Nutrition, Activity Intensity and Wage Linkages: Evidence from Rural India

I. Introduction

Recent scholarship on the nutritional status in India reports rather paradoxical findings showing high levels of income and consumption growth in India has not been accompanied by commensurate improvement in nutritional status (Deaton and Dreze, 2009; Palmer-Jones and Sen, 2001; Patnaik, 2004, 2007). Such findings have rekindled an interest to reexamine the long standing discourse on the relationship between wages, efficiency and nutrition. The central goal of the present study is to employ multiple comparable and most recent data to shed new light on the empirical puzzle- why nutritional status has declined or has improved only slowly across households with varying income levels despite recent high levels of income and consumption growth in India?

Since the efficiency-wage hypothesis was put forward by Leibenstein (1957) and was later theorized by Bliss and Stern (1978), it has been examined in varying contexts (Strauss, 1986, Behrman and Deolalikar, 1989 and Weinberger, 2003). Also, it (efficiency wage hypothesis) has been expanded to explore the effect of activity intensity and nature on nutrition (Church et al. 2011). Further, an analogous proposition of the efficiency-wage hypothesis that has been tested is the poverty-nutrition trap (PNT henceforth). The basic underlying premise of the efficiency wage hypothesis and PNT is that wages enable the purchase of food which then strengthens adults to continue with their work. Such linkages create a cyclical relationship between wages (income), ability to acquire food, nutrition and work. Following the pioneering contribution of Dasgupta and Ray (1986), the PNT hypothesis has been recently tested by Jha et al. (2009) in the context of rural India.

Premised on the on the efficiency-wage hypothesis, the extant literature has largely modeled the relationship around the wage effect of better nutritional status. However, given that the relationship between wages and nutritional status is complex and mediated through factors such as sector of employment, gender, interpersonal skills, social interactions, among several others (Jha et al. 2009), empirical research on the subject has failed to reach a consensus. The present study employs the multiple comparable data sources to examine the relationship between wages and nutrition by incorporating the

role of intensity or nature of activity in addition to wages in predicting nutritional status, the latter measured by the Body Mass Index (BMI[1]).

The study is organized as follows. The next section reviews the background relating to the two central hypotheses on the wage-nutrition link and the activity intensity-nutrition link. Data and variables used for the econometric analysis are provided in Section III. Section IV discusses the analytic strategy and econometric analysis. Section V presents the results. The final section lays down few concluding observations.

II Background and Research Question

The primary objective of the present study is to re-examine the empirical puzzle; why nutritional status has declined, or has improved only slowly, across households with varying income levels in both rural and urban areas despite recent high levels of income and consumption growth in India? Deaton and Dreze (2009) based on the National Sample Survey (NSS) data, argue that 'the calorie Engel curve', that plots per capita total calories or cereal calories and household per capita expenditure, has shifted consistently downwards between 1983 and 2005. Following the efficiency wage hypothesis (Dasgupta and Ray, 1986, 1987; Dasgupta, 1993) which predicts labour productivity and wage rates as being affected by nutritional intakes, the above observation, suggests those undernourished remain trapped in poverty[2]. Jha et al. (2009) tested the existence of PNT using National Council of Applied Economic Research[3] data and showed that the intake of calories or micronutrients (e.g. Iron, Riboflavin, Thiamine) affect agricultural wages for various activities such as harvesting or sowing and vice versa. The findings lend support to the PNT hypothesis (Jha et.al 2009). Specifically, the authors find that the elasticities for calories, protein, and five micronutrients (calcium, thiamine, riboflavin, carotene and iron) are positive and significant and, therefore, an increase in income would increase nutrient intake.

---

1 BMI is calculated by dividing weight in kilograms by height in meters squared (kg/m^2).

2 See Jha et al. (2009) for more detailed review of the PNT hypothesis.

3 National Council of Applied Economic Research is an autonomous think tank that is recognized by the Government of India and specializes in conducting large scale nationally representative household surveys.

Further, the expectation that engaging in energy sapping activities leads to undernutrition has triggered a debate but with little empirical investigation. Theoretically, the relationship between activity intensity and nutrition can be ensconced in the model of health production function (Thomas, 1994). The health production function postulates health or nutritional outcomes as a function of a number of inputs (such as nutrient intakes and the quantity and quality of health care and individual and household characteristics) following a standard utility function of household members under a budget constraint for the household. In this framework, it would be natural to assume that higher activity intensity (consuming more calories) results in lower levels of nutritional outcome.

Given the above context, the present study proposes to address the following question; whether the slow improvement is largely attributable to the decline of calorie requirements associated with changes in activity levels? Specifically, we explore whether activity levels have become less strenuous and what precisely are the factors linked causally to the nutritional status? In particular, we will estimate undernutrition measured by Body Mass Index (BMI) with intensity and with type of activity intensity and other determinants of calorie requirements (possession of labor saving household durables like bicycle, washing machine, sanitation) (Rao, 2000, 2006). We will consider the effects of (predicted) wage rates on nutrition. We employ the data provided by India's Demographic and Health Survey also called as the National Family Health Survey (NFHS henceforth) and National Council of Applied Economic Research (NCAER hereafter)[4].

III Data and Methods

The activity-nutrition and wage-nutrition hypotheses as mentioned earlier are examined using NFHS and NCAER datasets. The NFHS was initiated in 1992-93 and, since then, two additional rounds of the data have been collected – 1998-99 and 2005-06[5]. NFHS is nationally representative and covers

4 Imai (2011) used National Sample Survey (NSS) data and showed that access to Rural Public Works and Food for Work programme (FFW) on nutrition in India significantly reduced adult's undernutrition (in terms of the nutritional equivalent values of food expenditure).

5 NFHS data relies on technical assistance from ICF International via ORC Macro MEASURE DHS (Monitoring and Evaluation to Assess and Use Results Demographic and Health Surveys) and India's National AIDS Control Organization (NACO) and National AIDS Research Institute (NARI) of the Ministry of Health and Family Welfare

the topics relating to fertility, family planning, maternal and child health, gender, HIV/AIDS, nutrition and malaria. Data are collected at the individual level (children, mothers and in the latest rounds on fathers), household and community level. The sample for this study comprises information collected on ever married women, aged between 15 to 49 years residing in the rural areas. The India Human Development Survey (IHDS) 2005[6], is a nationally representative multi-topic survey and provides data on wages and activity intensity.

Analytic Strategy

In order to attain our first objective of examining the relationship between activity intensity and nutrition, we use type of profession and employer as indicator for activity intensity. The former, nature of profession, is premised on the fact that certain types of professions are more manual intensive or sedentary than others. The employer type, that is, working for someone else, family, self and not employed, provides another perspective of examining the effect of occupational characteristic on nutrition. Using the NCAER data, nature of profession is grouped into four categories based on the degree of physical activity required. The second objective of investigating the relationship between wages and nutrition is based on log of hourly wages as the explanatory variable.

The econometric techniques that are employed to examine the twin hypotheses of - activity-nutrition and wage-nutrition are 1) quantile 2) pseudo panel 3) instrumental variable (IV) and 4) Heckman sample selection regression models. In each of the different specifications, the least squares technique is used to estimate the structural model which we enumerate as the first model when we individually describe our models. The ensuing paragraphs lay down in brief our rationale for the choice of the four different types of estimation techniques. First, findings of the existing literature (Strauss and Thomas 1998) call for accounting for the effects of activity intensity varying across the different

(MOHFW) in India is responsible for the survey (International Institute for Population Sciences (IIPS) and Macro International (2007)). The MOHFW has designated the International Institute of Population Sciences (IIPS) as the nodal agency.

6 The IHDS data is collected by NCAER in collaboration with the University of Maryland, USA.

classifications of BMI. For example, the effect of activity intensity on malnutrition is expected to be more evident among the obese than the severely underweight. That is, the obese are more likely to respond to weight changes than the severely underweight in consuming extra calories. For this reason, quantile regression is appropriate for examining the effect of the correlates at different points of conditional distribution of a dependent variable.

Second, to examine age and state cohort unobserved effects, we construct a pseudo panel that helps in addressing this potential bias. These econometric models are used in the case of NFHS data only as the NCAER data do not have anthropometric indicators for adults.

Third, in an attempt to investigate causality between wages and malnutrition on one hand and between activity intensity and malnutrition on the other, the Instrumental Variable (IV) model and Heckman sample selection regression model are applied in the case of the 2005 NCAER data which in our study is cross-sectional nature. We use the IV model to investigate a wage-nutrition relationship given that there may exist a bi-causal relationship between the nutritional status and the wage rate in our hypothesis testing. The nutritional status is premised on how much better (health) we eat given a little more income and the wage rate is based on how healthier (productive) we become by eating a little bit more (Strauss, 1986; Behrman and Deolalikar, 1989). To address this from an econometric perspective, we use the availability of trade-union in a community and the state-level consumption inequality as instruments for wages in the BMI equation. The rationale for the trade union availability as an instrument is that the presence of a trade union enhances the bargaining power of workers to negotiate for better wages for vulnerable people (such as the malnourished). The availability of a trade union is therefore more likely to be correlated with wages than BMI. Also, the consumption inequality as an instrument for wages is based on the traditional income-consumption relationship. Although a recent study for the United States (Krueger and Perri, 2006) suggests that the increase in income inequality has not been accompanied by substantial increase in consumption inequality, the association between consumption inequality and income (wages) is far from fully refuted.

Finally, to carefully explore the effect of wages and activity intensity on nutrition, we compare the OLS and IV estimates with a case in which we strip away the effect of sample selection in a wage in equation. In this case, we use predicted wages from the corrected wage equation in the nutrition equation. Although, this may be subject to the criticism that the wage values are only the estimated values, and not real values, it offers us an opportunity to meticulously investigate the effect of wages on nutrition albeit with possible errors (sample selection bias). In the Heckman sample- selection model, the probit model is estimated to exclude the respondents that at the time of the survey were unemployed in the first step, and then the wage equation is estimated in the second step which corrects for the sample selection bias through the inverse Mills ratio derived by the probit model in the first step. This implies that the estimated wage effect will not capture the characteristics of the unemployed. In this study, we use the infant dependency ratio as an exclusion restriction variable for the probability of employment. The choice of infant dependency ratio is based on the hypothesized positive relationship between higher economic dependency and labour market participation. That is, a household with higher dependency burden has greater impetus to search for a job and participate in the labour market than households with lower dependency burden. However, this hypothesized positive relationship in the case of female labour market participation is likely to be rejected, at least in the short-run, due to health constraints around delivery period. This remains a long standing academic discourse (see Bilsborrow, 1977).

Variables

The **dependent variable** in our analyses is BMI, a measure of adult nutrition. We use the following classifications based on the raw scores of BMI; a) severely underweight – BMI < 16kg/m^2 b) underweight – 16kg/m^2 <= BMI <18.5kg/m^2 ; c) normal – 18.5kg/m^2 <=BMI<25kg/m^2 ; d)overweight – 25kg/m^2 <=BMI<30kg/m^2 and e)obese – BMI >= 30kg/m^2.

The **independent variables** are a vector of individual, household and state level factors. The individual level variables comprise the age and its square (to account for non-linearity between age and BMI), education, measured as a categorical variable (no education, attempted or completed primary, attempted or completed secondary and attempted or completed any higher than secondary education),

working status, measured as a categorical variable (not working, working for a family member, working for someone else and self-employed) and marital status (currently married, formerly married and never married). The household level characteristics include wealth, measured as a continuous variable[7], religious affiliation of the household head measured as a categorical variable (Hindu, Muslim, Christian, Sikh, Buddhist/Neo-Buddhist, Jain and Other), social group of the household head measured as a categorical variable (scheduled caste, scheduled tribe, other backward group and non-backward group), household size, measured as a non-categorical variable, distance to water measured as a continuous variables, agricultural land size owned by the household and its square and a set of dummy variables on asset ownership of household, namely, refrigerator, bicycle and flush toilet). The state level indicators specifically characteristics of different locations classified into BIMARU (Rajasthan, Uttar Pradesh, Bihar and Madhya Pradesh), North (Jammu & Kashmir, Himachal Pradesh, Punjab, Uttaranchal and Haryana), South (Maharashtra, Gujarat, Goa, Andhra Pradesh, Karnataka, Kerala and Tamil Nadu), East (Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, Assam, West Bengal, Jharkhand, Orissa and Chhattishgarh) and Delhi and state level prices of commodities (sugar, eggs and cereals). μ is the error term which is independently and identically distributed (*i.i.d).* As remarked earlier, the overlapping state and region could be problematic.

Model 1 – Ordinary Least Squares Regression

Equation 1 below represents the ordinary least squares (OLS) estimation of the functional relationship between BMI and its correlates.

$$BMI_i = \alpha_0 + \alpha_1 \boldsymbol{IND}_i + \alpha_2 \boldsymbol{HH}_h + \alpha_3 \boldsymbol{ST}_\rho + \mu \qquad (1)$$

where *i* stands for individual (or the $i^{\text{-th}}$ individual), *h* for household, and $\boldsymbol{\rho}$ for state.[8] *BMI* is the adult's body mass index.

---

[7] The wealth score in the NFHS data is computed based on the asset index. Hence the use of actual values as a ratio scale is not advisable. For details of the construction of the wealth index see Rutstein and Johnson (2004).

[8] Ideally, variance should be clustered at household level, but we do not take account of the clustering effects as the commands for the 'robust' estimator or quantile regression do not allow us to incorporate the clustering effects.

IND = individual level vector of variables, ***HH*** = household level characteristics, ***ST*** = state level indicators

Model 2 – Quantile Regression

As stated above, we augment the OLS regression with a quantile regression. Koenker and Basset (1978) prove that for any distribution that the median is a better measure of location the regression median[9] is more efficient compared to OLS which is underpinned by the Gaussian assumptions. In contrast to OLS, quantile regression sorts the data and identifies a threshold (τ) to estimate the coefficient (β) that minimizes the sum of absolute residuals. The general set-up of quantile regression, Equation (2), is solved from an optimization perspective using linear programming:

$$\hat{\beta}_{(\tau)} = \underset{\beta_t \in R^k}{\arg\min} \sum_{i=1}^{n} \rho_t\left(y_i - x_i'\beta\right) \qquad (2)$$

where estimated β(τ) called 'tauth' (τth) regression quantile estimates the coefficient at a specified threshold (τ). τ is the sample quantile and takes on any value between 0 and 1. The expression $\rho_t(y_i - x_i'\beta)$, the absolute value function, weights the absolute difference between y_i and $x_i'\beta$ with τ and by (1 – τ) for all observations below the estimated hyperplane. Koenker and Basset (1978) estimate conditional quantiles using the minimization procedure synonymous to least squares.

In contrast to earlier studies (Bassole, 2007 and Aturupane et al., 2008) that use traditional thresholds (for example, 10th, 25th and 50th), this study identifies respective thresholds that characterize the following group of respondents; a) severely underweight (BMI < 16kg/m^2 b) underweight (16kg/m^2 =< BMI <18.5kg/m^2); c) normal (18.5kg/m^2 <=BMI<25kg/m^2); d)overweight (25kg/m^2 =< BMI < 30kg/m^2) and e) obese (BMI >= 30kg/m^2). The rationale is to help situate the individual in the context of policy targeting.

However, the regression results of OLS with clustering effects and those without provide us with very similar results, suggesting that the clustering effects would not significantly affect the results in our case.

