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The Household Demographic Dividend:

Results from a Panel Study in India, 1994-2005

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ABSTRACT

Using data from the India Human Development Survey, we examine changes in household wealth and income between 1994 and 2005. While more advantaged households in 1994 (e.g., higher education, high caste, salaried occupations, wealthy states) enjoyed the biggest gains over the next decade, demographic composition also played a role. Households that had more adolescent boys in 1994 were somewhat better off in 2005. However, much of a "household demographic dividend" was offset by a higher likelihood of those households dividing into two or more separate households by 2005. But if the 1994 household did stay together as an extended household, it was much better off a decade later if there had been more boys in 1994.

INTRODUCTION

The recent economic successes of China and India have sparked popular interest in a so-called "demographic dividend". Countries that have undergone a demographic transition from high to low fertility experience a few decades in which the population age structure has a bulge in the early to mid-adult years, a time when people are most economically productive. The speculation is that China has reaped this demographic dividend for some time while India is beginning to benefit from the same phenomenon. Some estimates attribute as much as one third of East Asia's "economic miracle" to this demographic effect (Bloom, Canning, and Malaney 2000).

The observations and theory about a demographic dividend posit an effect on national economic growth rates. But there may also be a demographic dividend to *households* within these expanding economies, especially where extended, multi-generational, households are common. Households with high fertility in the 1970s and 1980s, for instance, may now have a large number of productive adults. These young adults, however, are having much smaller families, so the economic burden of the most recent generation of children may be smaller than was the burden these adults imposed on their own parents. With several productive adults under one roof, and not that many children to feed, clothe, and school, the household may enjoy a limited spurt of affluence that can be observed in an improved standard of living.

While the reasoning about households is analogous to the thinking about a national demographic-dividend, it is important to realize that there is no necessary connection

between a demographic dividend for national economies with many young adults and a return to those specific households who had the children that produced the demographic bulge. Even where extended households are common, households do split, so the gains to a large family may be dissipated over several households. Children also tend to be better educated in smaller families so it may not be the larger households who have benefited especially from the growth of the last few decades.

We test these mechanisms with a unique data set built from two waves of a large household panel survey in India. The first wave of this survey, the Human Development Profile of India (HDPI) was conducted in 1994; the second, the India Human Development Survey (IHDS http://ihds.umd.edu) was fielded eleven years later in 2005. This was a decade of unprecedented economic progress for India when the growth rates increased well above what they had been in the earlier post-Independence era. This is also sufficient time for many of the 1994 children to have reached adulthood. And the young adults in 1994 should now have reached very productive ages. If there is a demographic dividend for large households, we should expect the larger households in 1994 to have prospered especially well in 2005. We can also expect this dividend to have been lowered by household splits and by the better educated children in the smaller households. Each of these processes can be tested with the IHDS data.

DATA AND METHODS

In 2005, the University of Maryland and the National Council of Applied Economic Research fielded a survey of 41,554 households in 1503 villages and 971 urban

neighborhoods across India (Desai et al, 2010). Part of this sample was based on a re-survey of *rural* households that had been interviewed in 1994 for the Human Development Profile of India (Shariff 1999). In general, about half of the 1994 households were selected for re-interview. In 2005, interviewers recorded the current location of all members of the selected 1994 households. If a household had divided between the first and second waves, split households were followed who remained in the same village. 13,081 households in 2005 had been interviewed also in 1994; these 2005 households derived from 10,790 households in the 1994 survey. About 15% of the 1994 households had split in the eleven years between the two surveys, often into just two 2005 households but sometimes into more and in two cases into as many as seven new households. The units of analysis are the 2005 households although the data on household composition and other variables come from the 1994 households. So, the question being asked is how the last decade of changes in the economic situations of the 2005 households reflect the characteristics of the 1994 households from which they came. In particular, does coming from a 1994 household with more adolescent males lead to more economic improvement by 2005?

Economic indicators.

Two measures of household economic standing are available in both 1994 and 2005. First, we use a measure based on the number of consumer goods owned and the quality of its housing (Filmer and Pritchett 2001). This measure reflects a household's long-term economic wealth. The 1994 and 2005 surveys included a common set of 15 housing and consumer goods items: bicycle, motor scooter, cars, sewing machine, air

cooler, fan, television, kerosene or lpg stove, separate kitchen, indoor piped water, flush toilet, electric connection, and finished ("pucca") floors, walls, and roof. A count of the number of these items was used to create an assets scale in each survey. This scale had reasonable reliability (Cronbach's alpha= 0.813 for 2005, 0.757 for 2004).

In 1994, the mean on the assets scale was only 3.6; by 2005, this had improved to 5.3. Two thirds of the 2005 households had improved their economic standing since 1994, reflecting the prosperity that India, even rural India, has enjoyed during those years. Another 14% of households had not changed their position on the asset index; the remainder, almost 20% of 2005 households, had experienced downward economic mobility.

