# What does a well-being perspective add to our understanding of poverty?

Shams, Khadija

University of Glasgow

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# What does a well-being perspective add to our understanding of poverty?*

Khadija Shams†

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**Abstract**

Drawing on unique survey data for rural Pakistan, we investigate the impact of socio-demographic factors on life satisfaction with particular emphasis on subjective well-being measurement to evaluate poverty and its different components. The data elicits information on overall well-being in terms of households' satisfaction with the current socio-economic status as well as financial well-being regarding satisfaction with the current income or expenditure. We estimate a happiness model to explore to what extent a well-being perspective adds to our understanding of poverty. We find that the well-being approach closely depicts the idea of capability poverty in terms of the level education and health which both matter significantly. Our results moreover suggest that the proposed financial well-being approach is more promising in capturing both income and capability poverty on subjective grounds. This paper's main contributions are as follows. First, we link the emerging field of happiness economics with development studies. We believe that this paper fills an important gap in the literature and may well inspire a new holistic look at poverty, beyond the conventional dimension of the lack of income. Second, we intend to challenge the view that poverty is best understood from a more macro-level without properly accounting for individuals' own valuation of their well-being. Since poverty is often linked with human development, or the lack of it, this paper takes a special look at poverty and suggests that income poverty is only part of the picture.

**JEL Classification**: I32; I15; I25; R58.

**Keywords**: Well-being measurement, poverty evaluation, life satisfaction, socio-economic indicators, rural Pakistan.

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†University of Glasgow and Shaheed Benazhir Bhuto Women University, Department of Economics, Adam Smith Building, Glasgow, G12 8RT, United Kingdom; Tel: +44 (0)141-330 2592; Fax: +44 (0)141-330 4940; k.shams.1@research.gla.ac.uk

# 1 Introduction

The analysis of life satisfaction is an evolving topic in economics that is increasingly being used to shed light on various socio-economic aspects. While much of the literature presents evidence for developed countries, little economic research has been carried out thus far for the developing world – notable exceptions are Kingdon and Knight (2006) on South Africa and Knight et al. (2007) on rural China. Using unique household survey data for rural Pakistan, we link the fields of happiness economics with development studies. More specifically, we estimate various well-being functions to investigate to what extent well-being measures can help us to evaluate poverty on subjective grounds. As poverty is often linked with human development, or the lack of it, this paper intends to have a different take on the matter suggesting that income poverty is only part of the picture. The idea that people's well-being is not measured by income alone has been at the heart of all the Human Development Reports ever since the first one was produced for the United Nations Development Programme (UNDP) in 1990 and our paper is in line with that approach.

Well-being refers in this context to the life satisfaction as reported by the household such that poverty is measured in this paper exclusively in terms of the household's own assessment without demarcating a standard poverty threshold. This methodological twist of investigating poverty in purely subjective terms obviously raises the question whether well-being is a viable complementary measure to the conventional metric. Whilst conventional poverty measures are defined by income or consumption levels falling below a line set by the World Bank (typically 1 USD per day), we instead intend to explore a more subjective well-being approach to poverty. We do so because in a liberal and democratic spirit, we place a value on the individuals' own evaluation of their welfare, which underlies much of what we refer to as *well-being poverty*.

Elaborating on Kingdon and Knight (2006), we introduce and compare different measures of well-being poverty based on self-assessments. Unlike them, however, we do not only resort to the holistic concept of well-being (or life satisfaction) to measure well-being poverty but also introduce other well-being measures for poverty that exclusively focus on monetary terms; i.e. financial satisfaction, here defined as

satisfaction with income or expenditure.[1]

The economic analysis of psychological aspects such as happiness has increasingly received attention in the recent literature. There are several studies (see for example Blanchflower (2008) and the references therein) that try to establish a relationship between happiness and different socio-economic variables such as age, gender, income, employment, marital status, etc. to investigate the degree of households' satisfaction with their current situation.

The purpose of this paper is to link both socio-economic satisfaction capturing monetary and non-monetary factors (i.e. overall well-being) and financial satisfaction (i.e. financial well-being) with demographic as well as socio-economic variables.[2] In particular, we want to investigate whether concepts from the economics of happiness can indeed be used in development economics to employ the subjective well-being approach to poverty as suggested by Kingdon and Knight (2006). We shall do so by estimating a comprehensive model for rural Pakistan, using alternative well-being poverty measures. Comparing results, we shall argue that while subjective approaches indeed offer a sensible complementary approach to conventional measurement techniques in development economics, distinguishing between different measures of poverty matters and should always be considered to ensure robustness, given the self-assessment nature of such a metric. To our knowledge, there is no comparable adaption of the economics of happiness to exclusively rural areas. We therefore believe that this paper fills an important gap in the literature and may well inspire further research on other developing countries with similar socio-economic features.[3]

This paper is structured as follows. Section 2 lays the necessary ground for the further analysis. We develop the notion of life satisfaction in terms of overall satisfaction as well as financial satisfaction and present some stylised facts from the happiness literature. We outline the survey design and present descriptive statistics of the alternative well-being poverty measures in Section 3. We investigate the two different approaches to well-being (i.e. overall and financial well-being) applied to

[1] In the remainder, we shall use the terms happiness and well-being interchangeably.