9 The proof of the median regression can be easily replicated for other percentiles (quantiles).

Model 3 – Pseudo Panel Regression

The econometric analysis further makes a case to resolve unobserved unit-specific characteristics. The unobserved unit-specific (individual, household and community) also affects adult nutritional status. The use of pseudo panel is useful in our study of India where real panel data on nutritional issues at the national level is rare. In this study, we generate a pseudo panel based on mother's age cohorts for each state over the three waves of NFHS survey. Deaton (1986) makes a case for generating a pseudo panel when more than one cross- section data has a common variable, for example, age, education and location. The use of such variables is premised on the assumption that the classifications rarely change overtime and they are exogenously determined outside the model.

We specify the functional form relationship (Equation 3), followed by multiple regression of the pseudo panel (Equation 3a). The specification of Equation (3a) below is the fixed effects (FE) model applied to pseudo panel data. We do not specify the random effects (RE) model specification of Equation (3). The rationale for choosing FE is a counter test on the assumption that the unit-specific effects are constant over time and as such assuming arbitrary correlation (clumsy construction) between the unobserved heterogeneity term and the explanatory variables (see Wooldridge, 2009).

The functional form of the pseudo panel is specified as:

$$BMI_{i_{gt}} = f(IND_{i_{gt}}, \quad HH_{i_{gt}}) \qquad (3)$$

where subscript *g* is the cohort captured by age cohorts (classified into seven categories) for 18states[10]. *t* stands for year. This yields a sample size of 378 (7 x 18x 3). All the notations remain the same as per the Equation 1.

The estimable form of Equation (3) which takes the form of a real panel is specified as follows:

10 Over time states in India have been reclassified and that results in difference in the states across the three waves of the NFHS. The states used for the pseudo panel are; Arunachal Pradesh, Assam, Bihar, Gujarat, Haryana, Jammu and Kashmir, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Punjab, Rajasthan, Tripura and Utter Pradesh.

$$\overline{BMI_{i_{gt}}} = \sum_{z=1}^{q} \delta \bar{X}_{r_{gt}} + \varphi D_t + \bar{a}_{gt} + \bar{\mu}_{gt} \qquad (3a)$$

where the first term on the right hand side is a simple aggregation of the set of explanatory variables as specified in Equation (1) above. We denote the subscript of this composite term with r to represent the individual and household explanatory variables. Subscripts "g" indicates the cohort constructed by mother's age and state and "t" stands for each round of the NFHS survey. The term D captures the time effect and the last two variables are the decomposed error terms made up of the unobserved heterogeneity terms and the idiosyncratic component. The daunting issue is to examine the extent to which the pseudo panel approximates a real panel. With the absence of real panel data it is virtually impossible to address this issue, hence we rely on the argument by Verbeek and Nijman (1992) and Verbeek (1996) that the estimator is consistent if the number of observations in cohort *g* tends to infinity, $\bar{\mu}_{gt} \rightarrow \mu_g^*$. Since we tend to generate a large cohort we are confident that the estimator is likely to be almost consistent.

Model 4 – Instrumental Variable Regression

The theoretical underpinning of the PNT suggests that wages and nutrition are endogenous in the respective equations of the other (see Jha et al. 2009). This implies that in estimating a BMI equation, wages are endogenous and also in examining the determinants of wages, BMI is endogenous. Ideally, this will require the use of an instrument each for BMI and wages to estimate systems equation. In this study, however, we attempt to resolve the endogeneity inherent in the BMI equation. As discussed earlier, the instruments used for wages are: availability of trade union in a village and district level consumption inequality. Equations 4 and 4a below show the econometric specifications for the reduced form equations.

$$TU = \alpha_0 + \alpha_1 \boldsymbol{IND}_i + \alpha_2 \boldsymbol{HH}_h + \alpha_3 \boldsymbol{ST}_\rho + \mu \qquad (4)$$

$$Consumption\ Gini = \alpha_0 + \alpha_1 \boldsymbol{IND}_i + \alpha_2 \boldsymbol{HH}_h + \alpha_3 \boldsymbol{ST}_\rho + \mu \qquad (4a)$$

where *TU* and *Consumption Gini* are the two instruments used in correcting for endogeneity of wages in the BMI equation. The vector notations remain the same as specified in Equation 1 above. However, when we use the NCAER data, it is feasible to examine occupation-based physical activity disaggregated

into professionals/managers, clerical/sales/services, famers/fishermen and labourer/production workers. Following the standard approach for IV, these two equations are estimated in the first stage and their predicted values are jointly plugged into the structural equation (Equation 1 above). In estimating IV, efficiency is compromised due to large standard errors as a result of the two stages estimations. Hence IV is preferred to OLS if only the former yields consistent results. This largely depends on the validity of choice of instruments. In this study, the validity (strength and relevance) and identification of the instruments are examined by the Kleibergen-Paap rk LM statistic (underidentification), Cragg-Donald Wald F statistic (weak identification) and Hansen J statistic (overidentification). The first stage results and the Hausman test are used for choosing between OLS and IV estimations.

Model 5 – Heckman Sample Selection Regression

The Heckman sample selection model is premised on the argument that the estimation of wage equation should not be only based on a truncated data since the unemployed are purposively (or non-randomly) excluded from the model. The model based on the non-randomly selected sample yields biased estimators. To address this, we estimate the probit model for both employed and unemployed respondents (employment probability equation) that are randomly selected in the first stage. The main requirement for the Heckman sample selection is the exclusion restriction condition. That is, the employment probability equation (also termed as the selection equation) should include a variable that explains the probability of getting employed but not wages. This is normally a daunting task, but in this paper, we opt for the infant dependency ratio. Like the IV, the two stage Heckman model compromises on efficiency of the coefficients, hence the model should only be chosen over OLS if it yields consistent estimates, which would require a large sample. Otherwise the OLS based on the sub-sample should be chosen over the Heckman model.

Equations 5 and 5a below present the selection and outcome equations for the Heckman sample selection estimation. Equation 5 is a binary outcome model (Probit) and Equation 5a is an OLS regression. The first stage is the Probit model estimation, based on which the inverse Mills ratio (ratio of

the probability density function to the cumulative distribution function of a distribution) is estimated and plugged into the OLS equation.

1st stage: selection equation (probit)

$$Emp*_i = \alpha_0 + \alpha_1 \boldsymbol{PID}_i + \alpha_2 \boldsymbol{PID'}_h + \alpha_3 \boldsymbol{INF}_h + \mu \qquad (5)$$

2nd stage: wage equation (OLS)

$$Lnwages_i = \alpha_0 + \alpha_1 \boldsymbol{PID}_i + \alpha_2 \boldsymbol{PID'}_h + \varepsilon \qquad (5a)$$

$$E(Lnwages_i | Lnwages_i \text{ is observed}) = E(Lnwages_i | Emp*_i > 0) \qquad (5b)$$

where Emp_{i*} is a binary response (= 1 if respondent is employed and 0 otherwise). PID_i stands for respondent (individual) level variables, that is, age and it square, sex and education (measured as a categorical variable). Other non-person level variables (denoted by PID'_h) are household size and its square, social group of household head, presence of trade union in a village, district level consumption inequality and location dummies. INF_h represents the exclusion restriction variable, infant dependency ratio. In Equation 5a, $Lnwages_i$ represents the log of hourly wages and all other variables have the same notations as in Equation 5. ε and μ in both Equation 5 and 5a are the respective error terms with the following properties: $(\mu, \varepsilon) \sim N(0, 0, \sigma^2_u, \sigma^2_\varepsilon, \rho_{\varepsilon u})$. The first two terms are the usual zero mean condition for the two equations, the third and fourth represent constant variance for the respective equations and the last term is the correlation between the error terms of the two equations. Estimations of equations 5 and 5a give the expected value of log of wage conditional on the probability that log of wage is observed as in equation 5b.

V. Results

This section consists of two subsections that report descriptive statistics and econometric results.

Patterns of Malnutrition

Appendix Tables A1 through A4 provide an overview of the patterns of malnutrition in India. In these tables, we present both row and column percentages showing proportions for each sub- category across the nutritional classifications and depicting proportions for each nutritional group across the correlates of BMI respectively. The cross tabulation between BMI, classified into underweight

(BMI<18.5kg/m^2), normal (18.5kg/m^2<=BMI<25.0kg/m^2) and overweight (BMI>=25.0kg/m^2) and their correlates are given for each of the three waves of the NFHS and the 2005 NCAER.

To validate the final sample used for our study, we compare the patterns of malnutrition in the third wave of the NFHS with estimates in the NFHS report. The last two rows of Appendix Table A3 show that our estimates are comparable to proportions of adult nutritional status reported by IIPS and Macro International in 2007. That is, we observe that the proportions of underweight, normal and overweight are 35.30 percent, 52.30 percent and 12.50 percent, respectively, and this pattern is comparable to 35.60 percent, 51.80 percent and 12.60 percent as shown in the NFHS report (see IIPS and Macro International, 2007). Also in Appendix Table A5, we give the proportions of the correlates across the nutritional categories for the entire sample of the NFHS survey. The evidence shows that 34 percent and 40 percent of males and rural subjects, respectively, are underweight. Also, these estimates are exact compared to the NFHS report (see IIPS and Macro International, 2007).

One of the daunting issues on nutrition in India is the trend. The evidence based on the last two waves of NFHS reports indicates that the proportion of underweight women had fallen marginally, from 35.8 percent to 35.6 percent over the period 1999 to 2006. However, concentrating on the rural sample for women, we observed a significant drop from 43.60 percent to 40.20 percent over the same period (Appendix Tables A2 and A3, column 5). The nearly stagnant prevalence at the all-India level is thus a manifestation of the increase in proportion of underweight women in the urban areas. This urban-rural disparity in trends partly informed the decision to narrow the study to rural areas.

On the correlates, the third wave of the NFHS report shows in the case of underweight, about one in every four rural women is underweight (Appendix Table A3, column 8). The proportion of underweight declines for higher age categories of rural women. Also for education, in the case of underweight, more than half have no education compared to only 2 percent for rural women with higher than secondary education. However, the variation in the proportions across educational sub-categories is more visible in the case of the overweight sample compared to that of the underweight. It is worth noting that two-fifths

of the overweight rural women sample have secondary education and this is highest relative to no education, primary education and higher than secondary education.

In the context of the activity-nutrition hypothesis, we observed that classification of employer type (family member, someone and self-employed) by malnutrition yielded some differences within each of the three nutrition categories (Appendix Tables A2 and A3). From columns 8, 9 and 10 in Appendix Tables A1–A3, the proportion of respondents not working is higher for the obese group than for the underweight. In contrast, the proportion of those working for someone else is lower for the obese group than the underweight and normal groups. Based on the nature of profession, (professional/managers, clerical/sales/services, famers/fishermen and labourers/production workers) in Appendix Table 4, the proportions within BMI classification shows that the farmers/fishermen are relatively more in the underweight group than the obese group while professional/managers and clerical/sales/services are higher in the obese group than within the underweight group. These observations trigger further examination of the activity intensity-nutrition relationship.

Using the cross- tabulation between wealth and malnutrition, we observe a plausible pattern for the different wealth groups for the underweight and overweight respondents. Among the underweight, the richest (highest quintile) were the least while among the overweight the same wealth category (richest) were the most (Appendix Tables 2 and 3; columns 8 and 10). This pattern is consistent with the NFHS 3 report. In the case of the latter (be more specific), overweight requires significant wealth for additional diet, so the poorest cannot meet this required condition, hence are less likely to be obese. Also, inspecting the row percentages, that is, columns 5 – 7 of Appendix Tables 2 and 3, the wealth categories show that among rural women in the lowest quintile, the proportion of underweight is greater than the proportion that are obese. However, among the highest quintile, the proportion of underweight is lower relative to the proportion that is obese. This pattern corroborates the evidence reported by Chhabra and Chhabra (2007) for adults in Delhi. The cross-tabulation between nutritional categories and correlates of wealth gets more intriguing at the disaggregated level. For instance, in the case of agricultural land size owned, we observe that for the overweight sample, rural women belonging to households with large land size are just 5.20

percent compared to 71.90 percent for rural women belonging to households that do not own land (Appendix Table A3, column 10). A possible reason is that the expected relationship between size of agricultural land owned and BMI works via the activity intensity-nutritional status link (negative), rather than the wealth-nutritional link (positive). These observations motivate the need to examine the exact linkage and transmission mechanism between wages, wealth and nutrition. The econometric analyses in the next section seek to shed some light on these issues.

Econometric Results

The econometric results are given in Tables 1 – 6. Tables 1 – 5 are based on the NFHS data while Table 6 is based on the NCAER data. Column 1 of Tables 1 – 5 gives the OLS results and columns 2 – 5 give the quantile regression results. Tables 1 and 2 are based on the rural women sample for the first and second waves of the NFHS and Tables 3 and 4 are, respectively, based on the rural sample for both men and women of the third wave of the NFHS. Table 5 shows the pooled and pseudo-panel results for women across the three waves of the NFHS. Interpretation of the results will largely rely on the rural women sample for the second and third waves of the NFHS survey.

Fairly consistent and expected results are observed across the three waves and between males and females in the case of the third wave of the NFHS. For instance, based on the OLS results in Tables 2, 3 and 4 adult's age, education and wealth status of the household of the adult show a positive effect on BMI. That is, ageing, better education and higher wealth are associated with greater BMI. In the case of age, the presence of a non-linear quadratic term (square of age) shows that the marginal effect of age on BMI turns negative (Tables 3 and 4, column 1). That is, the observed positive effect weakened at older ages. This evidence supports an earlier finding by Jha et al. (2011). However, inspecting the quantile regression for rural women, the age effect is not significant in the case of severely underweight and underweight but significant for overweight and obese. This implies that across different nutritional groups (severely underweight, underweight, normal, overweight and obese) the effect of age on malnutrition varies by gender.

The evidence that BMI of adults increases with higher household wealth and higher education were expected (Tables 2, 3 and 4). In the case of the former, rural women belonging to wealthier households will be able to afford food which will improve their BMI. In Table 3, the coefficient for wealth scores across the quintile regression increases from 0.05 for the severely underweight to 0.21 for the obese. This implies that the marginal effect is higher for the latter than the former. The elasticity of gaining more weight among the obese is greater.

The effect of social group (scheduled castes, scheduled tribes, other backward and non-backward groups) and religious affiliation of household heads failed to reveal discernible effects across the NFHS waves and estimation techniques. However, from Table 2, we observe that respondents with heads belonging to scheduled castes have lower BMI compared to their counterparts, that is, household heads not belonging to a socially backward group. Also in some instances, household heads who were Hindus, Muslims, Sikhs and Jains had lower BMI. In contrast, column 3 of Table 3 shows that in the case where the household head is a Christian, we observed a positive effect on adult BMI. This variation of the effect on adult BMI across religious affiliation can be partly explained by the different teachings and varied lifestyles between doctrines.

Size of household is negatively associated with BMI of adults in the case of OLS for both the second and third waves of the NFHS. Our evidence contrasts the findings of Jha et al. (2011)[11]. However, the effect of household size on adult BMI is weak across the nutrition categories but for the normal and overweight categories for the second wave of the NFHS.

From Tables 2 and 3, rural sample for women, that is, the second and third waves of the NFHS, we observe that working for someone else or a family member compared to not working is associated with lower BMI. In both tables, this relationship is observed in the case of the OLS and for underweight, normal, overweight and obese – quantile regression. The effect of working for someone else in the case of severely underweight weakens and turns positive in column 2 of Table 3. A possible reason for the

[11] We still find contrasting results when we explore the non-linear quadratic effect by including the square of household size. However, we observe a minimum turning point where the effect becomes positive.

negative effect is that working for someone else entails high activity intensity compared to not working. The coefficient indicating a fall in BMI tends to increase comparing the estimates for normal, overweight and obese. In support of the argument in the extant literature, we surmise that activity intensity leads to lower BMI. In the case of the observed positive effect for the severely underweight, there is a potential that work nature interacts with other effects such as wages for higher BMI. This finding calls for further research that explores the effect of the interaction between working for someone else and wages on BMI.