Both the 1994 and 2005 surveys also measured household income (only the 2005 survey included a measure of consumption expenditures). The methodologies were somewhat different however so we can be less certain of how comparable the income measures are (the 1994 survey, for instance, estimated farm incomes based on farm size and crops grown, while the 2005 survey also collected data on production, prices, and costs). The 1994 survey also seems to have had more variation in data collection and processing across states. Nevertheless, we believe a within-state (or possibly even within-village) comparison of total household income and household incomes per capita can reflect a household's relative position on the previous year's income.

We use derive two variables from these income data to evaluate the demographic dividend. First, we analyze total household income (logged), then we look at income per

capita. As we will see, there are somewhat different results for the two measures, especially for adolescent girls who often marry out of the 1994 households and thus, while contributing little to changes in total household income may improve income per capita by reducing the denominator of the income per capita measure.

As is true in all panel studies, a household's initial position strongly influences not only where they ended up a decade later but also how much change occurred over the decade. The poorest households had the most room for improvement so increases in economic position are negatively correlated with the household's initial position (-0.23 for assets; -0.55 for log of household income; and -0.57 for log of income per capita). This usual phenomenon of a regression to the mean, does not mean that India's prosperity during this period was especially strong for the poor. In fact, there is good evidence that inequalities increased during this time and the groups that were already doing best in 1994 actually improved the most over this period (e.g., Brahmins, the educated, the landed or even better the salaried, and families in the northwestern states of Punjab and Haryana). But this negative correlation makes it important to include the initial position as a control in all analyses of change. We are interested in how the composition of the 1994 household influenced its subsequent economic changes so we want to compare households that started from the same position.

Household composition in 1994:

We have experimented with various methods of measuring household composition and change over the ten years between surveys. The survey data include counts of the

number of 2005 households deriving from the original 1994 household; tracking sheet data for each member of the 1995 household; and age and sex composition of the 1994 and 2005 households. In this paper we report results from comparisons of the age and sex composition of the two households. The advantage is that these data most directly capture the possibilities of a demographic dividend. Households with more boys in 1994 who mature into young men in 2005 (and who remain in their parents' household) are expected to benefit most from a household demographic dividend. However, these results also incorporate measurement error because of the vagaries of age reporting in India and because the time lapse between the two surveys was not exactly the same for all households. Moreover, counts by age and sex do not provide information of why changes occurred (household splits, deaths, temporary migration, for instance). However, other methods we have used to measure household composition reveal similar results so the basic conclusions appear robust to questions of how to measure household composition.

From the 1994 household survey, we divide the age range into five groups, guided by considerations of shifts between dependant and productive ages: 3 and below, 4 to 10, 11 to 17, 18 to 58, and 59 and over. The toddlers, 3 and under, will be only 11 to 14 in the 2005 survey, not yet productive workers so unlikely to be contributing to any increase in household economic standing. The 4 to 10 year olds will be 15 to 21 in the 2005 survey, some of whom will be working while others will still be in school. The effect on household economic standing in 2005 will be mixed therefore.

The adolescents, 11 to 17 in 1994 will be 22 to 28 in the second survey, almost all of whom should be productive parts of the household. They would be the key to a demographic dividend. Our expectation is that, all else equal, households with more of these 11 to 17 year olds in 1994 would have more productive members in 2005 and so should have acquired more household wealth and earn higher household incomes. This should be especially true for the numbers of adolescent boys, since women's labor force participation rates are low in much of India and most girls leave the household after marriage. The adolescent boys who are young men in 2005 however, even if married, are unlikely to have left the household. The more of them there were in 1994, the better off the household should be in 2005.

Most of the adults, 18 to 58 in the first survey, will still be productive workers in the second survey. Again, the more adults, especially the more adult men in 1994, the better off the household should be in 2005. Unlike the adolescents however, they don't necessarily represent increases in productive workers so their impact on the household's economic standing should be less dramatic.

Thirty-nine percent of 1994 households had at least one adolescent boy 11-17, eleven percent had two or more. Forty-five percent of 1994 households had two or more adult men between the ages of 18 and 58. Many of them will have split off to form their own households by 2005, however, so their effect on changes in the household's economic positions will be mixed.

Control variables.

In addition to household composition, many other aspects of the household will influence their relative economic gains in the decade intervening between the two surveys. We include six factors from the 1994 survey. The household head's education is classified into eight levels from illiterate to college graduate. Household income sources are grouped into eight types (agriculture, allied agriculture, agricultural wages, artisan work, non-agricultural wages, petty trade, salary, other sources such as rent), each defined as the percent of total income; agricultural income is the reference type. Caste is classified into five groups: Brahmins, other forward castes, other backward castes, *dalits* (scheduled castes), and *adivasis* (scheduled tribes). Religion is grouped into six categories: Hindus, Muslims, Christians, Sikhs, Buddhists, Jains, and Tribal. Dummy variables are also created for seventeen states (including Uttarakhand, Chhattisgarh, and Jharkhand which became states after the 1994 survey). Finally, a dummy variable is added for female-headed households.

Statistical Analyses

The basic OLS model for each of the three economic outcomes includes household counts of the number of males and the number of females in each of the five age groups, dummy variables for the six types of controls, plus a measure of the household's initial 1994 economic position. These models test the total impact of 1994 household composition, regardless of how that household might have changed over the intervening decade. Some households split, some lost members because of death or temporary

migration, some households added members through marriage and births. The basic model correlates the economic change over the decade with its original 1994 household composition.