[2] Socio-economic satisfaction refers to household satisfaction with their current socio-economic status, whilst financial satisfaction is measured by the reported satisfaction with income and expenditure.

[3] Also see Shams (2012) for a further discussion.

the data for rural Pakistan to evaluate poverty in Sections 4 and 5, respectively. Section 6 concludes.

## 2 Some stylised facts and basic concepts

There are numerous conventional measures of poverty in monetary terms. One may construct a so-called poverty line and then measure the distance of a household's income from a certain reference threshold, typically defined in a particular social context. The World Bank defines poverty in absolute terms suggesting that any income in terms of Purchasing Power Parity (PPP) below a certain subsistence level classifies households as being "poor". Rather than considering income, one may also categorise poverty by the uses of income, particularly focusing on consumption. Either way, the conventional poverty metric in the development studies literature suggests the presence of a straightforward and quantifiable method of assessing a households' economic situation. We believe, however, that the issue of poverty has more dimensions to it: what really matters is not how households may be classified in monetary or purchasing power terms but rather the household's self-reported degree of well-being.

The measurement of subjective well-being poverty is by its very nature closely related to the assessment of happiness as also brought forward by Kingdon and Knight (2006). Well-being is typically measured by means of an ordinal scale, where a higher value indicates a higher level of individual satisfaction (Blanchflower and Oswald, 2004). Studies on happiness are usually based on micro data and findings by and large seem to be materially robust regardless of whether estimation is done in an ordered logit model or by employing Ordinary Least Squares (OLS) regressions with categorical dependent variables.

Subjective well-being poverty can be measured along two dimensions. First, one may simply resort to the more holistic notion of happiness which encompasses overall well-being. Higher income (and hence less poverty in the conventional sense) should cet. par. induce households to feel happier; although effects are likely to occur at a diminishing rate (Frey and Stutzer, 2002b). Analysing happiness may thus be considered as a well-being metric to assess poverty. This approach is flexible enough to also measure poverty in more broader terms for instance by considering

*capabilities poverty* in line with the ideas of Sen (1983) and Sen (1993).[4] Second, one may exclusively assess financial well-being by simply asking how satisfied households feel about their incomes and expenditures.

To appreciate the subsequent estimation results in a broader context, it may be helpful to first discuss some stylised facts from the happiness economics literature. Based on US and European panel data, those may be summarised – at least for industrialised countries – as follows (Blanchflower, 2008):

- well-being depends positively on these controls:
  - being female
  - married couples
  - age (U-shaped behaviour)
  - level of education
  - active religious involvement
  - level of health
  - level of income
  - regular sexual engagement
  - monogamy
  - being childless

- well-being is decreasing among people with the following characteristics:
  - newly divorced (or separated)
  - adults in their mid to late 40s
  - unemployed
  - immigrants and ethnic minorities
  - commuters
  - people with poor health

[4]Sen introduced the capabilities approach to well-being and poverty which sought to emphasize a person's ability to achieve various valuable functions as part of living and thus focuses more on psychological rather than material deprivation.

- less educated
- poor
- sexually inactive
- having children

As this list of stylised facts reveals, next to microeconomic factors, perceived happiness is influenced by several variables that are more of a socio-economic nature such as age, sex, marital status, health status, education, social capital, religion, as well as social and political institutions (Helliwell, 2002). Psychologists and sociologists thus seem to rightly focus on the possible influence of personality-related factors (such as optimism, self-esteem and perceived personal control) in conjunction with socio-demographic factors, when studying why people are happy or unhappy.

The stylised facts moreover suggest that life satisfaction may be best thought of as an "umbrella concept" capturing various aspects of a person's life, including both social and financial satisfaction. Given that in the developing world poverty generally encompasses all these aspects, we feel it is reasonable to use those insights from this strand of the literature to construct an alternative, more subjective poverty metric which more closely reflects the specific socio-economic context.

