

Changes in Subjective *versus* Objective Well-Being in India¹

Vani S. Kulkarni, University of Pennsylvania, vanik@sas.upenn.edu,

Veena S. Kulkarni, Arkansas State University - Main Campus, vkulkarni@astate.edu,

Katsushi S. Imai, University of Manchester, Katsushi.Imai@manchester.ac.uk

Raghav Gaiha², University of Pennsylvania and GDI University of Manchester,
raghavdasgaiha@gmail.com

Abstract

Although there is abundant literature on subjective well-being (SWB), there is virtually none for India. Growing recognition of the validity and accuracy of measures of SWB of well-being underlies the rapid growth of literature on SWB in recent decades but it has mainly focused on developed countries. Ours is, to our knowledge, the first study of SWB at the all-India level, and one of the few on developing countries, with a rigorous validation of the results. Applying robust OLS and ordered probit models to the India Human Development Survey (IHDS) panel data in 2005 and 2012, we assess SWB *changes* in 2005-2012, based on a self-reported measure of changes in economic well-being, as a function of household and state covariates in 2005. This is in sharp contrast with earlier studies' focus on the *levels* of SWB. Another point of departure of our study and an innovative extension is to compare the covariates of SWB changes with those of objective well-being (OWB) changes, proxied by the relative growth in real per capita household consumption between 2005 and 2012. Households with an older and educated head in a larger household, located in urban areas or affluent states in 2005 tend to experience further improvement in both SWB and OWB between 2005 and 2012. On the contrary, households with a female household head, with more male members in the labour market, with regular access to mass media, without members suffering from non-communicable diseases or disability are more likely to be better off subjectively without experiencing corresponding improvement in OWB. The policy challenges raise serious concerns.

Key Words: Subjective Well-Being, Affluence, Age, Health, Caste, Religion, India.

JEL Codes: I31, I14, I38, J71, P35.

¹We are indebted to Raj Bhatia for his invaluable contribution to the econometric analysis, and to A. J. Oswald, Anil S. Deolalikar, S. Shankar, A. S. Venkatraman, N. Chandramohan and Radhika Aggarwal for constructive suggestions. Above all, we are grateful to Jere Behrman for his guidance and valuable suggestions. We appreciate valuable advice on the interpretations of IHDS by Sonalde Desai who led IHDS. The views are personal and not necessarily of the institutions to which we are affiliated.

² Corresponding Author: Raghav Gaiha, Email: raghavdasgaiha@gmail.com

Changes in Subjective *versus* Objective Well-Being in India

1. Introduction

Well-being is hard to define, and harder to measure. This, however, has not deterred economists and other social scientists as well as pollsters from assessing it. Relying on subjective measures of well-being, leading scholars have made important contributions to its measurement and elaboration of its policy importance.

Following Steptoe et al. (2015), three aspects of subjective well-being can be distinguished - evaluative well-being (or life satisfaction), hedonic well-being (feelings of happiness, sadness, anger, stress, and pain), and eudemonic well-being (sense of purpose and meaning in life).

Life evaluation refers to the quality or goodness of lives, overall life satisfaction, or sometimes happiness. Measurement is usually based on the Cantril ladder (1965), wherein individuals are asked to place themselves on an 11-step ladder with the worst possible life representing the lowest rung and the best possible life representing the top rung. Hedonic well-being refers to everyday feelings or moods such as experienced happiness (the mood, not the evaluation of life), sadness, anger, and stress, and is measured by asking respondents to rate their experience of several affect adjectives such as happy, sad, and angry. Eudemonic well-being focuses on judgments about the meaning and purpose of one's life; because the concept is more diverse, several questionnaires exploring various aspects of meaning have been developed (Steptoe et al. 2015).

Measures of SWB (life evaluation or overall life satisfaction) have been controversial. Ravallion et al. (2016), for example, are sceptical but not dismissive of such measures. Their scepticism rests on scale heterogeneity-the standard deviation of utility over different choice situations. However, subjective measures of poverty are not just similar to those obtained from income/expenditure thresholds but sometimes unavoidable³. Deaton (2018), however, offers robust support to self-reported measures of well-being, as such measures capture aspects of welfare beyond real income, which is what economists typically use to proxy utility. He uses cross-country and country-specific comparisons to validate measures of SWB, and draws out their policy significance.

Strands of the literature show that the relationship between well-being and age is U-shaped - well-being is at its lowest among the middle-aged (35-45 years), and highest in the oldest 75-plus age group. This is justified in terms of work-related stress and uncertainty about the future, while at much older ages, there is freedom from work-related stress and, perhaps, a

³In another important contribution, Ravallion (2014) conjectures that different people are likely to have different ideas about what it means to be "rich" or "poor," or "satisfied" or not with one's life, leading them to interpret survey questions on subjective welfare differently.

sense of accomplishment (Blanchflower and Oswald, 2007, Dolan et al. 2008, among others). Deaton (2018), however, offers a more balanced appraisal. Age patterns are neither universal, nor very pronounced. Specifically, the (unconditional) U-shape appears in the English speaking countries, to a lesser extent in East and in South Asia, and in (non-English speaking) Europe - more for men than women - but not elsewhere. Even in the US, using the nationally representative survey data (General Social Survey) in 1973-1994, Easterlin (2006) showed that the relationship between age and happiness represents an inverted U-shape curve where the happiness measure is on family and health satisfaction. That is, the happiness of a birth cohort rises mildly from age 18 to midlife, and declines after 50. So the age-wellbeing relationship cannot be generalised as it differs considerably depending on the study context (e.g. differences of country or regions, time, the definition of well-being, the nature of the data).

Our objective is to identify and assess the factors associated with *changes* in SWB in India between 2004-5 and 2011-12. We carry out econometric analyses using the large panel dataset constructed by India Human Development Surveys (IHDS) 1 and 2. These surveys form a national panel household survey covering all parts of India and were organised by the University of Maryland and the National Council of Applied Economic Research.⁴ It must be pointed out, however, that the measure of SWB that we use is focused on perceived economic well-being of the household, such as a respondent (or a household head) perceived that the household is economically better-off (2), just the same (1) and worse-off (0) between 2004-5 and 2011-12. To mitigate the endogeneity concern, we estimate this discrete dependent variable by a number of explanatory variables at household, community and state levels in 2004-5 (e.g. demographic and other variables such as age, health, caste, religion, location, and conflicts) using robust Ordinary Least Squares (OLS) and ordered probit models⁵.

Another objective is to compare factors associated with SWB changes with those of objective well-being (OWB). The latter is proxied by the relative growth in real per capita household consumption in 2004-5-2011-2. We have classified the entire sample into three groups, better-off (2), just the same (1) and worse off (0) based on the ranking of the real per capita household consumption growth, making the frequency distributions across the three categories identical to those of SWB changes to make the coefficient estimates comparable in their sign and size. We aim to assess the factors associated with SWB changes, not with OWB changes, to identify the specific covariates of SWB changes. To our knowledge, this is one of the few studies to compare SWB and OWB or their changes in terms of their covariates.⁶ While aiming to contribute to the aforementioned academic literature on SWB, we will pay particular attention to policy concerns arising from our results.

The rest of the study is organised as follows. Section 2 gives a selective review of important contributions to the rapidly growing literature on SWB. Section 3 discusses salient features of

⁴<https://ihds.umd.edu/data> (accessed on 22 February 2021).

⁵ Although this does not overcome the endogeneity of some of the explanatory variables, it allows us to rule out reverse causality..

⁶ A notable exception is Oswald and Wu (2010) who found a close correlation between SWB and OWB measures at the state level in the U.S.A.

the data, while showing the associations between the SWB change (or the OWB change) and key covariates, based on cross-tabulations. Section 4 offers brief expositions of multiple regression and ordered probit (OP) models for SWB and OWB changes. Section 5 is devoted to interpretation of the results obtained by multiple regression and OP. Section 6 concludes by discussing the significance of our results and the policy challenges.

2. Literature Review

One important empirical issue is whether the measures of subjective well-being (SWB) are reliable (e.g., Kahneman and Krueger, 2006; Kahneman and Deaton, 2010; Diener et al., 2013; Akay et al., 2017, and Deaton, 2011, 2018).

Kahneman and Krueger (2006) review the literature on SWB, including their own studies, and argue that the income level is not necessarily associated with better SWB and that one way of partially assessing the validity of SWB measures is to examine their correlation with various individual traits. Drawing upon empirical studies of SWB, the authors argue that (i) recent positive changes in circumstances, as well as demographic variables including schooling and health, are likely to be positively correlated with happiness or satisfaction; (ii) variables that are associated with low life satisfaction and happiness include: *recent* negative changes of circumstances; chronic pain; and unemployment, especially if only the individual concerned was laid off; (iii) gender is uncorrelated with life satisfaction and happiness; (iv) the effects of age are complex—the lowest life satisfaction is apparently experienced by those who have teenagers at home, and reported satisfaction improves thereafter. They resolve the puzzle of the relatively small and short-lived effect of changes in most life circumstances on reported life satisfaction by invoking evidence on adaptability. They conclude that despite their limitations, subjective measures of well-being enable welfare analysis in a more direct way that could be a preferred alternative to traditional welfare analysis.

Another important study by Diener et al. (2013) scrutinises the life satisfaction scales in the global context based on their critical review of relevant studies and verifies the reliability of the scales used and validity of judgments made in SWB measures. The stability of life satisfaction scores across time and situations suggests that consistent psychological processes are involved and similar information is used when people report their scores, while single-item scales are less stable than multi-item life satisfaction scales. Societal-level mean life satisfaction also shows robust consistency. In the Gallup World Poll, for example, in which there was an identical life evaluation question in the identical item-order collected over years, there is a .93 correlation across waves of the data for 1-year intervals ($N = 336$ nation-wave pairs), and a .91 correlation across a 4-year interval ($N = 74$ nations). To summarise the authors' findings, reliability and validity of life satisfaction scales reflect authentic differences in the ways people evaluate their lives, and the scores move in expected ways to changes in people's circumstances.

Among those who have emphatically endorsed SWB measures is Deaton (2018). He argues that SWB measures do not need to be related to behaviour. 'If decision utility differs from welfare utility, and if people sometimes behave against their best interests, the direct

measurement of well-being might still give an accurate measure, and might even enable people to do better, either through paternalistic government policies, or incentives, but more simply by providing information on the circumstances and choices that promote well-being...' (ibid., 2018, p. 18). Deaton elaborates that direct measures may also capture aspects of welfare beyond real income, which is what economists typically use to proxy utility. Health is a case in point; education, civil liberties, civic participation, respect, dignity, and freedom are others. Our study focusing on SWB and OWB changes is in line with Deaton's.

Deaton (2018), based on the Gallup World Poll, uses an evaluative measure of well-being that asks people to report, on an eleven-point scale, from 0 to 10, how their life is going. The question is originally due to Cantril (1965), and is asked in exactly the same way of all individuals sampled by Gallup in their World Poll. The question is "Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally stand at this time?" (Deaton, 2018, p. 19).

His main findings are: average ladder values vary greatly around the world, from around 4 in Africa, to between 7 and 8 for the rich countries of Europe and the English-speaking world; differences between men and women within regions are smaller than differences between regions; women tend to evaluate their lives somewhat more highly than men, except in Africa, and sometimes among those over 60; age patterns are apparent, but neither universal, nor very pronounced, at least compared with those associated with international differences in incomes; the (unconditional) U-shape appears in the English speaking countries (U.K., U.S., Canada, Ireland, New Zealand and Australia), to a lesser extent in East and in South Asia and perhaps in Latin America and the Caribbean - though only in the last age group (65-74), and in Europe—more for men than women—but not elsewhere. In the two poorest regions, Africa and South Asia, life evaluation is low throughout life and, in Africa, it falls with age. However, he is puzzled by the U-shape of well-being, where it exists, since SWB rises after middle-age, when people are losing their spouses, and when both morbidity and mortality are rising. In contrast, other components of psychological well-being may improve with age, less stress, and the negative side-effects (e.g., physical pain) of work diminish with retirement.

In a highly cited study, Blanchflower and Oswald (2007) analyse data on 500,000 Americans and Europeans. It draws two main conclusions. First, psychological well-being depends in a curvilinear way upon age. Second, there are important differences in the reported happiness levels of different birth-cohorts. The results draw upon regressions and use datasets covering the period long enough to distinguish age effects from cohort effects. The authors suggest that reported well-being is U-shaped in age and that the convex structure of the curve is similar across different parts of the Western world. A limitation is that the analysis does not track the same individuals over time.

In an admirably clear and comprehensive review of factors associated with SWB, Dolan et al. (2008) draw attention to ambiguities, inconsistencies and causality in the interpretation of the

results. The results generally show positive but diminishing returns to income. Some of this positive association is likely to be due to reverse causation, as indicated by the studies which show higher well-being leading to higher future incomes (Clark, Frijters, and Shields, 2008).

Studies that have included relative income (defined in a range of different ways with a range of different reference groups) suggest well-being is strongly affected by relativities. So, if additional income rises by similar amount in a person's reference group, it is unlikely to be associated with gains in SWB (Dorn et al. 2007)⁷. Indeed, much evidence indicates that rank in the income distribution influences life satisfaction. However, no studies have so far compared the covariates of SWB and those of the ranks defined by economic measures, that is, OWB.

Earlier studies consistently find a negative relationship between SWB and age and a positive relationship between age squared and SWB, which is consistent with a U-shaped curve in the SWB-age domain. For example, Blanchflower and Oswald (2007) show that well-being tends to be higher at the younger and the older age points, and lower at the middle age point⁸.

Women tend to report higher happiness but worst scores on the GHQ (Alesina, et al., 2004), although a few studies report no gender differences even using the same datasets. This is not surprising as specifications differ (Dolan et al. 2008).

Some studies find a positive relationship between SWB and each additional level of schooling, while others find that middle level of schooling is related to the highest life satisfaction (e.g., Blanchflower & Oswald, 2004, Stutzer, 2004). However, there is some evidence that schooling has more of a positive impact in low income countries. In addition, the coefficient on schooling is often responsive to the inclusion of other variables within the model. Schooling is likely to be positively correlated with income and health, and, if these are not controlled for, the schooling coefficient is likely to be more strongly positive (Fahey & Smyth, 2004; Ferrer-i-Carbonell, 2005).

Evidence shows a large negative effect of individual unemployment on SWB. Models, which treat life satisfaction scales as a continuous variable, tend to find that the unemployed have around 5-15% lower scores than the employed. Men have been found to suffer most from unemployment and some studies also find that the middle-aged suffer more than the young or old (e.g., Di Tella et al., 2001, Clark, 2003). While the evidence is relatively clear that employment is better than unemployment, the relationship between the amount of work (e.g., number of hours worked) and well-being is less straightforward. An interesting result is an inverted U-shaped curve between life satisfaction and hours worked suggesting that well-being rises as hours worked rise but only up to a certain point and then starts to drop as hours become longer (Meir and Stutzer, 2006).

⁷Much of the credit is due to Duesenberry (1949) who argued that relative income rather than the level of income affects well-being – earning more or less than others looms larger than how much one earns.

