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Closer, but No Cigar

Intergenerational Mobility across Caste Groups in India

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Abstract

This paper compares the intergenerational mobility of educational and occupational attainment of men from disadvantaged groups (Scheduled Castes (SC) and Scheduled Tribes (ST)) in India with the intergenerational mobility of men outside these groups during 1983–2009. Although there has been a modest convergence in mobility rates of non-SC/ST and SC/ST men in educational attainment, there has been no significant convergence in the mobility rates of occupational attainment. Upward mobility of SC/ST men remains much lower compared to non-SC/ST men. Additionally, the former are more susceptible than the latter to moving down the intergenerational ladder. The mobility gap varies over a large range across states, but the cross-state variation has declined, with convergence being higher in states with larger gaps initially. The paper finds no evidence of higher convergence in states with higher economic growth. As such, policies that focus on growth may not necessarily deliver convergence in outcomes across social groups.

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Closer, but No Cigar:
Intergenerational Mobility across Caste Groups in India

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1 Introduction

On the eve of Indian independence, a gulf separated the upper castes from the lower castes. The caste system – a hierarchical ordering of social groups based on notions of purity, through its enabling influence on social oppression and exclusion was instrumental in creating gaps in opportunities and resulting outcomes across people from different caste groups.[1] Such disparities weighed heavily on the framers of the Indian constitution which led to the identification of the disadvantaged groups in a separate schedule. Since its adoption, the constitution has made special provisions for this group and calls for the promotion of "*. . . educational and economic interests of the weaker sections of the people, and, in particular, of the Scheduled Castes and the Scheduled Tribes. . .* (Government of India, 1949)".[2]

The mandate to bridge the caste gap has been in effect for almost seven decades. At the same time, the country has realized significant economic and developmental progress, especially since the early 1990s that marked the beginning of the post-reform period. A key question then is what has happened to the caste gap with drastic transformations happening elsewhere. While this question is important for many facets of social life, the status of the gap in educational and occupational attainment is particularly relevant in the ongoing political and social context. Reservations and quotas in education and occupations have been powerful affirmative action instruments and their existence has become a divisive issue of late. Many argue that inequality of opportunities still persist whereas others call for a retirement of affirmative action policies citing either elimination of caste disadvantage or with advantages being reaped by the *well-to-do* section within the lower castes. In fact, often such policies are thought to be discriminatory towards higher castes which has given birth to the epigram that *one cannot go forward unless one is backward*.

In this paper, I study whether the importance of caste affiliation in determining educational and occupational attainment has waned with economic development. In line with previous literature, I consider differences in intergenerational outcomes of SC/ST men with respect to non-SC/ST men and ask if an SC/ST child realizes the same level of success as a non-SC/ST child conditional on both having a father with the same level of achievement. To answer this question, I use data from the

[1] The oppression and exclusion of the lower caste take many forms. For example, untouchability is still persistent, notably in the rural areas despite being abolished. People from lower castes are also subjected to geographical segregation with access being denied to wells, temples and schools. They are also likely to face violent abuse by police and members of higher castes. Narula (1999) studies violence and discrimination against the SCs and questions the effectiveness of laws protecting them from such episodes. Hoff (2016) provides a brief review of studies highlighting the caste disadvantage in behavioral settings.

[2] Since the late 1980s, the affirmative action policies have been extended to include caste groups not included in the scheduled list, but fare worse compared to higher caste groups. These caste groups have been collected in a separate category and are known as the Other Backward Classes (OBCs).

six rounds of the National Sample Survey (NSS) (National Sample Survey Office, 2016) that span a period from 1983 to 2009-10. The NSSs are country-wide surveys that contain educational and occupational information of respondents. As many sons co-reside with their fathers, it is possible to identify father-son pairs and compare their educational and occupational outcomes.[3] However, the likelihood of co-residence declines with son's age which results in lower matches. Thus, I restrict my attention on sons between the ages of 15 and 44 and compare their success relative to their fathers.

To compare the difference in outcomes across caste groups, I estimate the probability of moving out of father's educational and occupational outcome for both groups at each level of father's outcome. For example, I estimate the probability of attaining schooling for both SC/ST and non-SC/ST men conditional on their fathers having no schooling. I then explore if the gap in probability across the two groups has reduced over time or not. It is imperative that the gaps in probability should be analyzed at each level of father's outcome because the aggregate probability of moving relative to father's outcome depends not only on strength of association in outcomes across generations but also on the distribution of fathers across outcome levels (Altham, 1970). Hence, it is possible to observe a shrinking of the aggregate gap even when there is no change in the strength of association for any of the groups.[4]

The results show that the trend in mobility gaps has been quite different at different levels of father's outcomes. With respect to educational attainment, the gap has closed down significantly when measured for children with fathers with no education. The gap also contracted at higher levels of father's education, though the convergence was much weaker. I also decompose the mobility into upward and downward mobility and find that the mobility gaps have converged across both types. The convergence has been relatively stronger with respect to downward mobility with the downward mobility gap having disappeared entirely at the lowest level of father's education. Though encouraging, the convergence in intergenerational mobility gaps in educational attainment has been far from absolute. In particular, large absolute gaps remain at higher levels of father's education. In 2009, the downward mobility of SC/ST sons born to fathers with secondary or above education is not very different from what their counterparts from other caste groups encountered in 1983. The vitality of estimating gaps at each level of father's education is highlighted when the trend in mobility gap is estimated at an aggregate level. The aggregate gap between the two groups disappeared in 1999, and SC/ST sons started reporting a higher likelihood of moving out

[3]Establishing intergenerational links for daughters has a very low success rate due to the low likelihood of co-residence with parents, especially post-marriage. The gap in mother's information also prevents including them in the analysis and is unfortunate given the evidence of maternal influence on child's outcome (Currie & Moretti (2003), Currie & Moretti (2007), Aizer & Currie (2014) etc.).

[4]Sub-section 3.1 contains a more elaborate exposition of this argument.

of paternal status in 2004. The higher aggregate mobility is driven by the fact that SC/ST sons are over-represented at lower levels of father's education, at which the probability of making a move out of father's outcome is higher compared to other levels.

Similar to what was observed with respect to educational attainment, I find that the trend in mobility gap varies across paternal occupations. Looking at sons of elementary occupation workers – who may be considered to be at the lowest level of the occupational hierarchy, the increase in the likelihood of a move by SC/ST sons was offset by an almost equal increase in likelihood observed by non-SC/ST sons. At the other end of the spectrum, the gap in upward mobility for sons of farmers has doubled on the back of mobility rising faster for non-SC/ST sons. It is noteworthy that the moderate convergence in educational mobility has not translated to any meaningful convergence in occupational mobility.

Many factors operating at the state level – for example reservation quotas, have a direct effect on mobility gaps which is reflected in a notable heterogeneity both in levels and in the convergence of the gaps across states. I use this variation to analyze the relationship between convergence and factors that can be thought of as drivers of convergence. I find that convergence has been higher in states that had higher gaps initially. While this appears not very surprising, it is still a welcome development as it shows that these states are making progress towards parity and are not stuck at the extreme levels of inequality. This becomes all the more relevant given that many developed societies have seen stable levels of intergenerational mobility over long stretches of time (Hertz *et al.* (2007), Corak (2013), Chetty *et al.* (2014) etc.). The states that witnessed a larger decline in poverty rate also saw larger convergence, suggesting positive links between poverty alleviation and social change. Yet, there is no positive association between economic growth and convergence. It seems then that policies geared toward economic growth, or growth in itself, may not lead to disadvantaged groups in catching up with the rest of the population.

Finally, I test the robustness of the findings to any bias caused by selection of only father-son pairs living together. To do this, I analyze the mobility gaps by considering two much younger age group of sons: 15 – 19 and 20 – 24, for whom the matching success rate is much higher. I find that the conclusions derived from the base sample are confirmed by the smaller sub-samples.

Intergenerational mobility has been a rich area of research for many decades now. Mobility measured using labor earnings has been of particular interest to economists ever since the seminal work of Becker & Tomes (1979).[5] On the other hand, many scholars have studied intergenerational mobility in education and occupations given the close association of such outcomes with social

[5]Solon (1999) is an early review of this literature. See Black & Devereux (2011) for a survey that concentrates on the research that happened after the prior review.

status, including income and wealth.[6] Yet, the bulk of this literature has focussed on analyses of intergenerational mobility in developed countries due to lack of availability of data spanning generations.[7]

Within the context of developing economies, there has been a growing interest in analyzing intergenerational mobility in India since the early 2000s.[8] An endowment of rigid caste structure together with rapid economic transformation in recent times makes India an intriguing case study. Kumar *et al.* (2002a) and Kumar *et al.* (2002b) provided early cross-sectional evidence of prevailing mobility gaps across caste groups in the mid-1990s. Jalan & Murgai (2008) and Maitra & Sharma (2010) study mobility with respect to educational attainment, though like the former two studies, they use a single cross-section, thus abstaining from an inter-temporal analysis. Both Majumder (2010) and Hnatkovska *et al.* (2013) using the NSS data study trends in educational and occupational mobility gaps over time. However, by focussing on the aggregate probability of moving out of paternal outcome, both studies overlook the differences in mobility gaps prevalent at each level of paternal outcome. This abstraction proves to be crucial. I find that not accounting for the differences in prevalence across the two groups masks the glaring mobility gaps present at each level of paternal outcome and paints a picture of convergence in the aggregate mobility rates of the two groups. Reddy (2015) employing Altham statistics and the same data reports that the aggregate gap in occupational mobility across the two groups closed over the same period driven by a sharper decline in mobility for the SC/ST men, who initially exhibited a higher mobility. In his conclusion, he points that this aggregate decline, even after controlling for *prevalence*, veils the fact that the gap in the likelihood of mobility measured for sons of elementary occupation fathers increased over time.[9] The paper formalizes this by measuring mobility for the two groups conditional on father's occupation. A growing body of research using readily available representative data on men has performed a cohort analysis with respect to both educational and occupational mobility in India.[10][11] Finally, there exists a large literature that compares the outcomes of different groups

[6] See Ganzeboom *et al.* (1991) and Erikson & Goldthorpe (1992) for a survey of this literature.

[7] Lillard & Willis (1994), Lillard & Kilburn (1995), Hertz (2001), Dunn (2007), Nunez & Miranda (2010), Emran & Shilpi (2011) etc. analyze intergenerational mobility in different contexts in country-specific context., while Dahan & Gaviria (2001), and more recently, Ji (2016) and Sinha (2017) perform a cross-country analysis.

[8] Earliest work on intergenerational mobility in India, however, can be traced back at least to Driver (1962) who found frequent movement out of paternal occupations by male household heads in Nagpur district, but concluded that such movement remained confined to occupations of similar rank.

[9] Xie & Killewald (2013) highlight the sensitivity of aggregate mobility comparison across two occupational structures in relation to conditional mobility differences.

[10] Deshpande & Ramachandran (2014) highlight the intergenerational outcomes of OBCs who are generally excluded from the analysis due to earlier censuses and surveys not classifying them as a separate category. Azam & Bhatt (2015) and Asher *et al.* (2017) study educational mobility while Motiram & Singh (2012) and Azam (2015) focus on occupational mobility. See also Iversen *et al.* (2017) who analyze occupational mobility employing finer classification of occupations.

[11] While it is tempting to invoke an equivalency of trends in cohort with trends in time, the two analyses are essentially

independent of intergenerational links.[12]

In summary, the paper abandons the use of an aggregate measure of the mobility gap and instead performs a deeper analysis of gaps conditional on having the same paternal outcome. An analysis of conditional gaps is also valuable for policy guidance as it highlights the relative severity of inequality across groups at different levels of paternal background. The rest of the paper is prepared as follows. The next section describes the data and the sample selection criteria. Following, I present the trends in intergenerational mobility gaps in educational and occupational attainment across caste groups over 1983–2004. Next, I weigh the success of various states in closing mobility gaps succeeded by a robustness test of the results to biases induced via the use of a co-residence sample. Finally, I conclude the paper with a brief discussion of issues that require further investigation.

2 Data

The data for the analysis are sourced from the Integrated Public Use Microdata Series-International (IPUMS-I) (Minnesota Population Center, 2015) that houses census and survey data from many countries. The original source of IPUMS-I data are the various rounds of NSS. The NSSs are country-wide surveys and are conducted with an aim to perform analysis at both the national and the state levels. There are six rounds of NSSs available from the IPUMS-I (Round 38 (1983), Round 43 (1987–88), Round 50 (1993–94), Round 55 (1999–2000), Round 61(2004–05)) and Round 66 (2009-10) which I use in my analysis.

The educational information of a respondent in NSS is classified into seven categories. I

quite different. For instance, a lower gap for the younger cohort does not necessarily indicate a convergence. In a perverse scenario, gaps in both cohorts could be growing over time and yet, a faster growth in the gap for the older cohort can deliver the exactly same cross-section observation. It may also appear that an inter-temporal interpretation of cohort study is more alarming for occupational mobility given that occupational distributions have a higher possibility to differ across different cohorts with educational attainment being fixed after a certain age, multiple factors like adult education pose serious challenge to this view. Adult education has been a popular policy instrument in India since the early 1950s with National Literacy Mission (NLM) of 1988 having a vital impact on adult literacy. By 2007, more than 125 million adults gained literacy through the NLM and critically for the interest being pursued in the paper, the non-SC/ST castes reaped larger benefits (Government of India, 2017).

[12]See World Bank (2011b) for a detailed discussion. Comparing mobility measures across the two specifications (with and without controls for intergenerational links) is not straightforward. Yet, the findings are broadly consistent with this literature. For example, Desai & Kulkarni (2008) look at educational attainment across groups and find modest convergence at the primary level with almost no improvement at the college level. Dehejia & Panagariya (2013) look at the representation of caste groups as owners of proprietor and partnership businesses over time. They find an expansion in the share of disadvantaged groups. Given that their focus is limited to a single category, it is difficult to interpret this as an evidence of convergence as the gains in this category might be on the back of loss in representation at a more favorable category.

aggregate the three categories with most schooling into one which corresponds to a respondent having achieved an education at a secondary level or higher.[13] With respect to occupation, the IPUMS-I has this information available in a harmonized structure in which they map occupations to the one-digit International Standard Classification of Occupations (ISCO). For the purpose of my analysis, I aggregate the nine one-digit ISCO occupations into four categories.[14] The classification that I use here differs from the classification used by Hnatkovska *et al.* (2013) only in that I separate the elementary workers from sales, services and craft workers. The elementary workers constitute a considerable share of the workforce and, are typically engaged in lesser skilled tasks and earn relatively less compared to sales, service and craft workers.

The NSSs do not ask questions related to the educational and the occupational status of parents. While such surveys do exist for some developed countries, there is a widespread paucity of such data when it comes to developing countries. The availability of data becomes even more troublesome for studies that are looking to analyze time trends in intergenerational outcomes. In absence of such *direct* sources of data, intergeneration links are constructed using the household surveys in which children co-reside with parents and it is possible to identify parent-child pairs using relationship information. It is possible to construct intergenerational links using the NSS data which has been exploited by earlier studies. A consequence of constructing links in this fashion is that the success of matching daughters to parents is very low as it is highly unlikely for a daughter to reside in her parents' household post-marriage.[15] Due to low success of establishing intergenerational links for daughters, I focus on intergenerational trends in mobility by comparing outcomes of sons relative to their fathers.

Another challenge associated with using household relationships to construct intergenerational links is that it yields an unrepresentative sample of children. Using Round 61 of the NSS, Azam & Bhatt (2015) show that it is possible to link just over a quarter of male respondents in the 20–65 age group with their fathers. Drawing inference on intergenerational mobility based on such small share of the universe has the potential to bias the estimates of mobility measures as the decision to co-reside can be systematically linked to educational and occupational outcomes.[16] As noted by Hnatkovska *et al.* (2013) this bias can go in either direction as children with better outcomes may leave co-residence to explore opportunities far from their parents' households but can also have a higher likelihood to ask their parents to live with them as they are more able to take care of

[13] See table 1 for mapping details.

[14] See table 1 for mapping details.

[15] The success of matching is close to 50 percent for women between the ages of 15 and 19 but drops significantly thereafter. The success of matching falls below 10 percent for women aged 25 or higher.

[16] For example, Sinha (2017) compares occupational mobility (father-son) estimates obtained from unrepresentative samples with estimates from representative samples and finds that unrepresentative samples often yield a lower estimate of mobility.

them. It may seem reasonable that if the sample share remains stable over time then though the period estimates might be biased, the estimates of changes over time may themselves be unbiased. However, for the changes to be unbiased, a stricter condition is needed – the share of co-residence of children with better outcomes who are more likely to reside with their parents remain stable over time. In other words, in addition to sample share being stable, the mix of children of either type needs to be stable as well. To overcome such sample selection concerns, I focus on younger men for whom the success rate of matching is higher. I outline this process below.

2.1 Sample Selection

While the success of linking sons to fathers for the entire cross section is quite low, the rate is higher for younger sons potentially due to two reasons. First, sons are more likely to reside with their fathers when they are young. Dependence on parents for a host of reasons – including access to housing, can be an important factor behind such practice. Second, the higher the age of the son, the less likely it is for his father to be alive whether he co-resides with his son or not. Figure 3 shows the success rate of linking sons to fathers for various age groups of sons. The unrestricted sample consists of all men within the age group for which information on educational attainment and occupation is available together with some other variables that I use in analyzing intergenerational mobility. The restricted sample consists of men for whom linking is possible and, education and occupational information of the linked father are also available.

The success rate of matching varies depending on whether one is trying to measure the intergenerational mobility of educational or occupational attainment. The success rate is lower for the occupational case as there are more respondents with missing information on their occupations. The success rate with respect to educational mobility ranges between 72 – 79 percent for sons between the ages of 15 and 19 and falls to around 1 percent for sons between the ages of 55 – 64. In general, the success rate is below 10 percent for sons above the age of 44. A similar trend is observed for the occupational case in which the average annual success rate drops from around 70 percent for sons within the ages of 15 and 19 to close to zero for sons between the ages of 55 – 64. For the purpose of my analysis, I consider men between the ages of 15 and 44. The average success rate of matching for this group is around 40 percent and 30 percent for educational and occupational outcomes respectively. In order to check for robustness, I compare the results of this baseline sample with two other age groups: 15 – 19 and 20 – 24 for whom the success rate of matching is particularly high.