As a measure of sanitation, use of a flush toilet is associated with higher BMI (Tables 2, 3 and 4). Also, ownership of a refrigerator which can serve as a proxy for wealth or hygiene is related with higher BMI. Although these results are not consistent across the estimation techniques, the results corroborate the *prior* expectations.

On the effect of food prices on BMI, we observed that price of higher price of eggs is associated with lower BMI. On the other hand, higher price of cereals is associated with higher BMI. Finally, the evidence on the price of sugar did not follow any discernible pattern across the second and third waves of the NFHS and the OLS and quantile regressions.

Table 5 lays out the results for females based on the three waves of the NFHS data. The results are largely comparable to the individual round's estimates. Column 1 of Table 6 gives the pooled regression results while Columns 2 and 3 show the fixed and random effects of the pseudo-panel.

The post-estimation tests suggest that fixed effects estimation is preferred to the pooled and random effect estimations. That is, against the pooled regression, the null hypothesis that there is no variability across the cohorts used for the panel estimation is rejected (F-statistic 1.26(0.00). Also, comparing the fixed and random effects, both the Hausman test and the correlation between the errors and regressors supports the use of fixed effects estimation. We, therefore, confine our comments to the fixed effect results only. For the sake of brevity, we highlight only the main variables of interest.

One of the main variables explored in this study, employer type, a proxy for occupation based physical activity, shows that working for someone else or being self-employed is associated with lower BMI compared to not working. This is consistent with the previous findings based on the cross- sectional

data analysis. Cohorts with a higher proportion of wealthy people are associated with higher BMI. From an education perspective, greater proportion of non-educated individuals in a cohort is related to lower BMI scores. In a nutshell, both occupation-based physical activity intensity and wealth (proxy for wages) are related to BMI of adults.

In Table 6 below, we concentrate on the NCAER data to further explore the relationship between occupation-based physical activity intensity and nutrition on one hand, and investigate the BMI-wage relationship on the other. As indicated earlier, three variants of econometric analysis, namely; OLS, IV and Heckman sample- selection models are used. To examine the effects of the two hypotheses separately the OLS equation is estimated twice. The first equation estimates a restricted model, that is, without occupation- based physical activity variables while the second OLS equation estimates an unrestricted model. The results based on the OLS equations (columns 1 and 2 of Table 6) show that wages in both equations are highly significant and positive in explaining the BMI of adults.

The results (column 2 of Table 6) show that adults engaged in occupations that are physically (manual) strenuous (farmers, fishermen, labourers and production workers) have lower BMI compared to adults engaged in more or less sedentary work (professionals, managers, clerical and sales personnel).

The IV and OLS (based on Heckman wage regression) results are given in columns 3 and 4 of Table 6. In both estimations the positive effect of wages on nutrition is confirmed. However, the effect of occupation-based physical activity intensity on nutrition is observed only in the OLS results that are based on predicted wages obtained from Heckman wage estimation model. The OLS results (column 4 of Table 6) support the hypothesis that adults engaged in occupation-based physical activity intensive job have lower BMI. Indeed, the result is more revealing as we observe a 10 percent statistical significance on the dummy for clerical/sales/services personnel. That is, compared to professionals – though both engage in seemingly sedentary form of work – clerical and sales personnel have lower BMI. A possible reason is that between comparing managers to clerks, the latter are more likely to be active (based on occupation-based physical activity).

Interpretation of both the IV and the OLS (based on Heckman wage model) are supported by the first stage regressions shown in Appendix Table A9 and the post estimation tests in the last six rows of Table 6. In Appendix Table A9, the first stage regression for the IV shows that both instruments (availability of trade union in a village and district level consumption inequality) are significant at the 1 percent level. To verify validity of our instruments, the null hypotheses of underidentification and weak identification are rejected (Table 6). Also, from the last row of Table 6, we fail to reject the null hypothesis that the instruments are jointly valid. Finally, to makes a choice between the OLS and IV, the Hausman test rejects that null hypothesis that both OLS and IV are consistent, but OLS is efficient. That is, rejecting the null hypothesis means that it is only the IV that yields consistent estimates.

In the case of the Heckman-wage regression, infant dependency ratio is significant in the employment probability equation at the 1 percent level and the rho (correlation between the error terms in the participation and outcome equations) is significant. The latter suggests a rejection of the null hypothesis that there is no correlation between the employment probability and wage equations. This supports the use of the Heckman sample- selection in a wage equation.

VI. Conclusion

The present study, drawing upon three rounds (1992-93, 1998 and 2005) of NFHS data and 2005 NCAER data, tests the twin hypotheses; a) the activity hypothesis postulating that activity intensity affects adult nutrition in terms of Body Mass Index (BMI) and b) the poverty nutrition trap hypothesis predicting the wage effects on nutritional status. We employ the following four econometric models. First, we have applied quantile regressions to each round of cross-sectional data to take account of different behavioral response among different nutritional groups. Second, the pseudo panel model has been constructed to see any common pattern over the years. Finally, instrumental variable (IV) and Heckman sample- selection regression models have been used to test the poverty nutrition trap hypothesis in taking account of the sample selection bias associated with the labour market participation and the endogeneity of wages in the BMI equation.

Our results strongly support both hypotheses. That is, there exists a poverty nutrition trap associated with the labour market participation. We find, after taking account of the sample selection bias associated with the labor market participation and the endogeneity of wages, those who are left out from the labor market or experience lower wages tend to have lower levels of nutrition in terms of BMI. Further, our estimates show that those who are doing manual labour or more physically intensive and demanding activities (e.g. farmers, fishermen, labourers and production workers) are more likely to be undernourished than those who are doing less intensive activities (for example, professionals, managers).

The two results aid in understanding the relatively (to growth in income levels) slow improvement in BMI at all the ranges of nutritional groups. At the low end of the income distribution, people would need to enter into the labor market and earn wages to escape poverty. Additionally, even when they manage to find jobs, low wages and/or physically demanding jobs would prevent them from improving nutritional conditions. Only if they are able to earn higher wages, enter into the jobs which would require less physically demanding work and/or are self employed possibly with higher education, they would be able to improve their nutritional conditions. However, this opportunity appears to be still relatively limited. In terms of policy implications, facilitating diversifications of activities of the poor, for example, through providing employment in non-farm or service sectors would be effective as a poverty alleviation strategy in reducing the prevalence of malnutrition.

Although we have not analyzed explicitly the factors underlying the continued reduction of nutritional intakes, , our results suggest that it is too optimistic to relate this reduction to the fact that more and more people are now doing physically less demanding work as a result of economic growth. It is more likely that a substantial number of rural people have found it difficult to escape from the poverty nutrition trap or to shift to physically less demanding activities. Hence poverty alleviation programs aimed at directly and indirectly addressing the problem of nutritional deprivations should continue to serve as an important role in rural India.

References

Aturupane H., Deolalikar A. B. and Gunewardena D. (2008) 'The Determinants of Child Weight and Height in Sri Lanka: A Quantile Regression Approach' UNU WIDER Research Paper No. 2008/53 United Nations University.

Bassole L. (2007) 'Child malnutrition in Senegal: Does access to public infrastructure really matter? A quantile regression analysis' African Economic Conference 2007: Opportunities and Challenges of Development for Africa in the Global Arena.

Behrman J. R. and Deolalikar A. B. (1989) 'Agriculture wages in India: The role of health, nutrition and seasonality.' In Seasonal variability in Third World agriculture, ed. D.E. Sahn. Baltimore, Md.: Johns Hopkins University Press.

Bilsborrow R. E. (1977) 'Effects of Economic Dependency on Labour Force Participation Rates in Less Developed Countries' *Oxford Economic Papers* 29(1), 61-83.

Bliss C. and Stern, N. (1978) 'Productivity, wages and nutrition: Part I: The theory'. *Journal of Development Economics*, 5 (4), 331-362

Chhabra P. and Chhabra S. (2007) 'Distribution and Determinants of Body Mass Index of Non-Smoking Adults in Delhi, India' *Journal of Health Population and Nutrition* 25(3), 294-301.

Church T.S., Thomas D. M., Tudor-Locke C., Katzmarzyk P. T., Earnest C. P., Rodarte R. Q., Martin C. K., Blair S. N. and Bouchard C. (2011) 'Trends over 5 Decades in U.S. Occupation-Related Physical Activity and Their Associations with Obesity' *PLoS ONE* 6(5): e19657.

Dasgupta, P. (1993) *An inquiry into well-being and destitution,* Oxford: Oxford University Press.

Dasgupta, P., and D. Ray (1986) 'Inequality as a determinant of malnutrition and unemployment: Theory', *Economic Journal*, 96: 1011–1034.

Dasgupta, P., and D. Ray (1987) 'Inequality as a determinant of malnutrition and unemployment: Policy', *Economic Journal*, 97: 177–188.

Deaton A. (1986) 'Panel Data from a Time Series of Cross Sections', *Journal of Econometrics*, 30, pp. 109-126.

Deaton A. and Dreze J. (2009) 'Food and Nutrition in India: Facts and Interpretations', *Economic and Political Weekely* XLIV(7), 42-65.

International Institute for Population Sciences (IIPS) and Macro International (2007) *National Family Health Survey (NFHS-3), 2005–06: India*: Volume I Mumbai: IIPS.

Imai, K. S. (2011) 'Poverty, undernutrition and vulnerability in rural India: role of rural public works and food for work programmes,' *International Review of Applied Economics*, 25(6), 669–691.

Patnaik, U. (2004) 'The Republic of Hunger,' *Social Scientist*, 32(9-10): 9-35.

Patnaik, U. (2007) 'Neoliberalism and Rural Poverty in India,' *Economic & Political Weekly*, 42(30): 3132-50.

Jha, R., Gaiha, R., and Sharma, A. (2009) 'Calorie and Micronutrient Deprivation and Poverty Nutrition Traps in Rural India,' *World Development*, 37(5), 982-991.

Jha R., Gaiha R. and Pandey M. K. (2011) 'Body Mass Index, Participation, Duration of Work and Earnings, under NREGS Evidence from Rajasthan' *ASARC Working Paper 2011/06* Australia South Asia Research Centre Australia National University, Canberra.

Koenker R. and Basset G. (1978) 'Regression Results' *Econometric* 46(1), 33-50.

Krueger D. and Perri F. (2006) 'Does Income Inequality lead to Consumption Inequality: Evidence and Theory' *Review of Economic Studies* 73(1), 163-193.

Leibenstein H. (1957) *Economic Backwardness of Economic Growth*, New York: Wiley.

Palmer-Jones, R., and K. Sen (2001) 'On Indian Poverty Puzzles and Statistics of Poverty,' *Economic & Political Weekly,* 36(3), 20 January: 211-17.

Rao, C. H. H. (2000) 'Declining Demand for Foodgrains in Rural India: Causes and Implications', *Economic & Political Weekly*, 35(4), 22 January: 201-06.

Rao, C. H. H. (2006) *Agriculture, Food Security, Poverty and Environment: Essays on Post-Reform India*, New Delhi, Oxford University Press.

Rutstein S. O. and Johnson, K. (2004) *The DHS Wealth Index.* DHS Comparative Reports No. 6.Calverton, Maryland: ORC Macro.

Strauss J. (1986) 'Does Better Nutrition Raise Farm Productivity' , *The Journal of Political Economy* 94(2), 297-320.

Strauss J. and Thomas D. (1998) 'Health Nutrition and Economic Development' *Journal of Economic Literature* 36(2), 766-817.

Thomas, D. (1994) 'Like Father, like Son; Like Mother, like Daughter: Parental Resources and Child Height', *Journal of Human Resources*, 29 (4):950-988.

Verbeek, M. (1996) Pseudo Panel Data in Matyas, L. & Sevestre, P. (Eds.), 'The Econometrics of Panel data: A Handbook of the Theory with Applications', Second Edition, in *Advanced Studies in Theoretical and Applied Econometrics*, 33, Boston and London: Kluwer Academic, pp. 280-92

Verbeek, M. & Nijman T. E. (1992) 'Can Cohort Data Be Treated As Genuine Panel Data?' *Empirical Economics* 17, pp.9-23.

Weinberger K. (2003) 'The Impact of Micronutrients on Labor Productivity: Evidence from Rural India' Proceedings of the 25th International Conference of Agricultural Economists Durban, South Africa.

Wooldridge J. (2009) *Introductory Econometrics: A Modern Approach*, 4th Edition, Mason, Ohio, South Western Educational Publishing.

Table 1
Econometric Results: National Family Health Survey 1-Female – Rural Sample

Explanatory Variables	(1) Ordinary Least Squares	(2) Quantile Regression[$] Severely Underweight	(3) Quantile Regression[$] Under weight	(4) Quantile Regression[$] Normal	(5) Quantile Regression[$] Over weight	(6) Quantile Regression[$] Obese
		14.38(34.50)[a]	16.79(80.40)[a]	19.94(95.22)[a]	26.85(98.95)[a]	34.42(99.68)[a]
Age	-0.03	-0.02	-0.02	-0.14	-0.27	0.31
	[-0.80]	[-0.92]	[-0.44]	[-1.06]	[-0.64]	[0.46]
Age Squared	0.00	0.00	0.00	0.00	0.00	-0.01
	[0.70]	[1.11]	[0.35]	[0.69]	[0.36]	[-0.50]
Wealth Scores	0.44	0.22	0.32	1.41	2.20	3.20
	[5.71]**	[4.15]**	[3.92]**	[5.32]**	[2.73]**	[2.44]*
Education (Attempted or Completed Primary)[1]	0.02	0.06	0.01	0.03	-0.63	-1.41
	[0.25]	[0.85]	[0.10]	[0.10]	[-0.53]	[-0.62]
Education (Attempted or Completed Secondary)	0.04	0.25	0.09	-0.45	-2.57	-4.54
	[0.38]	[4.07]**	[0.88]	[-1.42]	[-2.62]**	[-2.80]**
Education (Attempted or Completed Higher than Secondary)	0.02	0.30	0.11	-1.69	-4.72	-3.67
	[0.07]	[1.13]	[0.23]	[-1.83]+	[-2.62]**	[-1.08]
Working for family member	0.10	0.16	0.02	-0.03	-1.13	-0.14
	[1.14]	[2.95]**	[0.19]	[-0.13]	[-1.21]	[-0.05]
Working for someone else	0.17	0.18	0.07	0.20	-1.18	-2.05
	[1.95]+	[2.91]**	[0.81]	[0.59]	[-1.26]	[-1.21]
Self employed	-0.56	-0.20	-0.35	-0.88	-3.96	-7.30
	[-3.60]**	[-1.24]	[-1.57]	[-2.14]*	[-3.99]**	[-4.44]**
Marital Status(Currently Married)[3]	0.02	-0.06	0.05	0.09	1.32	4.69
	[0.09]	[-0.43]	[0.15]	[0.15]	[0.40]	[1.62]
Religion (Hindu)[4]	-1.34	-0.57	-2.15	-3.93	-5.60	-10.59
	[-4.19]**	[-2.81]**	[-3.52]**	[-1.45]	[-1.83]+	[-2.09]*
Religion(Muslim)	-1.33	-0.50	-2.18	-4.59	-6.31	-11.04
	[-3.97]**	[-2.45]*	[-3.50]**	[-1.70]+	[-1.89]+	[-1.68]+
Religion(Christian)	-0.20	-0.05	-0.79	-0.73	1.06	-1.35
	[-0.52]	[-0.21]	[-1.21]	[-0.25]	[0.29]	[-0.27]
Religion(Sikh)	-1.36	-0.98	-1.99	-3.36	-5.73	-11.47
	[-3.58]**	[-3.21]**	[-3.07]**	[-1.20]	[-1.73]+	[-2.16]*
Social Group (Scheduled Caste)[5]	-0.12	-0.06	-0.06	-0.16	-1.59	-3.55
	[-1.38]	[-1.10]	[-0.48]	[-0.60]	[-1.61]	[-2.26]*
Social Group(Scheduled Tribe)	0.01	-0.17	0.14	1.11	1.12	0.24
	[0.07]	[-2.29]*	[0.95]	[2.01]*	[0.93]	[0.09]
Household Size	-0.00	0.01	0.01	-0.05	-0.11	-0.32
	[-0.23]	[1.26]	[0.97]	[-1.84]+	[-1.40]	[-2.72]**
BIMARU[6]	0.60	-0.40	0.92	4.22	8.51	13.51
	[3.97]**	[-3.34]**	[4.90]**	[8.74]**	[6.15]**	[5.85]**
South	-0.24	-0.70	-0.12	1.44	3.17	4.79
	[-1.93]+	[-6.42]**	[-0.81]	[2.89]**	[2.65]**	[2.45]*
East	1.04	-0.21	1.21	5.54	8.40	11.07
	[5.03]**	[-1.28]	[4.20]**	[8.73]**	[5.60]**	[4.58]**
Delhi	-0.70	-0.98	-0.24	-0.79	-2.46	-5.22
	[-2.96]**	[-5.55]**	[-0.78]	[-1.85]+	[-1.78]+	[-2.42]*