⁸As noted earlier, this view is not corroborated in more recent studies of Africa and South Asia (Deaton, 2018).

Studies consistently show a strong relationship between SWB and both physical and psychological health. Psychological health appears to be more highly correlated with SWB than physical health but this is not surprising given the close correspondence between psychological health and SWB. Some of the association may be caused by the impact that well-being has on health but the effect sizes of the health variables are substantial, suggesting that, even after accounting for the impact of SWB on health, the effect of health on SWB is still significant (Kohler et al. 2017). Furthermore, specific conditions, such as heart attacks and strokes reduce well-being, and the causality here is more likely to be from the health condition to SWB. Hence, deliberate exclusion of health variables, as suggested by Blanchflower and Oswald (2007), is problematic. Specifically, the omitted variable bias is likely to be large and thus our study controls for both non-communicable diseases (NCDs) and disabilities of household members.

The evidence is fairly consistent and suggests that regular engagement in religious activities is positively related to SWB. While some studies only examine whether or not the person actually attends church, others examine different amounts of time spent in these activities. Using World Values Survey (WVS) data, Helliwell (2003) finds higher life satisfaction to be associated with church attendance of once or more a week. On the related issue of religiosity (e.g., regular attendance of church), Deaton (2011) offers valuable insights. At least on average, over all countries, and over countries disaggregated into income groups, religious people do better on a number of health and health-related indicators. These protective effects appear to be stronger the poorer is the country, as religion is a route to a better life in poor countries, but not in rich ones, and stronger for men than women.

Generally, being alone appears to be worse for SWB than being part of a partnership. Although there is some variation across studies, it seems that being married is associated with the highest level of SWB and being separated is associated with the lowest level of SWB, lower even than being divorced or widowed (e.g., Helliwell, 2003).

The evidence on the impact of income inequality on well-being is mixed. Based on the WVS data, Fahey and Smyth (2004) find that inequality reduces life satisfaction, whereas Haller and Hadler (2006) find that inequality increases life satisfaction. One conjecture for these contrasting findings using international data may be that the inclusion of particular countries influences the results. The evidence suggests that living in an unsafe or deprived area is detrimental to life satisfaction, controlling for own income (Ferrer-i-Carbonell & Gowdy, 2007). Living in large cities is detrimental to life-satisfaction while living in rural areas is beneficial, after controlling for income (e.g., Graham and Felton, 2006).

In India's context, an important question is: Do *Dalits* and Other Backward Classes (OBC) in rural North India report lower life satisfaction than higher caste people, and if so, is it merely because they are poorer? Spears (2016) addresses this question, using the Sanitation Quality, Use, Access and Trends (SQUAT) survey data collected in rural Bihar, Haryana, Madhya Pradesh, Rajasthan and Uttar Pradesh in 2013–14 by a team of researchers, including the author. Two specific issues are: (i) Do Dalits and Other Backward Classes (OBC) in rural north India report lower life satisfaction than higher caste people, and, if so, (ii) is it merely

because they are poorer? The findings are: lower caste people in rural North India evaluate their lives to be worse than higher caste people, and this difference is not explained by income poverty. Spears (2016) is only among a few studies on SWB in the context of India and, to our knowledge, there have not been any national-level studies on SWB in India. We aim to fill the gap by using the nationally representative household survey data.

3. Data

Our analysis draws upon the two rounds of the nationally representative *India Human Development Survey* (IHDS) data for 2004-5 and 2011-12, conducted jointly by the University of Maryland and the National Council of Applied Economic Research, New Delhi. The first round (IHDS-1) is a survey of 41,554 households in 2004-5. The second round (IHDS-II) involves re-interviews with 83% of the original households as well as split households residing within the same locality, along with an additional sample of 2,134 households in 2011-12⁹. The total for IHDS-II is therefore 42,152 households. The sample is spread across 33 (now 34) states and union territories, and covers rural as well as urban areas. Repeated interviewing of the same households at two points in time facilitates a richer understanding of which households are able to partake in the fruits of growth, what allows them to move forward, and the process through which they are incorporated into or left out of a growing economy.

Topics covered by the IHDS relevant in the present context include the perceived changes in subjective well-being (SWB), expenditure, income, employment, major morbidity (including non-communicable diseases (NCDs)), limitations in activities of daily living (ADLs), health insurance, castes, religion, assets, social networks (e.g., self-help groups), trust in institutions, conflicts, crimes, exposure to mass media, and demographic characteristics (e.g. gender, age, marital status, household size and composition)¹⁰.

An important feature of IHDS is that it collected data on SWB changes. The question asked is: “Compared to 7 years ago, would you say your household is *economically* doing the same, better or worse today?” So the focus of this SWB is narrow and it has only three scales corresponding to *the perceived change* in the SWB (denoted as Δ SWB hereafter), not its level. It should also be noted that the measure is at the household level, not the individual level. While the focus of this variable is narrow, it has a few advantages. First, as reviewed in

⁹An additional sample of 2134 households was added to the urban sample of IHDS-II to reduce the impact of attrition on the standard errors of a few key variables. The simulations estimated that the attrition would increase standard errors to unacceptable levels if 8 out of 15 households were unreachable in each urban cluster. Hence, the interviewers were asked to report to NCAER supervisors if they were unable to recontact 5 or more households in a cluster. The supervisor verified the losses and randomly assigned households to the right, the left, or at the original location based on the original locations of the households which were not observed in 2011-12 using a predefined rule. A similar addition to the rural sample was not attempted because of much lower attrition rates (Personal communication with a scholar who led IHDS).

¹⁰It is noted that the IHDS-1 in 2005 does not allow identification of the respondent, while the IHDS-2 in 2012 does. As the respondents reported SWB changes in 2005-12 at the household level in IHDS-2, we have matched SWB or OWB changes, a dependent variable, to household head's characteristics, and other explanatory variables, by restricting the sample only to the cases where the household head data are available.

detail in the previous section, there exists a life-cycle effect on SWB, that is, perceived well-being changes at the point of life-cycle or age of the respondent as well as his/her spouse or other household members. While the survey question asks about the change in SWB compared to that 7 years ago, it can be different from the time-series comparison of the level in SWB because of the stronger effect of more recent experience of negative shocks (e.g. a flood) on SWB. In this sense, our proxy is likely to be more closely associated with SWB at the time of the survey (2011-12) rather than 7 years ago (2004-05), although given that this is a longitudinal survey, the individuals kept some memories of the last survey as a reference point. Second, because the survey specifically asks about the change of economic well-being of the household, compared with the state seven years ago, the question has an advantage of placing more weight on the respondent's own SWB rather than the relative SWB compared to others' SWB in the community or society. If a particular shock or a negative event hit only that household, relative to others, the measure can capture the relative components, but it captures the relative difference of the SWB of the respondent or his/her family. Third, by asking specifically about the economic well-being, the respondents will perceive the same aspect in well-being. This will minimise the heterogeneity in the respondent's perceptions or focus on well-being compared with the variable based on more general questions about happiness or 'the best possible life'. Fourth, while most of the earlier studies asked about the individual SWB, our measure captures Δ SWB at the household level.

As noted earlier, we have constructed the variable on the actual changes in objective well-being (Δ OWB). Δ OWB is defined based on the relative change in real per capita household consumption between 2004-5 and 2011-2. The entire households are classified into the three groups: better-off (2), just the same (1) and worse off (0) based on the ranking of the changes in real per capita household consumption, making the frequency distributions across three categories identical to those of Δ SWB. While this will lose continuous data in the change in per capita household consumption and the thresholds among the three cases are arbitrarily determined¹¹, our approach has the advantages of (i) making the estimated coefficients for Δ SWB and Δ OWB comparable in their sign and size as well as statistical significance; (ii) being able to apply ordered probit model to Δ OWB; and (iii) capturing the relative improvement or worsening of the objective well-being.

Ranking of the changes in the growth rate of real household consumption per capita in 2005-12 is created by using the entire national sample for the purpose of making the frequency distributions for Δ SWB and Δ OWB identical. This captures the relative positions in the improvement in OWB at different geographical aggregations, such as at state, district, or village levels, though the share of each category varies reflecting the distribution of the

¹¹ In Appendix Table A.1 we have estimated a robust OLS model by using the growth rate of real household consumption per capita between 2005 and 12 as a dependent variable. The results are very similar in terms of the sign and statistical significance to those where Δ OWB is used as a dependent variable in Table 2 and Table 3. It is noted that the coefficient of correlation between the growth rate of real household consumption per capita between 2005 and 12 and Δ OWB is 0.4173 and statistically significant at the 1% level. It should also be noted that the coefficient of correlation between Δ SWB and Δ OWB is 0.0401 and that between Δ SWB and the growth rate of real household consumption per capita in 2005-12 is 0.0221, both significant at the 1% level given the large sample size.

original variable. Though it is simple, our measure (ΔOWB) can capture how per capita consumption has grown over the period compared with the consumption growth of other households in society. In our model, we have controlled the initial level of per capita consumption and so ΔOWB is conceptually similar to ΔSWB , while the only difference is whether the measure is based on the household head's perception or the actual change in the economic status.

As noted earlier, since our measure of ΔSWB is based on self-reports, it connotes a broader view influenced by several factors other than income, assets, and employment at the household level. Indeed, as corroborated by our econometric analyses, this measure of well-being is associated with age, caste, religion, health, household size, and schooling. While some of these factors may influence economic well-being through income and employment- a case in point being health status-, arguably, these underlie perceptions of economic well-being.

Detailed expenditure data are collected, based on 52 questions about household consumption expenditure. The first 33, more frequently purchased items, use a 30-day recall while the remaining nineteen items use 365-day recall. Asset data are collected on 33 dichotomous items that households possessed and housing quality. Based on a principal component analysis, we constructed asset quartiles. Remittances are also closely linked to welfare through growth and poverty reduction (Imai et al. 2014). Hence, remittances are used as an explanatory variable. IHDS collects remittance data through non-resident household members/relatives. Location of households is classified into rural and urban, and the latter is further disaggregated into six metropolitan areas (Mumbai, Delhi, Kolkata, Chennai, Bangalore and Hyderabad) and slums. We use the rural and urban classification in our specification. Data are reported into five caste categories: Brahmins, High Castes, Other Backward Classes (OBCs), Scheduled Castes (SCs/*Dalits*), Scheduled Tribes (STs/*Adivasis*) and a residual "Other" category.

IHDS obtains labour force participation data as part of its detailed income question. Work participation includes farm, business, and wages/salary. Within each income section, IHDS asks who in the household participates in this activity and what their level of participation is. Detailed demographic data are collected including gender, age and marital status, and household size and its composition. The survey also collects detailed schooling data. At the household level, the highest school attainment of adult women and adult men are taken from individual education records. Adults are defined as individuals 21 years or older. Based on number of years of schooling, individuals are classified into illiterates, those with primary schooling, middle level schooling, matriculates and graduates, based on their years of schooling.

We have controlled for whether a household has any member suffering from the NCDs which include cataracts, high blood pressure, heart disease, type 2 diabetes, leprosy, cancer, asthma, epilepsy, and mental disorders. The number of cases of mental disorder and cancer are too small for detailed analysis. Disabilities in ADLs show the dependence of an individual on others, with need for assistance in daily life. The (reported) disabilities include (1) difficulty

walking; (2) difficulty using toilet facilities; (3) difficulty dressing; (4) difficulty with hearing; (5) difficulty speaking, (6) long sightedness/far sightedness; and (7) short sightedness.

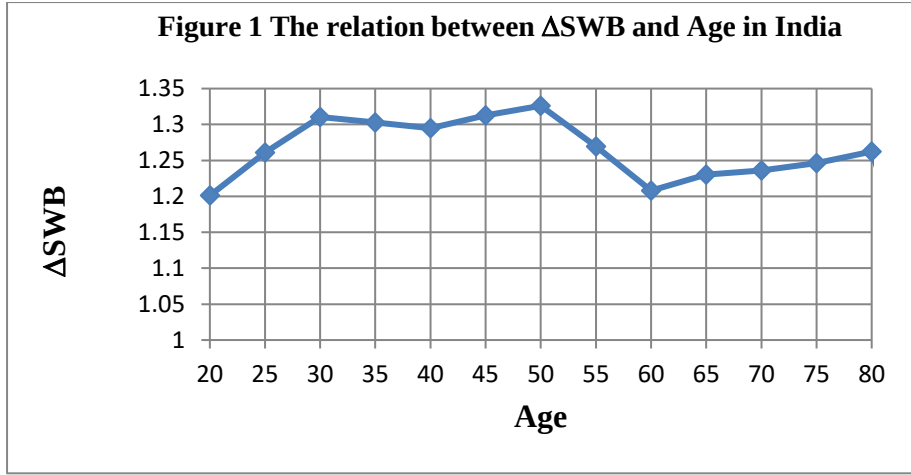
Local conflicts - both minor and major- result in loss of property, livelihoods, injuries and not infrequently human lives. Local crime is limited to whether a household reported a theft or whether something was stolen. However, the value of items stolen is not recorded.

Net state domestic product (NSDP) per capita at constant prices is obtained from state economic surveys. As noted in the literature survey, the evidence on the role of income/wealth inequality is mixed. We have experimented with the Piketty measure of income inequality (Piketty, 2014). We use a ratio of share of the top 1 per cent in total income to that of the bottom 50%.

Not enough attention is given in the literature to the relationship between SWB and exposure to mass media. IHDS has detailed data on exposure to radios, newspapers and TV by gender. Frequency of exposure comprises three categories: ‘never’, ‘sometimes’, or ‘regularly’. We use regular exposure to each medium by gender (the variable takes the value 1 for regular exposure and 0 otherwise). Precise definitions of the variables used in the econometric specifications with their means and standard deviations are given in Table 1.

In the total sample in 2012, the proportion of the worse-off is 9.70 %, of just the same 50.34 % and of the better-off 37.90 %. Hence proportion of just the same is highest with a considerably lower proportion of the better-off and still lower of the worse-off.

As we examine the associations between Δ SWB or Δ OWB in Section 5, we only consider the relationships between Δ SWB at the household level and age-group of household head in this section because the relationship between age and SWB has been identified as one of the key empirical issues in the literature on SWB. ‘Age’ in our study comprises 5 age groups: 15-30 years, 31-50 years, 51-60 years, 61-70 years and >70 years based on the age of the respondent. As shown below in Figure 1, the curve does not show any age pattern except a sharp plunge among 50-60 years old and then a gradual fall among the oldest (70 years +). It should be noted that the U shaped curve often derived in the literature reviewed in Section 2 (e.g., Blanchflower and Oswald, 2007) has been derived for the relationship between *the level*



Note: Δ SWB denotes the change in subjective economic well-being. Source: Authors' computations.

of SWB and age. Hence we do not expect the U-shaped or the inverted U-shaped in the relationship between Δ SWB and age.

4. Models

We have employed multiple regression and ordered probit models. Their salient features are described below.

