dreze and Khera, 2013). Therefore, the loss of access to subsidized PDS food and a host of other associated welfare benefits could act as an indirect barrier to migration in India.

The literature suggests that the lack of portability of PDS benefits and cards contributes to the inertia of the unskilled who are likely to be most dependent on it. Kone et al. (2016) show that the share of in-state unskilled emigration[13] and the share of the unskilled population participating in the PDS have a positive and significant association.[14] This suggests that the larger is the share of unskilled population who rely on PDS, the higher is the tendency for potential emigrants to choose home-state destinations over out-of-state destinations. This finding is consistent with the argument that inadequate portability of social welfare programs such as PDS tends to deter households who rely on these benefits from moving across state borders.

This paper's regression analysis based on the IHDS shows that households with identification documents are less likely to have nonresidents who migrated across states. Comparing households with and without nonresident members in 2011-12, there is no statistically significant relationship with a household having photo identification proof[15] (controlling for a range of household and household head characteristics that may influence the migration decision). However, when the sample is restricted to migrants who have moved across states, the coefficient on the identification proof is negative and significant (see Appendix Table 3). This suggests that having some form of identification proof was associated with a lower probability of a nonresident household member who has migrated across states. It is consistent with the argument that inadequate portability of identification documents to access social welfare benefits deters households from sending

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[12] These include mid-day meals for children; social security schemes for informal sector workers; pension schemes for the aged, physically challenged and widows; public employment schemes; elementary education; health care etc.

[13] The number of unskilled emigrants who moved to destinations within the state of their origin, divided by the total number of unskilled migrants from the said state.

[14] Controlling for average household income per capita and the share of agricultural households at the state level.

[15] Includes ration card, voter ID card and PAN card.

members across state borders. Households that do not possess the requisite documentation have little to lose and are therefore more likely to migrate across states.

The same regression analysis based on the IHDS also shows that SC/ST households are less likely to have nonresidents who migrated across states. Controlling for a range of household and household head characteristics, there is no statistically significant relationship between a household's social group and the probability of having a nonresident member. However, when the sample is restricted to migrants who have moved across states, the coefficient on the SC/ST dummy variable is negative and significant (see Appendix Table 3). This suggests that SC/ST households are less likely to have a nonresident member who migrated across states. It may simply reflect the fact that SC/ST households are poorer and moving across states is more expensive. But the level of household consumption is included as an explanatory variable in the regression equation. It therefore possibly reflects the lure of reserved seats on state educational institutes and public sector jobs. The same results hold true when we restrict the stock of nonresidents to "absent students" only.

State domicile requirements for employment in government entities could act as a disincentive to move across states, especially for highly educated individuals. Under India's policy of affirmative action, the employment quota for SCs and STs in state government jobs is equal to their respective shares of a state's population[16] (Howard and Prakash, 2012). Therefore, to be eligible for the SC/ST employment quota in a particular state, an individual has to be domiciled in that state. Some states even have quotas that cut across communities. For example, Karnataka announced a policy in 2016 under which both private or public sector firms would have to reserve 70 percent of their jobs for state residents to be eligible for any state government industrial policy benefits. Orissa, Maharashtra and Himachal Pradesh have similar quotas for state residents in factory jobs (Kone et al., 2016). Therefore, educated individuals, especially but not only those belonging to SC/ST communities, would care about remaining eligible for employment opportunities in their home state government.

The literature suggests that state domicile requirements to access reserved government jobs can be a disincentive for interstate migration of the individuals who are most likely to benefit from it. Kone et al. (2016) show that the share of in-state skilled emigration[17] is positively and significantly associated with the share of high-skilled workers who are employed by the public sector at the state level (controlling for average household income per capita). This suggests that the higher is the share of government job opportunities for the high-skilled, the stronger is the incentive for potential migrants to stay in their home states.

State-based quotas in public universities and technical institutes could also act as a disincentive for people to move across states. State residents get preferential access to state-run institutes of higher education through state quota seats. For example, in 2004, 50 percent of the seats in all state-level engineering colleges and medical colleges in Tamil Nadu were under the state quota. Similarly, in the state of Maharashtra, the current state quota in state-level medical colleges varies from 70 to 100 percent (Kone et al., 2016). Domicile "certificates" issued by state governments

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[16] In 1999, on average 25 percent of employment in state-level government jobs was reserved for SCs.