Flush Toilet	-0.03	0.02	-0.03	-0.54	-0.04	-0.45
	[-0.25]	[0.18]	[-0.18]	[-1.33]	[-0.02]	[-0.19]
Distance to Water (time)	0.00	0.00	0.01	0.01	0.03	0.03
	[2.88]**	[0.34]	[4.54]**	[2.65]**	[1.21]	[0.87]
Fridge	0.02	0.07	0.32	-0.60	-0.94	1.23
	[0.09]	[0.45]	[1.24]	[-0.87]	[-0.47]	[0.43]
Bicycle	-0.32	-0.16	-0.30	-0.63	-1.66	-2.01
	[-4.82]**	[-3.20]**	[-3.94]**	[-3.09]**	[-2.04]*	[-1.24]
Price of Sugar (State level)	-0.41	-0.15	-0.53	-1.10	-1.82	-4.40
	[-6.07]**	[-3.13]**	[-6.41]**	[-5.79]**	[-3.26]**	[-3.03]**
Price of eggs (State level)	0.02	0.01	0.04	0.07	0.22	0.82
	[1.05]	[0.54]	[2.14]*	[0.99]	[1.05]	[2.35]*
Price of Cereals (State level)	0.02	0.03	0.00	-0.02	0.09	-0.21
	[2.05]*	[3.33]**	[0.16]	[-0.35]	[0.72]	[-1.00]
Land Size (Usable for Agric.)	0.00	-0.00	-0.00	0.01	0.00	0.01
	[0.55]	[-0.17]	[-0.02]	[1.71]+	[0.04]	[0.13]
Land size squared	-0.00	0.00	0.00	-0.00	-0.00	-0.00
	[-0.18]	[0.17]	[0.67]	[-1.27]	[-0.04]	[-0.16]
Constant	24.14	18.02	27.84	44.48	61.16	101.37
	[17.00]**	[19.23]**	[14.72]**	[9.11]**	[5.57]**	[3.97]**
N	10336	10336	10336	10336	10336	10336
Adj. R^2	0.034	-	-	-	-	-
F-statistics	9.43	-	-	-	-	-
Log-likelihood	-2.6e+04	-	-	-	-	-

t statistics in brackets ----- + p<.10, * p<.05, ** p<.0; Base categories: [1] Education (None); [2] Work Status(Not working) [3] Marital Status (Formerly Married); [4] Religion (Other); [5] Social Group (Non-Backward Group); [6] Location (North); [$] Quantile regression standard errors are bootstrapped based on 100 replicates; [a] The median z-score and the corresponding percentile for the group

Table 2
Econometric Results: National Family Health Survey 2- Female-Rural Sample

Explanatory Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
		Quantile Regression[$]				
	Ordinary Least Squares	**Severely Underweight**	**Under weight**	**Normal**	**Over weight**	**Obese**
		15.37(3.45)[a]	**17.48(22.1)[a]**	**20.46(65.2)[a]**	**26.53(96.17)[a]**	**31.88(99.46)[a]**
Age	0.05	-0.01	-0.01	0.02	0.05	0.27
	[4.08]**	[-0.24]	[-0.98]	[0.83]	[1.69]+	[2.72]**
Age Squared	-0.00	-0.00	0.00	0.00	0.00	-0.00
	[-0.75]	[-0.65]	[1.07]	[1.51]	[2.30]*	[-1.18]
Wealth Scores	1.03	0.35	0.60	1.02	1.80	2.27
	[26.32]**	[7.87]**	[12.95]**	[21.96]**	[13.69]**	[5.69]**
Education (Attempted or Completed Primary)[1]	0.21	-0.03	-0.01	0.25	0.46	1.30
	[4.55]**	[-0.54]	[-0.14]	[6.93]**	[3.25]**	[2.10]*

Education (Attempted or Completed Secondary)	0.19	-0.09	-0.02	0.28	0.45	0.35
	[3.63]**	[-1.10]	[-0.37]	[2.64]**	[2.53]*	[0.60]
Education (Attempted or Completed Higher than Secondary)	0.43	-0.02	0.30	0.63	0.95	1.39
	[3.40]**	[-0.09]	[2.26]*	[2.70]**	[2.36]*	[1.31]
Working for family member	-0.11	0.12	0.08	-0.09	-0.38	-1.22
	[-2.84]**	[1.64]	[2.54]*	[-2.37]*	[-2.41]*	[-3.74]**
Working for someone else	-0.25	0.03	-0.09	-0.23	-0.63	-1.21
	[-5.99]**	[0.60]	[-1.82]+	[-4.67]**	[-4.63]**	[-2.48]*
Self employed	-0.02	0.18	0.14	-0.08	0.03	-0.76
	[-0.33]	[1.29]	[2.13]*	[-0.69]	[0.12]	[-1.04]
Marital Status(Currently Married)[3]	0.04	-0.04	0.03	0.03	-0.09	-0.54
	[0.68]	[-0.33]	[0.57]	[0.32]	[-0.41]	[-1.01]
Religion (Hindu)[4]	-0.86	-0.34	-0.93	-0.93	-0.23	-0.77
	[-6.67]**	[-1.23]	[-6.48]**	[-6.05]**	[-0.61]	[-0.58]
Religion(Muslim)	-0.39	-0.14	-0.63	-0.55	0.77	0.96
	[-2.68]**	[-0.46]	[-4.00]**	[-3.22]**	[1.82]+	[0.64]
Religion(Christian)	0.03	0.18	-0.11	0.02	0.46	0.89
	[0.17]	[0.73]	[-0.56]	[0.08]	[1.03]	[0.59]
Religion(Sikh)	0.20	-0.17	-0.47	0.25	2.92	-0.00
	[0.81]	[-0.53]	[-1.90]+	[0.46]	[4.63]**	[-0.00]
Religion(Buddhist/Neo-Buddhist)	-0.27	0.10	-0.28	-0.06	0.19	0.93
	[-1.24]	[0.15]	[-1.52]	[-0.23]	[0.31]	[0.68]
Religion(Jain)	0.37	0.95	-0.41	-0.14	2.77	4.12
	[0.63]	[3.10]**	[-0.52]	[-0.15]	[1.87]+	[1.19]
Social Group (Scheduled Caste)[5]	-0.22	-0.16	-0.19	-0.18	-0.30	-0.53
	[-4.73]**	[-1.87]+	[-4.29]**	[-3.54]**	[-1.47]	[-1.07]
Social Group(Scheduled Tribe)	-0.02	0.09	-0.03	0.03	0.01	-0.60
	[-0.37]	[1.20]	[-0.80]	[0.53]	[0.06]	[-0.81]
Social Group(Other Backward)	-0.02	0.06	-0.01	0.04	-0.01	-0.57
	[-0.41]	[0.91]	[-0.19]	[0.85]	[-0.06]	[-0.88]
Household Size	-0.02	0.01	-0.01	-0.02	-0.04	-0.10
	[-4.57]**	[0.90]	[-0.99]	[-3.01]**	[-2.96]**	[-1.69]+
BIMARU[6]	0.13	0.08	0.26	0.13	-0.11	-0.80
	[2.08]*	[0.99]	[4.65]**	[1.78]+	[-0.55]	[-1.06]
South	-0.10	-0.51	-0.35	-0.15	0.68	0.57
	[-1.47]	[-5.36]**	[-4.65]**	[-1.45]	[3.61]**	[0.54]
East	-0.05	-0.04	0.14	-0.12	-0.54	-1.03
	[-0.72]	[-0.33]	[2.44]*	[-1.12]	[-2.81]**	[-1.31]
Delhi	1.35	0.83	0.81	2.05	1.92	1.79
	[3.79]**	[2.41]*	[1.69]+	[4.27]**	[1.89]+	[1.46]
Flush Toilet	0.21	0.12	0.12	0.27	0.30	-0.49
	[2.71]**	[1.58]	[1.00]	[2.75]**	[1.15]	[-0.73]
Distance to Water (time)	0.00	-0.00	0.00	0.00	0.00	0.01
	[0.45]	[-0.50]	[0.71]	[1.14]	[0.35]	[1.30]
Fridge	0.52	0.26	0.34	0.65	0.84	1.09
	[4.38]**	[1.94]+	[2.71]**	[3.95]**	[2.98]**	[0.65]
Bicycle	-0.02	-0.02	-0.08	-0.05	0.15	0.60
	[-0.45]	[-0.57]	[-3.29]**	[-0.92]	[1.36]	[1.79]+
Price of Sugar (State level)	0.03	-0.08	-0.00	0.05	0.17	0.04
	[1.16]	[-1.90]+	[-0.09]	[1.61]	[1.90]+	[0.13]

Price of eggs (State level)	-0.03	-0.03	-0.03	-0.02	-0.02	0.03
	[-3.68]**	[-2.25]*	[-2.39]*	[-2.40]*	[-0.62]	[0.34]
Price of Cereals (State level)	0.02	0.03	0.04	0.03	0.01	-0.03
	[4.43]**	[3.86]**	[9.25]**	[5.01]**	[1.01]	[-0.87]
Land Size (Usable for Agric.)	0.00	0.00	-0.00	0.00	0.00	0.00
	[0.83]	[1.23]	[-0.35]	[0.97]	[1.27]	[1.86]+
Land size squared	-0.00	-0.00	0.00	-0.00	-0.00	-0.00
	[-0.62]	[-1.13]	[0.68]	[-0.62]	[-1.04]	[-1.86]+
Constant	19.36	17.99	18.69	19.69	20.27	24.61
	[34.37]**	[21.90]**	[34.27]**	[27.46]**	[11.96]**	[2.76]**
N	36227	36227	36227	36227	36227	36227
Adj. R^2	0.128	-	-	-	-	-
F-statistics	116.71	-	-	-	-	-

t statistics in brackets ----- + p<.10, * p<.05, ** p<.0; Base categories: [1] Education (None); [2] Work Status(Not working) [3] Marital Status (Formerly Married); [4] Religion (Other); [5] Social Group (Non-Backward Group); [6] Location (North); [$] Quantile regression standard errors are bootstrapped based on 20 replicates; [a] The median z-score and the corresponding percentile for the group

Table 3

Econometric Results: National Family Health Survey 3: Female-Rural Sample

Explanatory Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Ordinary Least Squares	**Quantile Regression[$]**				
		Severely Underweight	**Under weight**	**Normal**	**Over weight**	**Obese**
		15.37(3.10)[a]	**17.47(20.5)[a]**	**20.61(63.1)[a]**	**26.56(95.05)[a]**	**31.84(99.29)[a]**
Age	0.08	-0.01	-0.01	0.05	0.25	0.57
	[7.02]**	[-0.62]	[-0.63]	[3.65]**	[7.14]**	[6.13]**
Age Squared	-0.00	0.00	0.00	0.00	-0.00	-0.01
	[-1.83]+	[0.15]	[1.82]+	[1.08]	[-3.07]**	[-3.81]**
Wealth Scores	0.12	0.05	0.08	0.12	0.17	0.21
	[31.58]**	[8.90]**	[21.55]**	[24.58]**	[18.63]**	[5.99]**
Education (Attempted or Completed Primary)[1]	0.43	0.15	0.23	0.39	0.54	0.62
	[10.32]**	[2.12]*	[6.33]**	[7.90]**	[4.21]**	[2.01]*
Education (Attempted or Completed Secondary)	0.33	0.10	0.13	0.30	0.30	0.35
	[8.26]**	[1.50]	[3.38]**	[6.25]**	[3.10]**	[1.04]
Education (Attempted or Completed Higher than Secondary)	0.06	-0.13	0.22	0.17	-0.39	-0.18
	[0.58]	[-0.77]	[2.23]*	[1.49]	[-1.63]	[-0.27]
Working for family member	-0.31	0.03	-0.08	-0.25	-0.83	-1.48
	[-9.08]**	[0.58]	[-2.04]*	[-5.81]**	[-8.72]**	[-5.74]**
Working for someone else	-0.25	0.13	-0.07	-0.25	-0.65	-0.96
	[-6.24]**	[2.08]*	[-1.72]+	[-5.12]**	[-6.85]**	[-2.77]**
Self employed	-0.23	0.10	-0.01	-0.24	-0.67	-1.47
	[-4.23]**	[0.95]	[-0.20]	[-4.06]**	[-4.27]**	[-4.47]**
Marital Status(Currently Married)[3]	0.70	0.63	0.69	0.68	0.30	-0.39
	[15.40]**	[9.10]**	[14.28]**	[13.69]**	[2.62]**	[-1.43]
Marital Status(Formerly Married)	0.53	0.38	0.63	0.52	0.47	-0.39
	[6.53]**	[2.50]*	[7.91]**	[4.96]**	[2.39]*	[-0.64]
Religion (Hindu)[4]	-1.20	-0.80	-0.85	-1.25	-1.52	-1.27
	[-11.44]**	[-3.70]**	[-5.89]**	[-8.39]**	[-6.29]**	[-2.14]*