(1) Multiple Regression Model

We first estimate a multiple regression model where the dependent variable, Δ SWB (0, 1, 2), corresponding to 'worse-off', 'just the same' or 'better-off' - are estimated by a set of explanatory variables using OLS.¹² The explanatory variables include the age of the household head and its squared term, log per capita expenditure in the initial year¹³, and the ratio of per capita expenditure of the household to the maximum value in the primary sampling unit (PSU). The last variable captures the relative consumption level of the household compared to the richest household within a village (or a corresponding geographical unit). The model also controls for demographic characteristics such as gender of the household head, caste, marital status, and religion. To reflect the structure of the economy and society between urban and rural areas, we include a dummy variable on whether a household is in a rural or urban area. Also, we include the variables on employment in terms

¹²See Angrist and Pischke (2008) for the detailed argument in favour of the Linear Probability Model (LPM) over the probit model where OLS is used for a binary choice model, against the standard textbook recommendation for the use of probit or logit models for the binary variable. The use of OLS for the discrete variable (0, 1, 2) can be justified on the same grounds. OLS with robust clustered standard errors is used to address possible correlations among individuals within a household as well as heteroscedasticity.

¹³As Kahneman and Deaton (2010) point out, psychologists and sociologists often plot measures of subjective well-being against income in dollars, but a strong argument can be made for the logarithm of income as the preferred scale. The logarithmic transformation represents a basic fact of perception known as Weber's Law, which applies generally to quantitative dimensions of perception and judgment (e.g., the intensity of sounds and lights). The rule is that the effective stimulus for the detection and evaluation of changes or differences in such dimensions is the percentage change, not its absolute amount.

of both participation and duration. Other important factors are health or disability conditions. We include dummy variables on (i) whether a household member suffered from NCD, and (ii) whether there was a disabled member. Other covariates are whether there was a conflict in the village, exposure to mass media by gender, whether any household member experienced a theft and whether received remittances. The model also controls for the net state-level domestic product per capita and its squared term, and the Piketty measure of income inequality (i.e., the ratio of share of top 1% to that of bottom 50% in total income).

Because ΔSWB is the perceived change of economic well-being during the last 7 years or between 2005 and 2012, all the explanatory variables are based on the survey questions in 2005 to partially address the issue of reverse causation from ΔSWB to, for instance, health or income/expenditure.

In another specification, ΔSWB , a dependent variable, is replaced by ΔOWB (0, 1, 2), which indicates ‘worse-off’, ‘roughly the same’ or ‘better-off’ based on the ranking of the growth of real per capita household expenditure and with the frequency distribution identical to ΔSWB .

A standard OLS model is expressed as:

$$y_i = X_i\beta + \varepsilon_i \quad \dots\dots (1)$$

where y_i is a vector, ΔSWB or ΔOWB (0, 1, 2), the change in subjective or objective well-being from 2005 to 2012, and i stands for the household head (1, ..., 27,958). X_i denotes a matrix containing the intercept and a number of explanatory variables described above and β is a vector of coefficients to be estimated. X_i includes household characteristics (such as age, log of expenditure per capita in 2005, religion, caste, gender, location, household size, whether suffering from an NCD, a disability, whether experiences a theft, whether receives a remittance, and whether adult men and women are exposed to mass media in 2005). X_i also includes the Piketty measure of inequality at the state level (ratio of share of the top 1 % in total income to that of the bottom 50 %) in 2005. ε_i is a vector of the error term assumed to be independent and identically distributed. We have applied the Huber–White robust standard errors to address the heteroscedasticity as y_i is a discrete measure. As noted earlier, our application of the standard robust OLS to a discrete dependent variable is justified on the grounds of a well-known argument where robust OLS performs well for the binary dependent variable (Angrist and Pischke, 2008).

(2) Ordered Probit

As a robustness check, we have applied the ordered probit as well, as the dependent variable is an ordered discrete variable. It has two merits: it yields separate estimation of the three cases of ΔSWB or ΔOWB - whether worse-off or just the same or better-off between 2005 and 2012. Also, the prediction of the OLS model can be outside the range between 0 and 2, though we are not using the predictions in our study. Once we convert the coefficients to marginal effects/associations evaluated at means, the estimates are fully comparable between OLS and ordered-probit. More specifically, the coefficient estimates of OLS are equivalent to the average differences of marginal effects/associations for the three cases.

In the probit model, the inverse standard normal distribution of the probability is modelled as a linear combination of the predictors. The ordered probit (OP) model is a generalization of the probit model to the case of more than two outcomes of an ordinal dependent variable (a dependent variable for which the potential values have a natural ordering, as in worse-off, just the same, and better off).

To avoid repetition, we present below an algebraic exposition of a basic ordered probit model (Greene, 2018). Let us begin with a latent variable specification.

$$y_i^* = x_i\beta' + e_i$$

y_i^* is unobserved. What we do observe is

$$y_i = 0 \text{ if } y_i^* \leq 0$$

$$y_i = 1 \text{ if } 0 < y_i^* \leq \mu$$

$$y_i = 2 \text{ if } \mu < y_i^*$$

μ is an unknown parameter to be estimated with β' . The respondents have their own preferences which depend on certain measurable factors, represented by x_i , such as age, gender, and income/expenditure, and some unmeasurable factors distributed independently of the observed factors. The essential ingredient is the mapping from an underlying, naturally ordered preference scale to a discrete ordered observed outcome in terms of the perceived change in the economic well-being, or Δ SWB. Given only three possible answers, the respondents choose the cell that most closely represents their preferences (Greene, 2018).

It is assumed that e_i is normally distributed. The mean and variance are normalised to be zero and one, respectively. With the normal distribution, the following probabilities are obtained:

$$Prob(y_i = 0) = \Phi(-\beta'x_i)$$

$$Prob(y_i = 1) = \Phi(\Phi(\mu - \beta'x_i) - \beta'x_i) - \Phi(-\beta'x_i)$$

$$Prob(y_i = 2) = 1 - \Phi(\mu - \beta'x_i)$$

In order for all probabilities to be positive, it must be $\mu > 0$. The marginal effects/associations are different from the ordered probit (OP) regression coefficients. Both the sign and magnitude of marginal effects vary with the ordered outcome. As Greene (2018) offers a detailed account of how the marginal effects are calculated, we have refrained from an exposition here. There are mainly two ways of calculating the marginal effects. The first is to derive the marginal effects for all the explanatory variables in x_i for each observation (for $i=1, \dots, 27,958$) and take the averages for each explanatory variable. The second is to compute the marginal effect corresponding to each coefficient for a particular explanatory variable by assuming that all the other explanatory variables take the mean values. We have applied both methods, but we primarily focus on the results of the latter as this is directly comparable to the OLS estimates. We carry out the Wald test which examines the linear restrictions $\beta_1 = \beta_2 = \dots = \beta_{j-1}$ or $H_0: \beta_q - \beta_1 = 0, q = 2, \dots, J - 1$.

5. Results

(a) Descriptive Statistics

The list of variables and their means and standard deviation are given in Table 1.

Table 1: List of Variables and Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
SWB	1.292	0.634	0	2
Monthly Per capita expenditure ('00)	8.442	8.23	0.04	392.73
Household per capita expenditure as fraction of highest in PSU	0.456	0.268	0.004	1
Gender				
Female	0.078	0.268	0	1
Marital Status				
Unmarried	0.008	0.091	0	1
Widowed/Divorced	0.099	0.299	0	1
Age	45.926	12.406	16	97
Household Size				
1	0.007	0.082	0	1
>5	0.374	0.484	0	1
Sector				
Urban	0.311	0.463	0	1
Education				
1-4	0.117	0.322	0	1
5-8	0.236	0.425	0	1
9-10	0.170	0.376	0	1
>10	0.129	0.335	0	1
Religion				
Muslim	0.108	0.310	0	1
Others	0.061	0.239	0	1
Caste				
Brahmin	0.050	0.217	0	1
High Caste	0.154	0.361	0	1
Dalit	0.221	0.415	0	1
Adivasi	0.081	0.273	0	1
Others	0.130	0.336	0	1
Household remittance				
Yes	0.067	0.250	0	1
Any Work				
< 240Hrs	0.111	0.314	0	1
Number of Working Adults (20-50) males in HH				
0	0.248	0.432	0	1
>=2	0.076	0.264	0	1
Number of Working Adults (20-50) Females in HH				
1	0.465	0.499	0	1
>=2	0.027	0.161	0	1
NCD				

Yes	0.087	0.281	0	1
Disability				
Yes	0.031	0.173	0	1
Radio regular Men				
Regularly	0.143	0.350	0	1
Radio regular Women				
Regularly	0.120	0.325	0	1
Newspaper regular Men				
Regularly	0.201	0.401	0	1
Newspaper regular Women				
Regularly	0.105	0.307	0	1
TV regular Men				
Regularly	0.349	0.477	0	1
TV regular Women				
Regularly	0.411	0.492	0	1
Social Networks				
1	0.187	0.390	0	1
2	0.105	0.307	0	1
>2	0.071	0.257	0	1
Theft				
Yes	0.047	0.212	0	1
Conflict in village				
Yes	0.477	0.500	0	1
Ratio of share top 1% to bottom 50%	0.465	0.119	0.226	0.858
Net State domestic Product (in '000)	23.631	9.391	7.914	63.877

Notes: (i) Number of obs = 27,958; (ii) Source: Computed from IHDS

Tables 2 and 3 report the coefficient estimates of the OLS model and the marginal effects/associations (evaluated at the means) of ordered probit respectively.¹⁴ It is noted that we have converted the coefficient estimates to the marginal effects/associations evaluated at the means in Table 3 so that the OP results in Table 3 are comparable with the OLS results in Table 2 after a simple conversion. For instance, the first row of Table 3 in the case of Δ SWB shows that ‘being a female household head’ leads to a change of the probability in the case of ‘Worse Off (0)’ by ‘-1.37%’, that for ‘Just the Same (1)’ by ‘-2.21%’ and that for ‘Better Off (2)’ by ‘3.57%’ while other covariates are fixed at their means. That is, being a female head on average leads to a 4.93% ($= -1.37\% \times 0 + (-2.21\%) \times 1 + 3.57\% \times 2$) increase in the probability of shifting to the one above category. This is comparable with the OLS estimate of “0.0486” (4.86%) in the first row of Table 2. All the estimates in Table 2 and Table 3 are highly similar after this conversion. The probabilities of moving up by one category are shown as ‘Converted ME (Marginal Effect)’ in the last columns of Table 3 for both Δ SWB and Δ OWB. We follow Angrist and Pischke’s (2008) defence of the use of OLS for the binary dependent variable. As a robustness check, we have applied an alternative method of deriving the marginal effects for the ordered probit model by averaging marginal effects for all the observations (Appendix Table A2). The converted marginal effects are highly similar to those

¹⁴All marginal effects are significant at the $\leq 10\%$ level unless stated otherwise.

in Table 3 and the coefficient estimates in Table 2 (OLS). These three sets of results strongly corroborate the robustness of OLS in case it is applied to the discrete dependent variable.

Below we discuss the results of these tables together with a particular focus on distinct differences of the covariates of Δ SWB and Δ OWB. In Table 2 (OLS), although the null of homoscedasticity is not rejected, we report robust OLS results in Table 2 given that the dependent variable is discrete for both Δ SWB and Δ OWB. The overall explanatory power of the specification is validated by the F test in both cases. In Table 3 the overall validation of the OP specification is confirmed by the Wald test. As in the multiple regression analysis, the components of well-being are for 2012 and *most* covariates for 2005.

Table 2 Multiple Regression Analysis of Subjective and Objective Well-Being and Its Covariates

VARIABLES	Δ SWB		Δ OWB	
	Coefficient	Robust Std. Err	Coefficient	Robust Std. Err
(1) Individual and Household Characteristics and the location of households (2005)				
Gender				
Female	0.0486	(0.0328)	-0.0315	(0.0269)
Marital Status				
Unmarried	-0.0315	(0.0446)	0.0371	(0.0501)
Widowed/Divorced	-0.0145	(0.0292)	0.0356	(0.0250)
Age ³	0.00535**	(0.00251)	0.0184***	(0.00305)
Age*Age	-5.66e-05**	(2.60e-05)	-0.000186***	(3.29e-05)
Household Size				
1 ²	-0.115* ¹	(0.0604)	-0.0793	(0.0613)
>5	0.0438***	(0.0121)	0.0410***	(0.0105)
Sector				
Urban	0.0464***	(0.0118)	0.0728***	(0.0106)
Education				
1-4	0.0480***	(0.0181)	-0.0415***	(0.0159)
5-8	0.0923***	(0.0145)	0.0552***	(0.0127)
9-10	0.146***	(0.0172)	0.0836***	(0.0145)
>10	0.145***	(0.0198)	0.202***	(0.0176)
Religion				
Muslim	0.0552	(0.0386)	-0.130***	(0.0353)
Others	0.118***	(0.0267)	0.00638	(0.0237)
Caste				
Brahmin	-0.0114	(0.0226)	0.0187	(0.0213)
High Caste	-0.0153	(0.0155)	0.0266*	(0.0137)
Dalit	-0.0664***	(0.0154)	-0.0678***	(0.0130)
Adivasi	0.0391*	(0.0207)	-0.0359*	(0.0201)
Others	-0.0830**	(0.0368)	0.0847**	(0.0337)
Household remittance				
Yes	0.0673***	(0.0261)	-0.0345	(0.0219)
(2) Employment (2005)				
Any Work				
< 240Hrs	0.0305*	(0.0185)	0.0290*	(0.0164)
Number of Working Adults (20-50) males in HH				
0	-0.0874***	(0.0150)	0.0481***	(0.0127)
>=2	0.0510***	(0.0187)	-0.142***	(0.0160)
Number of Working Adults (20-50) Females in HH				
1	0.00927	(0.0119)	0.00308	(0.0103)
>=2	0.0367	(0.0298)	-0.102***	(0.0272)
(3) Health & Disability (2005)				
NCD				
Yes	-0.0371*	(0.0204)	0.0239	(0.0163)
Disability				
Yes	-0.0743***	(0.0284)	-0.0347	(0.0229)
(4) Media Access (2005)				
Radio regular Men				
Regularly	0.0954***	(0.0252)	-0.0109	(0.0226)
Radio regular Women				
Regularly	-0.0508*	(0.0278)	0.00732	(0.0239)
Newspaper regular Men				
Regularly	0.0565***	(0.0186)	0.0211	(0.0151)

<i>Newspaper regular Women</i>				
<i>Regularly</i>	<i>0.0404**</i>	<i>(0.0201)</i>	<i>0.108***</i>	<i>(0.0177)</i>
TV regular Men				
<i>Regularly</i>	-0.00981	(0.0175)	-0.00216	(0.0159)
TV regular Women				
<i>Regularly</i>	<i>0.0563***</i>	<i>(0.0176)</i>	<i>0.0314**</i>	<i>(0.0157)</i>
(5) Other Variables (2005)				
Social Networks				
1	0.00994	(0.0149)	-0.0152	(0.0127)
2	-0.0469***	(0.0175)	-0.0120	(0.0148)
>2	0.00267	(0.0182)	0.00385	(0.0173)
Theft				
Yes	-0.0269	(0.0255)	-0.0643***	(0.0212)
Conflict in village				
Yes	0.0163	(0.0105)	-0.0373***	(0.00929)
(6) Initial Economic Conditions (2005)				
Monthly Per capita expenditure ('00)	0.00449***	(0.00117)	-0.0463***	(0.00269)
Square of Monthly Per capita expenditure ('00)	-2.38e-05**	(1.02e-05)	0.000204***	(3.89e-05)
Household per capita expenditure as fraction of highest in PSU	0.0685***	(0.0258)	-0.249***	(0.0252)
Ratio of share top 1% to bottom 50%	0.261***	(0.0364)	-0.0670**	(0.0332)
Net State domestic Product (in '000)	<i>0.00738***</i>	<i>(0.00201)</i>	<i>0.0120***</i>	<i>(0.00176)</i>
Net State domestic Product (in '000) Square	<i>-7.77e-05**</i>	<i>(3.09e-05)</i>	<i>-0.000133***</i>	<i>(2.68e-05)</i>
Constant	0.736	(0.0639)	1.124	(0.0776)
Observations	27,958		27,945	
R-squared	0.063		0.223	

Notes: 1. Robust Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.;

2. The results where the coefficient estimates are statistically significant for Δ SWB and Δ OWB with an opposite sign, or only significant for Δ SWB are highlighted in bold;

3. The results where the coefficient estimates are statistically significant for Δ SWB and Δ OWB with a same sign are highlighted in Italics.