# 3 Data

## 3.1 Research design

Our analysis is based on a survey of households in rural Pakistan conducted in 2008. The dataset comprises all four provinces of Pakistan: Punjab, Sind, the North Western Frontier Province (NWFP) and Baluchistan. To ensure representativeness, we decided to sample households in 10 districts (i.e. roughly one tenth of the total number of districts) across the country (stratified sampling). Based on population figures, we allocated the number of districts across the provinces as follows: four districts from Punjab, three from Sind, two from NWFP and the remaining district could be assigned to Baluchistan. The selected districts in Punjab are Attock, Layyah, Rahimyarkhan and Sahiwal; Badin, Mirpurkhas and Thatta in Sind; Dir

and Malakand in NWFP and Kalat from Baluchistan. Those districts were selected for various reasons. First, they are geographically in a range that offered easy access without raising security concerns for the interviewers compared to further remote areas. Second, these districts paint a representative picture of the socio-economic environment in rural Pakistan. Due to the geographic scope of the districts, great care has been taken, where necessary, in sampling households from villages which are reasonably far away from major cities such as Lahore in Punjab, Karachi in Sind, Peshawar in NWFP and Quetta in Baluchistan. Two villages were chosen from each district. Within these predefined strata, households have been selected randomly. Our target was to achieve a total of 30 responses per village, that is 60 households per district, yielding an overall sample size of $N = 600$.

Thus, we have sampled a total of 240 households from Punjab, 180 households from Sind, 120 households from NWFP and 60 households from Baluchistan. Moreover, to ensure a good representation of rural Pakistan, we apply weights to each household with respect to the district of origin as shown in Table A-1. All our econometric results are based on that weighting scheme.

The different well-being poverty measures are derived from an ordinal scale. The measure of overall satisfaction is based on the following question: *"How satisfied are you with your current socio-economic status?"*. Answers were recorded on a numerical scale ranging from 1 to 4, where 1 is coded as *"Not at all satisfied"*, 2 as *"Less than satisfied"*, 3 as *"Rather satisfied"* and 4 as *"Fully satisfied"* to capture subjective well-being poverty. The alternative approach to subjective well-being poverty (focusing exclusively on monetary terms) was constructed using the same scale to ensure comparability. We distinguish between two alternatives: satisfaction with income and satisfaction with expenditure; responses for each of the two alternatives were coded according to the aforementioned 1-4 scale.

## 3.2 Descriptive statistics

Tables 1 and 2 report summary statistics for each of the subjective well-being poverty measures. The overall distribution of the satisfaction variables in terms of income and expenditure are rather similar with the first two moments of both measures being nearly identical (Table 1). Only few respondents report very high or very low

values of the satisfaction index. With regards to satisfaction with the current socio-economic status (i.e. overall satisfaction), the answers are more dispersed. Most of the responses lie between the two extremes: more than half of the respondents are *"not at all satisfied"*, whilst one third of the responses can be found on the other extreme of the scale.

| | **Overall well-being** | **Financial well-being** | |
|---|---|---|---|
| | **satisfaction with *socio-economic status* *(1-4)*** | **satisfaction with *income* *(1-4)*** | **satisfaction with *expenditure* *(1-4)*** |
| **Mean** | 2.11 | 2.40 | 2.37 |
| **Standard deviation** | 1.41 | 0.61 | 0.58 |
| **Frequency of value:** | | | |
| **4** | 33.67% | 4.50% | 2.33% |
| **3** | 5.50% | 30.50% | 32.67% |
| **2** | 4.00% | 63.33% | 62.50% |
| **1** | 56.83% | 1.67% | 2.50% |

**Table 1:** *Summary statistics of subjective well-being poverty metric. Source: Survey 2008.*

| **Average satisfaction with ...** | **Punjab** | **Sind** | **NWFP** | **Baluchistan** |
|---|---|---|---|---|
| socio-economic status | 2.99 | 1.77 | 1.53 | 1.28 |
| income | 2.81 | 2.22 | 2.13 | 1.83 |
| expenditure | 2.75 | 2.17 | 2.13 | 1.90 |

**Table 2:** *Alternative measures of well-being poverty across provinces. Note:* $N = 600$. *Source: Survey 2008.*

Table 2 shows how the satisfaction index of the well-being poverty measures differs across districts. The Table consistently ranks Punjab as the province, on average, with the highest degree of subjective well-being independently of the measure used. In line with the stylised facts reported above, agricultural employment is highest in that province which contributes to the comparatively elevated life satisfaction in that region.