[17] The number of high-skilled (i.e., those who completed at least secondary education) emigrants who moved to destinations within the state of their origin, divided by the total number of high-skilled migrants from that state.

are necessary to be eligible for the state quota in educational institutes. And the certificate is issued upon proof of continuous residence in the state, the duration of which varies from 3 to 10 years.[18] Therefore, a 16-year-old who attended high school in Tamil Nadu would lose eligibility for state quota seats if the family were to migrate, and yet not be immediately eligible for similar benefits in the destination state. This non-eligibility for state quota seats in either state would restrict a migrant's options for higher education compared to non-migrants, thereby reducing incentives to move.

The literature suggests that domicile requirements for state quota eligibility in institutions of higher education provide disincentives for interstate migration. Kone et al. (2016) show that the share of the migrants who chose home-state destinations among all migrants who moved for education-related reasons is positively correlated with the share of college-attending students among all 18-22-year-old state natives in each state (controlling for average household income per capita). This is consistent with the argument that state government policies granting preferential access to higher education to in-state students tend to induce potential migrants moving for education to move within states.

E. Circular or Short-Term Migrants

The definitions adopted by the NSSO and the Census are unlikely to result in reliable estimates of short-term migration. Individuals who migrate, leaving their families and property, with the intention of returning, either because they have precarious jobs in the destination areas or if the cost of permanent relocation is high relative to its benefits, are referred to as circular or short-term migrants. The 2001 Census defines a migrant as a person residing in a place that is different from his or her place of birth or "usual place of last residence", where the latter refers to place of residence for six months or more.[19] This is likely to miss a significant number of short-term migrants who have as much of a chance of being counted in their place of birth or last residence as they do at their new destination. The 2007-08 National Sample Survey (NSS) counts short-term migrants as those who have not stayed in their "usual place of last residence" for a period between one month and six months. The circular migration cycle, however, can be longer than six months.

Compared to these data sources, the India Human Development Survey (IHDS) more accurately captures circular migrants, the absolute numbers of which are notably higher. Unlike the Census and NSS household survey, the IHDS captures short-term/seasonal migrants who may be away for more than six months. In particular, the 2011-12 survey[20] asks respondents: "Have you or any member of your household left to find seasonal/short-term work during the last 5 years and returned to live here?" Only 9 percent of households reported having a circular migrant, and the share of circular migrants in the total population was less than 2 percent. Yet, the absolute number of short-term migrants – estimated at over 200 million in 2011-12 – was more than 10 times the 15.2 million short-term migrants in the 2007-08 NSSO household survey. Of the households that reported at least one circular migrant, 45 percent were classified as SC/ST, and for an

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[18] For example, the state of Rajasthan issues domicile certificates to individuals who have resided continuously in the state for at least 10 years, while the state of Uttar Pradesh (UP) requires continuous residence for at least 3 years.
[19] With the exception of newborn infants.
[20] This section of the questionnaire was not included in the 2004-05 survey.

overwhelming majority of close to 85 percent, household heads were either illiterate or had only completed primary education.

The evidence suggests that circular migrants moved largely to urban areas and over longer distances, mostly alone and typically to a job in the construction sector. Almost two-thirds of circular migrants move to urban areas and, unlike overall internal migration flows, migration between states (55%) exceeded migration within states (43%). One-third of circular migrants were employed in the construction sector, with agriculture and informal sector jobs in manufacturing and services[21] being the other major job destinations (Figure 18). These results broadly conform to the findings based on the 2007-08 NSSO survey. Analysis based on the IHDS also shows that an overwhelming majority of circular migrants (73%) traveled alone and, on average, were away for a duration of 7.5 months.