Religion(Muslim)	-0.77	-0.77	-0.73	-0.88	-0.73	-0.12
	[-6.55]**	[-3.54]**	[-4.97]**	[-5.66]**	[-2.44]*	[-0.15]
Religion(Christian)	0.06	0.25	0.42	0.08	-0.28	0.11
	[0.54]	[1.12]	[2.84]**	[0.53]	[-1.19]	[0.16]
Religion(Sikh)	0.49	0.08	0.28	0.62	0.98	2.20
	[3.15]**	[0.30]	[1.49]	[2.74]**	[2.43]*	[1.58]
Religion(Buddhist/Neo-Buddhist)	-0.74	-0.80	-0.52	-0.73	-1.11	1.94
	[-3.49]**	[-1.86]+	[-1.86]+	[-2.73]**	[-2.45]*	[0.57]
Religion(Jain)	-2.19	-1.71	-0.72	-2.35	-3.87	-3.24
	[-4.23]**	[-2.27]*	[-0.81]	[-6.65]**	[-2.03]*	[-1.35]
Social Group (Scheduled Caste)[5]	0.06	-0.12	-0.05	0.04	0.18	-0.01
	[1.37]	[-1.46]	[-0.99]	[0.70]	[1.35]	[-0.02]
Social Group(Scheduled Tribe)	0.02	0.13	0.11	0.03	-0.16	-0.62
	[0.35]	[1.56]	[2.28]*	[0.55]	[-1.19]	[-1.41]
Social Group(Other Backward)	0.10	0.10	0.09	0.06	0.12	-0.10
	[2.60]**	[1.65]+	[2.62]**	[1.07]	[1.03]	[-0.27]
Household Size	-0.02	0.01	-0.00	-0.02	-0.03	-0.04
	[-3.93]**	[1.63]	[-0.08]	[-3.02]**	[-2.12]*	[-1.00]
Health Insurance	0.05	0.11	0.10	0.00	-0.37	-0.12
	[0.52]	[0.85]	[1.06]	[0.00]	[-1.80]+	[-0.15]
BIMARU[6]	0.12	0.36	0.27	0.20	-0.44	-1.17
	[2.21]*	[3.76]**	[4.62]**	[3.33]**	[-2.53]*	[-2.48]*
South	-0.02	-0.18	-0.15	0.02	0.04	-0.23
	[-0.35]	[-2.01]*	[-2.21]*	[0.34]	[0.20]	[-0.47]
East	0.11	0.36	0.33	0.19	-0.65	-1.01
	[1.88]+	[3.69]**	[4.78]**	[2.88]**	[-3.59]**	[-2.17]*
Delhi	0.56	0.53	0.72	0.48	1.12	1.48
	[1.97]*	[1.78]+	[2.71]**	[1.55]	[0.79]	[1.08]
Robust walls (Cement or blocks)	-0.09	-0.08	-0.08	-0.05	-0.07	-0.04
	[-2.21]*	[-1.33]	[-1.91]+	[-0.89]	[-0.56]	[-0.10]
Flush Toilet	0.14	0.03	0.03	0.13	0.29	0.21
	[3.13]**	[0.45]	[0.64]	[2.19]*	[2.15]*	[0.53]
Distance to Water (time)	0.00	0.00	0.00	0.00	-0.00	0.01
	[1.66]+	[0.99]	[2.46]*	[1.64]	[-0.81]	[0.77]
Fridge	0.22	-0.20	0.03	0.27	0.53	0.72
	[3.34]**	[-1.69]+	[0.45]	[2.70]**	[2.69]**	[1.15]
Bicycle	-0.02	-0.10	-0.11	-0.05	0.08	0.23
	[-0.49]	[-2.12]*	[-3.49]**	[-1.35]	[1.03]	[0.91]
Price of Sugar (State level)	-0.04	0.07	-0.00	-0.05	-0.18	-0.62
	[-1.79]+	[1.84]+	[-0.16]	[-1.82]+	[-2.11]*	[-3.51]**
Price of eggs (State level)	-0.05	-0.03	-0.03	-0.05	-0.03	0.02
	[-6.72]**	[-3.07]**	[-3.68]**	[-4.98]**	[-1.98]*	[0.32]
Price of Cereals (State level)	0.02	0.01	0.02	0.02	0.02	-0.01
	[5.05]**	[2.50]*	[8.12]**	[6.96]**	[2.33]*	[-0.66]
Land Size (Usable for Agric.)	-0.01	0.03	0.00	-0.01	-0.01	-0.10
	[-1.00]	[2.29]*	[0.10]	[-0.78]	[-0.47]	[-2.42]*
Land size squared	0.00	-0.00	-0.00	0.00	-0.00	0.00
	[0.19]	[-1.56]	[-0.27]	[0.01]	[-0.14]	[1.52]
Constant	20.51	14.93	18.08	21.66	26.30	33.75
	[40.12]**	[18.47]**	[31.12]**	[41.21]**	[15.79]**	[8.60]**

N	51888	51888	51888	51888	51888	51888
Adj. R^2	0.173	-	-	-	-	-
F-statistics	236.62	-	-	-	-	-

t statistics in brackets ----- + p<.10, * p<.05, ** p<.0; Base categories: [1] Education (None); [2] Work Status(Not working) [3] Marital Status (Never Married); [4] Religion (Other); [5] Social Group (Non-Backward Group); [6] Location (North); [$] Quantile regression standard errors are bootstrapped based on 100; [a] The median z-score and the corresponding percentile for the group;

Table 4
Econometric Results: National Family Health Survey 3 – Male-Rural Sample

Explanatory Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
		Quantile Regression[$]				
	Ordinary Least Squares	**Severely Underweight**	**Under weight**	**Normal**	**Over weight**	**Obese**
		15.40(2.35)[a]	**17.52(16.7)[a]**	**20.87(58.5)[a]**	**26.55(93.25)**	**31.63(99.15)[a]**
Age	0.29	0.20	0.23	0.28	0.36	0.53
	[23.54]**	[8.43]**	[18.05]**	[18.43]**	[11.97]**	[6.38]**
Age Squared	-0.00	-0.00	-0.00	-0.00	-0.00	-0.01
	[-20.03]**	[-8.41]**	[-16.48]**	[-15.34]**	[-9.46]**	[-5.23]**
Wealth Scores	0.12	0.04	0.06	0.11	0.18	0.27
	[25.75]**	[5.15]**	[14.67]**	[21.95]**	[19.39]**	[8.79]**
Education (Attempted or Completed Primary)[1]	0.23	-0.03	0.11	0.26	0.31	0.24
	[4.61]**	[-0.34]	[2.12]*	[4.01]**	[2.49]*	[0.86]
Education (Attempted or Completed Secondary)	0.38	0.04	0.19	0.32	0.47	0.46
	[7.92]**	[0.42]	[3.89]**	[5.45]**	[4.54]**	[1.59]
Education (Attempted or Completed Higher than Secondary)	0.89	0.36	0.64	1.05	1.08	0.22
	[10.29]**	[2.34]*	[7.53]**	[10.73]**	[6.93]**	[0.42]
Marital Status(Currently Married)[2]	0.41	0.48	0.38	0.27	0.42	0.22
	[7.38]**	[4.38]**	[8.72]**	[4.81]**	[3.58]**	[0.66]
Marital Status(Formerly Married)	-0.22	-0.33	-0.16	-0.31	-0.47	-0.24
	[-1.66]+	[-1.14]	[-0.64]	[-2.59]**	[-1.70]+	[-0.29]
Religion (Hindu)[3]	-0.90	-1.02	-0.57	-1.24	-0.41	-0.05
	[-5.57]**	[-3.90]**	[-2.86]**	[-5.03]**	[-1.35]	[-0.03]
Religion(Muslim)	-0.65	-1.06	-0.42	-1.05	0.03	0.40
	[-3.74]**	[-3.79]**	[-1.99]*	[-4.03]**	[0.07]	[0.24]
Religion(Christian)	0.04	-0.09	0.42	-0.11	0.35	0.03
	[0.22]	[-0.29]	[1.84]+	[-0.46]	[1.26]	[0.02]
Religion(Sikh)	0.49	-1.20	0.40	0.27	1.63	3.57
	[2.12]*	[-3.07]**	[1.57]	[0.77]	[3.32]**	[1.34]
Religion(Buddhist/Neo-Buddhist)	-0.98	-1.09	-0.46	-1.24	-0.92	-1.31
	[-4.28]**	[-2.08]*	[-1.87]+	[-3.85]**	[-1.88]+	[-0.62]
Religion(Jain)	-2.54	-1.09	-0.94	-2.96	-4.14	-6.80
	[-4.81]**	[-1.77]+	[-1.44]	[-4.32]**	[-2.42]*	[-3.61]**
Social Group (Scheduled Caste)[4]	-0.06	0.10	0.02	-0.10	0.07	0.00
	[-1.14]	[0.98]	[0.32]	[-1.49]	[0.52]	[0.01]
Social Group(Scheduled Tribe)	0.04	0.23	0.25	-0.01	-0.05	-0.07
	[0.58]	[1.97]*	[3.89]**	[-0.08]	[-0.29]	[-0.15]
Social Group(Other Backward)	-0.03	0.04	0.10	-0.04	-0.10	-0.24

	[-0.70]	[0.44]	[2.22]*	[-0.68]	[-0.84]	[-0.76]
Household Size	-0.01	-0.01	-0.01	-0.01	-0.01	0.03
	[-2.06]*	[-0.54]	[-1.61]	[-1.35]	[-1.25]	[0.87]
Health Insurance	0.06	-0.02	0.15	0.03	0.05	1.67
	[0.56]	[-0.11]	[1.60]	[0.18]	[0.15]	[1.14]
BIMARU[5]	0.34	0.15	0.15	0.21	0.45	1.43
	[4.71]**	[1.25]	[2.06]*	[2.43]*	[2.85]**	[2.90]**
South	0.26	-0.05	-0.00	0.09	0.65	1.72
	[3.36]**	[-0.43]	[-0.05]	[0.98]	[3.56]**	[3.53]**
East	0.53	0.30	0.42	0.44	0.64	1.23
	[6.71]**	[1.89]+	[5.67]**	[4.53]**	[3.52]**	[2.40]*
Delhi	0.50	0.14	0.92	0.76	0.53	-1.32
	[1.58]	[0.12]	[1.84]+	[1.55]	[0.56]	[-1.78]+
Robust walls (Cement or blocks)	-0.03	-0.08	-0.02	-0.01	0.08	-0.33
	[-0.63]	[-0.84]	[-0.45]	[-0.17]	[0.69]	[-0.98]
Flush Toilet	0.04	0.03	0.01	0.15	-0.01	-0.38
	[0.80]	[0.35]	[0.10]	[2.40]*	[-0.09]	[-1.04]
Distance to Water (time)	0.00	0.00	0.00	0.00	0.00	0.01
	[1.51]	[0.19]	[2.43]*	[0.53]	[0.84]	[0.96]
Fridge	0.30	0.21	0.14	0.30	0.62	1.23
	[3.55]**	[1.30]	[1.77]+	[2.37]*	[2.79]**	[1.54]
Bicycle	-0.11	0.11	-0.01	-0.18	-0.22	-0.05
	[-3.11]**	[1.74]+	[-0.20]	[-4.48]**	[-2.39]*	[-0.22]
Price of Sugar (State level)	0.00	0.12	0.07	-0.04	-0.22	-0.07
	[0.04]	[2.11]*	[2.21]*	[-1.00]	[-2.84]**	[-0.33]
Price of eggs (State level)	-0.05	-0.01	-0.01	-0.04	-0.03	-0.08
	[-4.22]**	[-0.69]	[-1.09]	[-3.34]**	[-1.04]	[-1.25]
Price of Cereals (State level)	0.00	-0.00	0.01	0.01	0.01	0.01
	[0.79]	[-0.09]	[1.34]	[3.05]**	[1.09]	[0.52]
Land Size (Usable for Agric.)	-0.01	0.02	0.01	-0.02	-0.02	-0.07
	[-1.18]	[1.06]	[0.77]	[-2.20]*	[-0.67]	[-0.80]
Land size squared	0.00	-0.00	-0.00	0.00	0.00	0.00
	[1.94]+	[-1.08]	[-0.46]	[2.44]*	[0.61]	[1.02]
Constant	16.28	10.99	12.63	17.86	22.09	20.41
	[24.14]**	[10.18]**	[19.98]**	[22.91]**	[16.66]**	[4.54]**
N	28705	28705	28705	28705	28705	28705
Adj. R^2	0.200	-	-	-	-	-
F-statistics	204.10	-	-	-	-	-
Log-likelihood	-7.0e+04	-	-	-	-	-

t statistics in brackets ----- + p<.10, * p<.05, ** p<.0; Base categories: [1] Education (None); [2] Marital Status (Never Married); [3] Religion (Other); Social Group (Non-Backward Group); [5] Location (North); [$] Quantile regression standard errors are bootstrapped based on 100; [a] The median z-score and the corresponding percentile for the group;

Table 5
Econometric Results: National Family Health Survey: Female-Rural Sample (Pseudo Panel)

Explanatory variables	(1) Pooled	(2) Fixed Effects	(3) Random Effects
Age	0.15	2.91	0.01
	[6.49]**	[2.81]**	[0.10]
Age Squared	-0.00	-0.03	0.00
	[-3.64]**	[-1.62]	[0.14]
Wealth Score	0.07	0.19	0.10
	[10.63]**	[1.97]*	[1.24]
Proportion of cohort with no education	-	-2.39	0.33
	-	[-1.83]+	[0.39]
Education (Attempted or Completed Primary)[1]	0.48	-	-
	[3.57]**	-	-
Education (Attempted or Completed Secondary)	0.51	-	-
	[4.69]**	-	-
Education (Attempted or Completed Higher than Secondary)	0.42	-	-
	[3.93]**	-	-
Self employed[2]	-0.10	-3.25	-0.53
	[-0.56]	[-1.21]	[-0.30]
Working for someone else	-0.20	-4.48	-2.17
	[-1.37]	[-2.42]*	[-1.49]
Working for family member	-0.12	-1.62	0.35
	[-1.39]	[-1.32]	[0.36]
Religion (Hindu)[3]	-0.96	4.54	-4.72
	[-9.68]**	[1.29]	[-2.60]**
Religion(Muslim)	-0.51	7.22	-3.33
	[-3.61]**	[2.00]*	[-1.72]+
Religion(Christian)	0.23	2.35	-1.37
	[1.99]*	[0.83]	[-1.14]
Religion(Sikh)	0.22	9.54	-5.52
	[1.40]	[0.98]	[-2.39]*
Social Group (Scheduled Tribe)[4]	-0.12	-0.71	-2.73
	[-1.19]	[-0.28]	[-1.73]+
Social Group(Scheduled Caste)	-0.09	6.60	5.80
	[-0.69]	[2.98]**	[3.26]**
Household Size	-0.04	-0.06	-0.31
	[-3.17]**	[-0.33]	[-2.39]*
Flush Toilet	0.59	-2.51	-1.25
	[5.04]**	[-1.78]+	[-1.07]
Distance to Water (time)	0.00	0.02	0.03
	[0.06]	[0.79]	[1.11]
Fridge	0.61	5.08	7.17
	[4.31]**	[1.62]	[2.80]**
Bicycle	0.17	0.34	-0.80
	[1.85]+	[0.20]	[-0.77]
Price of Sugar (State level)	-0.04	-	-
	[-1.42]	-	-
Price of eggs (State level)	-0.05	-	-
	[-3.56]**	-	-
Price of Cereals (State level)	0.01	-	-
	[2.98]**	-	-
Land Size (Usable for Agric.)	0.00	-0.01	-0.01
	[1.16]	[-1.44]	[-1.54]
Land size squared	-0.00	0.00	0.00
	[-1.16]	[1.05]	[1.25]
BIMARU[5]	-0.03	-	1.14
	[-0.38]	-	[2.15]*
South	-0.34	-	1.22
	[-5.02]**	-	[1.86]+
East	-0.30	-	1.82
	[-2.99]**	-	[2.63]**
Delhi	6.32	-	-
	[1.58]	-	-
Survey round dummy (1998 -9)[6]	4.25	4.61	4.57
	[33.47]**	[9.29]**	[10.37]**

Survey round dummy (2006 -3)	4.54	5.27	4.26
	[68.61]**	[5.62]**	[5.67]**
Constant	15.25	-50.36	20.16
	[21.40]**	[-2.79]**	[8.10]**
N	103536	378	378
Adj. R^2	0.024	0.581	-
F-statistics	860.57	30.47	-
Correlation between the error and regressors	0.97	-	-
Hausman	-	41.92(0.00)	
F-test (Unobserved heterogeneity=0)	-	1.26(0.07)	-
Test for time effect	-	45.67(0.00)	112.01(0.00)

t statistics in brackets ----- + p<.10, * p<.05, ** p<.0; Base categories: [1] Education (None); [2] Work Status(Not working) [3] Religion (Other); [4] Social Group (Non-Backward Group); [5] Location (North); [6] Round Dummy(1993 -1);