Given that the subjective poverty measures in terms of income and expenditure are not only based on the same scale but also seem to point in a similar direction, it may be worthwhile to investigate their potential interrelationships further. Bruni and

Porta (2007), after all, suggest the presence of such linkages in that they argue that certain approaches in the happiness literature could not be dealt with adequately without employing insights from economics, psychology and sociology together. We may consider overall satisfaction an encompassing concept which not only covers monetary aspects but also considers other socio-demographic factors and may thus be treated as the most comprehensive approach to evaluate subjective well-being poverty.

| | **Satisfaction with socio-economic status** (1-4) | **Satisfaction with income** (1-4) | **Satisfaction with expenditure** (1-4) |
|---|---|---|---|
| Satisfaction with socio-economic status | 1 | | |
| Satisfaction with income | 0.81*** | 1 | |
| Satisfaction with expenditure | 0.81*** | 0.94*** | 1 |

**Table 3:** *Correlation matrix.*
$N = 600$ *households. *, **, *** indicates significance level of 10%, 5% and 1%, respectively.*

Table 3 reports correlation coefficients for the subjective well-being poverty variables. Indeed, the three measures we consider are strongly and positively correlated. We see that a high degree of income satisfaction goes hand in hand with a high satisfaction with expenditures (correlation of 0.94). Both financial well-being measures correlate with the overall well-being variable to a similar extent. We therefore consider the financial well-being measures as alternatives for evaluating subjective well-being poverty in the subsequent estimations of our well-being model.

# 4 Assessing overall well-being

## 4.1 The model

The model we use to evaluate subjective well-being poverty is a straightforward application from the happiness literature, where our unique dataset allows for a rather nuanced consideration of the different potential determinants of life satisfaction. As the findings summarised in Section 2 suggest, happiness is best thought of as a function of various socio-economic factors. In particular, we estimate a well-being function for rural Pakistan of the following form:

$$\begin{aligned} wellbeing = \beta_0 + \beta_1(sex) + \beta_2(age) + \beta_3(age)^2 + \beta_4(educ) + \\ \beta_5(numberofchildren) + \beta_6(unemployment) + \\ \beta_7 ln(income) + \beta_8 ln(relativeincome) + \\ \beta_9(maritalstatus) + \beta_{10}(health) + \beta_{11}(region) + \varepsilon. \end{aligned} \quad (1)$$

The regression Model (1) implies that well-being is not simply a binary case but is measured in terms of the ordered categories (1-4) introduced above. We employ an ordered probit (oprobit) model that is widely used to analyse discrete data of this type. Our framework is based on an underlying latent model with single index function and constant thresholds. The control variables included are sex, age, education, number of children, employment status, the household's monthly nominal income (both in absolute and relative terms) expressed in natural logs,[5] marital status, the overall family's health position and the regional background of household $i$. More specifically, potential gender differences are captured by means of a dummy, where *sex* is 1 if the respondent is male and 0 otherwise. Similarly, *unemployment* takes the value of 1 if the head of the household is unemployed and 0 otherwise. As for the *marital status*, living as a married couple implies a value of 1 and 0 otherwise (e.g. living in divorce or widowhood). Age effects, as usual, are allowed to be non-linear. We moreover constructed a health index to evaluate the

[5]Relative income is defined here as the household's income with respect to the corresponding regional mean income.

general health status, where a higher value refers to a higher level of health. The index is based on the following response from the household's head: *"During the last 12 months, how many times has someone in your household visited a doctor?"* The answer options: *none*, *once*, *twice*, *three times* and *four times or more* were then mapped correspondingly onto dummy variables which may be translated into the health index as follows: 4, 3, 2, 1 and 0 for excellent, good, fair, poor and very poor health status, respectively. The excluded category is being in excellent health condition indicated by an index value of 4 – our baseline case. In a similar fashion, the region variable refers to three mutually exclusive dummies for respondents living in Punjab, NWFP and Sind, respectively. The baseline category here corresponds to households living in Baluchistan.

Several studies on the economics of happiness add the number of children to the list of explanatory variables in the happiness equation as done for instance by Angeles (2009), Blanchflower (2008) and Clark et al. (2008). However, the empirical evidence is inconclusive. While some authors (Tella et al. (2003); Alesina et al. (2004)) find a negative or, respectively, no effect (Clark (2006)), others (Stutzer and Frey (2006)) detect a positive effect of having children at home on overall household's happiness. Only few papers account for the individual characteristics of the households. Frey and Stutzer (2000), for example, using Swiss household survey data of 1992, find that having children has no effect on the happiness of married couples but a sizable (and negative) impact on single parents. We therefore consider this a crucial aspect to be explored in more detail also for developing countries.

Thus, we moreover consider a variant of Model (1) that imposes dummies on the respective number of children per household instead of using the actual number of children per household:

$$\begin{aligned} wellbeing = \beta_0 + \beta_1(sex) + \beta_2(age) + \beta_3(age)^2 + \beta_4(educ) + \\ \beta_5(numberofchildren_{dummy}) + \beta_6(unemployment) + \\ \beta_7 ln(income) + \beta_8 ln(relativeincome) + \\ \beta_9(maritalstatus) + \beta_{10}(health) + \beta_{11}(region) + \varepsilon. \end{aligned} \tag{2}$$

In particular, the impact of the number of children on well-being in (2) is cap-

tured by $\beta_5$. We created six dummies in total to separate the cases when one, two, three, four, five, six, seven or more children are present in a household.[6] We chose households with seven (or more) children as the reference group. Note that children are here defined as individuals aged less than 16 years who live with their parents.