We will first focus on the coefficient estimates which show similar patterns in the results, that is, the common covariates of Δ SWB and Δ OWB (for which the results are given in italics in Tables 2 and 3). We will then discuss the explanatory variables which are statistically significant and show opposite signs for Δ SWB and Δ OWB, or significant only for Δ SWB in Table 2 and Table 3 to identify the correlates specific to Δ SWB (indicated in bold in Tables). Finally, we will selectively mention a few other coefficient estimates, that is, those which are statistically significant (or not significant) for either Δ SWB or Δ OWB.¹⁵ Only select cases are highlighted below due to the space constraint.

¹⁵Throughout the study, we use the terms, such as associations or marginal effects, given that Δ SWB or Δ OWB in 2005-2012 is regressed on the variables in 2005 following the convention, for instance, of the empirical studies on macroeconomic growth using cross-country data. We note that for Δ SWB, though it is based on the survey data in 2012, and the reference point is 2005, a few variables on economic status on the right hand side are not strictly exogenous, but the reverse causality is reasonably rejected. Δ OWB can also be influenced by the initial economic status, but, as noted earlier, it is crucial for the initial economic status to be controlled for in order to interpret Δ OWB as the well-being change after controlling for the initial differences in OWB. The possibility of reverse causality is ruled out for other covariates. We have avoided using an IV model as it is highly sensitive to the choice of an instrument, which would make the comparisons of the estimates for Δ SWB and Δ OWB difficult.

Table 3: Marginal Effects/Associations of Covariates with Components of Subjective Well-Being (evaluated at the means)

VARIABLES	Δ SWB				Δ OWB			
	Worse-off dy/dx (Std. Error)	Just the Same dy/dx (Std. Error)	Better-off dy/dx (Std. Error)	Converted ME ⁴	Worse-off dy/dx (Std. Error)	Just the Same dy/dx (Std. Error)	Better-off dy/dx (Std. Error)	Converted ME ⁴
(1) Individual and Household Characteristics (2005) and the location of households								
Gender								
Female ²	-0.0137** (0.00630)	-0.0221** (0.01120)	0.0357** (0.01750)	0.0493	0.00902 (0.00549)	0.0212* (0.01170)	-0.0302* (0.01720)	-0.0392
Marital Status								
Unmarried	0.00988 (0.01310)	0.0133 (0.01620)	-0.0232 (0.02930)	-0.0331	-0.00787 (0.00752)	-0.0222 (0.02350)	0.03 (0.03100)	0.0378
Widowed/Divorced	0.00467 (0.00638)	0.00657 (0.00868)	-0.0112 (0.01510)	-0.01583	-0.00860** (0.00386)	-0.0245** (0.01200)	0.0331** (0.01590)	0.0417
Age ³	-0.00156*** (0.00057)	-0.00227*** (0.00083)	0.00382*** (0.00140)	0.00537	-0.00416*** (0.00040)	-0.0108*** (0.00104)	0.0150*** (0.00142)	0.0192
Age*Age	.0000164*** (0.00001)	.000024*** (0.00001)	-.00004*** (0.00001)	-0.00006	4.21e-05*** (0.00000)	0.000109*** (0.00001)	-0.000151*** (0.00001)	-0.00019
Household Size								
1	0.0381** (0.01800)	0.0370*** (0.01210)	-0.0752** (0.03010)	-0.1134	0.0243* (0.01330)	0.0437** (0.01770)	-0.0681** (0.03090)	-0.0925
>5	-0.0127*** (0.00242)	-0.0190*** (0.00375)	0.0317*** (0.00616)	0.0444	-0.00843*** (0.00168)	-0.0225*** (0.00463)	0.0310*** (0.00630)	0.0395
Sector								
Urban	-0.0135*** (0.00274)	-0.0205*** (0.00437)	0.0340*** (0.00709)	0.0475	-0.0167*** (0.00183)	-0.0471*** (0.00552)	0.0638*** (0.00729)	0.0805
Education								
1-4	-0.0149*** (0.00404)	-0.0168*** (0.00481)	0.0317*** (0.00883)	0.0466	0.0123*** (0.00337)	0.0201*** (0.00518)	-0.0324*** (0.00852)	-0.0447
5-8	-0.0277*** (0.00323)	-0.0351*** (0.00419)	0.0628*** (0.00733)	0.0905	-0.0140*** (0.00229)	-0.0317*** (0.00524)	0.0457*** (0.00749)	0.0597
9-10	-0.0421*** (0.00351)	-0.0615*** (0.00558)	0.104*** (0.00892)	0.1465	-0.0200*** (0.00253)	-0.0494*** (0.00656)	0.0694*** (0.00902)	0.0894
>10	-0.0420*** (0.00410)	-0.0613*** (0.00692)	0.103*** (0.01090)	0.1447	-0.0401*** (0.00240)	-0.139*** (0.00928)	0.179*** (0.01130)	0.219
Religion								
Muslim	-0.0153* (0.00868)	-0.0238 (0.01490)	0.0390* (0.02360)	0.0542	0.0371*** (0.00921)	0.0680*** (0.01180)	-0.105*** (0.02090)	-0.1420
Others	-0.0313*** (0.00481)	-0.0571*** (0.01050)	0.0884*** (0.01530)	0.1197	-0.00221 (0.00381)	-0.0064 (0.01130)	0.00861 (0.01510)	0.01082
Caste								
Brahmin	0.00339 (0.00521)	0.00542 (0.00813)	-0.00881 (0.01330)	-0.0122	-0.00587* (0.00341)	-0.0165 (0.01020)	0.0224* (0.01360)	0.0283
High Caste	0.0044 (0.00328)	0.00697 (0.00512)	-0.0114 (0.00840)	-0.01583	-0.00656*** (0.00218)	-0.0187*** (0.00642)	0.0252*** (0.00860)	0.0317
Dalit	0.0194*** (0.00310)	0.0270*** (0.00420)	-0.0464*** (0.00725)	-0.0658	0.0175*** (0.00242)	0.0367*** (0.00487)	-0.0542*** (0.00721)	-0.0717
Adivasi	-0.0102*** (0.00388)	-0.0184** (0.00738)	0.0285** (0.01120)	0.0386	0.0101*** (0.00350)	0.0231*** (0.00745)	-0.0332*** (0.01090)	-0.0433
Others	0.0250** (0.01020)	0.0333*** (0.01160)	-0.0584*** (0.02180)	-0.0835	-0.0175*** (0.00475)	-0.0587*** (0.01870)	0.0762*** (0.02340)	0.0937
Household remittance								
Yes	-0.0185*** (0.00386)	-0.0312*** (0.00750)	0.0497*** (0.01130)	0.0682	0.00725** (0.00342)	0.0174** (0.00753)	-0.0246** (0.01090)	-0.0318
(2) Employment (2005)								
Any Work < 240Hrs	-0.00823** (0.00370)	-0.0127** (0.00602)	0.0209** (0.00971)	0.0291	-0.00606** (0.00253)	-0.0168** (0.00743)	0.0228** (0.00995)	0.0288
Number of Working Adults								

(20-50) males in HH								
0	0.0273*** (0.00348)	0.0344*** (0.00393)	-0.0617*** (0.00736)	-0.089	-0.0104*** (0.00191)	-0.0309*** (0.00601)	0.0414*** (0.00790)	0.0519
>=2	-0.0135*** (0.00371)	-0.0244*** (0.00734)	0.0379*** (0.01100)	0.0514	0.0412*** (0.00459)	0.0664*** (0.00499)	-0.108*** (0.00937)	-0.1496
Number of Working Adults (20-50) Females in HH								
1	-0.00243 (0.00246)	-0.00352 (0.00356)	0.00595 (0.00602)	0.00838	-0.000887 (0.00169)	-0.00234 (0.00446)	0.00323 (0.00615)	0.00412
>=2	-0.0101 (0.00658)	-0.0157 (0.01100)	0.0259 (0.01760)	0.0361	0.0285*** (0.00675)	0.0531*** (0.00921)	-0.0816*** (0.01590)	-0.1101
(3) Health & Disability (2005)								
NCD								
Yes	0.0116*** (0.00428)	0.0155*** (0.00525)	-0.0271*** (0.00952)	-0.0387	-0.00614** (0.00253)	-0.0171** (0.00752)	0.0232** (0.01000)	0.0293
<i>Disability</i>								
Yes	0.0239*** (0.00755)	0.0287*** (0.00739)	-0.0527*** (0.01490)	-0.0767	0.00803 (0.00496)	0.0189* (0.01060)	-0.0270* (0.01560)	-0.0351
(4) Media Access								
Radio regular Men								
Regularly	-0.0259*** (0.00425)	-0.0445*** (0.00861)	0.0704*** (0.01280)	0.0963	0.00275 (0.00359)	0.00695 (0.00884)	-0.0097 (0.01240)	-0.01245
Radio regular Women								
Regularly	0.0162*** (0.00600)	0.0211*** (0.00702)	-0.0373*** (0.01300)	-0.0535	-0.0018 (0.00364)	-0.00475 (0.00980)	0.00655 (0.01340)	0.00835
<i>Newspaper regular Men</i>								
Regularly	-0.0167*** (0.00361)	-0.0265*** (0.00625)	0.0432*** (0.00984)	0.0599	-0.00564** (0.00257)	-0.0153** (0.00727)	0.0209** (0.00983)	0.0265
<i>Newspaper regular Women</i>								
Regularly	-0.0136*** (0.00440)	-0.0218*** (0.00773)	0.0354*** (0.01210)	0.0490	-0.0229*** (0.00238)	-0.0771*** (0.01010)	0.1000*** (0.01240)	0.1229
TV regular Men								
Regularly	0.00286 (0.00418)	0.00412 (0.00597)	-0.00698 (0.01020)	-0.00984	0.000896 (0.00287)	0.00232 (0.00740)	-0.00321 (0.01030)	-0.0041
TV regular Women								
Regularly	-0.0160*** (0.00401)	-0.0238*** (0.00609)	0.0398*** (0.01010)	0.0558	-0.00760*** (0.00279)	-0.0200*** (0.00745)	0.0276*** (0.01020)	0.0352
(5) Other Variables (2005)								
Social Networks								
1	-0.00294 (0.00281)	-0.00446 (0.00431)	0.0074 (0.00712)	0.01034	0.00375* (0.00206)	0.00948* (0.00507)	-0.0132* (0.00713)	-0.01692
2	0.0146*** (0.00400)	0.0190*** (0.00475)	-0.0336*** (0.00874)	-0.0482	0.00236 (0.00257)	0.00608 (0.00646)	-0.00844 (0.00903)	-0.0108
>2	-0.000267 (0.00436)	-0.000394 (0.00646)	0.000661 (0.01080)	0.000928	-0.000733 (0.00298)	-0.00197 (0.00806)	0.0027 (0.01100)	0.00343
Theft								
Yes	0.00797 (0.00544)	0.0109 (0.00695)	-0.0188 (0.01240)	-0.0267	0.0163*** (0.00433)	0.0353*** (0.00774)	-0.0516*** (0.01200)	-0.0679
Conflict in village								
Yes	-0.00490** (0.00221)	-0.00713** (0.00324)	0.0120** (0.00545)	0.01687	0.00877*** (0.00157)	0.0226*** (0.00397)	-0.0314*** (0.00552)	-0.0402
(6) Initial Economic Conditions (2005)								
Monthly Per capita expenditure								
	-0.00126*** (0.00023)	-0.00183*** (0.00034)	0.00309*** (0.00056)	0.00435	0.0103*** (0.00027)	0.0267*** (0.00056)	-0.0370*** (0.00064)	-0.0473
Household per capita expenditure as fraction of highest in PSU								
	-0.0203*** (0.00481)	-0.0294*** (0.00700)	0.0497*** (0.01180)	0.0700	0.0509*** (0.00345)	0.132*** (0.00881)	-0.183*** (0.01200)	-0.2340
Ratio of share top 1% to bottom 50%								
	-0.0790*** (0.00983)	-0.115*** (0.01400)	0.194*** (0.02370)	0.273	0.0146** (0.00661)	0.0379** (0.01730)	-0.0524** (0.02390)	-0.0669
<i>Net State domestic Product</i>								
	-0.00107***	-0.00155***	0.00262***	0.00369	-0.00132***	-0.00343***	0.00475***	0.00607

(in '000)

(0.00014)

(0.00021)

(0.00035)

(0.00010)

(0.00026)

(0.00036)

Notes: 1. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. 2.;

2. The results where the coefficient estimates are statistically significant for Δ SWB and Δ OWB with an opposite sign, or only significant for Δ SWB are highlighted in bold. Significance judged by a subset of three marginal effects/associations at the 10% level;

3. The results where the coefficient estimates are statistically significant for Δ SWB and Δ OWB with the same sign are highlighted in italics. Significance judged by a subset of three marginal effects/associations at the 10% level;

4. Average ME (marginal effects) show the additional probability that a household shifts to the category (0,1,2) one above and this is equivalent to the OLS estimate in Table 2. This is equal to '0*ME for "0" + 1*ME for "1" + 2*ME for "2"'.

(a) Common Covariates of Δ SWB and Δ OWB

Age with a Non-linear effect

The coefficient of age is positive and significant while that of square of age is negative and significant for both Δ SWB and Δ OWB in OLS (Table 2). This is consistent with the ordered probit results where age is negatively associated with being worse-off and just the same and positively with being better-off for Δ SWB and Δ OWB (Table 3). Households with an old head tend to feel their economic well-being has improved both subjectively and objectively, with the association attenuating as the head gets older. If a head gets one year older, the household is more likely to move to one above category of Δ SWB (or Δ OWB) by 0.54% (or 1.84%) on average, other things being equal (Table 2). This is consistent with marginal effect/association estimates in Table 3 (0.537% (or 1.92%)). The association of age with the improvement in well-being is thus much larger for OWB than for SWB.