The differences in outcomes observed in the restricted sample compared to the unrestricted (representative) sample suggest that the bias in estimates may be higher for age groups in which

the success rate of matching is low. Figure 4 shows the composition of educational attainment for the two samples for men between the ages 15 – 44 and 45 – 64. Across both age groups, men with worse educational outcomes are under-represented in the restricted sample and men with better educational outcomes are over-represented. Nonetheless, the level of deviation is much lower for the younger group. For the older group, men with no education have 10 percentage points less representation in 1983 which increases over time to reach around 13 percentage points by 2009. This under-representation is mostly offset by an over-representation of men with secondary or higher education. With respect to occupational outcomes, figure 5 shows that farmers constitute a larger share in the restricted sample for both young and old men. The degree of over-representation is similar across the two age groups in the 1980s but diverge in later years. Another difference between the two age groups is that while skilled workers are over-represented in the older group, they are under-represented in the case of younger men. In general, the restricted occupational composition for younger men is closer to the unrestricted composition. While the actual bias in estimates of mobility depends on the parental attributes of dropped men in the restricted sample, the deviation in composition suggests that inclusion of the older group of men will likely create more bias. Also, note that the increasing deviation in composition over time suggests that an analysis of changes in mobility is also likely to be biased. Though focussing on younger men does not entirely eliminate selection bias, it helps in reducing it. A robustness analysis is done by considering narrower age groups for whom the success rate of matching is higher to check if the aggregate trends are preserved or not.

2.2 Controls

In addition to caste affiliations, there are many factors that have the ability to affect educational and occupational outcomes. I introduce some factors that are usually considered important and have been used in previous studies. At the individual level, I control for the age. At the household level, I control for the size of the household and whether the household was located in the urban region or not. The decision to practice agriculture depends crucially on whether the household owns land or not, and can also influence education decisions with education being valued somewhat differently in agricultural occupations. I introduce control for the land owned by a household to capture this effect. I also control for Muslim men in order to parse out the effects specific to SC/ST men from Muslim men, who also have fared worse generally. Finally, I also control for the state of a respondent as state-level factors such as affirmative action policies can have a meaningful impact on education and occupational outcomes.

In the next section, I outline the methodology employed to compare the mobility rate of SC/ST

men with that of non-SC/ST men.

3 Intergenerational Mobility

The primary purpose of the analysis is to ascertain whether the gaps in intergenerational mobility rates across the two groups of men have closed over time or not – does caste affiliations inherited at birth still matter in determining the educational and occupational outcomes of a child? In line with the previous literature, I estimate the likelihood of a son to have a different outcome relative to his father and analyze the gap in this likelihood across the two caste groups over time.

As discussed in the previous section, the educational and occupational outcome variables that I consider are of categorical nature. As such, the measure of mobility is the event of a son moving out of his father's category. It is important to note here that the event of moving out can be further classified as desirable upward moves in which a son ends up with a better outcome relative to his father as compared to non-desirable downward moves in which the son fares worse than his father. To separate desirable moves from the non-desirable, I also analyze mobility with respect to upward and downward mobility separately. In the context of educational outcome, the upward moves are pretty straightforward in which the son ends up with a higher level of education. To put hierarchy in occupational classification, I assume elementary occupations to be least preferred followed by farming and semi-skilled occupations with skilled occupations being the most preferred of the lot. This ranking of occupations roughly captures ranking of education levels and incomes associated with them.

3.1 Absolute Mobility: Role of Prevalence and Association

In order to compare mobility across groups or over time, it is essential to understand how *prevalence* and *association* both contribute in determining absolute mobility reflected by the likelihood of a move (Ferrie, 2005). Differences in absolute mobility can arise from changes in marginal distribution *(prevalence)* across educational and occupational outcomes or via changes in underlying strength between outcomes across generations *(association)*. The strength of *association* is captured by the transition probability – the likelihood that the son moves out of his father's level of outcome. Yet, it is possible that the transition probabilities differ across the levels of paternal outcomes. Hence, absolute mobility for a given distribution of paternal outcome increases with an increase in the transition probability. But, absolute mobility can also increase when the distribution

of paternal outcome shifts towards outcomes with higher transition probabilities independent of any changes in the underlying strength of association.

Figure 1: Absolute Mobility and Association: Period 1

(a) Period 1: non-SC/ST

		Fathers	
		Low	High
Sons	Low	10 *(0.5)*	0 *(0.0)*
	High	10 *(0.5)*	80 *(1.0)*
Absolute Mobility = 0.10			

(b) Period 1: SC/ST

		Fathers	
		Low	High
Sons	Low	40 *(0.8)*	0 *(0.0)*
	High	10 *(0.2)*	50 *(1.0)*
Absolute Mobility = 0.10			

Figure 2: Absolute Mobility and Association: Period 2

(a) Period 2: non-SC/ST

		Fathers	
		Low	High
Sons	Low	5 *(0.5)*	0 *(0.0)*
	High	5 *(0.5)*	90 *(1.0)*
Absolute Mobility = 0.05			

(b) Period 2: SC/ST

		Fathers	
		Low	High
Sons	Low	32 *(0.8)*	0 *(0.0)*
	High	8 *(0.2)*	60 *(1.0)*
Absolute Mobility = 0.08			

The tables show the distribution of 100 father-son pairs across the two levels of educational attainment. The fathers are represented in columns and the sons are represented in rows. The figures in parentheses report the transition probabilities – probability that a son attains the level of education reported in row conditional to being born to a father with education reported in the column. Figure 1 shows that absolute mobility for the two caste groups is the same even with different transition probabilities. Figure 2 shows that SC/ST sons end up with higher absolute mobility than non-SC/ST sons despite any changes in transition probabilities over time.

A hypothetical example can illustrate how absolute mobility can change without any change in the strength of association across two generations as captured by the transition probabilities. Figures 1 and 2 show the distribution of fathers and sons across the two caste groups for two consecutive generations when educational attainment can be either *High* or *Low*. All matrices contain 100 father-son pairs with the fathers being represented in columns and sons being represented in rows. For instance in figure 1, out of 100 non-SC/ST fathers 80 have a *High* level of education and the rest 20 have a *Low* level of education. The numbers in parentheses show the transition probabilities – as half of non-SC/ST sons of fathers with a *Low* education attain a *High* education, the transition probability is 0.5. On the other hand, conditional of being born to a SC/ST father with a *Low* education, the probability to attain a high education is only 0.2.

As shown in figure 1, suppose that initially, 80 percent of non-SC/ST fathers have a *High* education whereas only 50 percent of SC/ST fathers are at the same level. The matrices capture the fact that sons of fathers with a High level of education attain a *High* level of education irrespective of their fathers' caste affiliations. However, the probability of a non-SC/ST son to attain a *High* education differs from a SC/ST son conditional on being born to a father with a *Low* level of education. This is captured in their respective transition probabilities. In this stylized example, both caste groups have the same absolute mobility of 0.10. A first point to be noted here is that the difference in transition probabilities across the two groups is washed away by the differences in the distribution of fathers across the two educational outcomes. In the next period, the share of fathers with high education will increase to 90 percent for non-SC/ST and to 60 percent for SC/ST men (figure 2). With no changes in underlying strength of association across the two periods, the absolute mobility for non-SC/ST and SC/ST sons will decrease to 0.05 and 0.08 respectively. This decline in absolute mobility occurs despite no changes in transition probabilities, and solely due to changes in the distribution of paternal outcomes. Considering just the gap in absolute mobility across the two groups over time, one will conclude that the SC/ST sons had higher intergenerational mobility in the later period improving over their lagging mobility rate in the past. Yet, it is clear from the example that there was no change in association in outcomes across generations for either group and a SC/ST son of a father with a low level of education still experienced a much lower probability of making a move to high education compared to his non-SC/ST counterpart. Hence, it is critical to control for the changes in marginal distributions across groups and across time that may lead to differences in absolute mobility even in absence of any differences in association across generations.

To estimate the intergenerational mobility, I employ the following probit model

$$\begin{aligned} \text{Prob}(Y_i = 1|X_i) &= \Phi(X_i'\beta) \\ \text{where } X_i'\beta = \alpha &+ \beta_1 \text{age}_i + \beta_2 \text{age}_i^2 + \beta_3 \text{land}_i + \beta_4 \text{hhsize}_i \\ &+ \gamma_5 \text{urban}_i + \gamma_6 \text{muslim}_i + \gamma_{\mathbf{S}} \text{state}_i + \gamma_{\mathbf{CF}} (\text{caste}_i \times \text{FO}_i) \end{aligned} \tag{1}$$

where Y_i is a binary variable that equals 1 in the event of a change in the outcome of a son relative to his father, and 0 otherwise. This change in outcome can potentially depend on a multitude of factors as discussed previously which are represented by a vector of controls X_i. The γs represent the coefficients on dummies with $\gamma_{\mathbf{S}}$ and $\gamma_{\mathbf{CF}}$ representing a vector of dummies for capturing state-level and caste-father-level effects respectively. The variable FO denotes the father's outcome of interest which is interacted with caste affiliation of a son. This interaction is the main point of departure compared to other studies which helps in separating the effect of *prevalence* from absolute mobility. Using interacted dummies, I can compare the likelihood of mobility of a SC/ST

son compared to a non-SC/ST son conditional on both having a father with the same level of educational or occupational outcome. Equation 1 is estimated separately for each cross-section and the estimated model is used to predict individual level probabilities. I compute average predicted probabilities for both SC/ST and non-SC/ST sons at each level of father's outcome in order to compare the over time changes in mobility of the two groups. Round 66 (2009-10) of the NSS does not contain information on the religious affiliation. Hence, estimates for this round are derived without controlling for the Muslim dummy.

Another strategy to separate *prevalance* from absolute mobility will be to use the Altham statistics used by some of the previous studies. While Altham statistics are useful in controlling for differences in the distribution of outcome variables, controlling for important factors that influence outcomes becomes difficult. For instance, it is possible that the difference in mobility rates across the two groups may be borne out of systematic differences in mobility rates across urban and rural regions with one group being relatively dominant in one region. Controlling for such factors not only helps in identifying their strength but also in analyzing the residual gaps.[17] I now discuss the results of the analysis beginning with changes in intergenerational mobility of educational attainment for the two groups over time.

3.2 Intergenerational Mobility in Educational Attainment

Figure 6 tracks the intergenerational mobility of educational attainment of SC/ST and non-SC/ST men from 1983 – 2009 at each level of father's education. The bars in the figures indicate the 95 percent confidence interval around the point estimates of average probabilities. The aggregate likelihood of a son to attain an education level different than his father, either higher or lower, increased steadily from 0.56 in 1983 to 0.67 by 2009. Analyzing mobility at group and level of father's educational attainment assists in identifying the sources of these gains in aggregate mobility. A first point to notice here is that the trend in intergenerational mobility has been quite different at different levels of father's education. The mobility increased for both SC/ST and non-SC/ST sons of fathers with no education, less than primary education and primary education. The increase was particularly remarkable at the lowest level of father's education with the mobility increasing by 32 percentage points for non-SC/ST sons and by a mammoth 41 percentage points for SC/ST sons. The mobility went up for non-SC/ST sons of fathers with a middle level of education whereas it declined for SC/ST sons of fathers with the same level of education. The intergenerational mobility at the

[17] Altham statistics can be generated for urban and rural regions separately to answer this specific question. However, if one is interested in controlling for many factors together, the transition matrices used to compute Altham statistics will become fairly sparse and the estimates will become quite noisy.

high end of father's education declined for both groups but more so for SC/ST sons. However, the main objective of the analysis is to find whether the caste affiliation of a son remained a significant factor in explaining his educational attainment in 2004 compared to 1983.

To answer this question, I examine the changes in gaps in mobility rates of the two groups over time.[18] Notice that barring the highest level of father's education, SC/ST sons have always had a low level of mobility compared to non-SC/ST sons across all cross-sections. The gap in mobility rates across the two groups has closed down significantly at the lower levels of father's education. The gap reduced from 13 percentage points to 5 percentage points for sons of fathers with no education. The convergence is even more stark at the next higher level of father's educational outcome where the gap almost disappeared. The gap in mobility rates actually increased for sons with fathers that had completed middle school. Movements from the highest level of father's education are different from movements at other levels in that they necessarily capture a worse outcome for the sons. Hence, a higher mobility observed at this level for SC/ST sons indicates a higher probability of moving down the education status relative to their fathers. The likelihood of such worse outcome for SC/ST sons has declined over time, and together with a relatively flatter decline in the likelihood of non-SC/ST sons has led to a significant contraction in the gap at this level of father's education. While there has been convergence in gaps in mobility over time at most levels of father's education, the convergence is far from absolute. The SC/ST sons are 5–9 percent less likely than their higher caste counterparts to make an intergeneration move in educational attainment at three of the first four education levels. At the highest level of father's education, they are 11 percent more likely to fare worse than their fathers compared to the non-SC/ST sons and face a higher total mobility than what non-SC/ST sons faced in 1983.

Mobility for SC/ST sons can be higher if they face a sufficiently high likelihood of downward moves relative to non-SC/ST sons together with having a lower likelihood of upward moves. This would be a perverse scenario in which the disadvantaged group faces a higher probability of worse outcomes but a lower probability of better outcomes. To distinguish between the two, I separate the upward moves from the downward moves and check how the gap in mobility rates across the two groups compare. Figures 7 and 8 track the mobility rates for upward and downward moves respectively.

First, consider the gaps in mobility pertaining to upward mobility. As any movement at the lowest level of father's education is indicative of better outcomes, there is virtually no change in the behavior of the gaps over time. However, there are significant differences at all other levels of father's educational attainment. A first takeaway is that the gaps in mobility when considering

[18] Table 2 reports the point estimates of the excess mobility of SC/ST sons relative to non-SC/ST sons.

upward mobility were much higher in 1983. For example, for sons of fathers who had completed middle school, the mobility gap was essentially non-existent when I considered both the upward and the downward moves. Yet, studying only upward mobility reveals that in 1983, SC/ST sons of fathers who had completed middle school were 15 percent less likely to transition to a higher educational status compared to non-SC/ST sons of fathers with the same level of education. The second point of difference is that the convergence is much more evident in the case of upward mobility. In terms of the closing of the gap, 60–80 percent of the initial gap is closed for sons of fathers with less than primary and with primary education. Though not as large, the convergence also took place for sons of fathers who had completed middle school. This is in stark contrast to the previous case in which the gaps at this level of father's education seemed to enlarge over time.

Now, consider the gaps in downward mobility. An entirely new picture emerges where I find that the mobility rates of SC/ST sons lie above the non-SC/ST sons at all levels of father's education. This is reminiscent of what was observed earlier at the highest level of father's education and confirms the fact that in general SC/ST sons face a higher likelihood of downward mobility together with a lower likelihood of upward mobility. The encouraging fact emerging here is that akin to convergence in upward mobility, the likelihood of downward moves for SC/ST sons has moved closer to non-SC/ST counterparts over time. They face relatively much lower downward mobility in 2009 and the rate of decline has been much faster for them. The gap has almost disappeared for sons of fathers with less than primary and primary education. Yet, there is still some way to go before SC/ST sons catch up with non-SC/ST sons. For middle school completed fathers, the likelihood of making a downward move for SC/ST sons in 2009 is not very different from what non-SC/ST sons faced in 1999. Whereas at the highest level of father's education, SC/ST sons were more likely to move down in 2009 than what was expected for non-SC/ST sons in 1983.

How would the results look if I had not made an adjustment to separate out the impact of *prevalence*? To cast light on this, I re-do the exercise by estimating the probit model in equation 1 without the interaction of caste affiliation with father's education, but with caste affiliation only. The results are presented in figure 9. Mobility rates of both SC/ST and non-SC/ST sons are found to be growing over time when both upward and downward moves are considered together as well as when only upward moves are considered. The sharp difference, however, is that not adjusting for *prevalence* shows that in either case, the mobility gap across the two groups converged in 1999 and SC/ST sons were far more likely to experience a move in 2009. Although, the gap in downward mobility shows convergence not very dissimilar to what was observed earlier at various levels of father's education. Nonetheless, an important difference is that the *prevalence*-unadjusted mobility is higher for SC/ST sons across all time periods driven by the fact that they are over-represented at the lower levels of father's education, at which likelihood to make a downward move is lower

compared to upper levels of father's education.

In summary, I find that there has been convergence in mobility rates of the two groups in regards to educational attainment during 1983 – 2009. However, the convergence has been far from absolute with significant gaps still remaining, especially for sons of fathers with higher levels of education. Following, I shift focus to study whether the convergence in mobility rates of educational attainment also spread to convergence in rates of occupational attainment.

3.3 Intergenerational Mobility in Occupational Attainment

Figure 10 traces the intergenerational mobility of occupational attainment of SC/ST and non-SC/ST men from 1983 – 2009 for all paternal occupations. The aggregate likelihood of a son to practice an occupation different than his father, increased steadily from 0.26 in 1983 to 0.34 by 2004 before dropping slightly in 2009. Similar to what was observed with respect to educational attainment, I find that the trend in intergenerational mobility has been quite different for different paternal occupations. The mobility increased for both SC/ST and non-SC/ST sons of fathers engaged in elementary and farming occupations. In contrast, the mobility went down for sons of semi-skilled fathers. As the figure suggests, there was not any meaningful convergence in mobility across the groups during 1983 – 2004. This observation diverges distinctly from what was seen with respect to educational mobility.