As Frey and Stutzer (2002a) argue, life satisfaction from an economic perspective tends to be strongly driven by health and monetary factors. Age is another important determinant of well-being. However, the role of that variable is not so straightforward to assess for several reasons. The notion of well-being, after all, may change its connotation with varying age. All these factors are controlled for in our specified well-being functions.

## 4.2 Baseline results

The convention in the happiness economics literature is to define happiness as overall well-being. Therefore, we first estimate Model (1) with the overall well-being metric as dependent variable and use those results as benchmark. Table 4 gives an overview of the results which may be considered the relevant baseline. Our findings largely confirm the literature on the determinants of happiness. As expected, well-being depends on gender, education, family size, unemployment, health and region. To take an example, the probability of being happy increases with an increasing family size or educational achievements. On the other hand, being a male, unemployed or having a low health profile lowers one's chance of being satisfied. We furthermore observe that well-being is region-dependent. Relatively speaking, living in Punjab indicates an elevated chance of being happy compared to Sind.

[6]There is no household in the sample without any children.

| | | |
|---|---|---|
| Ordered probit regression | | |
| Number of obs | = | 600 |
| Wald $\chi^2(18)$ | = | 4962.88 |
| Prob > $\chi^2$ | = | 0.0000 |
| Pseudo $R^2$ | = | 0.1471 |
| Log pseudolikelihood | = | -537.14467 |
| Dependent variable: Overall well-being | | |
| Independent Variable | Coef. | Robust Std. Err. |
| Male | -0.6588*** | 0.1790 |
| Age | 0.0131 | 0.0702 |
| AgeSquared | -0.0001 | 0.0007 |
| Years of Education | 0.0402** | 0.0190 |
| No. of children | 0.1290** | 0.0628 |
| Unemployed | -0.2958** | 0.1535 |
| Log of household's income | 0.0373 | 0.1649 |
| Log of relative income | -0.0271 | 0.7456 |
| Couple | .1591 | 0.1727 |
| Health Satisfaction index: | | |
| 4 | *Reference Group* | |
| 3 | -0.3250 | 0.2076 |
| 2 | -0.2625 | 0.2077 |
| 1 | -0.5792** | 0.2279 |
| 0 | -9.9443*** | 0.2724 |
| Region: | | |
| Punjab | 1.5061*** | 0.1805 |
| NWFP | 0.1397 | 0.2080 |
| Sind | 0.5689*** | 0.1953 |
| Baluchistan | *Reference Group* | |
| /cut1 | 1.7275 | 2.1887 |
| /cut2 | 1.8541 | 2.1865 |
| /cut3 | 2.1074 | 2.1861 |

**Table 4:** *Baseline results. *,**,*** denote statistical significance at 10%, 5% and 1% levels.*

The linktest for the baseline Model (1) is statistically insignificant as shown in Table B-1 which suggests that there are no omitted relevant variables and that our link function is correctly specified. Seeking to ensure that all models are properly specified, we moreover conducted the linktest (or specification error test) for each of

the ordered probit regressions.[7]

The marginal effects for Model (1) are given in Table B-2. According to the Table, being a male increases the probability of being observed in a lower happiness category, say 1, and decreases the chance of experiencing higher outcomes such as 4. Similarly, unemployed people and people with a low health status, e.g. poor or very poor (1 and 0), are usually found in a lower happiness category compared to the higher category. With increasing education and family size, on the other hand, the probability of being part of the higher happiness category 4 increases and at the same time it decreases the chance of being observed in the lower happiness category 1. Our results also support regional effects. For instance, people living in Punjab and Sind are most likely to rank themselves amongst higher happiness categories compared to the lower happiness outcomes.

Our results with respect to gender, marital status and health are in line with several other studies of comparable scope. Knight et al. (2007), for example, analyse national household survey data on subjective well-being in rural China and also find that men report lower happiness than women. Taking singles as reference category, married couples are relatively more blissful according to their study, whereas divorced couples or widowhood dampen happiness. They furthermore suggest that happiness increases with a higher level of education, income or health, respectively. They suggest that happiness is U-shaped in age which is somewhat surprising, given that for developing countries one may suspect an inverted shape due to poor social security systems in place especially for older citizens.