Further, circular migration flows appear to be mediated by contractors and middlemen who perform the critical function of sourcing and recruiting workers. The IHDS data show that around half of all circular migrants migrated with the help of a contractor (Figure 17). Attention has been drawn to the role of contractors in recruiting workers for internal migration in India. The lowest links in this chain are often older migrants who are part of the same regional or caste-based social network in rural areas. The chain then progresses toward destination-based contractors who aggregate workers from different geographies and link them with the principal employers. While these networks do serve the purpose of providing migrants with information and subsequent access to work opportunities, they largely operate in the informal economy (Abbas and Varma, 2014).

Figure 17: Characteristics of circular migrants, 2011-12
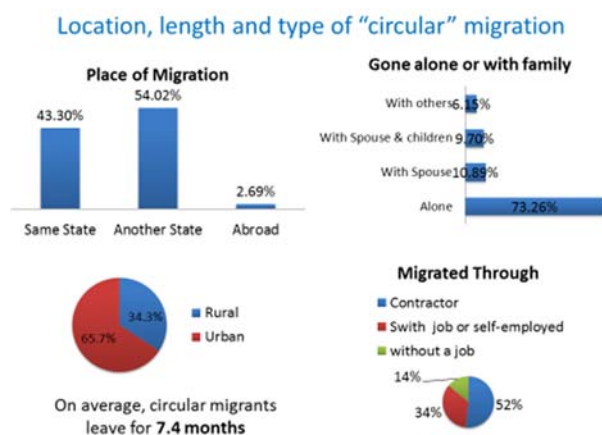
Source: Authors' calculation based on the IHDS

Figure 18: Top 5 occupations of circular migrants, 2011-12
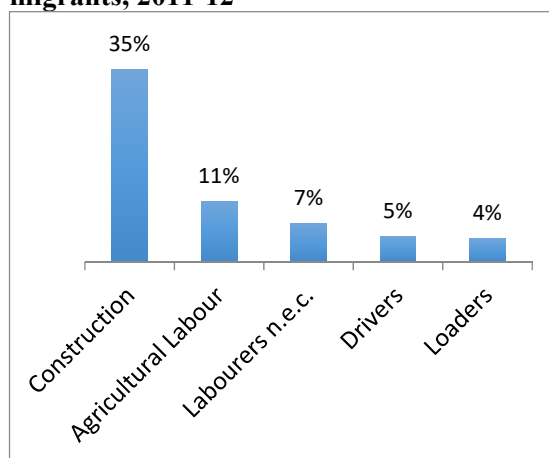
Source: Authors' calculation based on the IHDS

This paper's empirical analysis based on the IHDS shows that seasonal migrants are more likely to be from households that are poor, socially disadvantaged, less educated and employed in agriculture. There are a range of household characteristics that are significantly associated with the probability of a household having at least one circular migrant, as evidenced in a cross-sectional regression framework (see Appendix Table 4). It is worth noting the positive and statistically

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[21] Drivers, loaders and laborers not elsewhere classified were among the top 5 occupations for short-term migrants.

significant coefficient on the SC/ST dummy variable. This suggests that households classified as Scheduled Tribe or Scheduled Caste are more likely to have a short-duration out-migrant. This reinforces Dubey et al.'s (2004) argument that migration from lower caste households often represents a struggle for survival. Similarly, households whose head completed secondary or tertiary education have a lower probability to send out a circular migrant compared to those whose head was illiterate or had not completed primary education. The same holds true for households whose head was employed in industry rather than agriculture.

A number of micro-studies in the literature also allude to these patterns in short-term migration. In out-migration endemic rural areas of central and tribal regions, such as Andhra Pradesh, north Bihar, and eastern Uttar Pradesh, the incidence of families with at least one out-migrant ranges from 30 to 70 percent. Through household surveys of villages in central-western India, studies find that a majority of households were involved in seasonal migration in 2006–07, and overwhelmingly for casual urban construction work (Deshingkar et al., 2008; Mosse et al., 2005). Most migrants were between ages 16 and 40 and Scheduled tribes and castes – groups that are explicitly protected in India's constitution because of their historic social and economic inequality – were overrepresented in short-term migration flows (Parida and Madheswaran, 2011).