Household Size

Living arrangements can be associated with perceived change in well-being. These are captured through the household size. As households with 2-5 persons are the largest group, this group is omitted. So relative to this group, those living alone are associated with lower Δ SWB and Δ OWB and those belonging to households with more than 5 members express a higher Δ SWB and Δ OWB in OLS (Table 2). Given the weak social security system, and weakening family ties, it is not surprising that living alone is closely associated with lower well-being and belonging to large households (> 5 members) with higher Δ SWB or Δ OWB. In addition to economies of scale in household consumption expenditure, the joy of living with children, and perhaps better family support during contingencies (e.g., accident and serious illness) influences the results on Δ SWB and Δ OWB. So 'insurance' against misfortunes and other contingencies underlie this result. For instance, compared with the default household size (2-5), a larger household (>5) tends to see the probability of perceiving a better economic well-being (by one category) increase by 4.38% for Δ SWB and 4.10% for Δ OWB. Consistent results are found in Table 3 in terms of the sign and magnitude of marginal effects/associations (4.44% for Δ SWB and 3.96% for Δ OWB). In Table 3, for both Δ SWB and Δ OWB, relative to the omitted group of households with 2-5 members, those living alone are more likely to be worse-off and just the same and less likely to be better-off, while those living in households with > 5 members are less likely to be worse-off and just the same and more likely to be better-off. Not only the signs but also the magnitude of the associations are similar for both Δ SWB and Δ OWB.

Living in Urban Areas

It is interesting to observe that living in urban areas is associated with a higher Δ SWB and Δ OWB after controlling for schooling, employment and health factors as well as state-level income (Tables 2 and 3). That could reflect better quality of schooling, not captured by years of schooling, higher labour productivity, better health care, or more developed transportation and telecommunication infrastructure in urban areas. Those living in urban areas tend to be 4.64% (7.28%) more likely to move up by one category in Δ SWB (Δ OWB) in OLS (Table 2). Similar estimates (4.75% for Δ SWB and 8.05% for Δ OWB) are obtained from the ordered probit (Table 3).

Schooling

Schooling of adults endows them with skills and expertise to engage in remunerative employment, adds to their awareness of entitlements and obligations, and of prospects for their self-advancement. As illiterates are the largest group, they are omitted. Relative to this group, those with primary schooling (1-4 years of schooling) have significantly higher Δ SWB (4.8% more likely to move up to the above category), but the estimate for this category is negative and significant for Δ OWB. Those with successively higher levels of schooling have still higher likelihood of improvement in SWB (OWB): (9.23% (5.52%)) for 5-8 years/middle level, 14.6% (8.36%) for 8-9 years/pre-matriculation, and 14.5% (20.2%) for 10 years or more/matriculation and above) (Table 2). It is sometimes questioned whether the effect of schooling is exaggerated because it compounds both direct and indirect effects through better health (Dolan et al. 2008). This is not ruled out but since we control for the effects of health indicators, our estimate of the association between well-being and schooling is net of this indirect effect. The marginal correlates of education shown in Table 3 are similar to the coefficient estimates in Table 2. Overall, schooling, particularly secondary or higher level, is associated with significant improvements in both subjective and objective well-being.

Macroeconomic Environment –Higher Net State domestic Product

To capture specific aspects of the macro-economic environment, we have examined the associations between change in well-being and state affluence measured in terms of net state domestic product per capita and its square, and between change in well-being and extreme income inequality using a measure akin to Piketty's (2014) measure. We have computed the ratio of share of the income of the top 1% in total income to that of the bottom 50%. As expected, Δ SWB as well as Δ OWB are positively and significantly associated with state affluence (NSDP), while negatively and significantly with the squared term of NSDP (Table 2). It follows therefore that SWB (OWB) rises (decreases) in association with state affluence but at a diminishing rate. One conjecture is that state affluence is linked to better infrastructure (e.g. transport, health, telecommunications) leading to improvement in SWB. In such a context, well-being is likely to be higher in more affluent states. However, the diminution of this association at higher levels of affluence suggests that provision of public goods does not grow apace with state affluence because of special interest groups pursuing

their own agenda and diverting public resources to their own interests. Table 2 and Table 3 have similar results.

(b) Specific Covariates of Δ SWB

While the correlates of Δ SWB and those of Δ OWB are generally similar and consistent, there are some factors associated with only Δ SWB as delineated below.

Being a Female Head of Household

We find by ordered probit model that women (i.e. female heads of household) are less likely to be worse-off and just the same but more likely to be better-off (Δ SWB) with significant marginal effects/associations with a higher probability (4.93% on average) of moving up by one category (Table 3). This is surprising, especially in light of robust evidence of discrimination against women in allocation of food and medical resources (e.g., Kynch and Sen, 1983). However, the signs are reversed and the corresponding probability is -3.92 (Table 3). While the signs are the same, the coefficient estimates are not significant when OLS is applied to Δ SWB or Δ OWB (Table 2).

Religion

Another important variable is religion. As Hindus are the largest group, it is omitted. Relative to this group, 'Muslims' and 'Others' (including those belonging to Jainism and Buddhism) tend to have higher Δ SWB, while Muslims tend to have lower Δ OWB (Table 3). Three observations are pertinent: Hinduism is different from many religions because it has no specific beliefs that everyone must agree with to be considered a Hindu. Instead, it is inclusive of many different, sometimes contradictory, beliefs. For example, hidden within Hinduism are both theistic and semi-theistic schools or philosophies. Moreover, the caste system is integral to Hinduism. As the former is divisive and exclusionary, Hindus as a religious group are likely to have lower Δ SWB. The third observation is a pervasive view that belief in God helps imbibe values of forbearance, integrity and compassion (Dolan et al. 2008 and Deaton, 2011). These values are reinforced by, say, regular church attendance or performance of rituals or, more broadly, religiosity (Helliwell, 2003). It is noted that Muslims or 'Others' tend to perceive improved subjective well-being without experiencing corresponding improvement in objective-well-being. In particular, the lower Δ OWB among Muslims reflects that they are on average more deprived than Hindus.

Caste

The caste hierarchy reveals a somewhat intriguing pattern. As OBCs are the largest group, it is omitted. Relative to this group, the highest ranking *Brahmins* do not display a significantly higher well-being (either Δ SWB or Δ OWB), while those belonging to High Castes have a significantly higher level of well-being (only Δ OWB, Table 2). *Dalits*/SCs, who are on the lower rung, are, however, associated with significantly lower Δ SWB and Δ OWB in Table 2 (based on robust regression). However, Table 3 (based on OP) shows that their probability of moving up rises in both Δ SWB and Δ OWB by 6.58% (7.17%). *Adivasis*/STs, who are on the lowest rung, display a significantly higher well-being for Δ SWB (by 3.91%), but the sign is

reversed for ΔOWB (-3.56%) as shown in Table 2, with similar estimates (3.86%; -4.33%) of marginal correlates as given in Table 3. The residual category of ‘Others’ shows a significantly lower well-being for ΔSWB with the opposite sign for ΔOWB . The fact that there is little consonance between caste hierarchy and well-being - particularly SWB - suggests that the latter has little to do with poverty. To illustrate, while *Dalits* and *Adivasis* are most likely to be poor, their subjective well-being differs. In contrast, while Brahmins are least likely to be poor, their subjective well-being is not significantly higher than OBCs’.¹⁶

Employment

We also include the variables on whether employed as well as the duration of employment. The first variable shows the number of adult male and female workers in the household, respectively. The number of workers in the age-group 20-50 years is classified into the three categories, ‘0’, ‘1’, ‘2 or more’. As households with 1 adult male worker are the largest group, this is omitted. Relative to this group, households without any male worker are associated with lower ΔSWB and those with ‘2 or more’ adult male workers with higher ΔSWB , but the signs are reversed for ΔOWB (Tables 2 and 3). Since households without any adult female worker are the largest group, this is the omitted group. Relative to these households, those with ‘2 or more’ adult female workers are associated with lower ΔOWB , but it is not significant in the case of ΔSWB (Tables 2 and 3). The coefficient/marginal effect of households with a single worker is positive but not significant (Tables 2 and 3). Duration of employment is not sufficiently disaggregated for meaningful inferences. There are just two categories: ‘annual hours worked ≤ 240 hours’ and ‘ > 240 hours’. The first category lumps together those who hardly any work with those who work 20 hours or less in a month. The difficulty is that the threshold for the leisure-work choice cannot be identified. As households with workers exceeding 240 hours are more numerous, these are omitted. Relative to this group, those working ≤ 240 hours display higher ΔSWB and ΔOWB . This is counter-intuitive.

NCDs

Change in SWB and ill-health or disabilities are likely to be negatively associated. We use two relevant indicators: one is non-communicable diseases (NCDs) and the second is disabilities/limitations of ADL. Their separate roles suggest that NCDs or disabilities are significantly associated with lower well-being, relative to those not suffering from either, respectively. The reverse causality where high SWB lowers prospects of ill-health is minimised as ill-health (in 2005) is prior to well-being (in 2012). Though our SWB measure is the perceived change of economic well-being in 2005-2012, it is ruled out that the perception in 2012 influences ill-health in 2005. In any case, as observed by Kohler et al. (2017), the causality from health to well-being is more likely.

If an individual in a household suffers from any NCD, the household is more likely to be worse-off and just the same and less likely to be better-off, relative to those not suffering from any NCD only for ΔSWB , not ΔOWB (Tables 2 and 3). Similar results are obtained for

¹⁶For a definitive assessment based on rural samples from select north-Indian states, see Spears (2016).

individuals suffering from any disability only for Δ SWB, not for Δ OWB (Table 2). More specifically, households with disabled are more likely to be worse-off and just the same and less likely to be better-off in terms of SWB (Table 3).

Mass-media

The association between SWB and exposure to mass-media has not received much attention. IHDS allows us to examine this relationship in detail. The mass media include radio, newspapers and TV. Exposure of men and women is classified into ‘never’, ‘sometimes’ and ‘regularly’. By combining ‘never’ and ‘sometimes’, we are able to focus on regular exposure of men and women separately and their associations with Δ SWB and Δ OWB. For men, well-being and regular exposure to radio and newspapers but not TV are positively related, implying that they perceive a positive change in SWB. These factors are not significantly associated with Δ OWB (Tables 2 and 3). In sharp contrast, women reading newspapers and watching TV experience greater improvement in both subjective and objective well-being (Tables 2 and 3). However, regular listening to radio by women is not associated with Δ SWB or Δ OWB. Overall, the results corroborate the importance of exposure to mass-media - particularly for women in improving SWB.

Initial Consumption

The relationship between change in subjective well-being and income remains controversial with some studies reporting a positive relationship and others a varying relationship, depending on the region (Kahneman and Deaton, 2010). Following Deaton (2011), we use the log of per capita expenditure as a proxy for the log of per capita income. Our results show a positive and significant relation between Δ SWB and initial expenditure, implying the higher the initial expenditure, the higher is change in SWB, with the probability of moving up by one category as 0.45% (Table 2). The corresponding estimate is 0.44% in Table 3. However, the sign is reversed as higher initial expenditure reduces the growth rate of per capita consumption.¹⁷

(c) Other Covariates of Δ SWB and Δ OWB

Remittances

As remittances include international transfers mostly from non-resident relatives and acquaintances, they are in a large number of cases an important supplement to household income/expenditure (Imai et al. 2014). As expected, these are associated with higher Δ SWB, but not Δ OWB (Table 2). Households receiving remittances are less likely to be worse-off and just the same and more likely to be better-off, relative to those who do not in the case of Δ SWB, but not in the case of Δ OWB (Table 3).

¹⁷ Admittedly, the variables on the initial per capita household expenditure are likely to be endogenous, but we include them in estimating Δ OBW to facilitate the comparison of the results for Δ SWB and Δ OWB. Omitting the initial expenditure, its square and its share in PSU from the equation estimating Δ OBW does not significantly affect the estimates of other coefficients except that estimates for schooling in the top two categories become statistically non-significant.

Other Covariates

Marital status is found to be closely linked to SWB-in particular, the married are found to enjoy higher SWB (Helliwell, 2003). IHDS allows us to disaggregate marital status into: married, unmarried, separated and divorced. As ‘the married’ is the largest category, this is omitted. Neither unmarried nor widowed and divorced show significant differences in terms of Δ SWB or Δ OWB (Tables 2 and 3). It is important to bear in mind that married women do not enjoy improvement in their subjective or objective well-being. This may seem counter-intuitive, but is not because many of the married women are subject to intimate partner violence including marital ‘rape’.

There are frequent conflicts in the local neighbourhood, some minor and others not minor and on a larger scale. Inter-caste conflicts (e.g., rape of a *Dalit* woman), disputes over ownership of land or property, and communal riots vary in scale and intensity. Relative to no conflict, conflicts are associated with a significantly lower well-being changes for Δ OWB (Tables 2 and 3). For Δ SWB conflict is statistically non-significant in Table 2 but positive and significant in Table 3. The latter seems counter-intuitive, as even minor conflicts involve loss of property, loss of income and violence. Another variable of interest is crimes. IHDS is confined to thefts. Theft is not significantly associated with Δ SWB but is significantly and negatively associated with Δ OWB (Tables 2 and 3). A definitive result would have been obtained if the value of stolen items were given.

Participation in social networks such as self-help groups, women’s associations, and producers’ associations is potentially beneficial during illness, loss of livelihood, and other contingencies such as accidents and the death of the primary bread winner (Dolan et al. 2008; Birkman et al. 2012; Deaton 2018). However, in the absence of information on density of these networks and people’s frequency of participation, their importance in enhancing SWB may be inconclusive. There are four categories of participation in networks: 0, 1, 2 and > 2 . As households not affiliated to any social network are the largest group, it is omitted. So relative to this group, the only significant positive association is between change in Δ SWB and Δ OWB and households belonging to 2 networks (Table 2). However, in Table 3 the signs are reversed which is counter-intuitive.

Piketty (2014) drew attention to growth in developed countries over a long period leading to a rise in income inequality. In another study, Chancel and Piketty (2017) point to a rise in income inequality in India since 1922. The important contribution of these studies is to shift the attention away from conventional measures of income inequality (say, the Gini coefficient) to income disparity between the top 1 % and the bottom 50 %. We find that the association between well-being and the Piketty measure of extreme income inequality is positive and significant. This suggests that the higher the ratio of share of the top 1% in total income to that of the bottom 50 %, the higher is Δ SWB. This is counter-intuitive as the income accumulation of multi-millionaires is driven by speculative gains in the stock market and real estate.