After all, it is generally believed in the developing world that old people become increasingly less happy "by nature" not only because their physical and cognitive capacities deteriorate, but also due to psychological factors such as the increasing likelihood of suffering from depression. From a socio-economic point of view, older people tend to be in poorer health and have lower income which makes them less happier (Frey and Stutzer, 2002a). That situation may be fundamentally different in

[7]The idea of the linktest, loosely speaking, is that if the model is properly specified, one should not be able to find any additional predictors that are statistically significant. The variable *_hat* should thus be a statistically significant predictor since it is the predicted value from the model. This will be the case unless the model is misspecified. On the other hand, if our model is properly specified, *_hatsq* should not have much predictive power except by chance. Therefore, the linktest is significant for a significant *_hatsq*. Such a test outcome would usually suggest that either we have an omitted-variable bias or it might be the case that the link function is not correctly specified.

industrialised countries. Easterlin (2006), for instance, based on data from General Social surveys from 1973-1994, finds that both health and financial satisfaction in the US follow a U-shaped pattern in age. This would imply that well-being falls with rising age, up to a particular turning point and then starts rising again. Contrary to the results for rural China, the US or many EU countries, however, our results seem to support the idea of an inverted U-shaped relationship between age and happiness with a theoretical turning point of 65.5 years of age. On purely statistical grounds, on the other hand, it is not obvious per se whether any relationship exists at all.

While one might expect happiness to be of an inverted-U shape in age, a general relationship between age and happiness seems to be difficult to establish. Indeed, a U-shaped age effect on happiness has been challenged on empirical grounds.[8] The age-happiness pattern is found to differ across countries and time periods. The overall empirical evidence appears blurred at best and it is thus difficult to draw any robust conclusion.

We further extend the baseline results by using dummies for the different number of children per household rather than using the actual number of children per household, using regression Model (2). Results are provided in Table 5 and suggest that the probability of being happy is low for the households with a small number of children and a low health status. Similarly, being male or being unemployed reduces the chance of reporting happiness. On the other hand, the likelihood of happiness increases in the level of education. One possible explanation for this positive association may be that higher levels of education tend to increase employability. As for regional effects, in Punjab the probability of feeling satisfied is about three times higher than in Sind.

The linktest for Model (2) is statistically insignificant as shown in Table B-3. The variable *_hatsq* is statistically insignificant which indicates that the model is properly specified. There are no omitted relevant variables and one should not be able to find any additional predictors that are statistically significant except by chance. Apart from assessing model specification, we also test for the joint significance of the children dummies and, given the test statistic ($\chi^2(6) = 917.84$) with six degrees of freedom, we find strong evidence for this to be the case.

[8] See Horley and Lavery (1995) and the references therein for details.

| | | |
|---|---|---|
| Ordered probit regression | | |
| Number of obs | = | 600 |
| Wald $\chi^2(18)$ | = | 5420.19 |
| Prob > $\chi^2$ | = | 0.0000 |
| Pseudo $R^2$ | = | 0.1482 |
| Log pseudolikelihood | = | -536.45646 |
| Dependent variable: Overall well-being | | |
| Independent Variable | coef. | Robust Std. Err. |
| Male | -0.6865*** | 0.1903 |
| Age | 0.0095 | 0.0718 |
| AgeSquared | -3.2E-05 | 0.0007 |
| Years of Education | 0.0418** | 0.0192 |
| No. of children: | | |
| 1 | -7.6685*** | 0.4249 |
| 2 | -0.9727** | 0.4857 |
| 3 | -0.5966 | 0.3836 |
| 4 | -0.5308 | 0.3603 |
| 5 | -0.3789 | 0.3704 |
| 6 | -0.2798 | 0.3896 |
| 7 or more | *Reference Group* | |
| Unemployed | -0.2897* | 0.1538 |
| Log of household's income | 0.0434 | 0.1659 |
| Log of relative income | -0.0689 | 0.7494 |
| Couple | 0.1716 | 0.1731 |
| Health Satisfaction index: | | |
| 4 | *Reference Group* | |
| 3 | -0.3362 | 0.2082 |
| 2 | -0.2554 | 0.2097 |
| 1 | -0.5889*** | 0.2287 |
| 0 | -8.8264*** | 0.2889 |
| Region: | | |
| Punjab | 1.5068*** | 0.1822 |
| NWFP | 0.1442 | 0.2107 |
| Sind | 0.5766*** | 0.1990 |
| Baluchistan | *Reference Group* | |
| /cut1 | 0.6481 | 2.2762 |
| /cut2 | 0.7749 | 2.2734 |
| /cut3 | 1.0287 | 2.2730 |

**Table 5:** *Baseline results; using dummies for number of children. *,**,*** denote statistical significance at 10%, 5% and 1% levels.*