A second model adds controls for changes in the household composition over the decade. By holding constant these subsequent changes, the coefficients for the 1994 household composition in the second model reflect the impacts of household composition on economic change if there had been no household splits or losses due to death or migration. These second set of coefficients are interesting primarily for the contrast with the estimates from the first model; they estimate what the demographic dividend might have been without the disruptive effects of household splits.

RESULTS

Results for the 13,081 households confirm that there is a modest demographic dividend accruing to households with more children, especially more adolescent boys, in 1994. The basic results for the number of males and females of different ages in 1994 are reported in Table 2.

The first model reports changes in total household income. The largest coefficient is for the number of adolescent boys, exactly as the household demographic dividend would predict. Every additional boy 11-17 in 1994 yields 11% more income a decade later. Many of these boys were still in school in 1994 or had not yet become fully established in the labor market; however, few would have yet begun their own households in 2005 so their presence in 1994 almost always implies a net gain to the household over the following

decade. The positive coefficient (β= +0.110) reflects the demographic dividend to the household.

based on. All the household composition coefficients are modest, but each is statistically significant and in the expected direction. A household with boys 0 to 3 fell somewhat behind other equivalent households in accumulating household assets between 1994 and 2005. These babies and toddlers had not reached productive ages yet by 2005 and, in fact, probably restricted investments in household goods in favor of investments in their education.

Similarly, the number of boys 4 to 10 in 1994 are also associated with household income gains a decade later, although the gains are more modest (β= +0.044) than for their older brothers. This younger groups would be 15 to 21 in 2005, some of whom would still be in school, others in the labor force although often not fully established. On balance, this seems to have a weak positive association with gains in household income over the decade.

The coefficient for adult men, 18 to 59 in 1994, is also positive (β= +0.043) but again less than half the size for adolescent boys. Most of these adult men would remain in the labor force over the next decade adding to the household economic position; the more modest size of their impact on subsequent household assets reflects the fact that many leave to form their own households, as we shall see in table 3.

The coefficients for females are all smaller than for males. The coefficient for adult women is actually negative, suggesting the conventional wisdom that it is especially the daughters-in-law who lead to the division of the household.

The results for changes in income per capita are similar although weaker than for total household income. Again, the number of adolescent boys in the household in 1994 is the best predictor of gains in income per capita (β= +0.056). Adult men and boys, 4-10, also have positive but weaker effects on changes over the next decade (β= +0.021 and β= +0.024). The only substantive difference in the results for income per capita is the positive effect of adolescent girls (β= +0.054), a coefficient that was not statistically significant for total household income (β= +0.021). The importance of adolescent girls is that they get married and leave the household, thus raising the income per capita if not the total household income.

The final model reports changes in household assets. In contrast to annual income, household assets represent a less volatile measure of household economic position, the result of acquisitions accumulated over several years. There is, in fact, only a modest correlation between changes in household assets and changes in income (r = +.27). However, the pattern of results is remarkably similar. Again, the best predictor of economic gains is the number of adolescent boys (β= +0.108) with the number of young boys (β= +0.068) and adult men (β= +0.061) also statistically significant but weaker.

For changes in household assets, the number of male toddlers (0-3) has a negative coefficient (β= -0.182), as does the number of female toddlers (β= -0.085), possibly reflecting a shift in consumption patterns in the following decade away from household assets towards the children's education. The number of elderly men also has a negative coefficient (β= +0.021) in contrast to the number of elderly women which is positive (β=

+0.021) holding constant the number of elderly men. These coefficients may reflect the tendency of households to divide after the death of the senior male while the number of senior women holding constant the number of senior men may indicate an already divided household with the grandmother residing with the oldest (or most successful) son.

The key coefficients for evaluating a demographic dividend are for the number of adolescent boys. For each of the three outcome measures, households with more adolescent boys were economically better off eleven years later. While each of these three coefficients is statistically significant, none are especially large. For example, for household income the coefficient for the number of adolescent boys (β= +0.110), is still smaller than the difference between households whose head had a matriculate diploma and those whose head was illiterate (β= +0.192). Regional differences are even more pronounced ranging from a high in Himachal Pradesh (β= +0.592) to a low in Madhya Pradesh (β= -0.212). Similarly, the household's source of income, its caste and religion are all more important for its eventual income gains than was its demographic composition.

Changes in Household Composition

We can understand better why the demographic dividend is so small considering the results in Table 3 that adds controls for *changes* in the demographic composition over the decade. Age and sex compositions of the 2005 households were calculated, adjusting for the 11 years between surveys. The added variables in the Table 3 models are the differences between the 1994 age and sex composition and the 2005 age and sex compositions. (Counts of boys and girls under 11 in 2005 provide two more variables

because these children were born after the 1994 survey.) Many households lost adult men over that decade, usually to household division when married sons or brothers set up their own households. Means for these composition variables are all negative. For example, 73% households with two adult males in 1994 lost one of those men by 2005. Controlling for these household changes, alters the interpretation of the 1994 household composition coefficients: when holding constant the 1994-2005 changes, the coefficients for the 1994 household composition reflect what the impact would be if there had been no change in household composition. That is, by controlling for the 1994-2005 household changes, we can calculate what the demographic dividend might have been without the loss (or addition) of household members due to household splits, deaths, marriages, or migration.