The low interstate portability of identity documents can make it difficult for low-skilled interstate circular migrants to claim the benefits that they are entitled to under labor laws. Regression analysis based on the IHDS shows that the coefficient on the identification proof variable is statistically insignificant, even when the sample is restricted to circular migrants who have moved across states (see Appendix Table 4). This is perhaps indicative of the fact that because circular migrants, by definition, are looking to return home and most often move without their family, the inadequate portability of identification documents across state borders to access social welfare benefits is less relevant. Yet, a survey of seasonal migrant workers in Delhi's construction industry suggests that the migrant workers were not registered under the Building and Construction Workers' Welfare Act, a law that regulates social welfare, health care, and safety for construction workers. Lacking formal protection, the workers had to work long hours under poor health and safety conditions. Thus, poor interstate portability of identity documentation leads to asymmetric enforcement of labor regulation across interstate migrants, further reducing incentives to move even if wage gains are substantial (Srivastava and Sasikumar, 2003; Srivastava 2012).[22]

F. Conclusion

The IHDS provides a more recent source of data to analyze patterns in the incidence of economically motivated internal migration in India. 'Husbands' who leave the resident household are the dominant stream of migration in the IHDS, which does not capture women who migrate primarily for marriage. The most recent round of the IHDS, conducted in 2011-12, also provides information on circular migrants, with a definition that is more comprehensive compared to the

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[22] Recognizing these issues, the central government passed a law, called the 1979 Inter State Migrant Workmen Act, specifically to regulate practices associated with the recruitment and employment of interstate migrant workers. The law requires middlemen who recruit interstate migrant workers and the firms that hire them to get a special license. It requires that migrant workers be paid in accordance with local minimum wage laws, issued a passbook recording their identity, nature of work and remuneration, and provided with accommodation and health care. However, studies suggest that this law is not enforced (Srivastava and Sasikumar, 2003; Srivastava 2012).

2007-08 NSSO survey. The IHDS therefore presents an appropriate sample to analyze internal migration for economic reasons, which, in turn, can promote the agglomeration of economic activity in productive locations.

Tracking the same households between 2004-05 and 2011-12, internal labor migration rates appear to have increased notably. In the IHDS, working-age male migrants (15 years or older) constituted 4.6 percent of the population in 2011-12, up from 1.6 percent in 2004-05; this indicates an increase in the stock of labor migrants from 16 million to 60 million over the seven-year period. This trend of increasing labor mobility is line with the Government of India's recent Economic Survey, which estimates internal labor migration at between 5 million and 9 million annually – considerably higher than what has been previously estimated.

India's low-income states dominated migration flows across and within states, especially the former. In terms of spatial movements, rural-urban migration was the dominant stream in both 2004-05 and 2011-12. Further, the share of those moving within and across states was almost evenly split, with the share of the latter increasing from 40 to 45 percent during the same period. The stock of "interstate" and "intrastate" migrants is negatively correlated with per capita state NSDP. Bihar and Uttar Pradesh had the largest stock of out-migrants moving to other states. Uttar Pradesh and Madhya Pradesh had the largest stock of out-migrants moving within states. In per capita terms, India's seven low-income states had distinctly higher shares of internal migrants compared to richer states, with a few exceptions.

The absolute numbers of circular migrants, as measured in the IHDS, are much higher than previously documented estimates. The absolute number of short-term migrants – estimated at over 200 million in 2011-12 – is more than 10 times the 15.2 million short-term migrants in the 2007-08 NSSO household survey. These seasonal migrants are much more likely to be from socially disadvantaged groups and households with low levels of education. One-third of circular migrants were employed in the construction sector, with agriculture and informal sector jobs in manufacturing and services also being important. Circular migration flows appear to be mediated by contractors who perform the critical function of sourcing and recruiting workers.

The observed negative correlation between physical distance and migration can be explained by a range of factors from moving costs, through cultural alienation, to the availability of information. The analysis based on the IHDS showed that a household's ability to finance sending out a resident member, as indicated by its level of consumption/income, is positively correlated with the probability of migration. The analysis also highlighted the potential importance of the availability of information through a positive association between exposure to mass media and the probability of households having migrant members.