Table 6
Econometric Results: National Council for Applied Economic Research – Rural Sample[1]

Explanatory variables	**(1) OLS[£]**	**(2) OLS[$]**	**(3) IV[α]**	**(4) OLS (Based on Heckman wage regression)[π]**
Log of Wage	0.43	0.40	1.84	-
	[6.24]**	[5.69]**	[3.12]**	-
Predicted log of Wage	-	-	-	1.40
	-	-	-	[3.05]**
Sex(Male)	-0.12	-0.03	-0.66	-0.55
	[-0.56]	[-0.15]	[-2.00]*	[-1.79]+
Age years	0.07	0.07	0.06	0.02
	[2.75]**	[2.55]*	[2.34]*	[0.68]
Age years squared	-0.00	-0.00	-0.00	-0.00
	[-2.21]*	[-2.07]*	[-2.04]*	[-0.83]
Education (Lower Primary)[2]	-0.01	-0.03	-0.03	-0.09
	[-0.06]	[-0.23]	[-0.22]	[-0.78]
Education (Upper Primary)	0.11	0.08	0.02	-0.12
	[1.10]	[0.80]	[0.14]	[-0.93]
Education (Secondary)	0.32	0.17	0.00	-0.25
	[2.09]*	[1.08]	[0.01]	[-1.17]
Education (Higher Secondary)	-0.13	-0.51	-0.90	-1.10
	[-0.42]	[-1.58]	[-2.45]*	[-2.77]**
Education (Undergraduate)	-0.34	-0.89	-1.64	-1.53
	[-0.53]	[-1.20]	[-1.87]+	[-1.93]+
Education (Graduate)	0.89	0.28	-0.61	-0.93
	[2.86]**	[0.74]	[-1.08]	[-1.52]
Scheduled Caste	-0.17	-0.17	-0.23	-0.18
	[-2.44]*	[-2.38]*	[-2.93]**	[-2.51]*
Household size	-0.14	-0.14	-0.11	-0.14
	[-3.03]**	[-3.04]**	[-2.28]*	[-2.95]**
Household Size Squared	0.01	0.01	0.01	0.01
	[2.80]**	[2.82]**	[1.99]*	[2.70]**
Distance to market	-0.01	-0.01	-0.01	-0.01
	[-1.92]+	[-1.95]+	[-2.25]*	[-1.64]
BIMARU[2]	-0.69	-0.63	0.05	-0.18
	[-3.87]**	[-3.50]**	[0.14]	[-0.65]
South	-0.80	-0.75	-0.14	-0.42
	[-4.69]**	[-4.31]**	[-0.44]	[-1.78]+
East	-0.94	-0.88	-0.24	-0.51
	[-5.18]**	[-4.83]**	[-0.73]	[-1.99]*
Others	-1.33	-1.40	-1.61	-1.52
	[-1.75]+	[-1.76]+	[-1.98]*	[-1.88]+
Price of cereals	-0.01	-0.01	-0.02	-0.01
	[-1.74]+	[-1.82]+	[-2.51]*	[-0.99]
Activity Intensity (Clerical/Sales/Services)[3]	-	-0.44	0.19	-0.58
	-	[-1.28]	[0.41]	[-1.69]+
Activity Intensity(Farmers/Fishermen)	-	-0.84	0.30	-1.09
	-	[-2.45]*	[0.49]	[-3.26]**

Activity Intensity (Labourers and Production workers)	-	-1.01	-0.18	-1.21
	-	[-2.94]**	[-0.34]	[-3.57]**
Constant	18.95	19.91	16.39	19.47
	[36.62]**	[31.55]**	[10.17]**	[24.93]**
N	5811	5803	5790	5791
Adj. R^2	0.021	0.023	-0.045	0.019
F-statistics	8.54	7.93	5.70	6.74
Hausman Test	-		9.30(0.98)	
Under identification test	-		-	
			-	
			78.91(0.00)	
			-	
Weak identification test	-	-		-
		48.87		
Over identification test	-	-		-
		0.51(0.48)		

t statistics in brackets ---- + p<.10, * p<.05, ** p<.01; [1] The sample has been restricted to BMI less than 25; [2] Reference category for education is No education; [3] Base group for activity intensity is Professionals/Managers; [£] Basic OLS without activity intensity variables; [$] Basic OLS with activity intensity variables; [α] The instruments for correcting for wage endogeneity are the available of a trade union in the village and state level gini coefficient [π] Exclusion restriction variables used for the probability get employed is household's infant dependency ratio.

Appendices

Appendix Table A1
Proportion of Malnutrition by Correlates – National Family Health Survey 1

	Underweight	Normal	Overweight	Total	Underweight	Normal	Overweight	Underweight	Normal	Overweight	Total
	Frequencies				Row Percentages			Column Percentages			
Correlates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Age 5-year groups											
15-19	979	75	21	1,075	91.10%	7.00%	2.00%	10.30%	10.70%	12.40%	10.40%
20-24	3,210	234	66	3,510	91.50%	6.70%	1.90%	33.90%	33.30%	39.10%	34.00%
25-29	2,744	208	46	2,998	91.50%	6.90%	1.50%	29.00%	29.60%	27.20%	29.00%
30-34	1,562	121	19	1,702	91.80%	7.10%	1.10%	16.50%	17.20%	11.20%	16.50%
35-39	659	45	12	716	92.00%	6.30%	1.70%	7.00%	6.40%	7.10%	6.90%
40-44	246	14	3	263	93.50%	5.30%	1.10%	2.60%	2.00%	1.80%	2.50%
45-49	64	6	2	72	88.90%	8.30%	2.80%	0.70%	0.90%	1.20%	0.70%
Educational Level											
No Education	6,719	492	125	7,336	91.60%	6.70%	1.70%	71.00%	70.00%	74.00%	71.00%
Primary	1,344	102	27	1,473	91.20%	6.90%	1.80%	14.20%	14.50%	16.00%	14.30%
Secondary	1,336	102	16	1,454	91.90%	7.00%	1.10%	14.10%	14.50%	9.50%	14.10%
Higher	65	7	1	73	89.00%	9.60%	1.40%	0.70%	1.00%	0.60%	0.70%
Work Status											
Not working	6,065	452	115	6,632	91.50%	6.80%	1.70%	64.10%	64.30%	68.00%	64.20%
Work for family member	1,707	130	32	1,869	91.30%	7.00%	1.70%	18.00%	18.50%	18.90%	18.10%
Work for someone else	1,362	100	18	1,480	92.00%	6.80%	1.20%	14.40%	14.20%	10.70%	14.30%
Self employed	330	21	4	355	93.00%	5.90%	1.10%	3.50%	3.00%	2.40%	3.40%
Marital Status											
Formerly Married	126	12	2	140	90.00%	8.60%	1.40%	1.30%	1.70%	1.20%	1.40%
Currently Married	9,338	691	167	10,196	91.60%	6.80%	1.60%	98.70%	98.30%	98.80%	98.60%
Social Group											
Other	6,609	422	96	7,127	92.70%	5.90%	1.30%	69.80%	60.00%	56.80%	69.00%
Scheduled Caste	1,389	90	15	1,494	93.00%	6.00%	1.00%	14.70%	12.80%	8.90%	14.50%
Scheduled Tribe	1,466	191	58	1,715	85.50%	11.10%	3.40%	15.50%	27.20%	34.30%	16.60%
Religion											
Other	170	39	14	223	76.20%	17.50%	6.30%	1.80%	5.50%	8.30%	2.20%
Hindu	7,666	522	108	8,296	92.40%	6.30%	1.30%	81.00%	74.30%	63.90%	80.30%
Muslim	900	45	15	960	93.80%	4.70%	1.60%	9.50%	6.40%	8.90%	9.30%
Christian	568	89	31	688	82.60%	12.90%	4.50%	6.00%	12.70%	18.30%	6.70%
Sikh	160	8	1	169	94.70%	4.70%	0.60%	1.70%	1.10%	0.60%	1.60%
Wealth Index Quintiles											
Lowest quintile	2,742	217	44	3,003	91.30%	7.20%	1.50%	29.00%	30.90%	26.00%	29.10%
Second quintile	2,260	148	38	2,446	92.40%	6.10%	1.60%	23.90%	21.10%	22.50%	23.70%
Middle quintile	2,053	165	40	2,258	90.90%	7.30%	1.80%	21.70%	23.50%	23.70%	21.80%
Fourth quintile	1,846	133	37	2,016	91.60%	6.60%	1.80%	19.50%	18.90%	21.90%	19.50%

Highest quintile	563	40	10	613	91.80%	6.50%	1.60%	5.90%	5.70%	5.90%	5.90%
Household Size											
Less than 5	1,475	116	32	1,623	90.90%	7.10%	2.00%	15.60%	16.50%	18.90%	15.70%
5 – 8 inclusive	5,023	379	83	5,485	91.60%	6.90%	1.50%	53.10%	53.90%	49.10%	53.10%
9 – 12 inclusive	2,020	146	41	2,207	91.50%	6.60%	1.90%	21.30%	20.80%	24.30%	21.40%
Greater than 12	946	62	13	1,021	92.70%	6.10%	1.30%	10.00%	8.80%	7.70%	9.90%
Flush toilet											
No	8,872	660	157	9,689	91.60%	6.80%	1.60%	93.70%	93.90%	92.90%	93.70%
Yes	592	43	12	647	91.50%	6.60%	1.90%	6.30%	6.10%	7.10%	6.30%
Pipe Water											
No	6,604	454	110	7,168	92.10%	6.30%	1.50%	69.80%	64.80%	65.10%	69.40%
Yes	2,852	247	59	3,158	90.30%	7.80%	1.90%	30.20%	35.20%	34.90%	30.60%
Radio											
No	6,334	496	116	6,946	91.20%	7.10%	1.70%	66.90%	70.60%	68.60%	67.20%
Yes	3,130	207	53	3,390	92.30%	6.10%	1.60%	33.10%	29.40%	31.40%	32.80%
Television											
No	8,519	634	145	9,298	91.60%	6.80%	1.60%	90.00%	90.20%	85.80%	90.00%
Yes	945	69	24	1,038	91.00%	6.60%	2.30%	10.00%	9.80%	14.20%	10.00%
Bicycle											
No	5,987	516	122	6,625	90.40%	7.80%	1.80%	63.30%	73.40%	72.20%	64.10%
Yes	3,477	187	47	3,711	93.70%	5.00%	1.30%	36.70%	26.60%	27.80%	35.90%
Refrigerator											
No	9,240	690	165	10,095	91.50%	6.80%	1.60%	97.60%	98.20%	97.60%	97.70%
Yes	224	13	4	241	92.90%	5.40%	1.70%	2.40%	1.80%	2.40%	2.30%
Land Size											
Landless	3,251	239	54	3,544	91.70%	6.70%	1.50%	34.40%	34.00%	32.00%	34.30%
<=2.5 Hectares – Small	2,857	193	45	3,095	92.30%	6.20%	1.50%	30.20%	27.50%	26.60%	29.90%
>2.5 Hectares – Medium	813	58	10	881	92.30%	6.60%	1.10%	8.60%	8.30%	5.90%	8.50%
>= hectares – Large	2,543	213	60	2,816	90.30%	7.60%	2.10%	26.90%	30.30%	35.50%	27.20%
Total	**9,464**	**703**	**169**	**10,336**	**91.60%**	**6.80%**	**1.60%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Appendix Table A2

Proportion of Malnutrition by Correlates – National Family Health Survey 2

	Underweight	Normal	Overweight	Total	Underweight	Normal	Overweight	Underweight	Normal	Overweight	Total
	Frequencies				Row Percentages			Column Percentages			
Correlates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Age 5-year groups											
15-19	1,490	1,760	33	3,283	45.40%	53.60%	1.00%	9.40%	9.50%	1.80%	9.10%
20-24	3,044	3,165	108	6,317	48.20%	50.10%	1.70%	19.30%	17.00%	5.80%	17.40%
25-29	3,333	3,669	241	7,243	46.00%	50.70%	3.30%	21.10%	19.70%	13.10%	20.00%
30-34	2,677	3,227	345	6,250	42.80%	51.60%	5.50%	16.90%	17.40%	18.70%	17.30%
35-39	2,170	2,845	406	5,421	40.00%	52.50%	7.50%	13.70%	15.30%	22.00%	15.00%
40-44	1,769	2,220	381	4,370	40.50%	50.80%	8.70%	11.20%	11.90%	20.70%	12.10%
45-49	1,315	1,697	330	3,343	39.30%	50.80%	9.90%	8.30%	9.10%	17.90%	9.20%
Educational level											
No Education	10,854	11,704	698	23,257	46.70%	50.30%	3.00%	68.70%	63.00%	37.90%	64.20%
Primary	2,683	3,298	469	6,450	41.60%	51.10%	7.30%	17.00%	17.70%	25.40%	17.80%
Secondary	2,024	3,050	528	5,602	36.10%	54.40%	9.40%	12.80%	16.40%	28.60%	15.50%
Higher	238	532	149	919	25.90%	57.90%	16.20%	1.50%	2.90%	8.10%	2.50%
Work Status											
Not Working	6,713	9,116	1,163	16,992	39.50%	53.70%	6.80%	42.50%	49.10%	63.10%	46.90%
Work for Family Member	3,263	3,831	293	7,386	44.20%	51.90%	4.00%	20.70%	20.60%	15.90%	20.40%
Work for Someone Else	5,014	4,713	280	10,007	50.10%	47.10%	2.80%	31.70%	25.40%	15.20%	27.60%
Self Employed	810	923	108	1,841	44.00%	50.10%	5.90%	5.10%	5.00%	5.90%	5.10%
Marital Status											
Formerly Married	1,190	1,326	133	2,649	44.90%	50.10%	5.00%	7.50%	7.10%	7.20%	7.30%
Currently Married	14,609	17,257	1,712	33,578	43.50%	51.40%	5.10%	92.50%	92.90%	92.80%	92.70%
Social Group											
Other	4,504	6,007	852	11,363	39.60%	52.90%	7.50%	28.50%	32.30%	46.20%	31.40%
Scheduled Caste	3,766	3,901	229	7,896	47.70%	49.40%	2.90%	23.80%	21.00%	12.40%	21.80%
Scheduled Tribe	2,280	2,142	85	4,507	50.60%	47.50%	1.90%	14.40%	11.50%	4.60%	12.40%
Other Backward Class	5,249	6,533	679	12,462	42.10%	52.40%	5.50%	33.20%	35.20%	36.80%	34.40%
Religion											
Other	109	80	9	197	55.10%	40.30%	4.50%	0.70%	0.40%	0.50%	0.50%
Hindu	13,996	16,195	1,484	31,675	44.20%	51.10%	4.70%	88.60%	87.10%	80.40%	87.40%
Muslim	1,187	1,555	192	2,935	40.40%	53.00%	6.50%	7.50%	8.40%	10.40%	8.10%
Christian	324	452	83	859	37.70%	52.70%	9.70%	2.00%	2.40%	4.50%	2.40%
Sikh	58	129	50	238	24.40%	54.40%	21.20%	0.40%	0.70%	2.70%	0.70%
Buddhist/Neo-Buddhist	111	136	11	259	43.00%	52.70%	4.40%	0.70%	0.70%	0.60%	0.70%
Jain	14	36	15	64	21.70%	55.40%	22.90%	0.10%	0.20%	0.80%	0.20%
Wealth Index Quintiles											
Lowest quintile	5,353	4,985	138	10,476	51.10%	47.60%	1.30%	33.90%	26.80%	7.50%	28.90%
Second quintile	4,381	4,533	223	9,137	47.90%	49.60%	2.40%	27.70%	24.40%	12.10%	25.20%
Middle quintile	3,760	4,511	362	8,634	43.60%	52.30%	4.20%	23.80%	24.30%	19.60%	23.80%
Fourth quintile	1,838	3,199	557	5,593	32.90%	57.20%	10.00%	11.60%	17.20%	30.20%	15.40%
Highest quintile	467	1,355	565	2,387	19.60%	56.80%	23.60%	3.00%	7.30%	30.60%	6.60%
Household Size											
Less than 5	4,523	5,032	548	10,102	44.80%	49.80%	5.40%	28.60%	27.10%	29.70%	27.90%
5 – 8 inclusive	8,528	9,904	957	19,389	44.00%	51.10%	4.90%	54.00%	53.30%	51.90%	53.50%