6. Discussion and Policy Challenges

Although there is abundant literature on SWB, there is virtually none for India¹⁸. Growing recognition of the validity and accuracy of measures of SWB vis-à-vis objective measure of well-being (based on real income) underlies the rapid growth of literature on SWB in recent decades. As prominent studies in the SWB literature, such as Deaton (2018), Kahneman and Krueger (2006), Kahneman and Deaton (2010), Blanchflower and Oswald, (2007), and Diener et al. (2013), among others, have emphatically endorsed the case for SWB both conceptually and empirically, and drawn attention to its policy importance, we were motivated to examine the relationship between SWB and its covariates in the Indian context. However, our measure of SWB relates to changes and is confined to perceived economic well-being. Hence, arguably our analysis is both more challenging and more innovative. Furthermore, we identified the household-level covariates of the perceived changes in SWB in comparison with the changes in OWB, objective well-being, in the same period. To our knowledge, this has not been studied in the SWB literature.

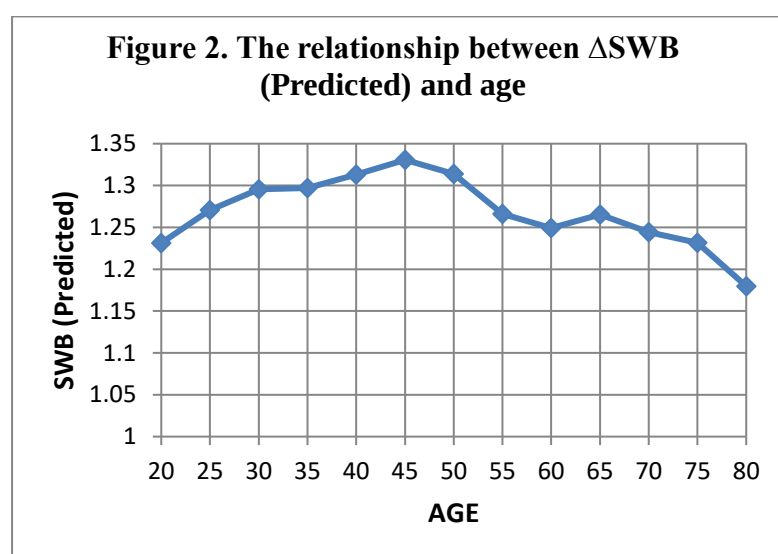
IHDS contains a measure of the perceived change of economic well-being at the household level compared with 7 years ago. Admittedly narrow, our SWB measure has advantages over the standard scale measures in econometric modelling because of its simplicity (e.g. being less subject to heterogeneity among different individuals in the level of their aspirations, or perception/interpretation of the survey questions on the scale of happiness). The measure is associated with income and related measures but also with other individual characteristics such as age, caste, religion, living arrangements, schooling, media exposure and state affluence and extreme income inequality. Hence this measure of well-being captures more than what is anticipated or implied by conventional measures of economic well-being. This imparts policy significance to analysis such as ours. As a broad statement, our discussion of the significance of the results highlights the importance of the context, model specifications and their implementation.

First, common factors associated with both Δ SWB and Δ OWB have been identified. We have found that larger households with an old (70 years and above) and highly schooled head, located in urban areas or affluent states in 2005 tended to experience further improvement in both SWB and OWB in 2005-2012.

From a life-cycle perspective, the relationship between SWB and age has received considerable attention. Some have reported a U-shaped SWB-age curve in Britain and USA (e.g., Blanchflower and Oswald, 2007), and others (notably, Deaton, 2018) report a U-shaped relationship in English speaking countries, and absence of an age pattern in low-income countries in Africa and South Asia. A few studies have reported an inverted U-shape in the USA (e.g., Easterlin, 2006). Our multiple regression analysis confirms a non-linear relationship between Δ SWB and age, with a positive coefficient of age and a negative coefficient of square of age. A similar relation is found for the relationship between Δ OWB and age. A graphical illustration of the relationship between the predicted Δ SWB and age is

¹⁸With the exception of Spears (2016) which is confined to rural areas in select north-Indian states.

shown in Figure 2, which is based on OLS predictions. This figure suggests a complex relationship between Δ SWB and age. There is a slight rise in Δ SWB among 15-20 years old, with a large flat segment between 20 and just under 45 years old, a sharp drop between the latter and 53 years old, and a slower decline for the older up to 58 years and then a rise up to 63 years and a fall among the oldest. A broad brush explanation is that in India most of the age groups have experienced a steady rise in SWB as the average value is above 1.15. That is, there were more households on average whose household head reported perceived improvement in SWB than those whose head reported perceived deteriorations in SWB, controlling for other covariates. Overall, a household with an older household head experienced a higher level in Δ SWB, but the magnitude of increase started to fall after the peak of 45 years of age.



Source: Authors' computations

On schooling, relative to illiterates, those with secondary school or higher levels of schooling are associated with significantly higher Δ SWB and Δ OWB. While higher levels of schooling open avenues of more remunerative and secure employment, no less important are the non-economic reasons: better awareness of rights, entitlements and obligations. Schooling is in fact key to women's empowerment. As Kabeer (2005) observes, better-schooled women in Tamil Nadu scored higher on a composite index measuring their access to, and control over resources, as well as their role in economic decision-making. Both OLS and OP results show consistent results.

Urbanisation has grown rapidly with globalisation in developing countries in recent decades. While there are distinct signs of rapid growth of prosperity, massive rural-urban migration has also resulted in rapid growth of slums. 1 out of 4 urban residents live in slums. However, compared to rural areas, public provision of education, medical care, and basic amenities such as electricity, drinking water and drainage system is much better. Hence it is not surprising that those living in urban areas are more likely to have higher Δ SWB and Δ OWB, relative to rural areas.

The macro context is significant too. Two aspects are considered. One is state affluence measured through NSDP per capita and its square. The second is the Piketty measure of extreme income inequality. As expected, the relationship between ΔSWB or ΔOWB and state affluence is positive and significant. We have also found that the relationship between ΔSWB or ΔOWB and the square of NSDP per capita is negative and significant. It follows therefore that well-being rises in association with state affluence but at a diminishing rate. One conjecture is that state affluence is linked to better infrastructure (public health, transportation, and telecommunication) and schooling quality. In such a context, well-being is likely to be higher in more affluent states. However, the diminution of this association at higher levels of affluence suggests that provision of public goods does not grow apace with state affluence because of special interest groups pursuing their own agenda and/or diminishing marginal effects of public goods. Besides, while lobbying is inevitable, it is not clear how to regulate it or, who regulates the regulator (Stigler, 1971).

Secondly, we have identified the factors significantly associated with ΔSWB , but not ΔOWB . We have found that households with a female household head, more male members in the labour market, with regular exposure to mass media, without members suffering from non-communicable diseases or disability are more likely to be better-off subjectively without experiencing corresponding improvement in OWB.

Relative to men, women are more likely to perceive a better change in SWB. Available evidence points to women being better-off in specific contexts (Deaton, 2011, 2018, Dolan et al. 2008, among others). However, women in India-especially in the north- are subject to widespread abuse, violence and discrimination in employment. It is thus highly improbable that they enjoy higher well-being unless there is diminution of abuse and violence (Kulkarni et al. 2013).

Religion is important.. While Dolan et al. (2008) is an early review of evidence on religion and its practice, Deaton (2011, 2018) offer a richer and more insightful review of the relationship between ΔSWB , religion and religiosity. Our analysis is confined to the relationship between change in well-being and major religious groups. Relative to Hindus, Muslims and Others (belonging to Jainism, Buddhism) are less likely to be worse-off and just the same and more likely to be better-off. The OLS results are similar in as much as change in SWB is significantly higher among these religions. Two observations are pertinent. One is that Hinduism has no specific beliefs that must be adhered to by every Hindu. Instead, it is inclusive of many different beliefs of which some are contradictory (e.g., hidden within Hinduism are both theistic and semi-theistic philosophies). Besides, in Hinduism today there exists, on the one hand, faith in the efficacy of ritual and desire for its worldly fruits and, on the other, disregard for all external practices and material results (*Encyclopaedia Britannica*, 2021). On the broader question of why religion matters is that belief in God enables the followers to be calm, generous, sensitive to pain and suffering of others and helps imbibe the virtues of integrity and forbearance (Dolan et al. 2008, Deaton, 2011, 2018). That this is not entirely true is manifested by communal riots except that more often than not these are caused by miscreants. Maintaining religious harmony is thus essential.

Inherent in the caste-system is a socio-economic hierarchy, with Brahmins and High Castes at the top and SCs/Dalits and STs/*Adivasis* at the bottom. Inter-caste marriages are abhorred and, despite affirmative action (reservations in schools and colleges, and public employment), the fate of lower castes has not significantly improved. Discrimination against lower castes in employment is rampant as the legislation against discrimination is largely ineffective (Deshpande, 2013). So the associations between improvement in perceived well-being (Δ SWB) and caste are not in consonance with the hierarchy. In comparison with OBCs (a low caste group but higher ranked than *Dalits* and *Adivasis*), Brahmins do not display a significantly higher increase in SWB. SCs/*Dalits* display a significantly higher Δ SWB and Δ OWB while STs/*Adivasis* record a significant positive relationship with respect to Δ SWB and a negative relationship to Δ OWB¹⁹. Others - a mixed but more affluent group- show a significantly lower Δ SWB. It is thus implied that poverty and well-being do not necessarily move in tandem.

Another income-related variable is employment. The larger the number of adult male workers in a household, the greater is improvement in SWB, but not OWB. It has been emphasised that short-term unemployment is not so demoralising as longer-term unemployment. We are unable to test this hypothesis. However, as noted in the previous two sub-sections, the estimates of duration of employment /hours worked in a year are not sufficiently disaggregated to identify number of hours at which work-leisure choice occurs. In any case, available evidence for other developing countries is mixed (Dolan et al. 2008).

Chronic diseases and disabilities have long-lasting effects. Stroke, osteoporosis, cancer, mental disorder, vision impairment, difficulty in walking, and dressing not only act as impediments to remunerative employment but also are a financial burden on the family. Besides, it is demeaning to be dependent on others in carrying out activities of daily living. So it is not surprising that a negative association between SWB and ill-health across different regions and countries is observed (e.g., Deaton 2011, 2018). Data constraints restricted our analysis to 4 major NCDS: hypertension, cardio-vascular diseases, diabetes and cancer and change in SWB. However, the coverage of disabilities or limitations of ADL is more detailed. Our results confirm a robust negative relationship between lower Δ SWB and NCDs in both OLS and OP results, but this is not found for Δ OWB. An equally robust negative association is observed between lower Δ SWB and disabilities, but this is not found for Δ OWB. Whether individuals adjust to disability is confirmed in a few studies (Dolan et al. 2008, Deaton, 2018). Due to the lack of data on adaptation to disabilities, we are unable to throw new light.

Exposure of men and women to mass media highlights the role of information in improvement in well-being. The results are striking. Mass media access is particularly important for improvement in SWB, but not much in OWB. For men, there is a significant positive association between Δ SWB and regular exposure to radio and newspapers but not TV. While women listening regularly to radio do not show a higher Δ SWB, those regularly reading newspapers and watching TV experience higher Δ SWB. Only women's regular

¹⁹The results vary with the specification. These are the findings based on the OP analysis.

access to radio significantly improved OWB. Does information content vary from one medium to another? Do men and women react differently to news coverage of, say, rapes, sexual harassment, violence against women, high food prices, health risks and mortality? These questions can only be answered through a more detailed investigation which is not feasible with IHDS. So, a common presumption that wider dissemination of information is necessarily a good thing is not consistent with our findings. More attention to its content is necessary. While self-regulation by the media has not been successful, there is a real risk that government intervention may suppress freedom of expression.

On the relationship between income/consumption and SWB, our literature review in Section 2 points to a divergence in the empirical evidence. As documented in Deaton (2018) and others, either the two are unrelated or there is a positive relationship, with the magnitude varying by region and even with the same data. We find that there is a robust positive relationship between Δ SWB and log of per capita expenditure in the initial year. This is not found for Δ OWB.

Finally, we have examined in detail whether other factors are associated with Δ SWB by including them as covariates in OLS and ordered probit models.

Whether SWB and marital status are linked has been widely studied, with the evidence favouring the married (e.g., Deaton, 2018, Diener et al. 2013, Dolan et al. 2008, among others). However, our multiple regression results do not show a significant difference in change in subjective well-being between the unmarried, or the widowed/divorced, relative to the married. These are plausible findings as married women are subject to intimate partner violence-including marital ‘rape’, discrimination in intra-household allocation of food and resources for medical care and restrictions on ‘outside’ employment.

The significant positive relationship between Δ SWB and the Piketty measure of extreme income inequality is intriguing-especially when the income gains of millionaires and billionaires are driven by speculative gains in the stock market and real estate. This is what Chancel and Piketty (2017) demonstrated with their meticulous research of income tax records and other sources in India. If their portfolio is more diversified and labour intensive, it cannot be ruled out that the income gains will be more widely distributed. At the same time, vigorous promotion of micro, small and medium enterprises/MSMEs is likely to expand employment and generate income on a large-scale. In contrast, a significantly negative association is found between Δ OWB and the Piketty measure.

A major limitation of our analyses is that with just two waves of the panel data in IHDS we are unable to capture household heterogeneity through experiments with random and fixed effects. This may be feasible when the third wave of IHDS is available,

Thanks to the important contributions of Sen (1985) and Deaton’s (2018) emphasising in different ways a broadening of the focus for assessing well-being-specifically, looking beyond per capita income as a measure-there is growing consensus that perceptions of well-being matter a great deal. Although our analysis of change in SWB is narrowly focused on perceived change in economic well-being, its comparison with changes in OBW yields

important insights into the commonalities and divergences between them. For example, the lack of consonance between the socio-economic hierarchy and change in SWB is revealing. While Brahmins are at the top of this hierarchy, they fare worse than the lower rungs comprising SCs and STs in this measure of well-being. Despite their greater vulnerability to poverty and other deprivations, they are more likely to move up the ranks of Δ SWB. To borrow Sen's powerful terminology, this is compatible with these deprived groups' better functioning (eg, easier access to education, healthcare). As Deaton emphasised, in a similar vein, measures such as SWB may enable individuals to live better lives while policy makers design and implement appropriate policies.

Although some policy concerns are briefly referred to in the preceding discussion, a more integrated perspective is delineated below.

As income and its growth are closely related to improvement in SWB, a fiscal stimulus that generates incomes through strengthening of infrastructure—roads, transportation, power generation, irrigation, schools, and hospitals—is a priority. But there are challenges within these components. Whether the state alone can finance massive investment in infrastructure is doubtful. Public-private partnerships are key but an environment that promotes such partnerships—while the public sector designs these interventions and commits financially in the MOU, incentives in the form of assured returns must be provided for the private sector. At the same time, regulation by the public sector must not stifle private participation through avoidable bureaucratisation.