Whether the mobility rate of SC/ST sons is higher or lower than the non-SC/ST sons depends on the father's occupation.[19] Looking only at sons of elementary workers – who may be considered at the lowest rung of occupational status, mobility has always been lower for SC/ST sons. As mobility at this level reflects an increase in intergenerational occupational status, the rate differential captures the fact that SC/ST sons coming from the most severe situations fare worse in attaining better outcomes relative to their fathers compared to non-SC/ST sons coming from similar situations. While mobility increased for an SC/ST son of an elementary worker, an almost equal increase in the mobility experienced by a non-SC/ST son meant there was no convergence in the mobility gap. At the other end of the spectrum, SC/ST sons face a considerable higher mobility throughout the period considered, conditional on them being born to fathers employed in semi-skilled or skilled jobs. Being at the top of the occupational ladder, a movement out of skilled occupation captures a worse outcome, which SC/ST sons are more likely to experience. In 1983, SC/ST sons were 25 percent more likely to fare worse than their fathers compared to non-SC/ST sons. This disadvantage narrowed a bit in 2009 to 19 percent. Yet, what is alarming is that the probability of an adverse

[19] Table 4 reports the point estimates of the excess mobility of SC/ST sons relative to non-SC/ST sons.

move for SC/ST sons is still way above what has been observed for non-SC/ST sons in any of the previous years.

Upward and downward moves are not as straightforward to define in occupation as in education. As such, I assume an occupational hierarchy in which elementary occupations are least preferred followed by farming and semi-skilled occupations with skilled occupations being the most preferred of the lot. This ranking of occupations is based on the ranking of education levels and incomes associated with them. Table 3 shows the median educational attainment associated with each occupational category.[20] Elementary and skilled occupations lie on the extreme of educational attainment across all the cross sections. The median educational attainment for farmers is lower than for workers in semi-skilled occupations in three of the five cross-sections. A large fraction of the workforce in India is self-employed or working under informal contracts which renders an analysis of wage income highly restrictive. In this case, expenditure data help in gaining insights on economic well-being. The NSS contains information on monthly household expenditure per capita for 1983 and 1993. Figure 11 plots the median household expenditure per capita across the four occupations. There is a definite ordering of occupations based on this measure which is consistent with the occupational ranking used in the analysis. The occupational hierarchy allows me to investigate the changes in gaps with respect to upward and downward mobility separately.

Figure 12 shows the upward mobility rates for the two groups over the years. Consistent with what was seen earlier, there is no change in the behavior of the gaps over time when the sons of elementary workers are considered. However, the upward mobility of non-SC/ST sons lies consistently above the mobility of SC/ST sons at each classification of father's occupation. It follows that higher mobility of SC/ST sons of semi-skilled workers observed earlier was driven not by them having a higher probability of moving to a better occupational status than their father. Instead, the aggregate higher mobility is driven by the higher probability of unfavorable outcome faced by them. In regards to convergence, I find that there has been practically no convergence in mobility rates across the two groups. In fact, the upward mobility of non-SC/ST farmer sons has risen more than for SC/ST sons, leading to an expansion of the mobility gap.

What happens when I only consider the downward occupational moves? The situation reverses and I find that the mobility rates of SC/ST sons lie above the non-SC/ST sons at all levels of father's education. This is exactly what was observed when only downward educational moves were considered and further confirms the fact that in general SC/ST sons face a higher downward mobility together with a lower upward mobility. While there has been no convergence in the upward mobility rates, I find that the downward mobility of SC/ST sons has somewhat shifted closer to

[20]The median is calculated using the unrestricted sample subject to both education and occupational data being available.

non-SC/ST counterparts over time. The probability of an unfavorable outcome has declined for both SC/ST and non-SC/ST sons of farmers. Though the decline has been larger for SC/ST sons leading to a contraction in the mobility gap. The convergence at other levels has followed a different dynamic. While downward mobility has declined for SC/ST sons, it has increased for non-SC/ST sons if their fathers were employed in semi-skilled or skilled occupations. The gaps in downward mobility have converged across all levels but SC/ST sons were still more prone to experience an adverse move in 2009.

Finally, I re-do the exercise by estimating the probit model in equation 1 with caste affiliation only to show how results differ if not controlling for *prevalence*. The results are shown in figure 14. When considering both the upward and the downward moves, I find that there is no discernible difference in mobility rates of the two groups over time. This happens because of two reasons. First, as shown in figures 14b and 14c, the upward mobility of SC/ST sons is lower and vice versa, which offset each other when both of them are considered together. Second, the over-representation of SC/ST sons at low levels of father's education leads to *prevalence* effects in which the upward and the downward mobility is higher and lower respectively.

The analysis shows that the convergence of gaps seen in educational attainment has not translated into the convergence of gaps in occupational attainment. More importantly, the likelihood of SC/ST sons to practice a better occupation than their fathers relative to non-SC/ST sons has fundamentally remained the same during the period of analysis.

3.4 Comparing within the Two Disadvantaged Groups

Before proceeding to evaluate how convergence in mobility gaps has varied across states, it is worthwhile to observe how the two distinct disadvantaged groups - the SCs and the STs have fared individually.

Figure 15 shows the upward educational mobility of non-SC/ST sons together with mobility rates of the sons from the two disadvantages separately. A first point to note is that both SC and ST sons have lower upward mobility than non-SC/ST sons throughout the period of study. It is not straightforward which group has been more successful. The contraction in the mobility gap relative to non-SC/ST sons is not very different for the two disadvantaged groups at the lowest two levels of father's educational attainment. The convergence at these levels lies between a narrow range of 8–11 percentage points. In terms of closing the initial gap though, this narrow range of absolute gains produces slightly larger variations. Of particular interest is the convergence for sons of fathers with less than primary education. The gap at this level has shrunk to less than a tenth

of the gap observed in 1983 for ST sons, whereas a quarter of the initial gap remains for SC sons. Apropos sons of fathers with primary education, the convergence was 4 percentage points higher for ST sons. Yet, this difference was not stark in terms of closing the initial gap. Both groups saw almost no change in upward mobility gap at the next level of educational attainment.

In contrast to upward mobility, downward mobility for SC sons has always been higher than ST sons indicating a worse outcome for them as seen in figure 16. The downward mobility rates for the two groups have moved closer to each other at three of the four educational outcomes. Relatedly, the convergence with respect to non-SC/ST sons has been stronger for SC sons in terms of percentage points gain at the three corresponding levels. Although the convergence is remarkable for ST sons at the highest level of educational attainment which closed a half of the initial gap, the success of SC sons was even more striking who bettered ST sons by a mammoth 11 percentage points. Unlike there not being a clear winner in upward mobility, it appears that SC sons outperformed ST sons in reducing the downward mobility disadvantage.

Next, consider the intergenerational mobility of occupational attainment. Both SC and ST sons report a lower likelihood of upward and a higher likelihood of downward move relative to non-SC/ST sons in all the rounds of the NSS (figure 17 and figure 18). Between the two disadvantaged groups, SC sons have a higher likelihood of upward mobility barring for sons of fathers in semi-skilled occupations. This relative advantage of SC sons has been growing over the decades. In fact, the gap in upward mobility for farmer sons has almost doubled. In contrast, the upward mobility of the two groups has been alike for sons of fathers in semi-skilled occupations with ST sons holding a small edge in 2009. Neither of the two groups saw any meaningful convergence in mobility gap relative to non-SC/ST sons. One exception to this pattern is the near equalization of upward mobility of ST sons with non-SC/ST sons with fathers engaged in semi-skilled occupations.

Except for farmer sons, ST sons have historically remained more likely to make a downward move compared to SC sons. What is even more disconcerting is that the gap between the two disadvantaged groups has widened over time. This is driven by the fact that ST sons have either witnessed no decline in the likelihood of making a downward move from these levels or worse, have seen an increase in the probability of such adverse likelihood. There is modest convergence in mobility gap between SC and non-SC/ST sons of skilled and semi-skilled fathers. On the other extreme, the gap between ST and non-SC/ST has closed for farmer sons and has increased for sons with semi-skilled fathers.

To sum up, the mobility gap for the two separate disadvantaged groups relative to non-SC/ST sons has followed similar patterns as seen in the aggregate. Nonetheless, there are some differences both in levels and trends between them. The fact that ST sons having fared somewhat better in

educational mobility report lower occupational mobility than SC sons highlights their grim labor market prospects post education.

4 Convergence of Mobility Gaps across States

The probit model that I use to estimate mobility rates for the two groups of men controls for the state fixed effects. Many factors, including affirmative action policies like reservation quotas in employment and education, have a direct impact on mobility gaps. As such, there is a notable heterogeneity both in the levels of gaps as well as in convergence of gaps across states. In this section, I investigate which states have fared better and whether factors like economic growth and poverty have some explanatory power in explaining such variation in convergence across states.

I begin by estimating the unconditional mobility (without controls) at each level of father's educational and occupational status for men from both groups. Mobility gap γ_{lt} for a certain year t for some level of father's educational or occupational status l can then be expressed as the percentage point differential between the two groups. Specifically,

$$\gamma_{lt} = \mu_{lt}^{N} - \mu_{lt}^{SC/ST} \tag{2}$$

where μ_{lt}^{N} and $\mu_{lt}^{SC/ST}$ denote the unconditional mobility at paternal status l in a certain year t for non-SC/ST and SC/ST sons respectively. The mobility gap captures the advantage of a non-SC/ST son over a SC/ST son. The convergence in mobility gap ζ_l at some level of father's outcome l from initial year t_0 to final year t_1 is then defined as the reduction in the relative advantage of non-SC/ST sons

$$\zeta_l = -(\gamma_{l,t_1} - \gamma_{l,t_0}) \tag{3}$$

I restrict my attention to only cases in which there are at least 50 observations available to estimate the mobility μ_{lt}. This implies that I drop a convergence at level l if there are fewer than 50 observations in either group of sons at that level of father's outcome. Moreover, this requirement is applied in both the initial and the final years. An outcome of putting this limit is that all convergences at higher levels of both educational and occupational attainment are dropped as there are very few SC/ST sons in the sample with fathers at that level of attainment in 1983.

Figures 19a and 19b plot the convergence in educational mobility gaps from 1983 to 2009 at various levels against the initial gap in 1983 when mobility is measured considering both the upward and the downward moves versus only the upward moves respectively. The first point to note is that there was a significant variation in mobility gaps across states in 1983. For instance, the

mobility gap for sons of fathers with no education ranged from a 25 percentage points advantage for non-SC/ST men in Madhya Pradesh (MPR) to a 5.5 percent disadvantage in the conflict-ridden state of Jammu and Kashmir (JKA). Second, there also is a significant variation in regards to the convergence across states. Again looking at sons of fathers with no education, I find that compared to a mean convergence in the gap of 7.6 percentage points, a massive 17 percentage points reduction was seen in the southern state of Tamil Nadu (TNA). On the other hand, the absolute convergence in three states – Assam, Bihar and JKA, was negative. For JKA though, this negative gap symbolizes a progress towards parity as non-SC/ST sons were the laggard group to begin with. Third and most interestingly, I observe that the convergence in gaps is strongly correlated with the level of initial gaps with the relationship being highly significant too. It is somewhat expected that convergence would be higher in states which initially were far from parity in mobility for the two groups. Nonetheless, a positive relationship is an assuring outcome in the sense that it suggests that the lagging states have not remained trapped at the depressed levels of the past. Figures 20a and 20b show that the same trends were observed with respect to convergence in occupational mobility as well.

To examine whether convergence in mobility gaps are related to other economic factors, I employ the following regression model

$$\zeta_l^s = \alpha + \beta_I \gamma_{l,t_0}^s + \beta_G g^s + \beta_P \text{Pov}_{t_0}^s + \beta_{DP} \Delta\text{Pov}^s + \gamma_{NE} \text{NE}^s + \gamma_L l + \epsilon^s \tag{4}$$

where ζ_l^s and μ_{l,t_0}^s denote the convergence and mobility gap in the initial year at level l of father's outcome respectively for a state s. The average growth rate of state GDP is given by g^s, whereas $\text{Pov}_{t_0}^s$ and ΔPov^s represent the poverty rate in the initial year and the percentage point decline in poverty rate respectively. The variable NE^s is a dummy that equals 1 for the eight states located in the North-Eastern region of India. Lastly, γ_l captures the fixed effects of variation in convergence at different levels of father's outcome.[21]

As convergence in intergenerational mobility is arguably a long-run phenomenon, it is appropriate to apply the above regression specification for the longest possible time period. However, the method of estimating poverty in India, especially at the state level, has undergone a series of revisions over the decades. As such, there is not a consistent measure of poverty that is available for both 1983 and 2009. In this scenario, I consider two separate time periods – 1983–2004 which is the longest time period for which a consistent measure of poverty is available for both initial and final years, and 2004–2009 which corresponds to the two most recent rounds of the NSS.[22]

[21] See appendix for more details on the variables used in the regression.

[22] The estimates of poverty for the first period (1983–2004) are derived using the Lakdawala methodology whereas the estimates for the later period uses the Tendulkar method. A principal difference between the two methodologies

Table 5 reports the results of the regression when convergence in educational mobility is regressed on the above-mentioned vector of controls. Columns (1)–(4) correspond to the first time period and columns (5)–(8) to the latter. Columns (1) and (2) refer to the case when convergence in mobility reflects both the upward and the downward mobility, while columns (3) and (4) correspond to upward mobility only. Columns (2) and (4) are robustness checks on baseline results presented in columns (1) and (3) respectively by tightening the requirement on including an observation in the exercise. Specifically, columns (2) and (4) require that to be included, the convergence should at least have 100 observations for each of the four mobility measures $\{\mu_{lt}^{G}\}_{G\in\{N,SC/ST\}}$. Columns (5)–(8) are arranged in a similar fashion.

The strong positive relationship between convergence and initial mobility gap is maintained when other controls are introduced. A one percentage point higher gap in 1983 is linked to a 0.78 – 0.84 percentage point higher convergence over the next two decades. The same holds for upward mobility, though the coefficients are a touch larger. The association between the growth rate of state GDP and convergence is mostly insignificant. The slope coefficient is significant for the baseline case in which a less strict inclusion rule is used. Surprisingly, the coefficient is negative indicating that the states that witnessed more economic growth saw lower convergence in mobility. A conservative inference will be that the economic growth is not associated with higher convergence. The poverty rate in 1983 is negatively correlated with convergence and the relationship is often statistically significant. The estimate is also fairly stable with respect to upward mobility, and a one percentage point higher poverty rate in 1983 is associated with approximately a quarter of a percentage point higher convergence in the mobility gap. The results show that the states that have undergone a larger decline in their poverty rate have also observed a higher convergence since 1983. A 1 percentage point decline in the poverty rate is associated with a 0.35 – 0.46 and 0.50 – 0.55 percentage points higher convergence of mobility and upward mobility respectively.

The results for the later period look very similar to what is obtained for the longer period. Convergence is still positively correlated to the initial gap but the relationship is neither as significant nor as strong. For example, a 1 percentage point higher gap in upward mobility in 2004 is associated with a 39 basis points contraction over the five-year period compared to almost a percentage point decline in the longer period when data are restricted to contain at least 50 observations. The convergence is negatively correlated with initial poverty rate, though unlike in the longer period, the relationship remains largely insignificant. The states that were relatively more successful at reducing poverty rate also were more successful in closing the mobility gap. The point estimates

is that the Lakdawala method uses two separate poverty line baskets for rural and urban areas in contrast to a single poverty line urban basket used in the Tendulkar method. See Planning Commission (2014) for more details.

for the later period lie close to what is obtained earlier. Growth continues to remain insignificant with the coefficients mostly lying in the negative territory.

Table 6 reports the estimated coefficients in regards to convergence in occupational mobility. Like educational mobility, the convergence in occupational mobility over the two decades bears a strong positive relationship with the initial gap in occupational mobility. The estimated coefficients, though, vary over a larger range now. For instance, a 1 percentage point higher mobility gap in 1983 is associated with anywhere from one-half to more than a full percentage point convergence when both upward and downward moves from father's occupation are considered. The coefficient on the growth of state GDP is never significant and is mostly negative, rejecting the notion that growth is associated with higher convergence. The decline in the poverty rate is not systematically associated with convergence when both upward and downward moves are admitted but is positively correlated to convergence when only upward moves are counted. The point estimate varies somewhat across the two inclusion restrictions. I also find that the northeastern states realized slightly lower convergence in occupational mobility, with the relationship being significant for three out of four specifications.

The regression results for the later short period are slightly different. The association between growth and convergence is still insignificant. Yet, in a departure from the previous case, the point estimates are always positive. Convergence is also no longer positively correlated with a decline in poverty. These differences notwithstanding, convergence is still higher in states with higher initial gaps. A 1 percentage point higher gap in 2004 is associated with a 70 - 97 basis points contraction in upward mobility gap in the shorter period.

Analyzing convergence across states shows that convergence has been higher in states that had higher gaps to begin with. While this seems expected, it is still a welcome respite because it shows that these states are making progress towards parity instead of being pinned to the extreme levels of disparity. It is also evident from the analysis that states that underwent a higher decline in poverty also realized a higher convergence, suggesting links between poverty alleviation and social change. However, I do not find a positive relationship between economic growth and convergence which hints that policies that target growth may not necessarily help disadvantaged groups catch-up with the rest.

5 Robustness Test: Comparing across Age Groups

The data used to estimate intergenerational mobility are constructed from household surveys by exploiting the co-residence status of fathers and sons. In the data section, I discussed how

the propensity of a successful match declines with an increase in the age of the son. Even after excluding sons aged 45 or more, there is a huge difference in matching success rate within the 15 – 44 age group as shown in figure 3. To check the robustness of the results, I analyze the mobility gaps across SC/ST and non-SC/ST sons by considering two much younger age groups: 15 – 19 and 20 – 24, for whom the matching success rate is much higher.

First, consider the gaps in mobility of educational attainment across the two groups. To keep discussion brief, I focus on the upward and the downward moves separately and skip the case when mobility is estimated to capture both. Figure 21 plots the upward mobility of SC/ST and non-SC/ST sons across all levels of father's educational attainment. The figures in the first column (21a, 21d, 21g and 21j) correspond to the baseline sample in which sons between the ages of 15 and 44 are covered. The figures in columns two (21b, 21e, 21h and 21k) and three (21c, 21f, 21i and 21l) represent the restricted samples that can offer robustness check for the results as the matching success rate for these restricted samples far exceed that of the baseline. I find that the gap in mobility rates across the two groups is higher in the baseline sample. There is a convergence in the mobility rates at all levels of father's education in the baseline sample. This is also true for the two sub-samples barring for the 20–24 age sample when the gap is measured for sos of fathers with middle school education. Nonetheless, the main takeaway remains the same. There is significant convergence in the mobility rates at low levels of father's education which gets muted as higher levels of father's education are considered. Moreover, the convergence even at high levels of father's education is far from complete as SC/ST sons still face a lower likelihood of making an upward move compared to their non-SC/ST counterparts.