As expected, the coefficients for 1994 household composition are much stronger when we hold constant changes in household composition (see Table 3). Because the pattern of results are similar for the three economic outcomes, we focus on the household income results. The coefficient for teenage boys increases over 2½ times, from (β= +0.110) to (β= +0.294). Households with an additional teenage boy in 1994 had an additional 34% increase (exp[.294]=1.34) in income by 2005 *if the boy stayed at home.* If the boy had left by 2005, those gains were, of course, negated (β[change]= -0.279). The role of adult men increased even more, not unexpectedly, since adult men in 2005 should be even better established and more productive than the erstwhile teenagers who would still be in their 20s in 2005. For each additional adult man in 1994, household income would be expected to increase by an additional 40% by 2005 (β= +0.337) – if that man remained in the

household (β[loss]= -0.350). In fact, the Table 3 results now show that the number of adult men in 1994 would be even more important than the number of adolescent boys if the household remained intact (β[men]= +0.337 vs. β[adolescent boys]= +0.294). The reason that Table 2 showed that adolescent boys were most important for future gains is that they were more likely to stay at home so their potential income benefits to the household were better realized a decade later.

Other male age groups (children, the elderly) also show significant and positive effects on increases in income if they remain in the home. These coefficients are far more modest however, as would be expected. Their contributions to household income probably include both indirect and direct effects, perhaps in unpaid work on the family farm or business.

Even the female coefficients show significant although modest increases in household income in Table 3. Each additional teenage girl in 1994 is associated with a 12% increase in income; each additional adult woman with a 11% increase – again, only if they remained in the household in 2005. The teenage girl coefficient in Table 2 was non-significant and the adult women coefficient, negative, because these girls and women were so likely to leave the household in the ensuing eleven years. But Table 3 shows that if they remained, household income increased, although modestly.

Other control variables

At least as interesting as the results for household composition are the differences across caste, religion, education, and states. In every case, groups that started out more advantaged in 1994 gained more in the subsequent decade: Brahmins and other forward castes more than *dalits* (β= -0.138) and *adivasis* (β= -0.202), Hindus more than Muslims (β= -0.113) although Sikhs more than Hindus (β= +0.233), the well educated more than the illiterate (β[matriculates]= +0.192; β[graduates]= +0.527), and the prosperous northwest (e.g., β[Himachal Pradesh]= +0.592 and β[Haryana]= +0.574) and South (e.g., β[Kerala]= +0.547) more than the Hindi heartland (e.g., β[Madhya Pradesh]= -0.212 and β[Uttar Pradesh]= -0.080).

Income sources reveal the same pattern. Households with all their income from salaries gained 33% more over the decade than did agricultural households (exp[0.286]=1.33). Households with all their income from agricultural wages did even worse than farm households (β= -0.039) and nonagricultural wage households worse yet (β= -0.119)

These results suggest that it was a decade of growing inequality with the rich getting richer. In fact, the income gini inequality index did increase from 1994 (gini = .468 before household divisions) to 2005 (gini = .504) for this group of households.

DISCUSSION

These results show some support for a small "household demographic dividend" for households with more adolescent boys in the initial period. Such households prospered slightly more during the following decade than households who started at a similar economic level but with fewer or no adolescent boys. A similar, though much smaller dividend was earned by households with more adult men. The "problem" with 1994 households with many men is that they were much likelier to divide in the subsequent eleven years. If they avoided that division, they could expect to reap a substantial demographic dividend from their previous high fertility. But most of that demographic dividend was lost to household members because of the higher likelihood of household division.

Not surprisingly given its low female labor force participation rate, there is little evidence of a household demographic dividend for adolescent girls. Not only were these girls unlikely to join the labor force over the next decade, they were even more likely to leave the original household. Similarly, households with more adult women had lower (or negative) income changes than households with fewer women.

The picture that emerges from these analyses is of an extremely modest household demographic dividend resulting from previous high fertility. Much of the potential for a household benefit is lost by the division of the household. Much is also lost because even the modest dividend that is observed goes only to boys so about half the potential benefit is lost because girls have little effect on income increases.

Appendix Table 1. Means of all variables.