To illustrate challenges for public policies within specific areas, a few examples suffice. Positive externalities of building roads in rural areas—especially those that do not get washed away during the monsoon—are likely to be greater than building highways and strengthening inter-city connectivity. Limited allocations to solar energy development and continued heavy reliance on thermal energy are lop-sided given high levels of pollution and rising incidence of respiratory ailments and certain types of cancer such as breast, liver, and pancreatic, and high risk of mortality. In irrigation, as opposed to large-scale projects, higher priority should be given to small-scale projects that pool local water resources (ponds, streams) and are shared equitably through community networks (Wade, 1988). A substantial increase in public investment for schooling is of course imperative but alongside greater attention must be given to upgrading its quality. Rampant absenteeism of teachers, their lack of training, shortage of text books, and absence of toilets for female students to which pointed attention was drawn by Sen and Dreze (1995) are still as relevant and cry out for reform. A National Health Policy was announced in 2017. It proposed raising public health expenditure progressively to 2.5% of the GDP by 2025 and advocated a major chunk of resources to primary health care, followed by secondary and tertiary health care. This policy together with the NITI Aayog action agenda have set targets for reduction of premature death and morbidity due to major NCDs in India. There are two serious concerns, however. One is that scant attention is given to where the resources will come from. Another glaring omission is that little is said about the rapid rise in the share of the old in the total population and associated multi-morbidities of NCDs. Besides, continuing neglect and failure to anticipate these demographic and epidemiological shifts—from infectious diseases to NCDs—may result in enormously costlier

policy challenges (Jan et al. 2018, Bloom et al. 2020). Given the rapid deterioration in the quality of public healthcare and rising life expectancy and expectations of good quality health care, the supply - demand imbalance is likely to widen sharply. So a priority is to increase substantially expenditure on health. But more important than higher financial allocation is reorganisation of the health care system and effective regulation. As argued emphatically in an important study (Patel et al. 2015), it is imperative to develop a fully integrated population-based healthcare system that brings together the public and private sectors and the allopathic and indigenous systems, and is well-coordinated at different levels of service delivery platforms-primary, secondary and tertiary. Moreover, a case is made for a shift from a standard health insurance model to an entitlement-based model.

India enacted the Rights of Persons with Disabilities Act, 2016 (the “New Act”) and the rules thereunder (the “Rules”) in 2017. The New Act replaced the Persons with Disabilities (Equal Opportunity Protection of Rights and Full Participation) Act, 1995 (the ‘previous Act’), which covered only seven disabilities. The New Act covers more than 15 disabilities including dwarfism, acid attack victims, intellectual disability and specific learning disabilities. It defines a ‘person with disability’ as someone with long term physical, mental, intellectual or sensory impairment which, in interaction with barriers, hinders his / her full and effective participation in society equally with others.

Yet discrimination persists in various forms - in employment, access to financial services, health services-specifically, against women, elderly and tribal communities (Kulkarni et al. 2020).

Behavioural changes are no less important and perhaps also no less challenging. A few important contributions using evidence from LMICs and from India yield useful insights (Gaiha et al. 2020). Inadequate physical activity and unbalanced high-calorie diets promote weight gains. Obesity is a risk factor for cardiovascular and diabetes and can aggravate symptoms of CVD such as emphysema and bronchitis (Academy of Medical Sciences, 2018). Limiting tobacco consumption is expected to benefit at the individual level but wider reduction in multi-morbidity prevalence requires taxation on unhealthy products. For example, there is evidence that tobacco taxation reduces smoking and such benefits might also lead to a reduction in certain multi-morbidity clusters (Sassi et al. 2018). It is reassuring therefore that taxation of *beedis* and smokeless tobacco (SLT) has risen sharply in the recent Goods and Services Tax (GST).

Information through mass-media adds to awareness of healthy living, entitlements, social safety nets, and discriminatory behaviour. While the links between improvement in well-being and mass-media vary between men and women, it is plausible that some information content is more offensive to women. That self-censorship by the media has been shrouded in corruption is common knowledge while government regulation is oversensitive to any criticism and frequently authoritarian. It is thus a challenge that defies any resolution.

The socio-economic hierarchy inherent in the caste system is not reflected in change in SWB. Indeed, relative to OBCs, upper castes do not display significantly higher changes in SWB

while among SCs on the lower rung change in well-being is significantly higher. Despite affirmative action, caste inequities and discrimination against lower castes have persisted. While a case could be made for lower castes catching up with upper castes through more equitable opportunities of schooling, employment and personal advancement, it is arguable that upper castes might resent it unless their attitudes towards lower castes change drastically. As legislation has limited potential because of weak enforcement, it has been argued that, since mere exhortations to change attitudes are likely to be ignored, carefully framed persuasion can work. For instance, people conform to others they perceive to be in their reference group. These effects are quite powerful messages that are framed to appeal to self-interest or moral commitments usually lead to less behavioural (and attitude) change than those that are framed to make the recipients believe that others just like them are behaving in the desired way. For example, rates of tax compliance go up, and deductions go down, when citizens believe *other* citizens are paying their fair share (Bilz and Nadler, 2014).

The fact that Muslims and Others, relative to Hindus, are associated with higher levels of improvement in SWB is not surprising as Hinduism is 'more a way of life than a religion'. It lacks a code of beliefs and religious practices are flexible. Moreover, the caste system- an integral part of Hinduism- is iniquitous and exclusionary. Religious harmony is vital for improvements in SWB.

Inequality in income/wealth distribution at different levels is yet another challenge, as it is tied up with incentives to invest and grow. While there is no question about progressive taxation of inherited wealth, progressive taxation of income is likely to be resisted as it affects negatively investment behaviour. So the policy challenge is to ensure that the trade-off between income tax and investment is not unacceptably high. Our analysis suggests that high disparity between personal incomes within a primary sampling unit (a cluster of villages/small towns) is linked to the gap between aspiration and achievement and thus breeds resentment and frustration, and a negative association with well-being. Expansion of more remunerative employment opportunities may narrow this gap and enhance well-being. Reduction of disparity in affluence between states through larger allocations of revenues through the Finance Commission without compromising their incentive to raise more revenue is an option. But this must be complemented with larger investments by the Centre and state governments.

Finally, the positive association between well-being and the Piketty measure of extreme inequality is puzzling especially if the latter is driven mainly by speculative gains in the stock market and real estate. So there is a case for a more diversified investment portfolio. Whether speculative gains could be curbed through taxation is moot. Combined with promotion of small and medium enterprises through tax exemption in the initial phase and easier financing of their loans could promote more inclusive growth and perhaps substantial gains in SWB.

In brief, there are many policy challenges that are daunting and some that seem unresolvable.

References

- Academy of Medical Sciences (2018).“Multi-morbidity: A Priority for Global Health Research,” London.
- Akay, A. O. B. Bargain, &H. X. Jara (2017) “Back to Bentham, Should We? Large-Scale Comparison of Experienced versus Decision Utility”, IZA DP No. 10907, Bonn.
- Alesina, A., Di Tella, R., & MacCulloch, R. (2004). Inequality and happiness: Are Europeans and Americans different? *Journal of Public Economics*, 88, 2009–2042.
- Angrist, J. D., & J. S. Pischke (2008).*Mostly harmless econometrics: An empiricist's companion*. Princeton university press, Princeton, NJ:
- Berkman, L. F, T V Sekher, B. Capistrant, and Y. Zheng (2012): “Social Networks, Family, and Care Giving Among Older Adults in India,” *Aging in Asia: Findings from New and Emerging Data Initiatives*, J P Smith and M Majmundar (eds), Washington, DC: National Research Council, pp . 261-278.
- Bilz, K., & J. Nadler (2014) “Law, Moral Attitudes, and Behavioural Change”, New York: Oxford University Press.
- Blanchflower, D. G., & Oswald, A. J. (2004). “Well-being over time in Britain and the USA”.*Journal of Public Economics*, 88, 1359–1386.
- Blanchflower, D.G., & A. Oswald (2007) “Is Well-Being U-Shaped Over The Life Cycle?”, NBER Working Paper Series, Working Paper 12935, Cambridge, MA.
- Bloom, D.E., S. Chen, M.Kuhn, M. E. McGovern, L. Oxley, &K. Prettnner (2020) “The economic burden of chronic diseases: Estimates and projections for China, Japan, and South Korea”, *TheJournal of the Economics of Ageing*, forthcoming.
- Cantril, H (1965). *The pattern of human concerns*. New Brunswick, NJ: Rutgers University Press.
- Chancel, L., &T. Piketty. (2017). *Indian income inequality, 1922–2014: From British Raj to Billionaire Raj?* WIDER.Working Paper Series, No. 2017/11.
- Clark, A. (2003). “Unemployment as a social norm: Psychological evidence from panel data”. *Journal of Labor Economics*, 21(2), 323–351.
- Clark, A., Frijters, P., & Shields, M. A. (2008).“A survey of the income happiness gradient”.*Journal of Economic Literature*.
- Clark, A., P. Frijters& M. A. Shields (2008) “Relative Income, Happiness, and Utility: An Explanation for the Easterlin Paradox and Other Puzzles”, *Journal of Economic Literature*, vol. 46, no. 1, March, pp. 95-144.

Council for Social Development (2016) *Social Development Report: Disability Rights Perspectives*, New Delhi: Oxford University Press.

Deaton, A. (2011) "Aging, Religion, and Health", D. A. Wise (ed.) *Explorations in the Economics of Aging*, University of Chicago Press.

Deaton, A. (2018) "What do self-reports of wellbeing say about life-cycle theory and policy?", *Journal of Public Economics*, 162, 18-25.

Deshpande, A. (2013) *Affirmative Action in India*, Oxford India Short Introductions, New Delhi.

Di Tella, R., MacCulloch, & A. Oswald (2001). "Preferences over inflation and unemployment. Evidence from surveys of happiness". *The American Economic Review*, 91(1), 335–341.

Diener, E. R. Inglehart, L. T. (2013) "Theory and Validity of Life Satisfaction Scales", *Soc Indic Res*, 112:497–527.

Dolan, P., T. Peasgood, & M. White (2008) "Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being". *Journal of Economic Psychology* 29, 94–122.

Dorn, D., J. A. Fischer., G., Kirchgassner., & A. Sousa-Poza, (2007). "Is it culture of democracy? The impact of democracy, and culture on happiness". *Social Indicators Research*, 82(3), 505–526.

Duesenberry, J. S (1949). *Income, Saving and the Theory of Consumer Behaviour*. Cambridge: Harvard University Press.

Easterlin, R. A. (2006). "Life cycle happiness and its sources: Intersections of psychology, economics, and demography", *Journal of Economic Psychology*, 27(4), 463-482.

Encyclopædia Britannica (2021), "Practical Hinduism", [Encyclopædia Britannica, Inc.](https://www.britannica.com/topic/practical-hinduism)

Fahey, T., & Smyth, E. (2004). "Do subjective indicators measure welfare? Evidence from 33 European societies". *European Societies*, 6(1), 5–27.

Ferrer-i-Carbonell, A. (2005). "Income and well-being: An empirical analysis of the comparison income effect". *Journal of Public Economics*, 89, 997–1019.

Ferrer-i-Carbonell, A., & Gowdy, J. M. (2007). "Environmental degradation and happiness". *Ecological Economics*, 60(3), 509–516.

Gaiha, R., S. Mathur, & Vani S. Kulkarni. (2020). "Rural Poverty and Disability in LMICs." University of Pennsylvania Population Centre Working Paper (PSC/PARC), 2020-47.

Greene, W. H. (2018) *Econometric Analysis*, 8th Edition, Pearson India.

Haller, M., & M. Hadler, (2006). "How social relations and structures can produce happiness and unhappiness: An international comparative analysis". *Social Indicators Research*, 75, 169–216.

Helliwell, J. F. (2003). "How's life? Combining individual and national variables to explain subjective well-being". *Economic Modelling*, 20, 331–360.

Imai, K, R. Gaiha, A. Ali, & N. Kaicker. (2014). "[Remittances, Growth and Poverty: New Evidence from Asian Countries](#)", *Journal of Policy Modeling*, 36(3), pp. 524-538.

Jan, S. Tracey-Lea Laba, B. M. Essue, A. Gheorghe, J. Muhunthan, M. Engelgau, A. Mahal, U. Griffiths, D. McIntyre, Q. Meng, R. Nugent, & R. Atun (2018) "Action to address the household economic burden of non-communicable diseases", *Lancet*; 391: 2047–58.

Kabeer, N. (2005) "Gender equality and women's empowerment: a critical analysis of the third Millennium Development Goal", *Gender and Development*, Vol. 13, No. 1, March.

Kahneman, D., & A. B. Krueger (2006) "Developments in the Measurement of Subjective Well-Being", *Journal of Economic Perspectives—Volume 20, Number 1—Winter—3-2*.

Kahneman, D., & A. Deaton (2010) "High income improves evaluation of life but not emotional well-being", *PNAS* | September 21 | vol. 107 | no. 38 | 16489–16493.

Kynch, J., and Sen, Amartya (1983) "Indian women: well-being and survival", *Cambridge Journal of Economics*, [Vol. 7, No. 3/4 1983](#), pp. 363-380.

Kohler, I.V., C. F. Payne, C. Bandawe & Hans-Peter Kohler (2017) "The Demography of Mental Health Among Mature Adults in a Low-Income, High-HIV-Prevalence Context", *Demography*, 54:1529–1558

Kulkarni, Vani S., R. Gaiha and M. Pandey (2013) "MDGs and gender inequality", BWPI Working Paper Series 188, University of Manchester.

Kulkarni, Veena, S. Vani, S. Kulkarni, & R. Gaiha. (2020). "Poverty Transitions, Health, and Socio-Economic Disparities in India." *University of Pennsylvania Population Center Working Paper (PSC/PARC)*, 2020-50.

Meier, S. & A. Stutzer. (2006). "Is volunteering rewarding in itself?" Centre for Behavioural Economics and Decision-Making, Federal Reserve Bank of Boston.

Mosse, D. (2018) "Caste and development: Contemporary perspectives on a structure of discrimination and advantage", *World Development*, vol. 110, October, pp. 422-436.

Oswald, A. J., & Wu, S. (2010). "Objective confirmation of subjective measures of human well-being: Evidence from the USA". *Science*, 327(5965), 576-579.

Patel, V., R. Parikh, S. Nandraj, P. Balasubramaniam, K. Narayan, V. K. Paul, A. K. Shiva Kumar, M. Chatterjee, & K. Srinath Reddy (2015), "Assuring health coverage for all in India", *Lancet*; 386: 2422–35.

- Piketty, T. (2014) *Capital in the Twenty First Century*, Cambridge: Harvard University Press.
- Ravallion, M., K. Himelein & K. Beegle (2016) "Can Subjective Questions on Economic Welfare Be Trusted?", *Economic Development and Cultural Change*, volume 64, no. 4.
- Ravallion, M. (2014) "Poor, or Just Feeling Poor? On Using Subjective Data in Measuring Poverty", In *Happiness and Economic Growth*, A. Clark and Cl. Senik (eds,) Oxford: Oxford University Press.
- Sassi, F., A. Belloni, A. J. Mirelman, M. Suhrcke, A. Thomas, N. Salti, S. Vellakkal, C. Visaruthvong, B. M Popkin, & R. Nugent (2018) "Equity Impacts of Price Policies to Promote Healthy Behaviours", *Lancet*, May 19; 391, 2059–2070.
- Sen, Amartya & J. Dreze (1995) *India: Economic Development and Social Opportunity*, Oxford: Clarendon Press.
- Sen, Amartya (1985) *Commodities and Capabilities*, Amsterdam, North Holland.
- Spears, D. (2016) "Caste and Life Satisfaction in Rural North India", *Economic and Political Weekly*, January 23.
- Stigler, G. (1971). "The theory of economic regulation", *Bell J. Econ. Man. Sci.* 2:3-21.
- Stutzer, A. (2004) "The role of income aspirations in individual happiness", [*Journal of Economic Behavior & Organization*](#), vol. 54, issue 1, 89-109.
- Wade, R. (1988) *Village Republics: Economic Conditions for Collective Action in South India*, Cambridge: Cambridge University Press.