The influence of social networks on internal migration in India cannot be emphasized enough. Community-based networks in destination areas increase the likelihood of an individual migrating to the same destination. At the same time, the literature also suggests that people are perhaps reluctant to migrate because they would lose access to social insurance provided by caste-based networks in source areas. Analysis based on the IHDS also shows that weaker 'community bonds' in addressing common issues or greater crime in source areas is associated with a lower probability

of the (male) household head being a nonresident, possibly because that leaves family members of the migrant who are left behind more vulnerable.

The deterrent effect of distance, combined with the role of an established network in destination areas, can reinforce the lack of mobility for those residing in remote locations. An idiosyncratic decision to move to where no one has gone before initiates the establishment of a network. Given that distance acts as a deterrent, the cumulative effect of this is to have remote rural settlements that become isolated from the migration process. This cumulative inertia then denies these more remote locations any of the benefits that may emerge from having fellow villagers or family members in town, leaving them disconnected from progress in the central core of the economy.

There is also a possible administrative dimension to interstate migration barriers, as a result of domicile provisions for work and study, lack of portability of social benefits, and legal and other entitlements upon relocation. Although anyone in India is legally free to move from one location to another, policies implemented at the state level can inhibit the mobility of labor across state boundaries. This includes poor interstate portability of identification documents, which means that migrants risk losing access to social protection. The lure of reserved seats on state educational institutes and public sector jobs could also keep people from moving across states. Looking ahead, internal migration might be constrained less if the central government contribution to social welfare benefits increases or if states are legally obliged to grant the entitlement to social protection to migrants. For the latter, elementary education, which now invokes a constitutional guarantee, is a case in point. Continued progress on the national "Unique Identity Documentation" project will also be a factor, because the bureaucratic processes involved to surrender a ration card issued by the origin state, and obtain a new one in the destination state are complex, and often prone to corruption and administrative errors (Abbas and Verma, 2014).

For future research, there is need to improve databases on internal migration. Traditional migration data, based on the Census and household surveys conducted by India's NSSO, are often outdated, due to their limited frequency and lag in publication. The Census is conducted once every decade, which is understandable given the scale of the exercise. Yet, the speed of data dissemination can potentially be improved considerably; for instance, migration data from the 2011 Census are still not publicly available. In the case of the migration module conducted by India's NSSO, the latest available survey is from 2007-08. Prior to this, much like the modules on employment and consumer expenditure, the migration round was completed every 4-5 years. Therefore, there is the possibility to renew the earlier frequency of the NSSO's migration survey.

Further, there is the issue of questionnaire design. The biggest inadequacy of migration data based on the Census and NSSO household surveys, especially the former, is the fact that they do not accurately capture circular labor migration, which is prevalent in both short- and long-term migration streams. Another weakness of the Census/NSSO surveys is the fact that different types of migration are measured on the 'principal' reason basis. For instance, female migration for work is concealed in 'reason-for-migration' statistics because the principal reason given to the enumerator is 'marriage' or 'moved with household.'

Unlike the conventional data sources, The IHDS tracks the same households over time and this availability of panel data could potentially improve the analysis on migration dynamics. It is also

an improvement in its coverage of seasonal/circular migrants. At the same time, there are a number of shortcomings. First, while it covers the same households between 2004-05 and 2011-12, it does not specify the year in which household members migrated. It also does not specify the destination of migrants beyond whether they move within or across state boundaries. Secondly, the questionnaire design disregards the fact that quite often entire households and not individuals participate in both seasonal and longer-term migration. Third, the sample size of the survey is much smaller relative to the NSS (and obviously to the census) and is only representative at the state level.

In estimating international migration flows, a new field of research that uses 'big data' to proxy for migration flows has emerged. However, most big data sources are limited to online data users, generally biased towards younger, wealthier, and more urban citizens. Therefore, their potential to estimate internal migration flows in a developing country, such as India, may be considered limited. The Government of India's recent Economic Survey presents an innovative railway passenger data–based migration metric. The key idea is to use monthly data on unreserved passenger traffic between every pair of stations as a proxy for work-related migrant flow. This class of travel serves less affluent people, who are more likely to travel for work-related reasons. It is also relatively unconstrained by capacity, hence reflecting the demand for travel, whereas reserved passenger traffic is more likely to be constrained by the supply of seats. Net annual passenger flows for the last five financial years starting 2011-12 averaged close to 9 million, considerably above levels suggested by the Census.