	N observations	Mean	SD	Min	Max
Household income (ln)					
wave 1 (1994)	13,081	9.822	0.857	6.361	13.460
wave 2 (2005)	12,776	10.141	0.928	6.908	14.580
change	12,776	0.322	1.054	-5.323	5.371
Income per capita (ln)					
wave 1 (1994)	13,081	8.090	0.799	4.680	12.019
wave 2 (2005)	12,776	8.574	0.874	4.711	13.110
change	12,776	0.489	1.031	-5.323	5.904
Household assets					
wave 1 (1994)	13,081	3.651	2.616	0	15
wave 2 (2005)	13,081	5.277	3.320	0	15
change	13,081	1.626	2.670	-9	13
Household composition: wave 1					
N male toddlers (0 - 3)	13,081	0.302	0.558	0	5
N male children (4 - 10)	13,081	0.599	0.831	0	8
N male teens (11 - 17)	13,081	0.518	0.737	0	5
N male young adults (18 - 38)	13,081	1.156	0.967	0	8
N male older adults (39 - 58)	13,081	0.529	0.539	0	4
N male adults (18 - 58)	13,081	1.685	1.050	0	12
N male elderly (59+)	13,081	0.235	0.436	0	3
N female toddlers (0 - 3)	13,081	0.288	0.563	0	5
N female children (4 - 10)	13,081	0.554	0.820	0	6
N female teens (11 - 17)	13,081	0.421	0.699	0	5
N female young adults (18 - 38)	13,081	1.028	0.776	0	7
N female older adults (39 - 58)	13,081	0.508	0.529	0	4
N female adults (18 - 58)	13,081	1.536	0.881	0	8
N female elderly (59+)	13,081	0.180	0.395	0	4
Change in household composition					
boys 0-10 in 2005	13,081	0.662	0.914	0	9
change male toddlers (11-14 in 2005)	13,081	-0.040	0.555	-4	6
change male children (15-21 in 2005)	13,081	-0.218	0.738	-8	4
change male teen (22-28 in 2005)	13,081	-0.185	0.679	-5	3
change male adults (29-69 in 2005)	13,081	-0.669	1.041	-8	4
change male elderly (70+ in 2005)	13,081	-0.134	0.408	-2	1
girls 0-10 in 2005	13,081	0.607	0.920	0	8
change female toddlers (11-14 in 2005)	13,081	-0.048	0.541	-5	3
change female children (15-21 in 2005)	13,081	-0.167	0.814	-6	4
change female teen (22-28 in 2005)	13,081	-0.120	0.812	-5	3
change female adults (29-69 in 2005)	13,081	-0.506	0.918	-7	4
change female elderly (70+ in 2005)	13,081	-0.089	0.380	-4	2
1994 household head is female	13,081	0.044	0.206	0	1
1994 household income source (%)					
from agriculture	13,081	0.412	0.395	0	1
from allied agriculture	13,081	0.041	0.117	0	1
from artisan work	13,081	0.053	0.189	0	1
from petty trade	13,081	0.066	0.212	0	1
from salary or profession	13,081	0.123	0.283	0	1
from other sources (e.g., rent)	13,081	0.024	0.117	0	1
from agricultural wages	13,081	0.169	0.306	0	1
from non-agricultural wages	13,081	0.111	0.250	0	1

Appendix Table 1. Means of all variables.

	N observations	Mean	SD	Min	Max
Head's educaiton					
Illiterate	13,081	0.495	0.500	0	1
Below Primary	13,081	0.154	0.361	0	1
Primary	13,081	0.125	0.330	0	1
Middle	13,081	0.113	0.316	0	1
Matriculation	13,081	0.068	0.252	0	1
Higher Secondary	13,081	0.023	0.149	0	1
Graduate	13,081	0.020	0.141	0	1
Other	13,081	0.002	0.048	0	1
Caste					
Brahmin	13,081	0.037	0.189	0	1
Other forward castes	13,081	0.244	0.429	0	1
OBC	13,081	0.408	0.492	0	1
SC	13,081	0.230	0.421	0	1
ST	13,081	0.081	0.273	0	1
Religion					
Hindu					
Muslim	13,081	0.093	0.291	0	1
Christian	13,081	0.013	0.115	0	1
Sikh	13,081	0.022	0.147	0	1
Buddhist	13,081	0.008	0.087	0	1
Jain and other	13,081	0.001	0.026	0	1
Tribal	13,081	0.009	0.094	0	1
States					
Himachal Pradesh	13,081	0.012	0.108	0	1
Punjab	13,081	0.018	0.132	0	1
Uttaranchal	13,081	0.032	0.176	0	1
Haryana	13,081	0.026	0.159	0	1
Rajasthan	13,081	0.058	0.234	0	1
Uttar Pradesh	13,081	0.100	0.300	0	1
Bihar	13,081	0.030	0.171	0	1
Assam	13,081	0.075	0.264	0	1
West Bengal	13,081	0.031	0.174	0	1
Jharkhand	13,081	0.070	0.255	0	1
Orissa	13,081	0.010	0.101	0	1
Chhattishgarh	13,081	0.126	0.332	0	1
Madhya Pradesh	13,081	0.055	0.228	0	1
Gujarat	13,081	0.056	0.229	0	1
Maharashtra	13,081	0.111	0.314	0	1
Andhra Pradesh	13,081	0.092	0.289	0	1
Tamil Nadu	13,081	0.018	0.135	0	1
Kerala	13,081	0.078	0.269	0	1

Table 2. Regressions of changes in household income and assets on household composition.