Similarly, figure 22 contrasts the downward mobility across the two groups for the various samples. In the baseline sample, there is essentially no difference in the downward mobility of the two groups in 2009 when movement out of fathers with less than primary education are considered. This is a notable advancement since 1983 when SC/ST sons were 6 percent more likely to make a downward move. I find an equally strong convergence in the 20–24 age sub-sample. For the 15–19 age sub-sample, the gap in 2009 flared up a bit after near convergence in 2004. Most likely, this deviation from the long-term trend is not indicative of a reversal as the point estimates of mobility are noisier than other years. In fact, the SC/ST sons in 2004 display a marginally lower downward mobility. An analogous trend is observed at other levels of father's education in the baseline sample which is generally preserved when smaller sub-samples are considered. The convergence is not absolute with an SC/ST son still having a higher likelihood of attaining a lower educational outcome than his father compared to a non-SC/ST son. The gap in this likelihood is particularly large at a high level of father's education for the two sub-samples which is consistent with what is observed in the larger sample.

I now examine whether the trends in intergenerational occupational mobility observed in the baseline persist when I study the sub-samples. Figure 23 plots the probability of making an upward move in occupation relative to father's occupation for the three samples. Focussing on sons of elementary workers and using the baseline sample, I find that the almost all the gains in mobility achieved by SC/ST sons have been replicated by non-SC/ST sons. As such, there has been almost no convergence in mobility gap at this level of father's education. The evidence from the two sub-samples also tells a similar story. For the younger of the two sub-samples, the gains made by non-SC/ST sons are marginally higher than that made by SC/ST sons leading to a minor widening of the gap. The gap has widened by 3 – 6 percentage points for farmer sons across the three samples indicating a worsening situation. The gains in mobility for sons of semi-skilled fathers has been muted compared to the earlier cases for both SC/ST and non-SC/ST sons across all samples. More importantly, the mild convergence in mobility rates across the two groups observed in the benchmark extends to the sub-samples.

Unlike non-convergence in upward mobility, the baseline analysis provided evidence that there was a little convergence in downward mobility. The likelihood of a SC/ST son to make a low occupational move is relatively closer to a non-SC/ST son in 2009. This holds true when the gaps are examined at smaller sub-samples as shown in figure 24. A main takeaway from the earlier discussion is that the downward mobility remains significantly high for SC/ST sons across all levels of father's education still holds in the two sub-samples. Despite the minor convergence, the higher likelihood for SC/ST sons is way more than what non-SC/ST sons have ever experienced. To summarize, I find that the robustness exercises performed with smaller sub-samples confirm the main conclusions derived using the baseline sample.

6 Conclusion

Is caste still an important factor determining success in life as measured by educational and occupational attainment even after decades of high economic growth? Is there still a case for affirmative action after more than half a century of such policies? The paper provides evidence of the prevalent existence of gaps in intergenerational mobility rates across caste groups when mobility is measured at the same level of paternal outcome. There is a modest convergence of gaps with respect to educational attainment, particularly for sons of fathers with low levels of educational attainment. The convergence at these levels is driven both by convergence in upward as well as downward mobility, though the convergence in downward mobility has been stronger. Nevertheless, SC/ST men still have a much lower probability of attaining higher education than

their fathers compared to non-SC/ST men, often higher than what non-SC/ST men experienced in 1983. In contrast, SC/ST men have a noticeably higher likelihood of dropping to an educational outcome lower than their fathers. What is even more striking is that the modest convergence in educational mobility gaps has not being replicated with respect to occupational mobility.

Explaining this divergence presents an interesting avenue for future research. On the one hand, this divergence could be a reflection of continued discrimination in the labor markets where lower castes are still discriminated against and human capital gains through schooling are not rewarded (Borooah (2005), Thorat & Neuman (2012)). In contrast, it is also possible that the low quality of schooling obtained by SC/ST children who mainly rely on public schools leads to human capital differences across castes. As such, the SC/ST sons are unprepared to compete in the labor market and fail to get into high-skilled occupations. Understanding the relative strength of either has direct implications for policy intervention.

Another interesting finding of the paper is that the convergence in mobility gaps has been relatively weaker in faster growing states. This is related to the broader evidence of growing inequality in India during this period of high economic growth (Sarkar & Mehta (2010), Jayadev *et al.* (2011), World Bank (2011a), Motiram & Vakulabharanam (2012) etc.). On the other hand, the faster-growing states were more successful in regards to poverty alleviation. A mechanism that can reconcile this trade-off between poverty alleviation and mobility operates via labor markets and productivity growth. Faster productivity growth leads to higher incomes across the board including the poor thus reducing poverty. However, a skill-biased technological growth disproportionately raises returns on the higher end of human capital thus leading to larger investments in human capital by the households. Yet, such higher returns can potentially perpetuate disparities in human capital investment as rich households are better positioned to increase their investment compared to the poor households. A deeper investigation of this mechanism is left for the future.

Finally, the analysis points to some differences in the relative performance of ST sons compared to SC sons. ST sons have fared somewhat better in closing the educational mobility gap. Despite this, they report adverse occupational mobility compared to SC sons suggesting their grim labor market prospects post education. This is consistent with the finding in Xaxa (2001) who showed that STs lagged SCs in take-up of reservation policy in the late 1990s, especially in higher education and high skilled occupations. The analysis suggests that this trend has continued in the early 21st century.

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Table 1: Educational and Occupational Classification

Education	
NSS/IPUMS	Aggregated
Illiterate, less than Primary	No Education
Literate, less than Primary	Less than Primary
Primary	Primary
Middle	Middle
Secondary	Secondary and above
Higher Secondary	
Undergraduate or Graduate	

Occupation	
NSS/IPUMS	Aggregated
Legislators, Senior Officials and Managers	Skilled
Professionals	
Technicians and Associate Professionals	
Clerks	
Service workers and Shop and Market Sales	Semi-Skilled
Crafts and related Trades workers	
Plant and Machine Operators and Assemblers	
Skilled Agricultural and Fishery workers	Farmer
Elementary Occupations	Elementary

Figure 3: Matching Success Rate

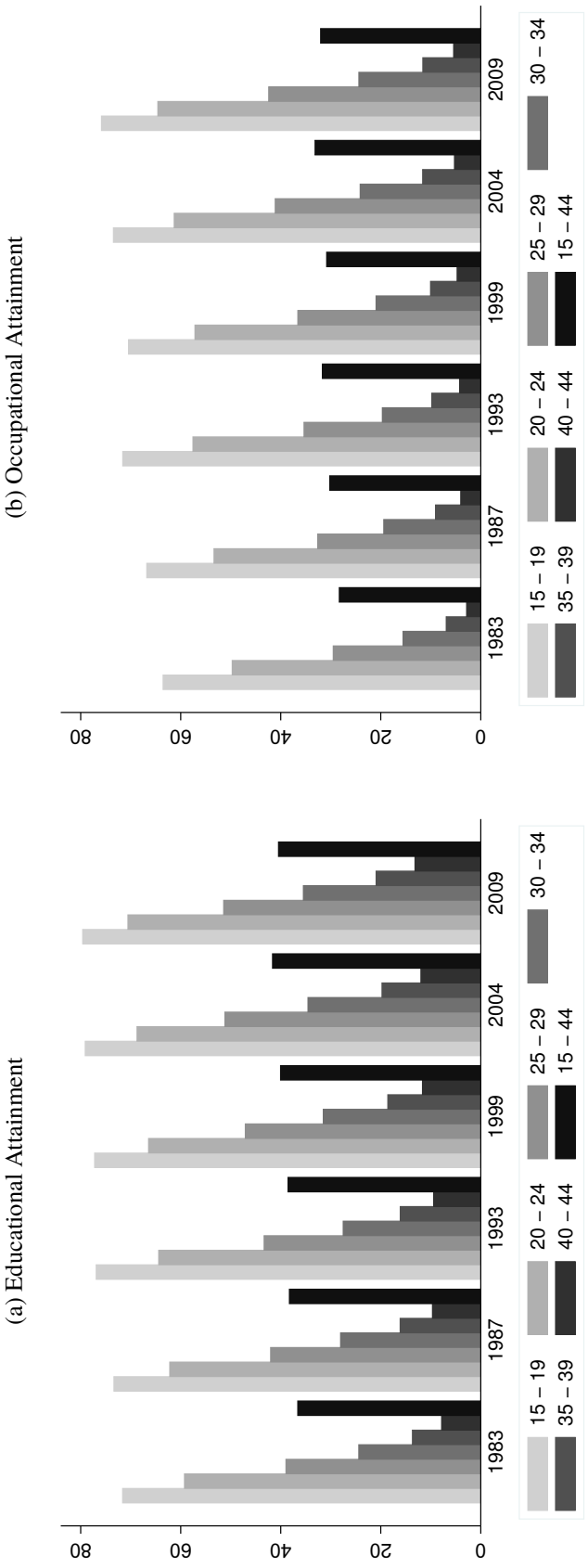
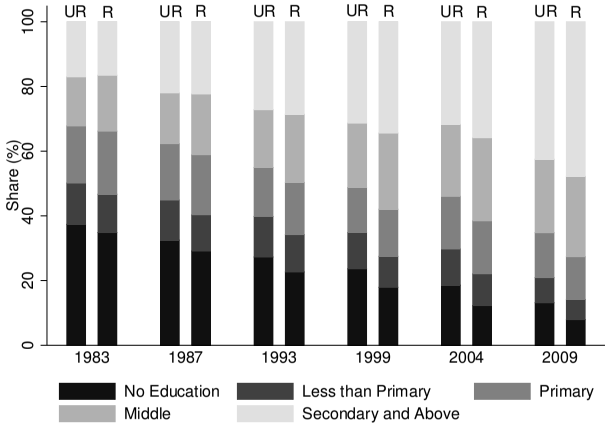


Figure 4: Educational Attainment: Unrestricted vs. Restricted Sample

(a) Ages 15 – 44



(b) Ages 45 – 64

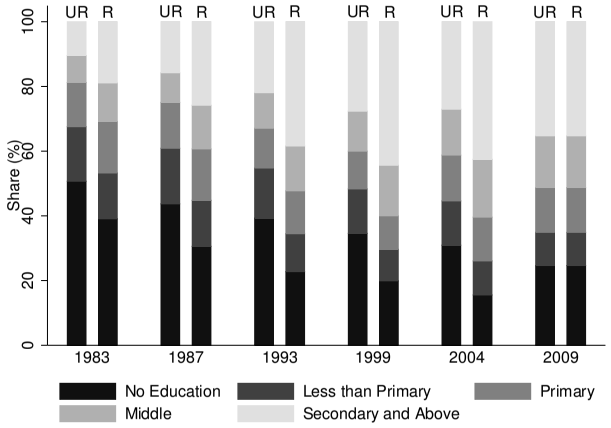
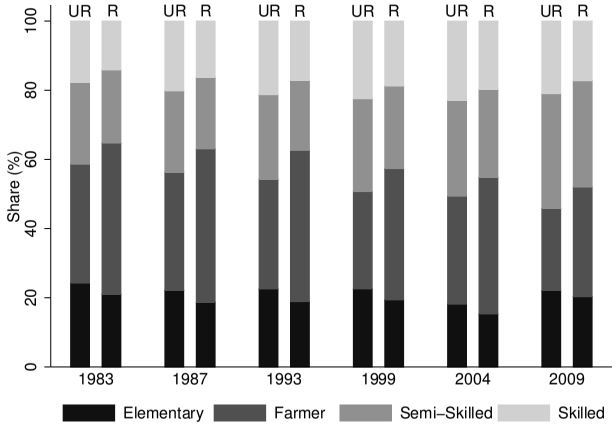


Figure 5: Occupations: Unrestricted vs. Restricted Sample

(a) Ages 15 – 44



(b) Ages 45 – 64

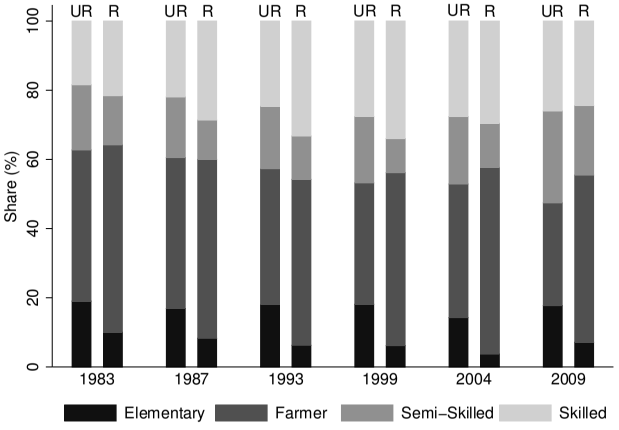
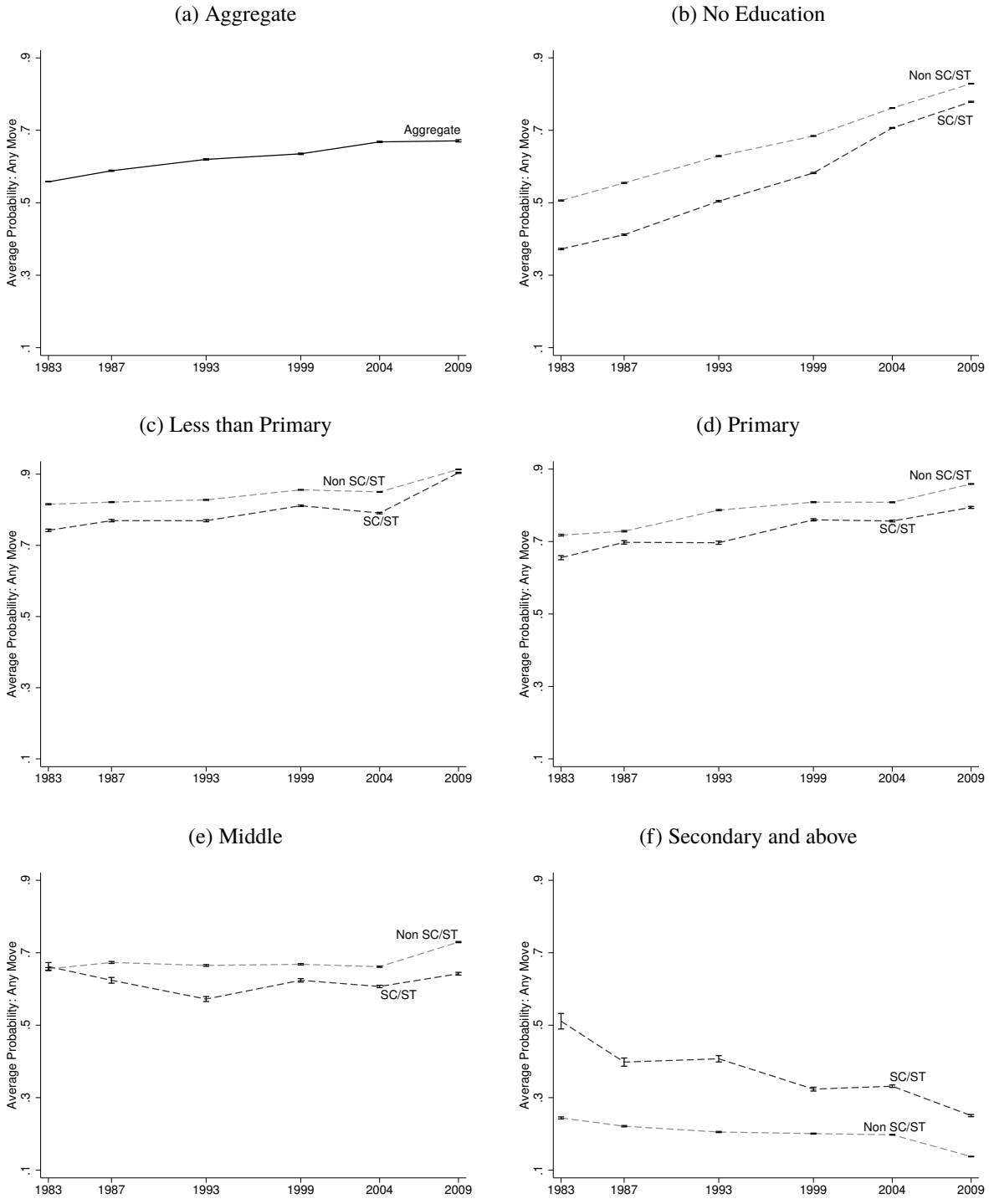


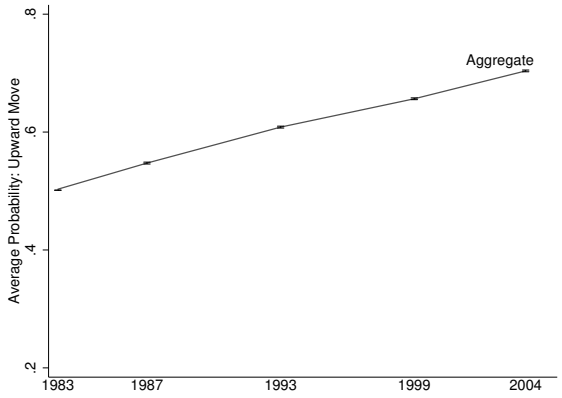
Figure 6: Intergenerational Mobility in Educational Attainment: 1983 – 2009



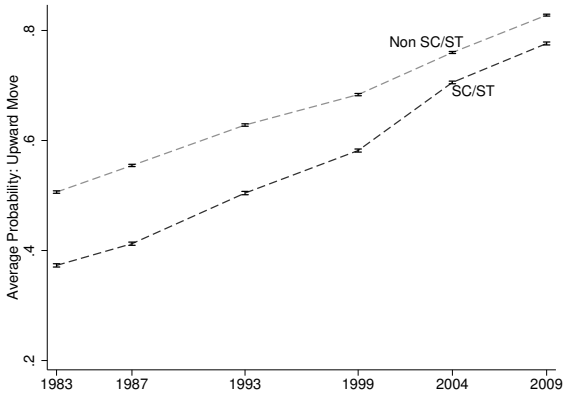
The figures report the average predicted probability of an intergenerational move out of father's educational attainment for the two caste groups as estimated by equation 1. The bars represent the ±2 standard error intervals.