Table B-4 shows the marginal effects resulting from the ordered probit regression analysis of Model (2); i.e. using dummies for the number of children per household. According to Table B-4, if a household only has a limited number of children (i.e. no more than two), the likelihood of reporting higher levels of satisfaction (i.e. 2, 3 and 4) decreases and at the same time the family is more likely to be observed in the lowest happiness category. The same applies to health. Households revealing a low degree of health satisfaction (i.e. 0 or 1) are most likely to fall in the lowest happiness category (1) relative to the higher categories. Similarly, if a respondent is unemployed or in case of a male-headed family, the risk of being in the lowest satisfaction category increases, while it diminishes for the highest possible outcome. Furthermore, perceived happiness is more likely to occur among more educated households as shown in Table B-4. With increasing educational attainment, the probability of observing higher happiness outcomes increases, while it decreases for lower happiness outcomes. However, we may argue that the marginal effects of education are considerably small in either case. Lastly, well-being depends on the regional background. Households for instance living in Punjab are more likely to report higher levels of satisfaction, relative to those who belong to the province of Sind.

While our baseline results are in keeping with economic intuition, only gender, the level of education, the number of children, the employment as well as health status and the regional background turn out to be of some statistical meaning. In particular, a large family size seems to be vital for well-being. On the other hand, a higher nominal income (both in absolute and relative terms) does not seem to significantly improve households' perceived well-being – a result which seems at odds with economic reasoning, as one would expect households in developing countries to feel strongly about monetary factors. Thus, our results suggest that overall well-being is the broader measure which seems to capture reasonably well other important aspects of poverty such as health and the level of education that matter most in economic and econometric terms. With income being insignificant, subjective well-being poverty encompasses in this context the idea of capabilities poverty, but it is more general than this approach as it moreover incorporates important and often neglected socio-economic factors. This seems to suggest that in order to capture poverty in monetary terms, we should resort to more targeted subjective well-being poverty measures. We therefore consider in the following other response variables

(i.e. financial well-being measures) and compare those with the baseline results.

# 5 Assessing financial well-being

In this Section we test whether income remains insignificant for the financial well-being metric, using Model (2). Since overall well-being is a rather "soft" concept, it seems more straightforward to use subjective categories which focus more on financial terms.[9]

Table B-5 shows the results of the ordered probit regressions that can be compared with the baseline results. The results suggest that male are less likely to be satisfied with their finances (both in income and expenditure terms) compared to female households. Education increases the probability of financial satisfaction, particularly in terms of satisfaction with income. We find that financial satisfaction is a positive function of education; however, the estimate is significantly positively associated with the income measure. Furthermore, households having more children are more likely to be financially satisfied compared to households with less or fewer children. As expected, a higher income increases the likelihood of financial satisfaction and vice versa. Similarly, a higher level of health satisfaction increases the probability of reporting higher financial satisfaction. Regarding regional effects, families in Punjab are most likely to be satisfied with their income and expenditure compared to the other provinces, consistent with previous findings.

Table B-6 shows the marginal effects resulting from ordered probit regressions based on Model (2), using financial satisfaction (i.e. satisfaction with income or expenditure) as response variable. According to Table B-6, being a male increases the probability of being observed in the lower financial satisfaction categories (1 and 2), and makes it less likely to be in the higher satisfaction categories (3 and 4). A large family size is beneficial in terms of financial satisfaction of a household. Compared to the reference category of seven or more children, a small family of one to three children reduces the chances of a household of being in the higher financial satisfaction categories (3 and 4), whilst increasing the likelihood of reporting the lower outcome (2). Similarly, households with lower health outcomes are more likely

[9] As the output reported in Table B-5 suggests, the model is properly specified, also in terms of the joint significance of the children dummies.

to be part of the lower financial satisfaction category (2), while in this case chances of being observed in the higher response categories (3 and 4) are lower. Higher income leads to higher financial outcomes even on pure subjective grounds. For instance, higher income increases the likelihood of being in the higher categories (3 and 4) of financial satisfaction and at the same time decreases the probability of being in the lower response categories (i.e. 1 or 2). Similarly, higher education ensures higher income satisfaction; for instance, education increases the likelihood of being in the higher income satisfaction category (3) and decreases the probability to be observed in the lower category (2) of income satisfaction. However, we cannot confirm such a pattern in the case of satisfaction with expenditure on pure statistical grounds. As far as regional effects are concerned, we find that compared to other provinces, being in Punjab increases the chances to be observed in the higher categories of financial satisfaction (i.e. 3 and 4), whereas it reduces the chances of being in the lower categories of financial satisfaction (i.e. 1 and 2). In other words, households in Punjab are most likely to be satisfied with their income or expenditure compared to the families living in the other provinces.