9 – 12 inclusive	1,994	2,671	239	4,904	40.70%	54.50%	4.90%	12.60%	14.40%	12.90%	13.50%
Greater than 12	755	977	101	1,832	41.20%	53.30%	5.50%	4.80%	5.30%	5.50%	5.10%
Flush Toilet											
No	14,999	16,975	1,360	33,335	45.00%	50.90%	4.10%	94.90%	91.30%	73.80%	92.00%
Yes	800	1,608	484	2,892	27.60%	55.60%	16.70%	5.10%	8.70%	26.20%	8.00%
Pipe Water											
No	11,082	11,968	730	23,780	46.60%	50.30%	3.10%	70.10%	64.40%	39.60%	65.60%
Yes	4,716	6,614	1,115	12,445	37.90%	53.10%	9.00%	29.90%	35.60%	60.40%	34.40%
Radio											
No	11,240	12,329	887	24,455	46.00%	50.40%	3.60%	71.10%	66.30%	48.10%	67.50%
Yes	4,559	6,255	958	11,772	38.70%	53.10%	8.10%	28.90%	33.70%	51.90%	32.50%
Television											
No	13,378	14,268	863	28,510	46.90%	50.00%	3.00%	84.70%	76.80%	46.80%	78.70%
Yes	2,421	4,315	981	7,717	31.40%	55.90%	12.70%	15.30%	23.20%	53.20%	21.30%
Bicycle											
No	9,166	9,925	763	19,853	46.20%	50.00%	3.80%	58.00%	53.40%	41.40%	54.80%
Yes	6,633	8,658	1,082	16,374	40.50%	52.90%	6.60%	42.00%	46.60%	58.60%	45.20%
Refrigerator											
No	15,593	17,979	1,552	35,124	44.40%	51.20%	4.40%	98.70%	96.70%	84.10%	97.00%
Yes	206	604	293	1,103	18.70%	54.80%	26.60%	1.30%	3.30%	15.90%	3.00%
Land Size											
Landless	6,134	7,124	768	14,026	43.70%	50.80%	5.50%	38.80%	38.30%	41.60%	38.70%
<=2.5 Hectares – Small	211	214	23	448	47.00%	47.90%	5.10%	1.30%	1.20%	1.20%	1.20%
>2.5 Hectares – Medium	281	271	19	571	49.20%	47.50%	3.30%	1.80%	1.50%	1.00%	1.60%
>= hectares – Large	9,174	10,974	1,035	21,183	43.30%	51.80%	4.90%	58.10%	59.10%	56.10%	58.50%
Total	**15,799**	**18,583**	**1,845**	**36,227**	**43.60%**	**51.30%**	**5.10%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Appendix Table A3
Proportion of Malnutrition by Correlates – National Family Health Survey 3

	Underweight	Normal	Overweight	Total	Underweight	Normal	Overweight	Underweight	Normal	Overweight	Total
	Frequencies				Row Percentages			Column Percentages			
Correlates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Age in 5-year groups											
15-19	4,949	5,228	139	10,316	48.00%	50.70%	1.30%	23.70%	19.20%	3.70%	19.90%
20-24	3,745	4,873	301	8,919	42.00%	54.60%	3.40%	17.90%	17.90%	8.00%	17.20%
25-29	3,347	4,580	487	8,414	39.80%	54.40%	5.80%	16.00%	16.80%	13.00%	16.20%
30-34	3,042	3,969	659	7,669	39.70%	51.70%	8.60%	14.60%	14.60%	17.50%	14.80%
35-39	2,456	3,511	777	6,744	36.40%	52.10%	11.50%	11.80%	12.90%	20.70%	13.00%
40-44	1,968	2,911	743	5,623	35.00%	51.80%	13.20%	9.40%	10.70%	19.80%	10.80%
45-49	1,376	2,176	650	4,203	32.80%	51.80%	15.50%	6.60%	8.00%	17.30%	8.10%
Educational level											
No Education	11,412	13,492	1,301	26,205	43.50%	51.50%	5.00%	54.60%	49.50%	34.60%	50.50%
Primary	3,135	4,366	707	8,209	38.20%	53.20%	8.60%	15.00%	16.00%	18.80%	15.80%
Secondary	5,946	8,582	1,543	16,071	37.00%	53.40%	9.60%	28.50%	31.50%	41.10%	31.00%
Higher	391	807	205	1,403	27.80%	57.50%	14.60%	1.90%	3.00%	5.50%	2.70%
Work Status											
Not working	9,359	13,685	2,342	25,385	36.90%	53.90%	9.20%	44.80%	50.20%	62.30%	48.90%
Work for family member	5,829	6,829	619	13,277	43.90%	51.40%	4.70%	27.90%	25.10%	16.50%	25.60%
Work for someone else	4,320	4,938	520	9,779	44.20%	50.50%	5.30%	20.70%	18.10%	13.90%	18.80%
Self employed	1,376	1,796	275	3,447	39.90%	52.10%	8.00%	6.60%	6.60%	7.30%	6.60%
Marital Status											
Never Married	4,661	4,573	201	9,435	49.40%	48.50%	2.10%	22.30%	16.80%	5.40%	18.20%
Currently Married	15,252	21,379	3,330	39,962	38.20%	53.50%	8.30%	73.00%	78.50%	88.70%	77.00%
Formerly Married	971	1,295	225	2,491	39.00%	52.00%	9.00%	4.60%	4.80%	6.00%	4.80%
Social Group											
Other	4,830	7,317	1,506	13,654	35.40%	53.60%	11.00%	23.10%	26.90%	40.10%	26.30%
Scheduled Caste	4,655	5,341	594	10,589	44.00%	50.40%	5.60%	22.30%	19.60%	15.80%	20.40%
Scheduled Tribe	2,768	2,886	130	5,783	47.90%	49.90%	2.20%	13.30%	10.60%	3.50%	11.10%
Other Backward Class	8,631	11,704	1,527	21,862	39.50%	53.50%	7.00%	41.30%	43.00%	40.60%	42.10%
Religion											
Other	117	145	4	266	43.90%	54.70%	1.40%	0.60%	0.50%	0.10%	0.50%
Hindu	18,010	23,128	2,908	44,046	40.90%	52.50%	6.60%	86.20%	84.90%	77.40%	84.90%
Muslim	2,122	2,635	423	5,180	41.00%	50.90%	8.20%	10.20%	9.70%	11.30%	10.00%
Christian	266	593	103	962	27.60%	61.60%	10.70%	1.30%	2.20%	2.80%	1.90%
Sikh	202	569	294	1,065	19.00%	53.40%	27.60%	1.00%	2.10%	7.80%	2.10%
Buddhist/Neo-Buddhist	155	163	22	340	45.60%	47.80%	6.50%	0.70%	0.60%	0.60%	0.70%
Jain	12	15	2	29	40.50%	52.60%	6.90%	0.10%	0.10%	0.10%	0.10%
Wealth Index Quintile											
Lowest quintile	6,545	6,217	218	12,980	50.40%	47.90%	1.70%	31.30%	22.80%	5.80%	25.00%
Second quintile	6,069	6,637	477	13,184	46.00%	50.30%	3.60%	29.10%	24.40%	12.70%	25.40%
Middle quintile	4,724	6,768	791	12,283	38.50%	55.10%	6.40%	22.60%	24.80%	21.10%	23.70%
Fourth quintile	2,690	5,193	1,198	9,080	29.60%	57.20%	13.20%	12.90%	19.10%	31.90%	17.50%
Highest quintile	856	2,433	1,073	4,361	19.60%	55.80%	24.60%	4.10%	8.90%	28.60%	8.40%
Household Size											
Less than 5	6,149	8,304	1,467	15,921	38.60%	52.20%	9.20%	29.40%	30.50%	39.10%	30.70%

5 – 8 inclusive	11,499	14,070	1,706	27,275	42.20%	51.60%	6.30%	55.10%	51.60%	45.40%	52.60%
9 – 12 inclusive	2,451	3,624	408	6,483	37.80%	55.90%	6.30%	11.70%	13.30%	10.90%	12.50%
Greater than 12	785	1,250	174	2,210	35.50%	56.60%	7.90%	3.80%	4.60%	4.60%	4.30%
Flush toilet											
No	17,808	21,057	1,930	40,795	43.70%	51.60%	4.70%	85.30%	77.30%	51.40%	78.60%
Yes	3,076	6,191	1,827	11,093	27.70%	55.80%	16.50%	14.70%	22.70%	48.60%	21.40%
Pipe Water											
No	15,684	20,003	2,253	37,940	41.30%	52.70%	5.90%	75.10%	73.40%	60.00%	73.10%
Yes	5,195	7,240	1,503	13,937	37.30%	51.90%	10.80%	24.90%	26.60%	40.00%	26.90%
Radio											
No	15,198	18,581	2,186	35,966	42.30%	51.70%	6.10%	72.80%	68.20%	58.20%	69.30%
Yes	5,680	8,664	1,570	15,914	35.70%	54.40%	9.90%	27.20%	31.80%	41.80%	30.70%
Television											
No	15,267	17,020	1,249	33,537	45.50%	50.80%	3.70%	73.10%	62.50%	33.30%	64.60%
Yes	5,617	10,227	2,507	18,351	30.60%	55.70%	13.70%	26.90%	37.50%	66.70%	35.40%
Bicycle											
No	9,147	11,024	1,392	21,563	42.40%	51.10%	6.50%	43.80%	40.50%	37.10%	41.60%
Yes	11,737	16,224	2,364	30,325	38.70%	53.50%	7.80%	56.20%	59.50%	62.90%	58.40%
Refrigerator											
No	19,969	25,052	2,841	47,861	41.70%	52.30%	5.90%	95.60%	91.90%	75.60%	92.20%
Yes	915	2,196	915	4,027	22.70%	54.50%	22.70%	4.40%	8.10%	24.40%	7.80%
Land Size											
Landless	16,405	20,514	2,702	39,621	41.40%	51.80%	6.80%	78.60%	75.30%	71.90%	76.40%
<=2.5 Hectares – Small	3,228	4,731	626	8,585	37.60%	55.10%	7.30%	15.50%	17.40%	16.70%	16.50%
>2.5 Hectares – Medium	813	1,243	235	2,291	35.50%	54.30%	10.30%	3.90%	4.60%	6.30%	4.40%
>= hectares – Large	438	760	194	1,392	31.50%	54.60%	13.90%	2.10%	2.80%	5.20%	2.70%
Total (Female –Rural)	**20,884**	**27,248**	**3,756**	**51,888**	**40.20%**	**52.50%**	**7.20%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Total (Males – Rural)	**10,203**	**16,679**	**1,823**	**28,705**	**35.50%**	**58.10%**	**6.40%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Total (Females – ALL)	**33,618**	**49,780**	**11,866**	**95,264**	**35.30%**	**52.30%**	**12.50%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**
NFHS (Report)	**-**	**-**	**-**	**111,781**	**35.60%**	**51.80%**	**12.60%**	**-**	**-**	**-**	**-**

Appendix Table A4
Proportion of Malnutrition by Correlates – National Council of Applied Economic Research 2005

	Underweight	Normal	Overweight	Total	Underweight	Normal	Overweight	Underweight	Normal	Overweight	Total
	Frequencies				Row Percentages			Column Percentages			
Correlates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Gender											
Female	2,019	3,593	300	5,912	34.20%	60.80%	5.10%	97.30%	96.70%	93.80%	96.80%
Male	57	121	20	198	28.80%	61.10%	10.10%	2.70%	3.30%	6.30%	3.20%
Social Group											
Does Not Belong to Scheduled Caste	1,446	2,619	233	4,298	33.60%	60.90%	5.40%	69.70%	70.50%	72.80%	70.30%
Belongs to Scheduled Caste	630	1,095	87	1,812	34.80%	60.40%	4.80%	30.30%	29.50%	27.20%	29.70%
Location											
North	45	149	26	220	20.50%	67.70%	11.80%	2.20%	4.00%	8.10%	3.60%
BIMARU	503	963	67	1,533	32.80%	62.80%	4.40%	24.20%	25.90%	20.90%	25.10%
South	1,078	1,881	190	3,149	34.20%	59.70%	6.00%	51.90%	50.60%	59.40%	51.50%
East	447	713	36	1,196	37.40%	59.60%	3.00%	21.50%	19.20%	11.30%	19.60%
Others	3	8	1	12	25.00%	66.70%	8.30%	0.10%	0.20%	0.30%	0.20%
Nature of Occupation											
Professionals and Managers	24	81	17	122	19.70%	66.40%	13.90%	1.20%	2.20%	5.30%	2.00%
Clerical, sales and Services	73	178	39	290	25.20%	61.40%	13.40%	3.50%	4.80%	12.20%	4.70%
Farmers and Fishermen	1,596	2,791	197	4,584	34.80%	60.90%	4.30%	76.90%	75.10%	61.60%	75.00%
Labourers and Production Workers	383	664	67	1,114	34.40%	59.60%	6.00%	18.40%	17.90%	20.90%	18.20%
Total	**2,076**	**3,714**	**320**	**6,110**	**34.00%**	**60.80%**	**5.20%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Appendix Table A5

Nutritional Categories and BMI Correlates: National Family Health Survey - Third Wave (2005-2006)