Figure 7: Intergenerational Upward Mobility in Educational Attainment: 1983 – 2009

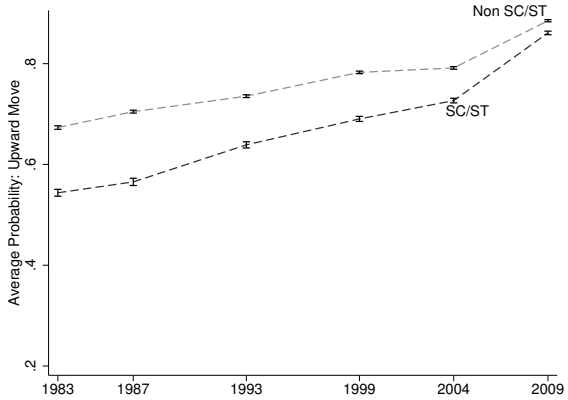
(a) Aggregate



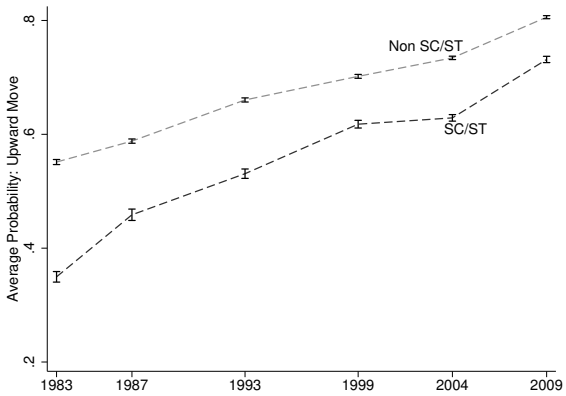
(b) No Education



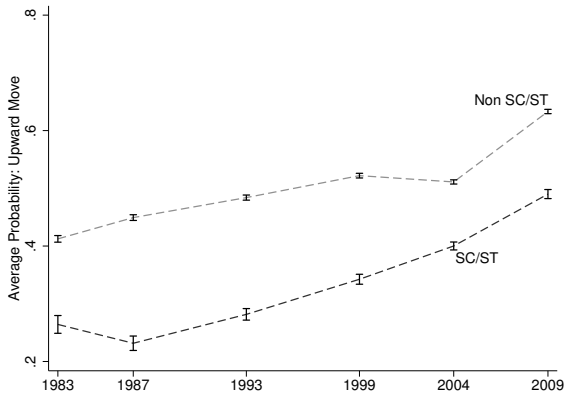
(c) Less than Primary



(d) Primary

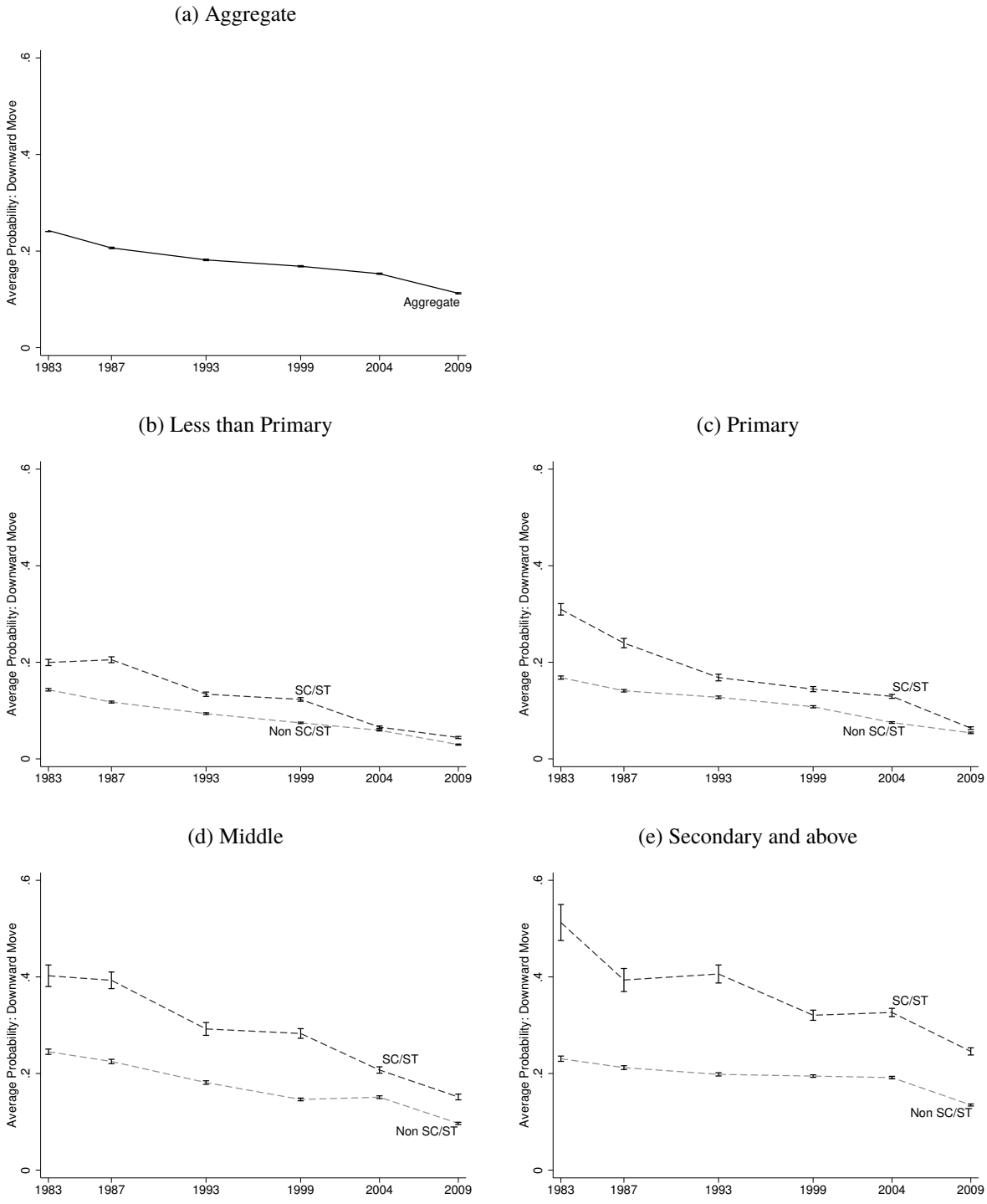


(e) Middle



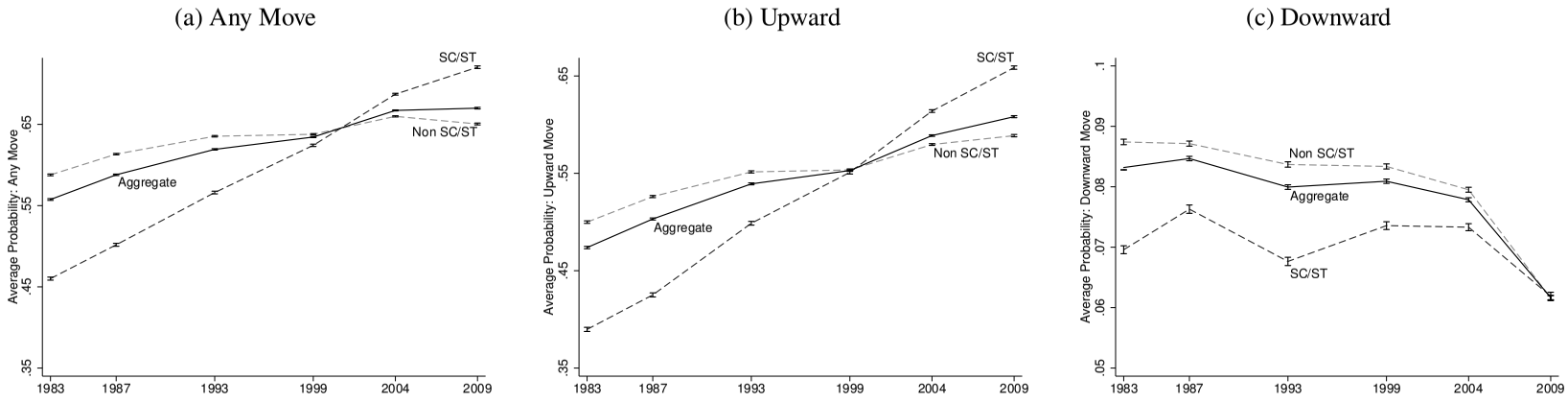
The figures report the average predicted probability of an intergenerational move out of father's educational attainment for the two caste groups as estimated by equation 1. The bars represent the ±2 standard error intervals.

Figure 8: Intergenerational Downward Mobility in Educational Attainment: 1983 – 2009



The figures report the average predicted probability of an intergenerational move out of father's educational attainment for the two caste groups as estimated by equation 1. The bars represent the ±2 standard error intervals.

Figure 9: Intergenerational Mobility in Educational Attainment, Without Interaction: 1983 – 2009



The figures report the average predicted probability of an intergenerational move out of father's educational attainment for the two caste groups when $\gamma_{\mathbf{CF}}$ in equation 1 is not interacted with father's outcome FO. The bars represent the ±2 standard error intervals. The mobility gap across the two groups is markedly different from what is observed in Figures 6, 7 and 8.

Table 2: Intergenerational Educational Mobility Gap

Panel A: Any Move

Level	(1)	(2)	(3)	(4)	(5)	(6)
	1983	1987	1993	1999	2004	2009
No Education	0.134	0.143	0.125	0.102	0.055	0.050
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	***	***	***	***	***	***
< Primary	0.073	0.052	0.059	0.045	0.059	0.010
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
	***	***	***	**	***	***
Primary	0.062	0.031	0.090	0.049	0.052	0.065
	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
	***	***	***	***	***	***
Middle	-0.006	0.049	0.093	0.044	0.054	0.087
	(0.006)	(0.004)	(0.004)	(0.003)	(0.002)	(0.002)
		***	***	***	***	***
≥ Secondary	-0.267	-0.177	-0.202	-0.123	-0.134	-0.113
	(0.011)	(0.006)	(0.004)	(0.003)	(0.002)	(0.002)
	***	***	***	***	***	***

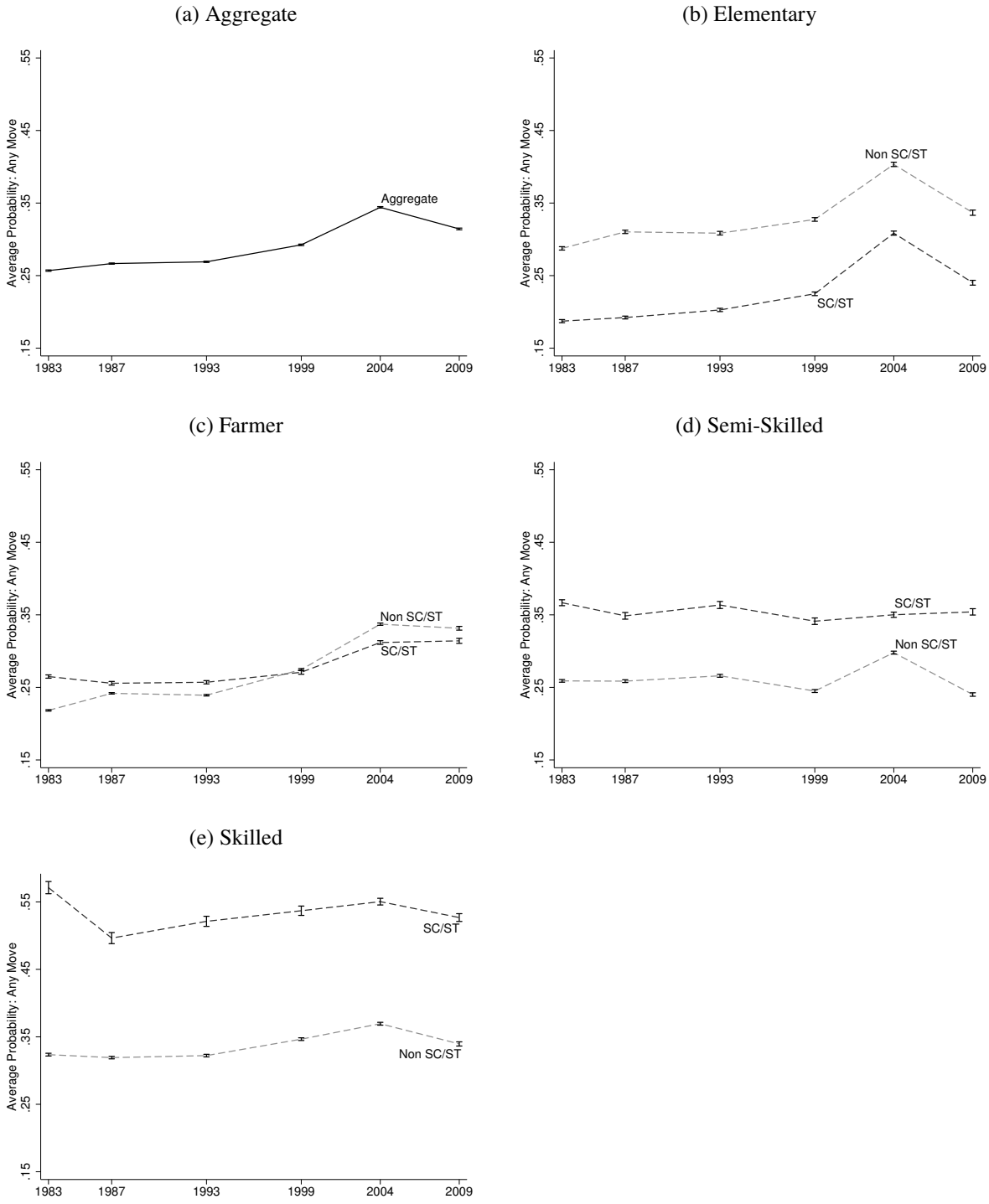
Panel B: Upward and Downward Move Separately

Level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Upward						Downward					
	1983	1987	1993	1999	2004	2009	1983	1987	1993	1999	2004	2009
No Education	0.133	0.142	0.124	0.102	0.054	0.052	.	.	.	.	.	.
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	.	.	.	.	.	.
	***	***	***	***	***	***	.	.	.	.	.	.
< Primary	0.129	0.139	0.097	0.092	0.065	0.024	-0.057	-0.088	-0.040	-0.049	-0.007	-0.015
	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)
	***	***	***	***	***	***	***	***	***	***	***	***
Primary	0.202	0.129	0.130	0.084	0.105	0.074	-0.141	-0.099	-0.041	-0.037	-0.096	-0.054
	(0.005)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.006)	(0.005)	(0.004)	(0.003)	(0.002)	(0.002)
	***	***	***	***	***	***	***	***	***	***	***	***
Middle	0.148	0.218	0.202	0.179	0.111	0.143	-0.157	-0.168	-0.111	-0.137	-0.096	-0.056
	(0.008)	(0.007)	(0.006)	(0.005)	(0.004)	(0.004)	(0.012)	(0.009)	(0.007)	(0.005)	(0.004)	(0.003)
	***	***	***	***	***	***	***	***	***	***	***	***
≥ Secondary	.	.	.	.	.	.	-0.282	-0.181	-0.208	-0.126	-0.135	-0.111
	.	.	.	.	.	.	(0.019)	(0.012)	(0.010)	(0.006)	(0.005)	(0.004)
	.	.	.	.	.	.	***	***	***	***	***	***

Standard errors in parentheses.

*** Significant at 1%, ** Significant at 5%

Figure 10: Intergenerational Mobility in Occupational Attainment: 1983 – 2009



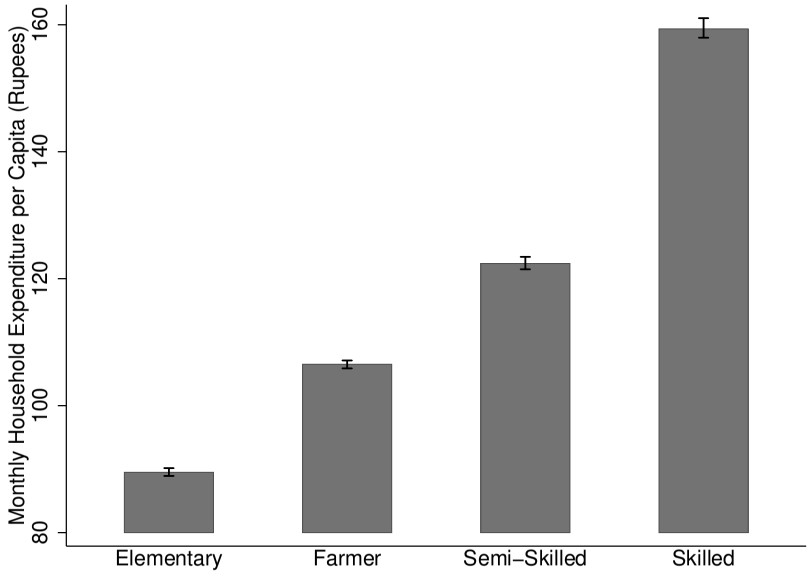
The figures report the average predicted probability of an intergenerational move out of father's occupational attainment for the two caste groups as estimated by equation 1. The bars represent the ±2 standard error intervals.