	Household Income		Income per capita		Household Assets	
	Wave 1 only		Wave 1 only		Wave 1 only	
Number of observations	12,776		12,776		13,081	
F(42, 13041)	146.18				63.96	
Prob > F	0				0	
R-squared	0.3785				0.2477	
Adj R-squared	0.3759				0.2438	
Root MSE	0.8324				2.3219	
Household composition: wave 1	coef	std. error	coef	std. error	coef	std. error
N male toddlers	0.0101	0.0143	-0.0358	0.0137 **	-0.1816	0.0394 ***
N male children	0.0444	0.0093 ***	0.0214	0.0089 *	0.0680	0.0258 **
N male teen	0.1105	0.0105 ***	0.0557	0.0099 ***	0.1079	0.0287 ***
N male adults	0.0434	0.0095 ***	0.0216	0.0088 *	0.0609	0.0257 *
N male elderly	-0.0289	0.0190	0.0250	0.0180	-0.1129	0.0524 *
N female toddlers	0.0062	0.0140	-0.0757	0.0134 ***	-0.0849	0.0388 *
N female children	0.0238	0.0094 *	-0.0058	0.0090	0.0377	0.0260
N female teen	0.0121	0.0109	0.0543	0.0105 ***	0.0093	0.0302
N female adults	-0.0289	0.0116 *	-0.0082	0.0110	0.0080	0.0320
N female elderly	0.0431	0.0203 *	0.0451	0.0193 *	0.1867	0.0560 ***
1994 household head is female	-0.1935	0.0387 ***	0.0448	0.0368	-0.1989	0.1061 +
Household income source (reference= agriculture)						
% of 1994 income from allied agriculture	-0.1052	0.0675	-0.0892	0.0643	-0.3667	0.1863 *
% of 1994 income from artisan work	0.0102	0.0413	0.0840	0.0394 *	0.1021	0.1138
% of 1994 income from petty trade	0.0652	0.0379 +	0.0691	0.0362 +	0.6519	0.1053 ***
% of 1994 income from salary or profession	0.2860	0.0304 ***	0.3202	0.0290 ***	1.2183	0.0848 ***
% of 1994 income from other sources (e.g., re	-0.1076	0.0657	0.0309	0.0626	0.5049	0.1815 **
% of 1994 income from agricultural wages	-0.0392	0.0306	0.0037	0.0291	-0.2723	0.0814 ***
% of 1994 income from non-agricultural wage	-0.1194	0.0334 ***	-0.0544	0.0319 +	-0.2850	0.0911 **
Household head education (reference= illiterate)						
Below Primary	0.0421	0.0225 +	0.0236	0.0214	0.4687	0.0622 ***
Primary	0.0962	0.0243 ***	0.0971	0.0231 ***	0.3810	0.0678 ***
Middle	0.2305	0.0258 ***	0.1959	0.0246 ***	0.6389	0.0721 ***
Matriculation	0.1918	0.0324 ***	0.2147	0.0309 ***	0.7533	0.0909 ***
Higher Secondary	0.3194	0.0520 ***	0.3404	0.0496 ***	1.0116	0.1455 ***
Graduate	0.5273	0.0551 ***	0.5071	0.0525 ***	1.5755	0.1550 ***
Other	0.4256	0.1518 **	0.5386	0.1447 ***	0.7140	0.4254 +

Table 2. Regressions of changes in household income and assets on household composition.

	Household Income		Income per capita		Household Assets	
	Wave 1 only		Wave 1 only		Wave 1 only	
Caste (reference = other forward caste)						
Brahmin	0.0582	0.0438	-0.0043	0.0417	0.7829	0.1206 ***
OBC	-0.1024	0.0211 ***	-0.1277	0.0201 ***	-0.3469	0.0583 ***
Dalits (scheduled castes)	-0.1384	0.0244 ***	-0.1690	0.0233 ***	-0.8077	0.0676 ***
Adivasis (scheduled tribes)	-0.2020	0.0341 ***	-0.2228	0.0325 ***	-1.4371	0.0943 ***
Religion (reference=Hindu)						
Muslim	-0.1130	0.0289 ***	-0.1805	0.0276 ***	-0.5120	0.0803 ***
Christian	-0.0620	0.0672	-0.0035	0.0641	-0.3274	0.1869 +
Sikh	0.2327	0.0761 **	0.2107	0.0726 **	0.3038	0.2113
Buddhist	-0.0047	0.0889	0.0188	0.0847	0.2571	0.2452
Jain	0.2874	0.2840	0.5365	0.2707 *	1.5567	0.7949 +
Tribal	-0.2870	0.0832 ***	-0.2865	0.0793 ***	-0.2035	0.2328
State (reference= Tamil Nadu)						
Himachal Pradesh	0.5916	0.0739 ***	0.3331	0.0705 ***	-0.2053	0.2057
Punjab	0.1964	0.0624 **	-0.0316	0.0595	-1.2153	0.1728 ***
Uttarakhand	0.4863	0.0689 ***	0.1788	0.0656 **	0.8979	0.1906 ***
Haryana	0.5744	0.0543 ***	0.2366	0.0517 ***	0.3408	0.1500 *
Rajasthan	0.1088	0.0427 *	-0.2338	0.0407 ***	-2.2726	0.1188 ***
Uttar Pradesh	-0.0796	0.0373 *	-0.4039	0.0355 ***	-2.8182	0.1057 ***
Bihar	0.1855	0.0533 ***	0.0992	0.0508 +	-1.2710	0.1492 ***
Assam	0.3171	0.0398 ***	0.0290	0.0379	-1.1113	0.1103 ***
West Bengal	0.0774	0.0509	-0.0958	0.0485 *	-1.5051	0.1421 ***
Jharkhand	-0.1807	0.0405 ***	-0.3916	0.0386 ***	-2.3039	0.1119 ***
Orissa	0.2843	0.0798 ***	0.2419	0.0761 ***	-2.1495	0.2190 ***
Chhattisgarh	0.0557	0.0368	-0.0647	0.0351 +	-1.8168	0.1039 ***
Madhya Pradesh	-0.2124	0.0426 ***	-0.4254	0.0406 ***	-2.3791	0.1186 ***
Gujarat	0.0770	0.0428 +	-0.0937	0.0408 *	0.1663	0.1174
Maharashtra	0.1890	0.0365 ***	0.0006	0.0348	-1.1682	0.1010 ***
Andhra Pradesh	0.0435	0.0369	-0.0157	0.0352	-0.3993	0.1020 ***
Kerala	0.5470	0.0626 ***	0.3274	0.0597 ***	1.0402	0.1733 ***
wave 1 (1994) income/ assets	-0.8256	0.0113 ***	-0.8576	0.0107 ***	-0.5141	0.0104 ***
constant	8.2095	0.1161 ***	7.4589	0.1016 ***	4.6395	0.1178 ***