Correlates	Underweight	Normal	Overweight	Total	Underweight	Normal	Overweight	Underweight	Normal	Overweight	Total
Gender											
Female	32,931	48,748	11,611	93,290	35.30%	52.30%	12.40%	62.40%	59.80%	67.30%	61.60%
Male	19,809	32,727	5,637	58,173	34.10%	56.30%	9.70%	37.60%	40.20%	32.70%	38.40%
Place of residence											
Rural	39,825	53,988	6,783	100,597	39.60%	53.70%	6.70%	75.50%	66.30%	39.30%	66.40%
Urban	12,915	27,487	10,464	50,866	25.40%	54.00%	20.60%	24.50%	33.70%	60.70%	33.60%
Age in 5-year groups											
15-19years	14,373	13,163	602	28,138	51.10%	46.80%	2.10%	27.30%	16.20%	3.50%	18.60%
20-24years	9,649	14,454	1,355	25,457	37.90%	56.80%	5.30%	18.30%	17.70%	7.90%	16.80%
25-29years	7,841	13,442	2,290	23,572	33.30%	57.00%	9.70%	14.90%	16.50%	13.30%	15.60%
30-34years	6,492	11,793	2,966	21,251	30.50%	55.50%	14.00%	12.30%	14.50%	17.20%	14.00%
35-39years	5,476	10,792	3,442	19,711	27.80%	54.80%	17.50%	10.40%	13.20%	20.00%	13.00%
40-44years	4,479	8,882	3,259	16,619	26.90%	53.40%	19.60%	8.50%	10.90%	18.90%	11.00%
45-49years	3,452	6,870	2,733	13,055	26.40%	52.60%	20.90%	6.50%	8.40%	15.80%	8.60%
50-54years	979	2,079	601	3,659	26.80%	56.80%	16.40%	1.90%	2.60%	3.50%	2.40%
Educational level											
No Education	20,301	26,040	3,164	49,505	41.00%	52.60%	6.40%	38.50%	32.00%	18.30%	32.70%
Primary	8,400	12,938	2,268	23,607	35.60%	54.80%	9.60%	15.90%	15.90%	13.20%	15.60%
Secondary	21,680	34,693	8,480	64,852	33.40%	53.50%	13.10%	41.10%	42.60%	49.20%	42.80%
Higher	2,359	7,805	3,335	13,499	17.50%	57.80%	24.70%	4.50%	9.60%	19.30%	8.90%
Marital Status											
Never Married	17,618	19,278	1,645	38,541	45.70%	50.00%	4.30%	33.40%	23.70%	9.50%	25.40%
Currently Married	33,253	59,435	14,904	107,592	30.90%	55.20%	13.90%	63.10%	72.90%	86.40%	71.00%
Formerly Married	1,869	2,763	698	5,331	35.10%	51.80%	13.10%	3.50%	3.40%	4.00%	3.50%
Social group of household head											
Other	13,467	25,551	7,943	46,961	28.70%	54.40%	16.90%	25.50%	31.40%	46.10%	31.00%
Scheduled Caste	11,765	15,523	2,347	29,634	39.70%	52.40%	7.90%	22.30%	19.10%	13.60%	19.60%
Scheduled Tribe	5,765	6,610	394	12,770	45.10%	51.80%	3.10%	10.90%	8.10%	2.30%	8.40%
Other Backward Class	21,743	33,792	6,563	62,098	35.00%	54.40%	10.60%	41.20%	41.50%	38.10%	41.00%
Religion											
Other	228	291	12	532	43.00%	54.70%	2.30%	0.40%	0.40%	0.10%	0.40%
Hindu	44,858	68,027	13,549	126,434	35.50%	53.80%	10.70%	85.10%	83.50%	78.60%	83.50%
Muslim	5,789	8,805	2,097	16,691	34.70%	52.80%	12.60%	11.00%	10.80%	12.20%	11.00%
Christian	756	1,968	503	3,227	23.40%	61.00%	15.60%	1.40%	2.40%	2.90%	2.10%
Sikh	500	1,531	838	2,870	17.40%	53.40%	29.20%	0.90%	1.90%	4.90%	1.90%
Buddhist/Neo-Buddhist	517	609	126	1,252	41.30%	48.60%	10.10%	1.00%	0.70%	0.70%	0.80%
Jain	92	244	121	457	20.10%	53.40%	26.50%	0.20%	0.30%	0.70%	0.30%
Wealth index											

Poorest	12,888	12,646	432	25,965	49.60%	48.70%	1.70%	24.40%	15.50%	2.50%	17.10%
Poorer	12,663	14,898	943	28,503	44.40%	52.30%	3.30%	24.00%	18.30%	5.50%	18.80%
Middle	11,649	17,316	2,063	31,027	37.50%	55.80%	6.60%	22.10%	21.30%	12.00%	20.50%
Richer	9,429	18,671	4,343	32,442	29.10%	57.50%	13.40%	17.90%	22.90%	25.20%	21.40%
Richest	6,112	17,946	9,466	33,524	18.20%	53.50%	28.20%	11.60%	22.00%	54.90%	22.10%
Household Size											
Less than 5	16,247	27,518	7,200	50,965	31.90%	54.00%	14.10%	30.80%	33.80%	41.70%	33.60%
5 - 8 inclusive	28,402	41,008	7,802	77,212	36.80%	53.10%	10.10%	53.90%	50.30%	45.20%	51.00%
9 - 12 inclusive	6,143	9,610	1,570	17,323	35.50%	55.50%	9.10%	11.60%	11.80%	9.10%	11.40%
Greater than 12	1,948	3,339	676	5,962	32.70%	56.00%	11.30%	3.70%	4.10%	3.90%	3.90%
Household has: flush toilet											
No	37,648	47,269	4,404	89,321	42.10%	52.90%	4.90%	71.40%	58.00%	25.50%	59.00%
Yes	15,093	34,207	12,843	62,142	24.30%	55.00%	20.70%	28.60%	42.00%	74.50%	41.00%
Source of drinking water											
No	33,966	47,547	6,624	88,136	38.50%	53.90%	7.50%	64.40%	58.40%	38.40%	58.20%
Yes	18,770	33,923	10,622	63,315	29.60%	53.60%	16.80%	35.60%	41.60%	61.60%	41.80%
Household has: radio											
No	37,284	53,314	9,506	100,104	37.20%	53.30%	9.50%	70.70%	65.40%	55.10%	66.10%
Yes	15,438	28,153	7,740	51,332	30.10%	54.80%	15.10%	29.30%	34.60%	44.90%	33.90%
Household has: television											
No	32,700	39,897	3,325	75,921	43.10%	52.50%	4.40%	62.00%	49.00%	19.30%	50.10%
Yes	20,040	41,579	13,922	75,542	26.50%	55.00%	18.40%	38.00%	51.00%	80.70%	49.90%
Household has: bicycle											
No	22,403	33,313	6,875	62,591	35.80%	53.20%	11.00%	42.50%	40.90%	39.90%	41.30%
Yes	30,337	48,162	10,373	88,872	34.10%	54.20%	11.70%	57.50%	59.10%	60.10%	58.70%
Refrigerator											
No	48,185	68,112	9,934	126,231	38.20%	54.00%	7.90%	91.40%	83.60%	57.60%	83.30%
Yes	4,556	13,364	7,313	25,232	18.10%	53.00%	29.00%	8.60%	16.40%	42.40%	16.70%
Hectares of agricultural land owned											
Landless	42,526	65,230	14,206	121,962	34.90%	53.50%	11.60%	80.60%	80.10%	82.40%	80.50%
Less than 3 Hectares - Small	7,252	11,104	1,793	20,149	36.00%	55.10%	8.90%	13.80%	13.60%	10.40%	13.30%
3 - 5 Hectares - Medium	1,926	3,227	670	5,823	33.10%	55.40%	11.50%	3.70%	4.00%	3.90%	3.80%
Greater than 6 hectares - Large	1,036	1,915	578	3,529	29.30%	54.30%	16.40%	2.00%	2.40%	3.40%	2.30%
Total	52,740	81,476	17,247	151,463	34.80%	53.80%	11.40%	100.00%	100.00%	100.00%	100.00%

Appendix Table A6
Summary Statistics for Regression Analysis (N = 10249) – National Family Health Survey 1

Variables	Mean	Std. Dev.	Min.	Max.
BMI	15.294	3.055	0.7186	49.383
Age	26.201	5.974	15	49
Age Squared	722.182	343.811	225	2401
Wealth Scores	-0.543	0.666	-1.667	2.685
Education (Attempted or Completed Primary)	0.133	0.339	0	1
Education (Attempted or Completed Secondary)	0.132	0.338	0	1
Education (Attempted or Completed Higher than Secondary)	0.007	0.084	0	1
Working for Family Member	0.194	0.395	0	1
Working for Someone Else	0.137	0.344	0	1
Self Employed	0.033	0.178	0	1
Currently Married	0.988	0.108	0	1
Religion(Hindu)	0.826	0.379	0	1
Religion (Muslim)	0.096	0.295	0	1
Religion (Christian)	0.041	0.198	0	1
Religion (Sikh)	0.019	0.136	0	1
Scheduled Caste	0.160	0.367	0	1
Scheduled Tribe	0.144	0.351	0	1
Household Size	7.772	3.701	2	31
BIMARU	0.445	0.497	0	1
South	0.255	0.436	0	1
East	0.169	0.375	0	1
Delhi	0.007	0.082	0	1
Flush toilet	0.050	0.218	0	1
Distance to Water Source	18.386	25.901	0	600
Refrigerator	0.025	0.155	0	1
Bicycle	0.363	0.481	0	1
Price of Sugar	20.364	1.092	18.169	22.108
Price of Eggs	24.399	2.846	16.067	30.769
Price of Cereal	18.607	5.911	12.400	31.539
Land Size	12.356	98.973	0	2468.58
Land Size Squared	9947.385	231441.300	0	6.1E+06

Appendix Table A7
Summary Statistics for Regression Analysis (N = 36113) – National Family Health Survey 2

Variables	Mean	Std. Dev.	Min.	Max.
BMI	19.629	3.092	4.662	46.189
Age	31.372	8.737	15	49
Age Squared	1060.553	568.434	225	2401
Wealth Scores	0.437	0.742	-1.530	2.713
Education (Attempted or Completed Primary)	0.170	0.376	0	1
Education (Attempted or Completed Secondary)	0.157	0.364	0	1
Education (Attempted or Completed Higher than Secondary)	0.027	0.163	0	1
Working for Family Member	0.215	0.411	0	1
Working for Someone Else	0.226	0.418	0	1
Self Employed	0.048	0.214	0	1
Currently Married	0.934	0.248	0	1
Religion(Hindu)	0.847	0.360	0	1
Religion (Muslim)	0.083	0.276	0	1
Religion (Christian)	0.032	0.176	0	1
Religion (Sikh)	0.011	0.102	0	1
Religion(Buddhist/Neo-Buddhist)	0.015	0.121	0	1
Religion (Jain)	0.002	0.040	0	1
Scheduled Caste	0.203	0.402	0	1
Scheduled Tribe	0.147	0.354	0	1
Other Backward Social Group	0.315	0.465	0	1
Household Size	6.588	3.364	1	41
BIMARU	0.336	0.472	0	1
South	0.310	0.462	0	1
East	0.207	0.405	0	1
Delhi	0.003	0.059	0	1
Flush toilet	0.097	0.296	0	1
Distance to Water Source	16.260	20.043	0	600
Refrigerator	0.045	0.208	0	1
Bicycle	0.422	0.494	0	1
Price of Sugar	20.320	0.998	18.169	22.108
Price of Eggs	24.287	2.575	16.067	30.769
Price of Cereal	19.921	7.412	12.400	35
Land Size	161.647	1377.150	0	24705.6
Land Size Squared	192262 0	33600000	0	6.10E+0 8

Appendix Table A8
Summary Statistics for Regression Analysis (N = 50695) – NFHS-3

Variables	Mean	Std. Dev.	Min.	Max.
BMI	20.021	3.407	5.401	67.367
Age	29.228	9.533	15	49
Age Squared	945.148	588.930	225	2401
Wealth Scores (Adjusted)	-4.872	8.080	-17.530	21.943
Education (Attempted or Completed Primary)	0.164	0.370	0	1
Education (Attempted or Completed Secondary)	0.346	0.476	0	1
Education (Attempted or Completed Higher than Secondary)	0.033	0.179	0	1
Working for Family Member	0.254	0.435	0	1
Working for Someone Else	0.179	0.383	0	1
Self Employed	0.071	0.256	0	1
Marital Status(Currently Married)	0.748	0.434	0	1
Marital Status (Formerly Married)	0.048	0.214	0	1
Religion(Hindu)	0.788	0.409	0	1
Religion (Muslim)	0.087	0.282	0	1
Religion (Christian)	0.069	0.253	0	1
Religion (Sikh)	0.035	0.185	0	1
Religion(Buddhist/Neo-Buddhist)	0.006	0.079	0	1
Religion (Jain)	0.001	0.023	0	1
Scheduled Caste	0.193	0.395	0	1
Scheduled Tribe	0.168	0.374	0	1
Other Backward Social Group	0.365	0.481	0	1
Household Size	6.147	3.053	1	34
Health Insurance	0.032	0.175	0	1
BIMARU	0.253	0.435	0	1
South	0.272	0.445	0	1
East	0.294	0.455	0	1
Delhi	0.004	0.061	0	1
Robust Walls	0.318	0.466	0	1
Flush toilet	0.251	0.433	0	1
Distance to Water Source	11.149	18.527	0	360
Refrigerator	0.112	0.315	0	1
Bicycle	0.529	0.499	0	1
Price of Sugar	19.938	0.855	18.169	22.108
Price of Eggs	23.160	2.884	17.309	30.769
Price of Cereal	17.772	4.928	12.400	35
Land Size	0.733	2.873	0	95
Land Size Squared	8.791	175.742	0	9025

Appendix Table A9
First Stage IV and Heckman Selection Results

Explanatory Variables	(1)	(2)	(3)
	IV	Heckman	
		Participation Eq.	Outcome Eq.
	Dependent Variables		
	Log of Hourly Wages	Employed or otherwise	Log of Hourly Wages
Availability of Trade Union in a village	0.16	-0.04	0.17
	[18.15]**	[-3.01]**	[18.19]**
District level consumption inequality	0.36	-0.10	0.47
	[13.25]**	[-2.18]*	[15.62]**
Infant dependency Ratio	-	0.64	-
	-	[16.78]**	-
Gender	0.35	1.00	0.47
	[51.07]**	[91.63]**	[16.25]**
Age	0.02	0.14	0.03
	[18.60]**	[59.37]**	[6.85]**
Age Squared	0.03	-0.00	0.04
	[3.40]**	[-58.63]**	[3.30]**
Education (Lower Primary)[1]	0.11	-0.24	0.16
	[13.39]**	[-13.19]**	[11.41]**
Education (Upper Primary)	0.20	-0.40	0.32
	[20.65]**	[-29.25]**	[15.52]**
Education (Secondary)	0.27	-0.66	0.50
	[17.94]**	[-41.80]**	[17.40]**
Education (Higher Secondary)	0.31	-0.87	0.60
	[6.12]**	[-39.06]**	[9.11]**
Education (Undergraduate)	0.49	-1.24	1.02
	[24.53]**	[-19.06]**	[40.83]**
Education (Graduate)	-0.00	-0.63	-0.00
	[-13.81]**	[-22.86]**	[-4.70]**
Scheduled Caste	-0.00	0.43	0.01
	[-0.54]	[35.89]**	[1.08]
Household Size	-0.00	-0.09	-0.02
	[-0.33]	[-19.32]**	[-4.00]**
Household Size Squared	0.00	0.00	0.00
	[2.64]**	[5.70]**	[4.92]**
Distance to Market	-0.00	-	-
	[-6.86]**	-	-
BIMARU[2]	-0.40	0.24	-0.41
	[-37.16]**	[14.36]**	[-30.11]**
South	-0.28	0.52	-0.37
	[-27.40]**	[33.32]**	[-20.60]**
East	-0.38	0.33	-0.39
	[-34.93]**	[19.31]**	[-25.99]**
Others	-0.01	0.31	0.03
	[-0.19]	[5.09]**	[0.59]
Price of cereals	0.01	-	-
	[11.00]**	-	-
Activity Intensity (Clerical/Sales/Services)[2]	-0.40	-	-
	[-21.74]**	-	-
Activity Intensity(Farmers/Fishermen)	-0.89	-	-
	[-50.50]**	-	-
Activity Intensity (Labourers and Production workers)	-0.60	-	-
	[-34.35]**	-	-
Constant	1.73	-2.74	0.67
	[42.93]**	[-46.13]**	[5.47]**
Correlation between the error terms in the participation and outcome equations	-	-	2.89
	-	-	[0.00]**
N	30852	80707	80707
Adj. R^2	0.443	-	-
F-Statistics	1066.57	-	-

t statistics in brackets ----- + p<.10, * p<.05, ** p<.01; [1] Reference category for education is No education; [2] Base group for activity intensity is Professionals/Managers