Table 3: Median Educational Attainment by Occupations

Occupation	**1983**	**1987**	**1993**	**1999**	**2004**
Elementary	No Education	No Education	Less than Primary	Less than Primary	Less than Primary
Farmer	Less than Primary	Less than Primary	Middle	Middle	Middle
Semi-Skilled	Primary	Primary	Primary	Middle	Middle
Skilled	Secondary and above	Secondary and above	Secondary and above	Secondary and above	Secondary and above

Figure 11: Median Household Expenditure per Capita

(a) 1983



(b) 1993

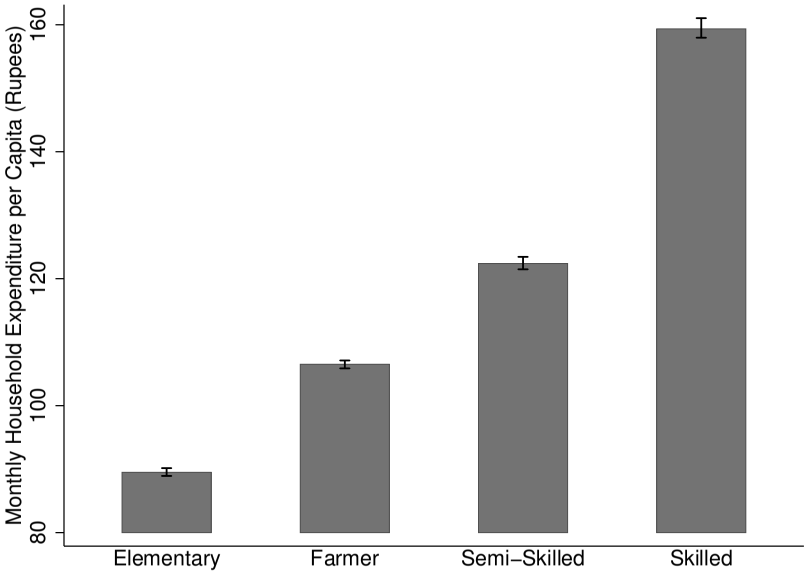
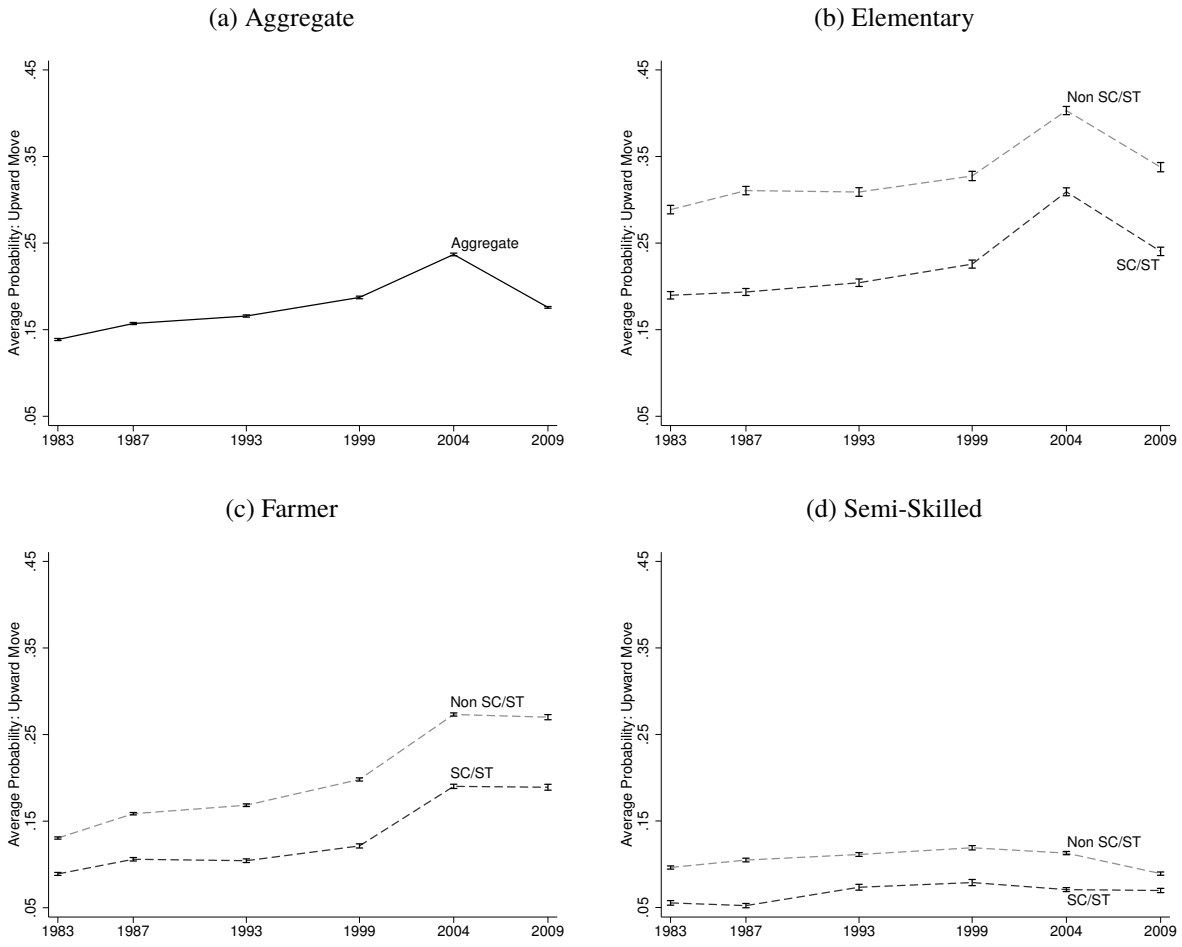


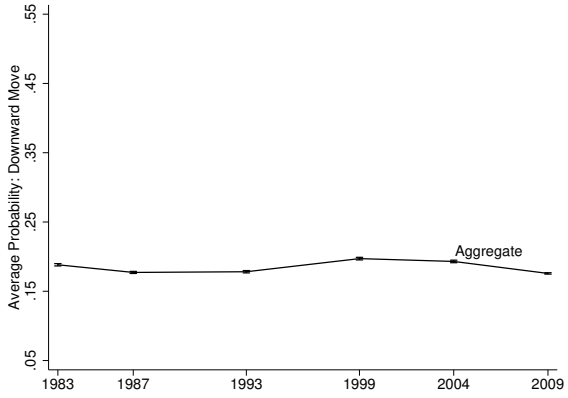
Figure 12: Intergenerational Upward Mobility in Occupational Attainment: 1983 – 2009



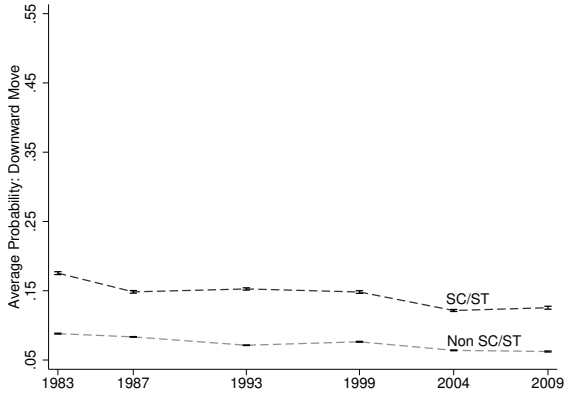
The figures report the average predicted probability of an intergenerational move out of father's occupational attainment for the two caste groups as estimated by equation 1. The bars represent the ±2 standard error intervals.

Figure 13: Intergenerational Downward Mobility in Occupational Attainment: 1983 – 2009

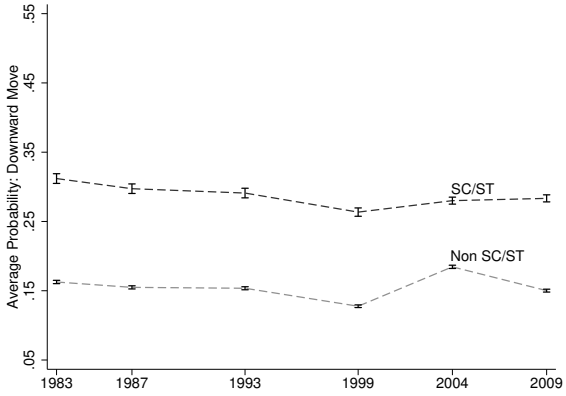
(a) Aggregate



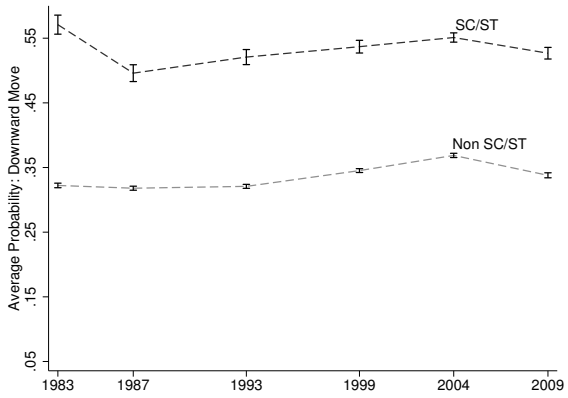
(b) Farmer



(c) Semi-Skilled

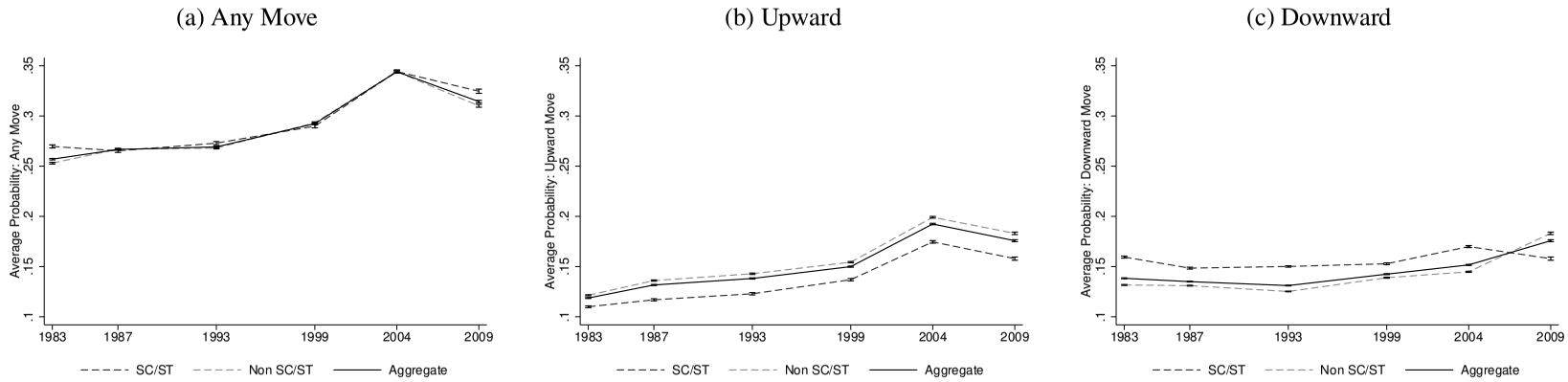


(d) Skilled



The figures report the average predicted probability of an intergenerational move out of father's occupational attainment for the two caste groups as estimated by equation 1. The bars represent the ±2 standard error intervals.

Figure 14: Intergenerational Mobility in Occupational Attainment, Without Interaction: 1983 – 2009



The figures report the average predicted probability of an intergenerational move out of father's occupational attainment for the two caste groups when $\gamma_{\mathbf{CF}}$ in equation 1 is not interacted with father's outcome FO. The bars represent the ±2 standard error intervals. The mobility gap across the two groups is markedly different from what is observed in Figures 10, 12 and 13.

Table 4: Intergenerational Occupational Mobility Gap: SC/ST over non-SC/ST

Panel A: Any Move

Level	(1)	(2)	(3)	(4)	(5)	(6)
	1983	1987	1993	1999	2004	2009
Elementary	0.100	0.118	0.106	0.102	0.095	0.097
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	***	***	***	***	***	***
Farmer	-0.047	-0.014	-0.018	0.004	0.025	0.017
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
	***	***	***	**	***	***
Semi-Skilled	-0.108	-0.090	-0.098	-0.096	-0.052	-0.114
	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)
	***	***	***	***	***	***
Skilled	-0.248	-0.177	-0.199	-0.190	-0.181	-0.187
	(0.005)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)
	***	***	***	***	***	***

Panel A: Upward and Downward Move Separately

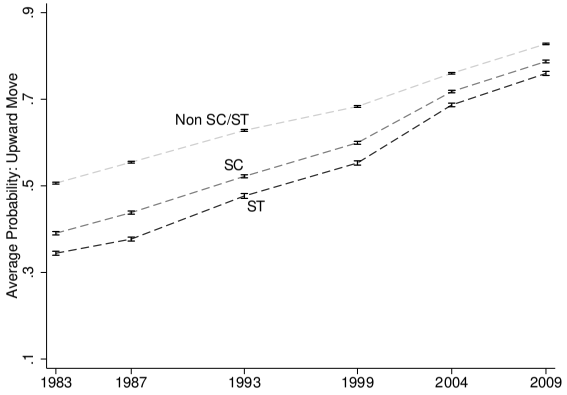
Level	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Upward						Downward					
	1983	1987	1993	1999	2004	2009	1983	1987	1993	1999	2004	2009
Elementary	0.099	0.117	0.105	0.102	0.094	0.097	.	.	.	.	.	.
	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)	.	.	.	.	.	.
	***	***	***	***	***	***	.	.	.	.	.	.
Farmer	0.041	0.053	0.064	0.077	0.083	0.081	-0.087	-0.065	-0.081	-0.072	-0.058	-0.063
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	***	***	***	***	***	***	***	***	***	***	***	***
Semi-Skilled	0.041	0.053	0.038	0.040	0.042	0.020	-0.149	-0.142	-0.137	-0.136	-0.096	-0.133
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
	***	***	***	***	***	***	***	***	***	***	***	***
Skilled	.	.	.	.	.	.	-0.249	-0.178	-0.200	-0.192	-0.182	-0.189
	.	.	.	.	.	.	(0.008)	(0.007)	(0.006)	(0.005)	(0.004)	(0.005)
	.	.	.	.	.	.	***	***	***	***	***	***

Standard errors in parentheses.

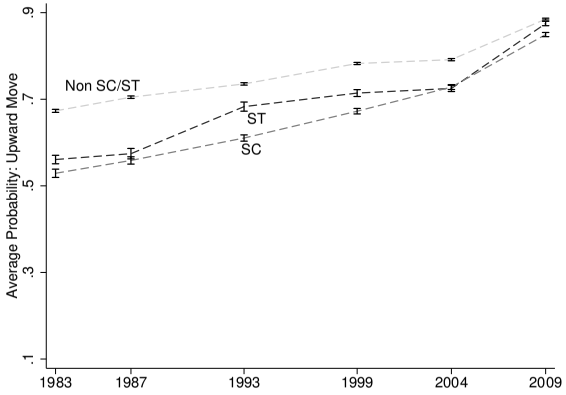
*** Significant at 1%, ** Significant at 5%

Figure 15: Intergenerational Upward Mobility in Educational Attainment: 1983 – 2009 (SCs and STs)

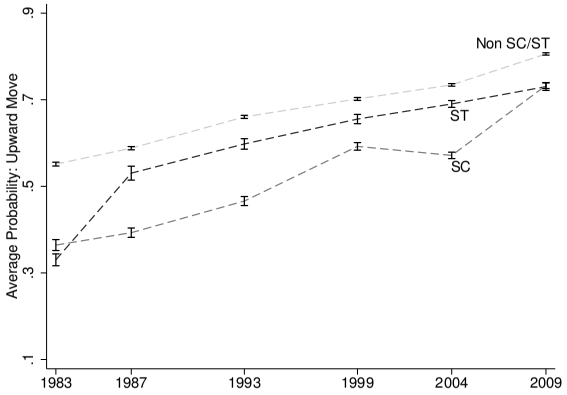
(a) No Education



(b) Less than Primary



(c) Primary



(d) Middle

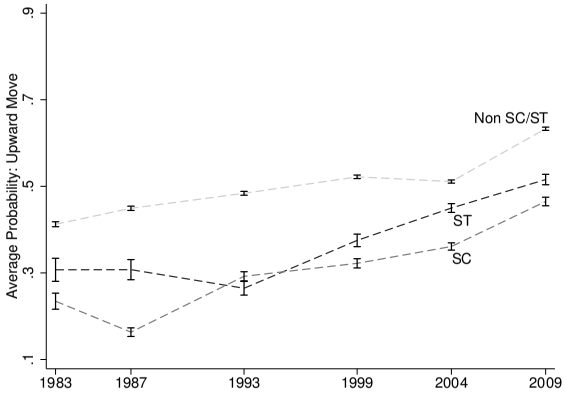
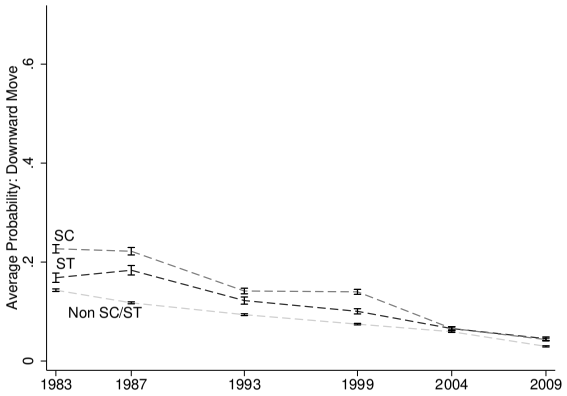
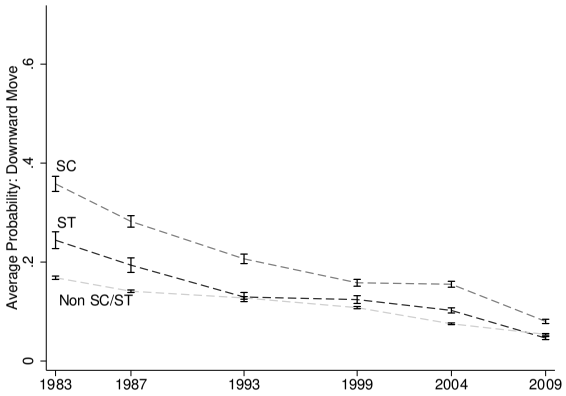


Figure 16: Intergenerational Downward Mobility in Educational Attainment: 1983 – 2009 (SCs and STs)