Table 3. Regressions of changes in household income and assets on household composition and changes in household composition.

	Household Income + change in composition		Income per capita + change in composition		Household Assets + change in composition	
Number of observations	12,776		12,776		13,081	
F(42, 13041)	185.39				84.8	
Prob > F	0				0	
R-squared	0.4867		0.4647		0.2943	
Adj R-squared	0.4841				0.2908	
Root MSE	0.7568				2.2487	
Household composition: wave 1	coef	std. error	coef	std. error	coef	std. error
N male toddlers	0.0660	0.0156 ***	-0.0987	0.0157 ***	-0.1435	0.0457 **
N male children	0.1741	0.0114 ***	0.0060	0.0114	0.2115	0.0334 ***
N male teen	0.2943	0.0136 ***	0.1517	0.0135 ***	0.3231	0.0398 ***
N male adults	0.3372	0.0139 ***	0.1808	0.0138 ***	0.4385	0.0407 ***
N male elderly	0.1333	0.0253 ***	0.0210	0.0253	0.1537	0.0733 *
N female toddlers	0.0653	0.0159 ***	-0.1102	0.0160 ***	0.0804	0.0470 +
N female children	0.0873	0.0122 ***	-0.0722	0.0122 ***	0.2539	0.0358 ***
N female teen	0.1150	0.0177 ***	-0.0242	0.0177	0.4932	0.0517 ***
N female adults	0.1005	0.0157 ***	-0.0213	0.0156	-0.0241	0.0327
N female elderly	0.1062	0.0265 ***	-0.0215	0.0264	0.7063	0.0710 ***
Change in household composition						
boys 0-10 in 2005	0.0055	0.0084	-0.1685	0.0084 ***	-0.0977	0.0249 ***
change male toddlers (11-14 in 2005)	0.0531	0.0154 ***	-0.1232	0.0154 ***	-0.0502	0.0452
change male children (15-21 in 2005)	0.1974	0.0130 ***	0.0090	0.0130	0.2073	0.0383 ***
change male teen (22-28 in 2005)	0.2790	0.0142 ***	0.1068	0.0142 ***	0.3758	0.0417 ***
change male adults (29-69 in 2005)	0.3497	0.0133 ***	0.1619	0.0133 ***	0.4349	0.0391 ***
change male elderly (70+ in 2005)	0.1188	0.0256 ***	-0.0339	0.0255	0.2058	0.0739 **
girls 0-10 in 2005	0.0211	0.0082 *	-0.1510	0.0082 ***	-0.1006	0.0239 ***
change female toddlers (11-14 in 2005)	0.0542	0.0160 ***	-0.1302	0.0160 ***	0.1443	0.0472 **
change female children (15-21 in 2005)	0.0815	0.0123 ***	-0.0901	0.0123 ***	0.3094	0.0361 ***
change female teen (22-28 in 2005)	-	0.0161 ***	-0.0663	0.0160 ***	0.5228	0.0471 ***
change female adults (29-69 in 2005)	0.1180	0.0149 ***	-0.0177	0.0149	-	
change female elderly (70+ in 2005)	0.0626	0.0262 *	-0.0862	0.0262 ***	0.4548	0.0433 ***
1994 household head is female	-0.0465	0.0355	0.0645	0.0354 +	0.0020	0.1033

Table 3. Regressions of changes in household income and assets on household composition and changes in household composition.