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Appendix

Table 1: Household consumption and migrant remittances
(Panel household-fixed effects)

Dependent variable →	Real household consumption	Real household consumption (Absent husbands only)
Explanatory variables ↓		
Household wage	0.382***	0.383***
	(0.007)	(0.007)
Remittance received	0.112***	0.095***
	(0.010)	(0.013)
Household size	2267.73	1904.39
	(1237.68)*	(1240.74)
Household size-squared	75.66	91.03
	(80.64)	(80.81)
SC/ST dummy variable	947.10	1108.79
	(2512.09)	(2519.41)
Religion dummy variable	5789.49	5403.94
	(5457.10)	(5473.07)
Ration card dummy variable	5669.51**	5661.42**
	(2432.90)	(2440.05)
Government program dummy variable	9529.75***	10059.16***
	(2540.06)	(2539.31)
Household head age	1450.96***	1313.37***
	(455.98)	(456.93)
Household head age-squared	-7.70*	-6.21
	(4.14)	(4.42)
Household head sex	-2531.79	-2802.29
	(5307.52)	(5322.33)
Household head marital status	5628.32	5310.45
	(4031.30)	(4040.68)
Household head occupation dummy variables	Yes	Yes
Household head industry dummy variables	Yes	Yes
Household head education level dummy variables	Yes	Yes
Urban area dummy variable	Yes	Yes
Observations	45,131	45,131
R-squared	0.42	0.42

Table 2: Determinants of migration
(Panel household-fixed effects)

Dependent variable Explanatory variables	Non-resident member dummy variable	Non-resident member dummy variable (Absent husbands only)
Household consumption	2.93e-07***	5.11e-08***
	(2.20e-08)	(9.39e-09)
Household size	-0.0986***	-0.000175**
	(0.00331)	(8.89e-05)
Household size-squared	0.00396***	0.00485***
	(0.000208)	(0.00141)
SC/ST dummy variable	0.00429	0.00502
	(0.00731)	(0.00313)
Religion dummy variable	0.0202	0.000281
	(0.0163)	(0.00699)
Community bond dummy variable	-0.00184	-0.0207***
	(0.00186)	(0.00434)
Crime dummy variable	-0.0130	-0.0636***
	(0.00827)	(0.0193)
Exposure to TV	0.0613***	0.0117***
	(0.00289)	(0.00124)
Exposure to newspapers	0.0528***	0.00904***
	(0.00319)	(0.00137)
Household head age	-0.00168	-0.00388***
	(0.00134)	(0.000571)
Household head age-squared	4.10e-05***	3.41e-05***
	(1.27e-05)	(5.42e-06)
Household head sex	-0.0409***	-0.0809***
	(0.0156)	(0.00669)
Household head marital status	-0.0294**	-0.0191***
	(0.0117)	(0.00501)
Household head occupation dummy variables	Yes	Yes
Household head industry dummy variables	Yes	Yes
Household head education level dummy variables	Yes	Yes
Urban area dummy variable	Yes	Yes
Observations	58,656	58,656
R-squared	0.24	0.21

Table 3: Determinants of migration (2011, Cross-sectional regression)