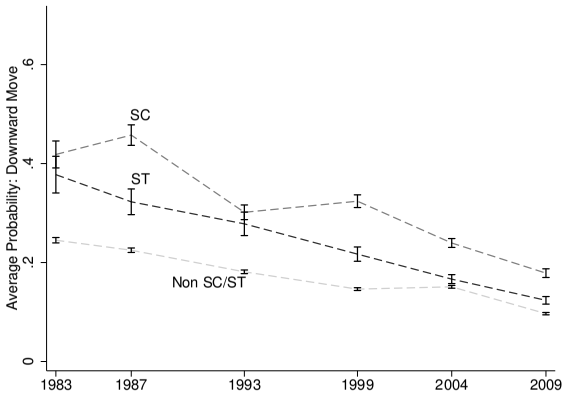
(a) Less than Primary



(b) Primary



(c) Middle



(d) Secondary and above

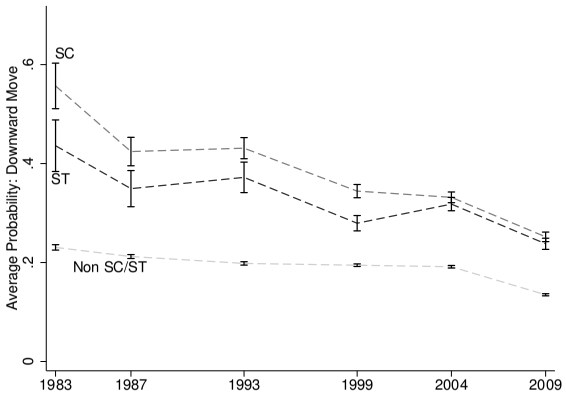
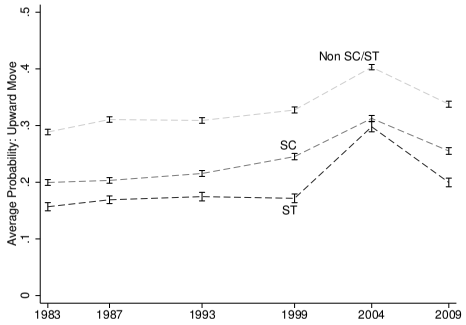
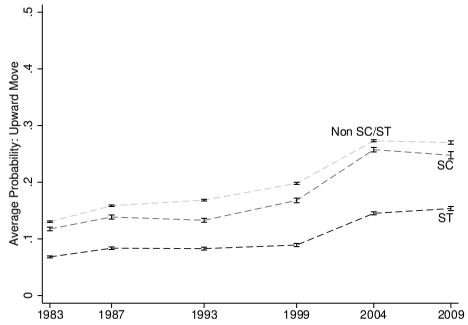


Figure 17: Intergenerational Upward Mobility in Occupational Attainment: 1983 – 2009 (SCs and STs)

(a) Elementary



(b) Farmer



(c) Semi-Skilled

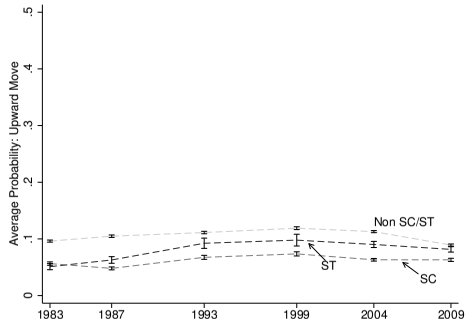
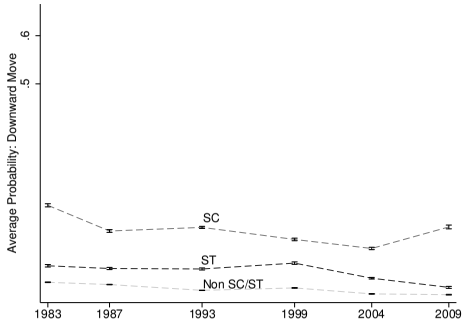
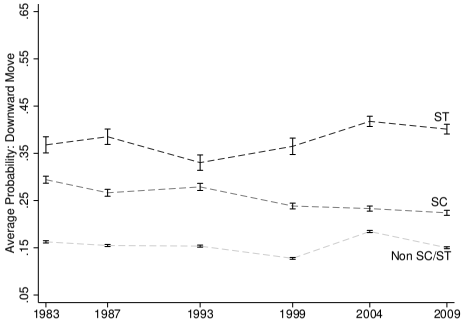


Figure 18: Intergenerational Downward Mobility in Occupational Attainment: 1983 – 2009 (SCs and STs)

(a) Farmer



(b) Semi-Skilled



(c) Skilled

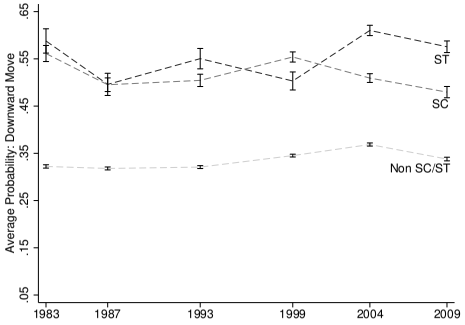
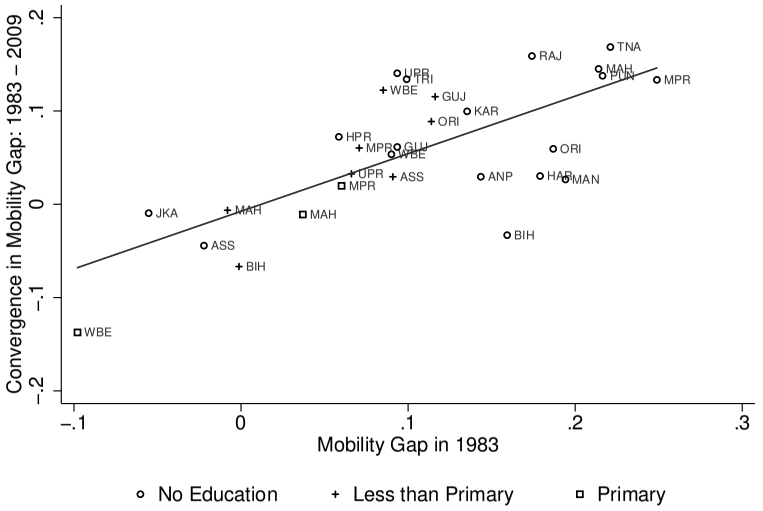
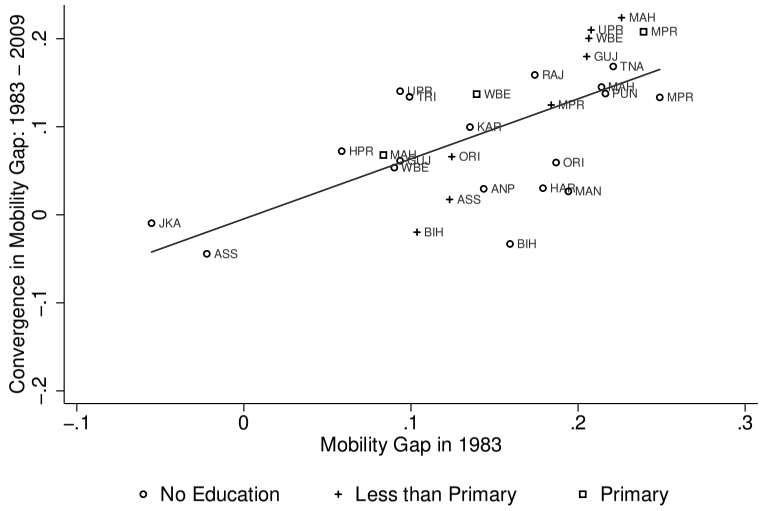


Figure 19: Convergence in Educational Mobility Gap Across States: 1983 – 2009

(a) Any Move

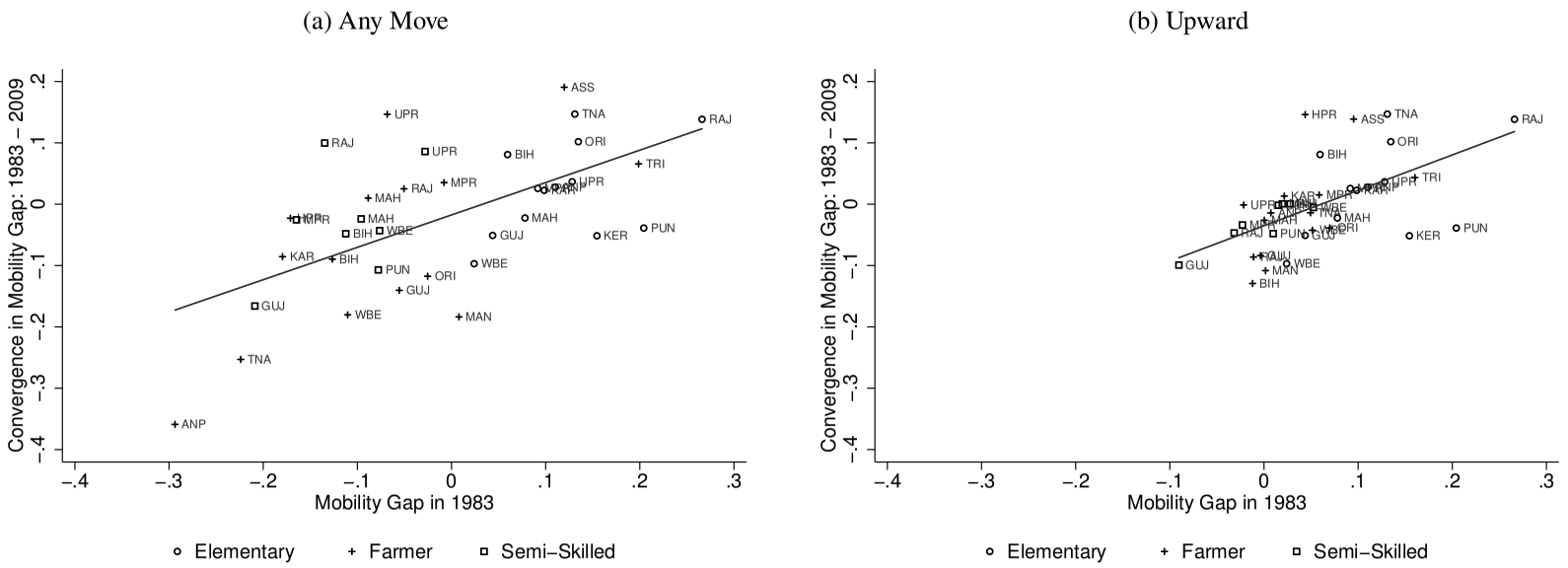


(b) Upward



States and union territories have been aggregated to account for changes in political boundaries over time. The harmonized boundaries match the political boundaries of 1983.
BIH: Bihar and Jharkhand, GOA: Daman and Diu and Goa, MPR: Chhattisgarh and Madhya Pradesh, UPR: Uttar Pradesh and Uttaranchal.

Figure 20: Convergence in Occupational Mobility Gap Across States: 1983 – 2009



States and union territories have been aggregated to account for changes in political boundaries over time. The harmonized boundaries match the political boundaries of 1983.
BIH: Bihar and Jharkhand, GOA: Daman and Diu and Goa, MPR: Chhattisgarh and Madhya Pradesh, UPR: Uttar Pradesh and Uttaranchal.

Table 5: Coefficients

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Convergence in Mobility Gap: 1983 – 2004				Convergence in Mobility Gap: 2004 – 2009			
	Any Move		Upward		Any Move		Upward	
Mobility Gap in 1983	0.835***	0.777***	0.957***	0.806***	0.600***	0.361	0.392**	0.455
	(0.133)	(0.162)	(0.144)	(0.167)	(0.154)	(0.478)	(0.191)	(0.438)
Average Annual Growth Rate of GSDP	-1.532	0.087	-2.393**	0.187	-0.136	-1.153	0.459	-0.951
	(0.937)	(1.405)	(1.015)	(1.458)	(0.937)	(1.405)	(1.015)	(1.458)
Poverty Rate in 1983	-0.121	-0.208*	-0.205**	-0.236*	-0.161*	-0.134	-0.181	-0.134
	(0.092)	(0.105)	(0.096)	(0.109)	(0.094)	(0.212)	(0.124)	(0.218)
Decline in Poverty Rate	0.354**	0.458**	0.501***	0.547**	0.278*	0.448	0.449**	0.403
	(0.172)	(0.200)	(0.180)	(0.206)	(0.166)	(0.485)	(0.207)	(0.483)
North-Eastern State	-0.002	0.029	-0.007	0.032	-0.006	-	0.013	-
	(0.027)	(0.051)	(0.028)	(0.053)	(0.027)	-	(0.034)	-
Number of Observations	32	19	32	19	46	18	42	17
R^2	0.72	0.84	0.66	0.77	0.51	0.66	0.46	0.35
Minimum Datapoints	50	100	50	100	50	100	50	100

Standard errors in parentheses.
*** Significant at 1%, ** Significant at 5%, * Significant at 10%

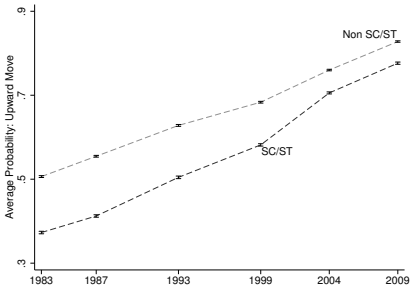
Table 6: Coefficients: Occupational Mobility

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Convergence in Mobility Gap: 1983 – 2004				Convergence in Mobility Gap: 2004 – 2009			
	Any Move		Upward		Any Move		Upward	
Mobility Gap in 1983	0.530***	1.176***	0.633***	0.907**	0.965***	0.829**	0.913***	0.702***
	(0.147)	(0.252)	(0.189)	(0.324)	(0.214)	(0.314)	(0.176)	(0.235)
Average Annual Growth Rate of GSDP	0.747	-2.015	-0.493	-1.493	0.448	1.096	0.942	0.425
	(1.581)	(2.806)	(1.191)	(2.070)	(1.662)	(2.332)	(1.094)	(1.216)
Poverty Rate in 1983	0.047	-0.343	-0.086	-0.162	0.093	0.244	0.048	0.130
	(0.141)	(0.225)	(0.103)	(0.156)	(0.168)	(0.258)	(0.114)	(0.135)
Decline in Poverty Rate	-0.056	0.556	0.342*	0.525*	-0.252	-0.704	-0.121	-0.114
	(0.277)	(0.386)	(0.201)	(0.278)	(0.309)	(0.545)	(0.211)	(0.291)
North-Eastern State	-0.116*	-0.299**	-0.084*	-0.086	-0.114	-0.113	0.001	0.062
	(0.066)	(0.129)	(0.042)	(0.083)	(0.076)	(0.126)	(0.045)	(0.060)
Number of Observations	38	23	38	23	41	22	39	22
R^2	0.43	0.63	0.35	0.48	0.54	0.48	0.52	0.61
Minimum Datapoints	50	100	50	100	50	100	50	100

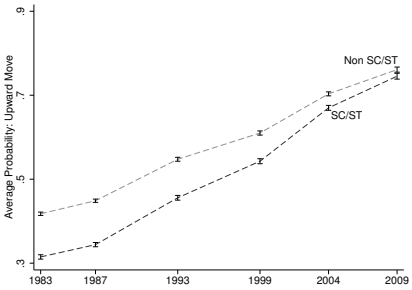
Standard errors in parentheses.
*** Significant at 1%, ** Significant at 5%, * Significant at 10%

Figure 21: Intergenerational Upward Mobility in Educational Attainment: Across Age Groups