	Household Income		Income per capita		Household Assets	
		+ change in composition		+ change in composition		+ change in composition
Household income source (reference= agriculture)						
% of 1994 income from allied agriculture	-0.0638	0.0614	-0.0628	0.0614	-0.2885	0.1799
% of 1994 income from artisan work	0.0717	0.0377 +	0.0849	0.0376 *	0.1797	0.1101
% of 1994 income from petty trade	0.0635	0.0345 +	0.0582	0.0345 +	0.6688	0.1018 ***
% of 1994 income from salary or profession	0.3194	0.0277 ***	0.3198	0.0277 ***	1.2598	0.0821 ***
% of 1994 income from other sources (e.g., re	0.0000	0.0598	0.0327	0.0597	0.7060	0.1755 ***
% of 1994 income from agricultural wages	0.0119	0.0279	0.0152	0.0278	-0.2058	0.0787 **
% of 1994 income from non-agricultural wage	-0.0343	0.0305	-0.0568	0.0305 +	-0.1439	0.0882
Household head education (reference= illiterate)						
Below Primary	0.0213	0.0205	0.0226	0.0204	0.4290	0.0602 ***
Primary	0.0862	0.0221 ***	0.0868	0.0221 ***	0.3635	0.0655 ***
Middle	0.1858	0.0235 ***	0.1760	0.0235 ***	0.5655	0.0698 ***
Matriculation	0.1690	0.0295 ***	0.1812	0.0295 ***	0.7243	0.0879 ***
Higher Secondary	0.2806	0.0474 ***	0.3097	0.0473 ***	0.9762	0.1405 ***
Graduate	0.4338	0.0502 ***	0.4654	0.0502 ***	1.4066	0.1499 ***
Other	0.4273	0.1381 **	0.4706	0.1380 ***	0.8032	0.4108 +
Caste (reference = other forward caste)						
Brahmin	0.0056	0.0398	0.0116	0.0398	0.6751	0.1165 ***
OBC	-0.0885	0.0192 ***	-0.0887	0.0192 ***	-0.3102	0.0565 ***
Dalits (scheduled castes)	-0.1204	0.0223 ***	-0.1283	0.0223 ***	-0.7511	0.0655 ***
Adivasis (scheduled tribes)	-0.1842	0.0310 ***	-0.1856	0.0310 ***	-1.3959	0.0912 ***
Religion (reference=Hindu)						
Muslim	-0.0690	0.0265 **	-0.0737	0.0265 **	-0.3891	0.0782 ***
Christian	0.0125	0.0612	0.0474	0.0612	-0.1885	0.1807
Sikh	0.1852	0.0693 **	0.1755	0.0692 *	0.2372	0.2040
Buddhist	0.0043	0.0810	0.0127	0.0809	0.2575	0.2371
Jain	0.3591	0.2584	0.3431	0.2582	1.7475	0.7677 *
Tribal	-0.2501	0.0757 ***	-0.2543	0.0756 ***	-0.1542	0.2248

Table 3. Regressions of changes in household income and assets on household composition and changes in household composition.

	Household Income		Income per capita		Household Assets	
	+ change in composition		+ change in composition		+ change in composition	
State (reference= Tamil Nadu)						
Himachal Pradesh	0.5171	0.0674 ***	0.4506	0.0673 ***	-0.2975	0.1990
Punjab	0.2034	0.0570 ***	0.1653	0.0570 **	-1.1688	0.1677 ***
Uttarakhand	0.3633	0.0629 ***	0.3162	0.0628 ***	0.7548	0.1847 ***
Haryana	0.4557	0.0498 ***	0.4149	0.0497 ***	0.2139	0.1459
Rajasthan	0.0387	0.0396	0.0298	0.0396	-2.3119	0.1168 ***
Uttar Pradesh	-0.1157	0.0348 ***	-0.1406	0.0348 ***	-2.8112	0.1045 ***
Bihar	0.1656	0.0486 ***	0.1675	0.0486 ***	-1.2745	0.1444 ***
Assam	0.2493	0.0368 ***	0.2551	0.0368 ***	-1.1648	0.1082 ***
West Bengal	0.0493	0.0464	0.0277	0.0464	-1.5264	0.1376 ***
Jharkhand	-0.2088	0.0373 ***	-0.2214	0.0372 ***	-2.2820	0.1091 ***
Orissa	0.3434	0.0726 ***	0.2859	0.0726 ***	-2.0823	0.2116 ***
Chhattisgarh	0.0683	0.0336 *	0.0281	0.0336	-1.8083	0.1007 ***
Madhya Pradesh	-0.2629	0.0389 ***	-0.3009	0.0389 ***	-2.4643	0.1150 ***
Gujarat	0.0345	0.0391	0.0175	0.0391	0.1431	0.1139
Maharashtra	0.1398	0.0334 ***	0.1012	0.0333 **	-1.2414	0.0980 ***
Andhra Pradesh	0.0519	0.0336	0.0427	0.0336	-0.3881	0.0986 ***
Kerala	0.4388	0.0570 ***	0.3429	0.0570 ***	0.8682	0.1675 ***
wave 1 (1994) income/ assets	-0.8439	0.0103 ***	-0.8580	0.0102 ***	-0.5400	0.0101 ***
constant	7.7789	0.1062 ***	7.3969	0.0979 ***	3.6585	0.1194 ***