Dependent variable Explanatory variables	Non-resident member dummy variable	Non-resident member dummy variable (Inter-state only)	Non-resident member dummy variable (students only)	Non-resident member dummy variable (inter-state and students only)
Household consumption	1.72e-07***	5.63e-08***	1.28e-07***	7.08e-08
	(2.52e-08)	(1.47e-08)	(2.02e-08)	(9.42e-08)
Household size	-0.0728***	-0.0208***	-0.0389***	-0.0466***
	(0.00511)	(0.00260)	(0.00353)	(0.0131)
Household size-squared	0.00371***	0.00112***	0.00201***	0.00212***
	(0.000398)	(0.000195)	(0.000262)	(0.000799)
SC/ST dummy variable	-0.00180	-0.0107***	-0.00276	-0.0450*
	(0.00541)	(0.00350)	(0.00480)	(0.0241)
Religion dummy variable	0.00866	0.0107**	-0.00420	-0.0589*
	(0.00651)	(0.00419)	(0.00589)	(0.0308)
Household head age	0.0145***	0.00660***	0.00915***	0.00999**
	(0.00115)	(0.000744)	(0.000909)	(0.00445)
Household head age-squared	-0.000108***	-4.91e-05***	-9.04e-05***	-0.000136***
	(1.15e-05)	(7.33e-06)	(9.00e-06)	(4.41e-05)
Household age sex	-0.0581***	-0.0523***	0.0177	0.0443
	(0.0163)	(0.0113)	(0.0114)	(0.0434)
Household head marital status	-0.0562***	-0.0170**	0.0110	0.126***
	(0.0125)	(0.00809)	(0.00966)	(0.0340)
Proof identification dummy variable	-0.00157	-0.0312**	0.0119	-0.0106
	(0.0178)	(0.0138)	(0.0106)	(0.0427)
Community bond dummy variable	Yes	Yes	Yes	Yes
Crime dummy variable	Yes	Yes	Yes	Yes
Exposure to TV	Yes	Yes	Yes	Yes
Exposure to newspapers	Yes	Yes	Yes	Yes
Household head occupation dummy variables	Yes	Yes	Yes	Yes
Household head industry dummy variables	Yes	Yes	Yes	Yes
Household head education level dummy variables	Yes	Yes	Yes	Yes
Urban area dummy variable	Yes	Yes	Yes	Yes
State dummy variable	Yes	Yes	Yes	Yes
Observations	27,491	27,491	15,760	15,960
R-squared	0.115	0.069	0.054	0.205

Table 4: Determinants of circular migration
(2011, Cross-sectional regression)

Dependent variable Explanatory variables	Non-resident member dummy variable	Non-resident member dummy variable (Inter-state only)
Household consumption	2.0105e-08 (2.2466e-08)	1.6783e-08 (1.0737e-08)
Household size	4.3959e-03 (4.8203e-03)	-2.6333e-03 (2.5212e-03)
Household size-squared	2.5653e-04 (3.7893e-04)	1.0615e-04 (1.9570e-04)
SC/ST dummy variable	1.6038e-02** (6.6328e-03)	7.3900e-03** (3.5155e-03)
Religion dummy variable	-7.2568e-03 (8.6380e-03)	3.7039e-03 (5.2944e-03)
Household head age	-3.8874e-03** (1.8645e-03)	-4.5730e-03*** (1.2609e-03)
Household head age-squared	2.7372e-05 (1.9351e-05)	3.1490e-05** (1.2240e-05)
Household age sex	2.3516e-02 (1.7184e-02)	2.0469e-02** (8.3924e-03)
Household head marital status	-1.3666e-04 (1.4787e-02)	1.3122e-02* (7.4735e-03)
Proof identification dummy variable	-4.2633e-03 (2.8475e-02)	-1.2716e-02 (1.9427e-02)
Community bond dummy variable	-4.3894e-03 (7.6019e-03)	-1.9245e-03 (4.6073e-03)
Crime dummy variable	-2.9932e-02 (2.0319e-02)	-2.9250e-02 (3.1114e-02)
Exposure to radio	2.0032e-02** (8.3178e-03)	1.7283e-02*** (6.1414e-03)
Exposure to newspapers	1.6198e-02** (6.7748e-03)	9.3583e-03** (3.7742e-03)
Household head secondary education dummy	-2.8504e-02*** (6.7829e-03)	-1.4377e-02*** (4.4203e-03)
Household head tertiary education dummy	-3.1079e-02*** (8.7592e-03)	-1.8345e-02*** (4.9217e-03)
Household head industrial sector dummy	-8.5109e-03 (9.3530e-03)	-1.7490e-02*** (6.0437e-03)
Household head services sector dummy	-2.9768e-02*** (5.9118e-03)	-1.5965e-02*** (3.7161e-03)
Household head occupation dummy variables	Yes	Yes
Urban area dummy variable	Yes	Yes
State dummy variable	Yes	Yes
Observations	21,796	22,161
R-squared	0.22	0.23