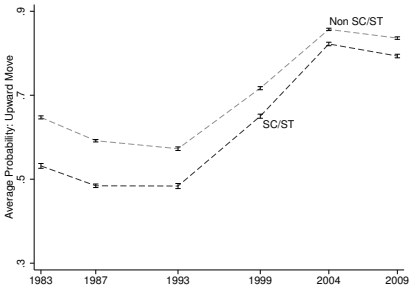
(a) No Education, Ages 15 - 44



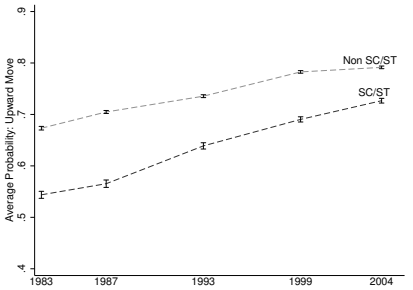
(b) No Education, Ages 15 - 19



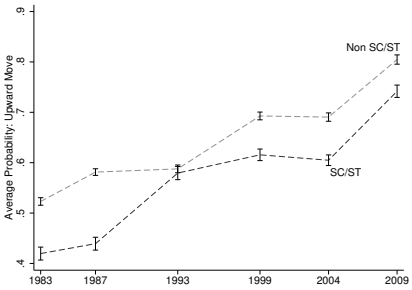
(c) No Education, Ages 20 - 24



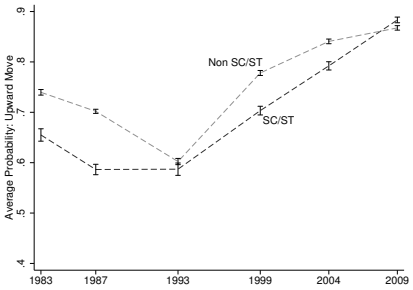
(d) Less than Primary, Ages 15 - 44



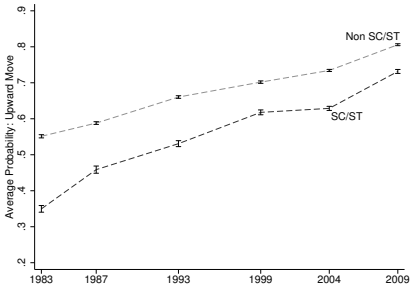
(e) Less than Primary, Ages 15 - 19



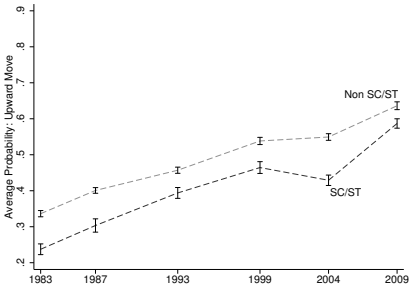
(f) Less than Primary, Ages 20 - 24



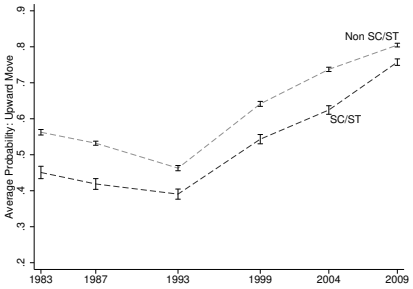
(g) Primary, Ages 15 - 44



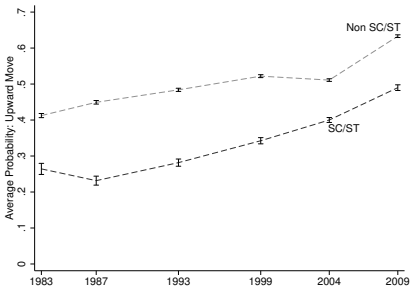
(h) Primary, Ages 15 - 19



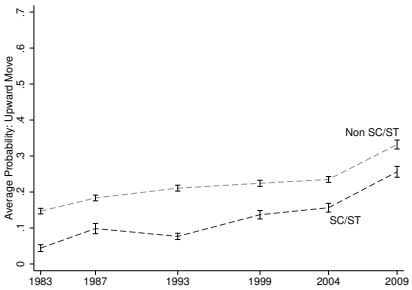
(i) Primary, Ages 20 - 24



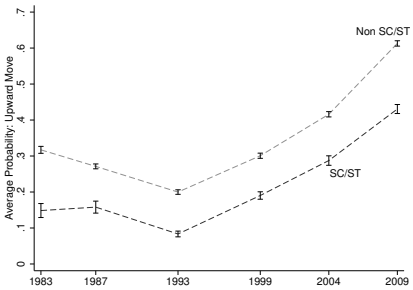
(j) Middle, Ages 15 - 44



(k) Middle, Ages 15 - 19



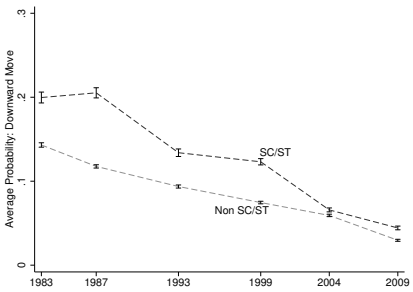
(l) Middle, Ages 20 - 24



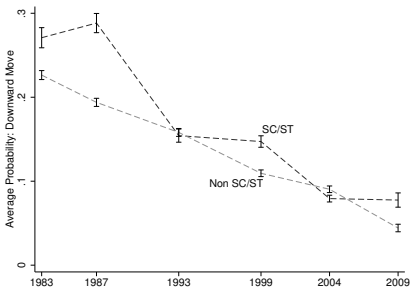
The figures report the average predicted probability of an intergenerational move out of father's educational attainment for the two caste groups as estimated by equation 1. The bars represent the ±2 standard error intervals.

Figure 22: Intergenerational Downward Mobility in Educational Attainment: Across Age Groups

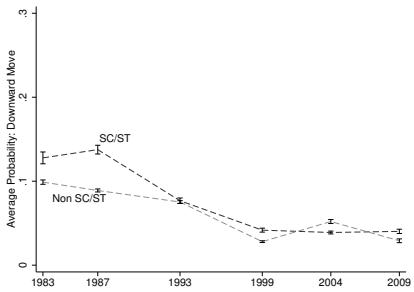
(a) Less than Primary, Ages 15 - 44



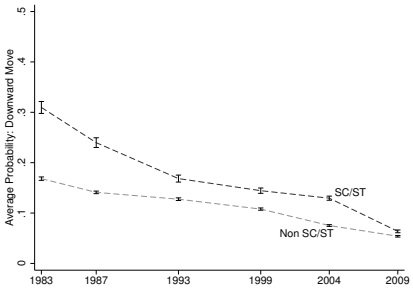
(b) Less than Primary, Ages 15 - 19



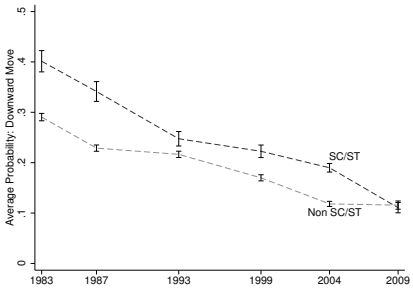
(c) Less than Primary, Ages 20 - 24



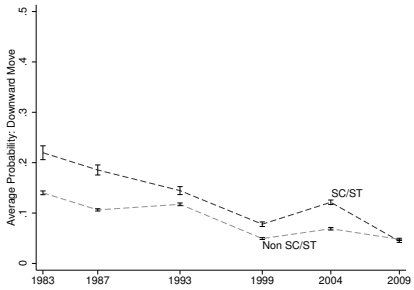
(d) Primary, Ages 15 - 44



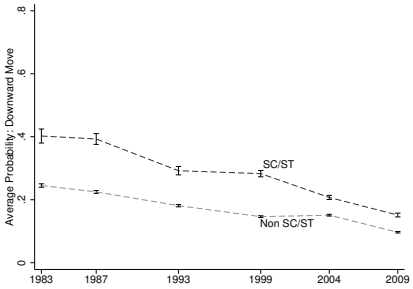
(e) Primary, Ages 15 - 19



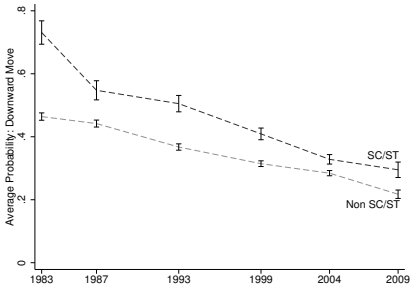
(f) Primary, Ages 20 - 24



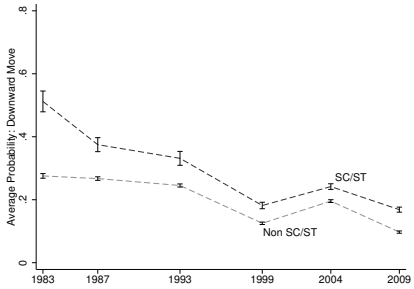
(g) Middle, Ages 15 - 44



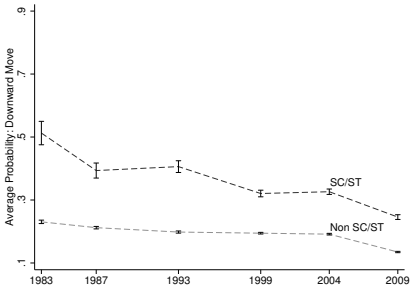
(h) Middle, Ages 15 - 19



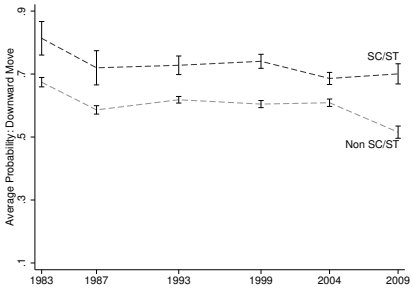
(i) Middle, Ages 20 - 24



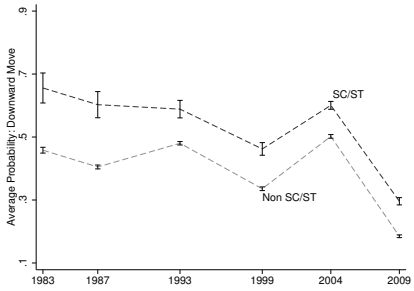
(j) Secondary and above, Ages 15 - 44



(k) Secondary and above, Ages 15 - 19

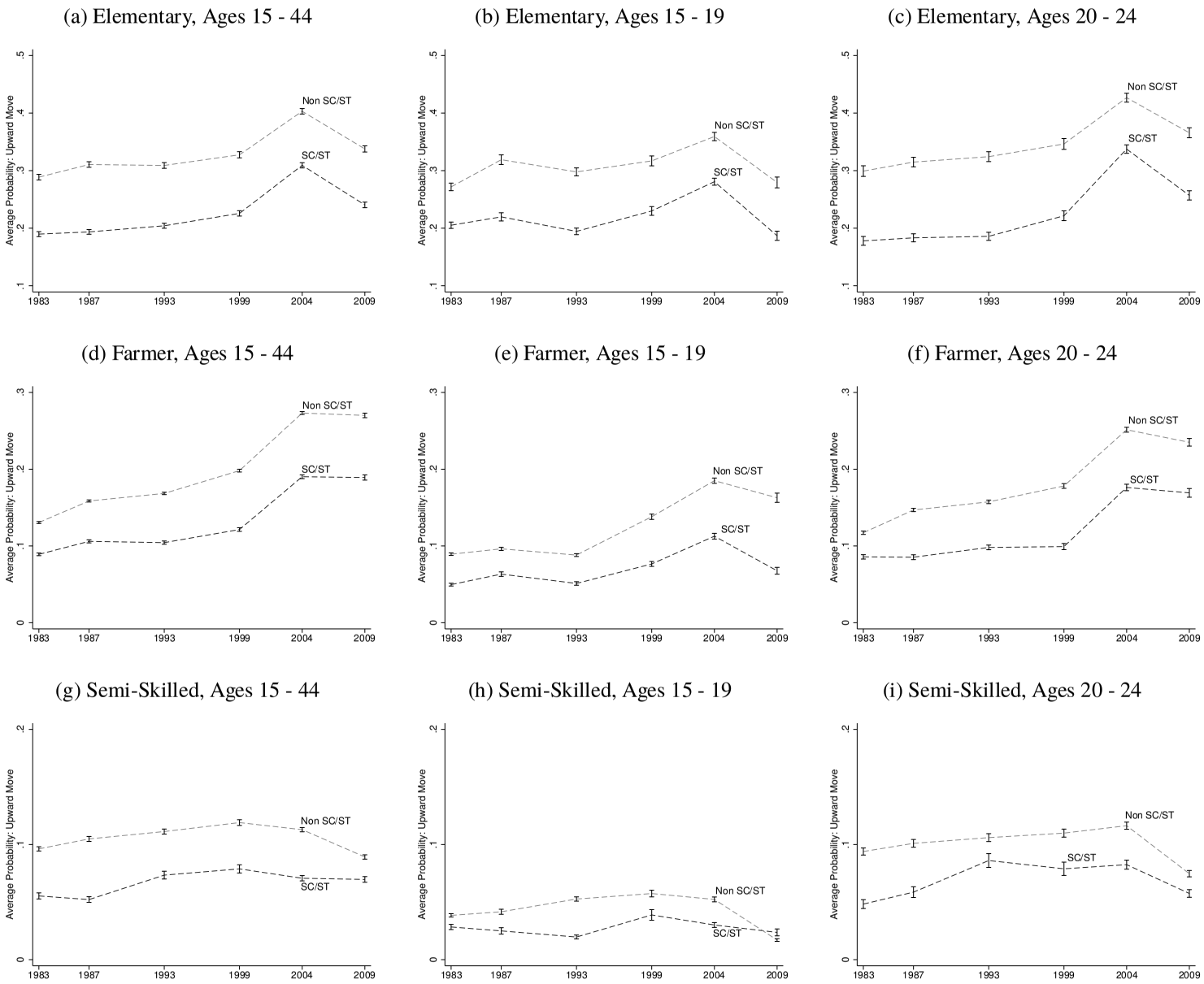


(l) Secondary and above, Ages 20 - 24



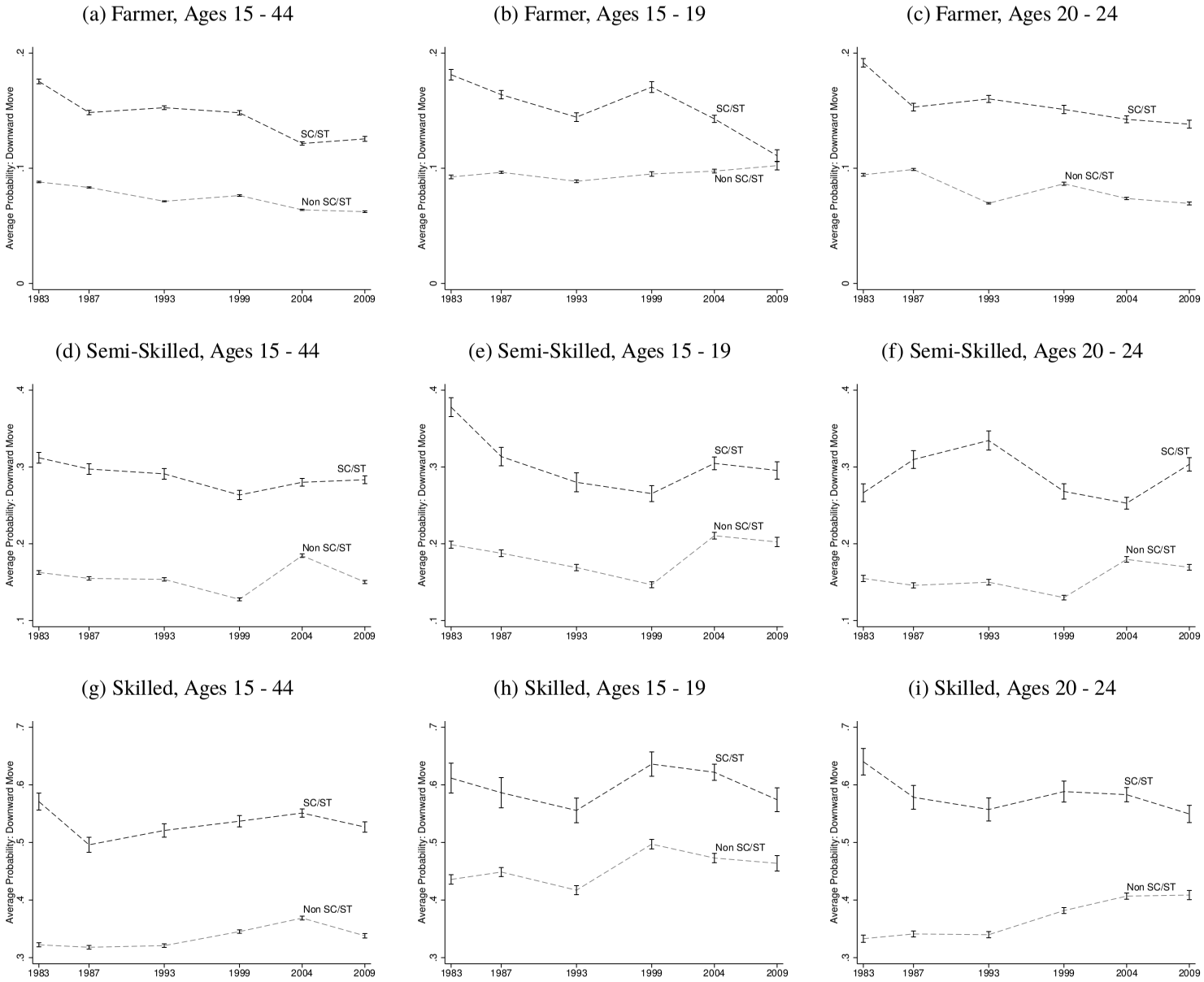
The figures report the average predicted probability of an intergenerational move out of father's educational attainment for the two caste groups as estimated by equation 1. The bars represent the ±2 standard error intervals.

Figure 23: Intergenerational Upward Mobility in Occupational Attainment: Across Age Groups



The figures report the average predicted probability of an intergenerational move out of father's occupational attainment for the two caste groups as estimated by equation 1. The bars represent the ±2 standard error intervals.

Figure 24: Intergenerational Downward Mobility in Occupational Attainment: Across Age Groups



The figures report the average predicted probability of an intergenerational move out of father's occupational attainment for the two caste groups as estimated by equation 1. The bars represent the ±2 standard error intervals.

Appendix

A Variables in the Convergence Regression

This appendix provides details on the variables used in regression equation 4. All state-level estimates of intergenerational mobility and the gaps across caste groups are estimated using the NSS data outlined in the data section. Apart from this, the regression employs four other state-level variables - growth rate of the state GDP (g^s), poverty rate in 1983 $\left(\text{Pov}^s_{1983}\right)$, decline in poverty rate (DPov^s) and a sector dummy (NE^s) if the state is a northeastern state. Below, I briefly discuss the sources of these data together with some other important details.

1. Growth Rate of State GDP: These data are sourced from the statistics released by the Ministry of Finance. The available data correspond to the average annual growth rate of state GDP for two periods: 1980-81 to 1989-90 and 1990-91 to 2001-02. The growth rate relates to real state GDP by keeping prices constant at the 1993-94 level. For the regression, I compute the average annual growth rate from 1980-81 to 2001-02[23] which differs slightly from the period for which the changes in mobility gaps are measured.

2. Poverty Rate and Decline in Poverty Rate: These data are sourced from the database of the now defunct Planning Commission (2014). The poverty measures are calculated using a Uniform Reference Period as the poverty estimates using Mixed Reference Period are not available for 1983 as it was adopted as a measure much later. The final year over which the decline in poverty rate is calculated is 2004-05 which is a year later compared to the changes in the mobility gap.

3. North-Eastern States: These consist of the following eight states in the north-east region of the country: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura.

Additionally, the political boundaries of states have undergone changes over time with new states being carved out of other states. Regions from the four states of Bihar, Goa, Madhya Pradesh and Uttar Pradesh were modeled out to create three new states and a Union Territory: Jharkhand from Bihar, Daman and Diu from Goa, Chhattisgarh from Madhya Pradesh and Uttaranchal from Uttar Pradesh. The harmonized boundaries used in the paper match the political boundaries of 1983.

[23] For the state of Jammu and Kashmir, the average growth covers the period from 1980-81 to 2000-01.

References

Planning Commission. 2014. Population Below Poverty Line by States & UTs: 1973-74 to 2004-05, Databook of the Planning Commission, *Government of India*.