Appendix Table A.1: Robust OLS – The Growth Rate of Real Household Consumption Per Capita in 2005-12

VARIABLES	Coefficient	Robust Std. Err
(1) Individual and Household Characteristics (2005) and the location of households		
Gender		
Female	-0.0280	(0.0646)
Marital Status		
Unmarried	0.161	(0.108)
Widowed/Divorced	-0.0137	(0.0640)
Age	0.0494***	(0.00739)
Age*Age	-0.000490***	(7.82e-05)
Household Size		
1	-0.170	(0.104)
>5	0.155***	(0.0383)
Sector		
Urban	0.102***	(0.0298)
Education		
1-4	-0.0862**	(0.0418)
5-8	0.0878**	(0.0406)
9-10	0.156***	(0.0544)
>10	0.334***	(0.0454)
Religion		
Muslim	-0.426***	(0.0941)
Others	0.0280	(0.0504)
Caste		
Brahmin	0.0409	(0.0510)
High Caste	0.0638	(0.0563)
Dalit	-0.177***	(0.0493)
Adivasi	-0.138***	(0.0468)
Others	0.230**	(0.0921)
Household remittance		
Yes	0.134	(0.127)
(2) Employment (2005)		
Any Work		
< 240Hrs	-0.0114	(0.0536)
Number of Working Adults (20-50) males in HH		
0	0.139***	(0.0393)
>=2	-0.335***	(0.0388)
Number of Working Adults (20-50) Females in HH		
1	0.00944	(0.0331)
>=2	-0.248***	(0.0678)
(3) Health & Disability (2005)		
NCD		
Yes	0.0100	(0.0399)
Disability		
Yes	-0.0414	(0.0623)
(4) Media Access (2005)		
Radio regular Men		
Regularly	-0.0360	(0.0827)
Radio regular Women		
Regularly	0.0174	(0.0878)
Newspaper regular Men		
Regularly	0.0904	(0.0748)
Newspaper regular Women		
Regularly	0.0819	(0.0761)
TV regular Men		
Regularly	-0.0401	(0.0389)
TV regular Women		
Regularly	0.0403	(0.0402)
(5) Other Variables (2005)		
Social Networks		
1	-0.0320	(0.0497)
2	-0.0441	(0.0357)
>2	0.0655	(0.0502)
Theft		
Yes	-0.174***	(0.0382)
Conflict in village		
Yes	-0.132***	(0.0320)
(6) Initial Economic Conditions (2005)		
Monthly Per capita expenditure ('00)	-0.0711***	(0.00586)
Square of Monthly Per capita expenditure ('00)	0.000344***	(7.62e-05)
Household per capita expenditure as fraction of highest in PSU	-0.522***	(0.0668)

Ratio of share top 1% to bottom 50%	-0.0881	(0.127)
Net State domestic Product (in '000)	0.0246***	(0.00484)
Net State domestic Product (in '000) Square	-0.000247***	(7.34e-05)
Constant	-0.126	(0.169)
Observations	27,945	
R-squared	0.053	

Robust Standard errors in parentheses.

Appendix Table A.2: Marginal Effects/Associations of Covariates with Components of Subjective Well-Being (an alternative estimate of marginal effects based on the average marginal effects for all the observations)

VARIABLES	Δ SWB				Δ OWB			
	Worse-off dy/dx (Std. Error)	Just the Same dy/dx (Std. Error)	Better-off dy/dx (Std. Error)	Converted ME ⁴	Worse-off dy/dx (Std. Error)	Just the Same dy/dx (Std. Error)	Better-off dy/dx (Std. Error)	Converted ME ⁴
(1) Individual and Household Characteristics and the Location of Households (2005)								
Gender								
Female ²	-0.0146** (0.00705)	-0.0195* (0.01020)	0.0341** (0.01670)	0.0487	0.00953* (0.00578)	0.0182* (0.01040)	-0.0278* (0.01590)	-0.0374
Marital Status								
Unmarried	0.0104 (0.01400)	0.0117 (0.01410)	-0.0221 (0.02790)	-0.0325	-0.00854 (0.00822)	-0.0188 (0.02000)	0.0273 (0.02810)	0.0358
Widowed/Divorced	0.00494 (0.00678)	0.00581 (0.00766)	-0.0107 (0.01440)	-0.01559	-0.00935** (0.00435)	-0.0207** (0.01030)	0.0300** (0.01440)	0.0393
Age ³	-0.00165*** (0.00061)	-0.00200*** (0.00073)	0.00365*** (0.00134)	0.0053	-0.00446*** (0.00043)	-0.00921*** (0.00088)	0.0137*** (0.00130)	0.01819
Age*Age	1.74e-05*** (0.00001)	2.11e-05*** (0.00001)	-3.84e-05*** (0.00001)	-0.000056	4.51e-05*** (0.00000)	9.31e-05*** (0.00001)	-0.000138*** (0.00001)	-0.0001829
Household Size								
1	0.0397** (0.01900)	0.0321*** (0.01230)	-0.0719** (0.02890)	-0.1117	0.0248* (0.01350)	0.0387** (0.01680)	-0.0635** (0.02940)	-0.0883
>5	-0.0134*** (0.00298)	-0.0168*** (0.00410)	0.0302*** (0.00594)	0.0436	-0.00905*** (0.00209)	-0.0193*** (0.00431)	0.0283*** (0.00579)	0.0373
Sector								
Urban	-0.0142*** (0.00333)	-0.0183*** (0.00471)	0.0326*** (0.00689)	0.0469	-0.0181*** (0.00479)	-0.0400*** (0.00650)	0.0581*** (0.00644)	0.0762
Education								
1-4	-0.0155*** (0.00447)	-0.0152*** (0.00528)	0.0307*** (0.00867)	0.0462	0.0123*** (0.00366)	0.0181*** (0.00513)	-0.0304*** (0.00804)	-0.0427
5-8	-0.0288*** (0.00448)	-0.0320*** (0.00677)	0.0608*** (0.00755)	0.0896	-0.0146*** (0.00276)	-0.0275*** (0.00546)	0.0420*** (0.00704)	0.0565
9-10	-0.0440*** (0.00614)	-0.0564*** (0.00977)	0.100*** (0.00929)	0.1436	-0.0211*** (0.00347)	-0.0425*** (0.00696)	0.0636*** (0.00841)	0.0847
>10	-0.0439*** (0.00649)	-0.0563*** (0.01060)	0.100*** (0.01110)	0.1437	-0.0447*** (0.00584)	-0.116*** (0.01050)	0.160*** (0.01020)	0.204
Religion								
Muslim	-0.0162* (0.00940)	-0.0211 (0.01370)	0.0373* (0.02260)	0.0535	0.0380*** (0.01020)	0.0596*** (0.01260)	-0.0976*** (0.01980)	-0.1356
Others	-0.0335*** (0.00669)	-0.0510*** (0.01090)	0.0845*** (0.01460)	0.118	-0.00241 (0.00419)	-0.00539 (0.00951)	0.0078 (0.01370)	0.01021
Caste								
Brahmin	0.0036 (0.00556)	0.00482 (0.00722)	-0.00842 (0.01270)	-0.01202	-0.00638* (0.00378)	-0.0139 (0.00867)	0.0203* (0.01230)	0.0267
High Caste	0.00467 (0.00354)	0.0062 (0.00460)	-0.0109 (0.00803)	-0.0156	-0.00714*** (0.00253)	-0.0157*** (0.00555)	0.0229*** (0.00779)	0.0301
Dalit	0.0205*** (0.00425)	0.0239*** (0.00485)	-0.0443*** (0.00690)	-0.0647	0.0182*** (0.00343)	0.0318*** (0.00507)	-0.0500*** (0.00663)	-0.0682
Adivasi	-0.0108** (0.00431)	-0.0164** (0.00693)	0.0273** (0.01080)	0.0382	0.0106*** (0.00390)	0.0199*** (0.00664)	-0.0305*** (0.01010)	-0.0411
Others	0.0264** (0.01110)	0.0294*** (0.01120)	-0.0558*** (0.02090)	-0.0822	-0.0196*** (0.00601)	-0.0489*** (0.01560)	0.0684*** (0.02080)	0.0879
Household remittance								

Yes	-0.0198*** (0.00474)	-0.0277*** (0.00758)	0.0475*** (0.01090)	0.0673	0.00768** (0.00372)	0.0149** (0.00663)	-0.0226** (0.01010)	-0.0303
(2) Employment (2005)								
Any Work < 240Hrs	-0.00873** (0.00399)	-0.0112** (0.00567)	0.0199** (0.00933)	0.0286	-0.00656** (0.00281)	-0.0142** (0.00648)	0.0208** (0.00907)	0.0274
Number of Working Adults (20-50) males in HH 0	0.0286*** (0.00467)	0.0305*** (0.00634)	-0.0591*** (0.00742)	-0.0877	-0.0114*** (0.00262)	-0.0262*** (0.00527)	0.0376*** (0.00712)	0.049
>=2	-0.0144*** (0.00453)	-0.0219*** (0.00683)	0.0363*** (0.01050)	0.0507	0.0415*** (0.00610)	0.0595*** (0.00955)	-0.101*** (0.00985)	-0.1425
Number of Working Adults (20-50) Females in HH 1	-0.00257 (0.00261)	-0.00311 (0.00319)	0.00568 (0.00576)	0.00825	-0.000952 (0.00181)	-0.002 (0.00381)	0.00295 (0.00562)	0.0039
>=2	-0.0108 (0.00717)	-0.0139 (0.00994)	0.0247 (0.01680)	0.0355	0.0292*** (0.00740)	0.0467*** (0.01010)	-0.0759*** (0.01520)	-0.1051
(3) Health & Disability (2005)								
NCD Yes	0.0122*** (0.00467)	0.0136*** (0.00513)	-0.0259*** (0.00915)	-0.0382	-0.00665** (0.00291)	-0.0145** (0.00641)	0.0211** (0.00911)	0.0277
Disability Yes	0.0251*** (0.00835)	0.0252*** (0.00777)	-0.0503*** (0.01440)	-0.0754	0.00849 (0.00527)	0.0163* (0.00933)	-0.0248* (0.01440)	-0.0333
(4) Media Access								
Radio regular Men Regularly	-0.0276*** (0.00558)	-0.0398*** (0.00921)	0.0674*** (0.01240)	0.095	0.00294 -0.00385	0.00594 -0.00757	-0.00888 -0.0114	-0.01182
Radio regular Women Regularly	0.0171*** (0.00656)	0.0185*** (0.00680)	-0.0356*** (0.01240)	-0.0527	-0.00193 (0.00394)	-0.00405 (0.00833)	0.00598 (0.01230)	0.00791
Newspaper regular Men Regularly	-0.0176*** (0.00444)	-0.0239*** (0.00640)	0.0416*** (0.00953)	0.0593	-0.00607** (0.00290)	-0.0130** (0.00622)	0.0191** (0.00894)	0.0252
Newspaper regular Women Regularly	-0.0144*** (0.00506)	-0.0195*** (0.00731)	0.0339*** (0.01160)	0.0483	-0.0255*** (0.00428)	-0.0646*** (0.00910)	0.0901*** (0.01100)	0.1156
TV regular Men Regularly	0.00303 (0.00444)	0.00363 (0.00527)	-0.00666 (0.00967)	-0.00969	0.00096 (0.00308)	0.00198 (0.00631)	-0.00294 (0.00938)	-0.0039
TV regular Women Regularly	-0.0169*** (0.00471)	-0.0214*** (0.00622)	0.0383*** (0.00977)	0.0552	-0.00815** (0.00317)	-0.0171*** (0.00647)	0.0252*** (0.00933)	0.0333
(5) Other Variables (2005)								
Social Networks 1	-0.00312 (0.00300)	-0.00395 (0.00386)	0.00707 (0.00680)	0.01019	0.00400* (0.00225)	0.00811* (0.00439)	-0.0121* (0.00653)	-0.01609
2	0.0154*** (0.00453)	0.0167*** (0.00497)	-0.0321*** (0.00841)	-0.0475	0.00253 (0.00275)	0.00519 (0.00555)	-0.00772 (0.00827)	-0.01025
>2	-0.000282 (0.00462)	-0.000349 (0.00572)	0.000631 (0.01030)	0.000913	-0.00079 (0.00322)	-0.00167 (0.00685)	0.00246 (0.01010)	0.00325
Theft Yes	0.00841 (0.00583)	0.00959 (0.00625)	-0.018 (0.01180)	-0.02641	0.0171*** (0.00489)	0.0306*** (0.00746)	-0.0477*** (0.01130)	-0.0648
Conflict in village Yes	-0.00519** (0.00237)	-0.00631** (0.00307)	0.0115** (0.00524)	0.01669	0.00939*** (0.00209)	0.0193*** (0.00365)	-0.0287*** (0.00503)	-0.0381
(6) Initial Economic Conditions (2005)								
Monthly Per capita expenditure	-0.00136*** (0.00025)	-0.00159*** (0.00029)	0.00295*** (0.00054)	0.00431	0.0108*** (0.00022)	0.0235*** (0.00047)	-0.0343*** (0.00057)	-0.0451

Household per capita expenditure as fraction of highest in PSU	-0.0214*** (0.00509)	-0.0260*** (0.00617)	0.0474*** (0.01130)	0.0688	0.0545*** (0.00369)	0.113*** (0.00727)	-0.167*** (0.01080)	-0.221
Ratio of share top 1% to bottom 50%	-0.0836 (0.01030)	-0.101 (0.01240)	0.185 (0.02260)	0.269	0.0156 (0.00711)	0.0323 (0.01470)	-0.0479 (0.02180)	-0.0635
Net State domestic Product (in '000)	<i>-0.00119</i> (0.00016)	<i>-0.00128</i> (0.00017)	<i>0.00247</i> (0.00032)	<i>0.00366</i>	<i>-0.00145</i> (0.00011)	<i>-0.00290</i> (0.00021)	<i>0.00435</i> (0.00032)	<i>0.0058</i>

Notes: 1. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. 2.;

2. The results where the coefficient estimates are statistically significant for Δ SWB and Δ OWB with an opposite sign, or only significant for Δ SWB are highlighted in bold. Significance judged by a subset of three marginal effects at 10% level;

3. The results where the coefficient estimates are statistically significant for Δ SWB and Δ OWB with a same sign are highlighted in Italics. Significance judged by a subset of three marginal effects at 10% level;

4. Average ME (marginal effects) show the additional probability that a household shifts to the category (0,1,2) one above and this is equivalent to the OLS estimate in Table 2. This is equal to '0*ME for "0" + 1*ME for "1" + 2*ME for "2"'.