Summing up, we see that using this metric, income does matter also on subjective grounds. Estimates are significantly positively associated with the corresponding measure. Closely related to higher income levels is the degree of schooling in the developing world. Indeed, the variable capturing years of education is significantly positively associated with the subjective poverty measures, all other things held constant. Similarly, a higher health index and an increased number of children also seem to be positively associated with the household's reported financial well-being. In contrast to our baseline results, financial satisfaction appears to be U-shaped in age. The estimated turning point corresponds to the age of 55 years. This is similar to Easterlin (2006) who also reports evidence for a U-shaped relationship between financial satisfaction and age in the US. Such a pattern, however, cannot be confirmed for the case at hand on purely statistical grounds. Given the limited public provision of social security (for instance, pensions, old age benefits, etc.) in Pakistan, one would expect an inverted U-shaped relationship between these two variables.

Overall, comparing all three measures of subjective well-being poverty, a somewhat consistent picture seems to emerge: We may conclude that the level of education, health and the number of children matter the most both in econometric and

economic terms. Particularly a large family size seems to be vital which appears to confirm the notion of having children as insurance mechanism in developing countries. In areas such as rural Pakistan children are integrated in the family life early on. Many of them contribute considerably to the overall household income already at a young age. In line with this anecdotal evidence, our empirical results suggest that the number of children is one of the major determinants of subjective well-being poverty in rural areas.

# 6 Conclusion

Using unique survey data for rural Pakistan, we have sought to investigate the impact of socio-demographic factors on life satisfaction in order to shed light on issues associated with subjective well-being. This is to our knowledge the first study of life satisfaction in this part of the developing world. We estimate a happiness model with categorical variables to evaluate subjective well-being poverty and its different components. Our main contributions are the following. First, we link the emerging field of the economics of happiness with development studies. In particular, we construct subjective well-being measures to evaluate poverty, highlighting their differences but also similarities. Second, we intend to challenge the view of poverty being a purely macro-level phenomenon which is based on a conventional nominal (either absolute or relative) metric. We demonstrate that analysing the issue on a more micro-level allows for a much richer analysis and more differentiated insights.

We employ different ways of measuring subjective well-being, i.e. satisfaction with the socio-economic status (overall well-being) and satisfaction with income as well as with expenditure (financial well-being). Our happiness model is general enough to map the different well-being measures capturing subjective well-being poverty and its different components. We find that subjective well-being is the broader measure which seems to capture reasonably well other important components of poverty. In particular, health and the level of education both matter significantly in economic and econometric terms. The notion of well-being in this context encompasses the idea of capabilities poverty. However, the approach here is more general than this as it also incorporates important and often neglected socio-economic factors such as the number of children in a household. Our results moreover suggest that the

financial well-being measure is more appropriate in capturing the conventional notion of income poverty; with income being highly significant. We find that both overall and financial well-being are positive functions of income. Our results are thus in line with Easterlin (2001)'s micro approach towards happiness.

In addition, the baseline results are in line with common findings in the happiness literature: Happiness is higher among females, married couples, educated and healthy individuals. Unlike other studies, particularly for industrialised nations, an inverted (as opposed to a conventional) U-shaped pattern characterises the age-happiness profile. While this finding matches theoretical considerations, the jury is still out to provide convincing empirical evidence for either shape.

Pakistan shares distinct demographic features with many other developing countries: It is characterised by a large population as well as high population growth and fertility rates. As expected, the socio-economic environment is crucial for explaining perceived poverty. Our analysis suggests a positive effect of the number of children on individual household's well-being – a novel result which has not yet been established in such a framework.

On a more general note, we also try to make the case in this paper that it is not appropriate to measure subjective well-being poverty by income alone. Just as human development encompasses aspects of life much broader than income, so does poverty that should be regarded as consisting of many dimensions. We cannot rely on positive growth effects trickling down by themselves after all. It takes sound government policies and action to ensure that income supports citizens in expanding their choices and to remain in adequate health as well as to obtain education and resources for themselves and for their children – in short, to achieve human development.

The economics of happiness is still in its infancy, yet it seems to offer promising approaches for development studies. This paper is a further contribution to linking these two fields. Ultimately, further ground is yet to be established from which also other development issues may be analysed from a more psychological perspective in conjunction with solid economic underpinnings. It does appear, however, that a well-being perspective contributes to our understanding of poverty.

# A Weighting matrix

| | Census 1998 | | | Survey 2008 | | |
|---|---|---|---|---|---|---|
| District | No. of households | Total Population | Rural Population | Sample Population | pweights $[(RP)'_j/(SP)_j]$ | pweights-normalised $[(pw)_j/\Sigma(pw)_j]$ |
| $(j)$ | $(hh)'_j$ | $(TP)'_j$ | $(RP)'_j$ | $(SP)_j$ | $(pw)_j$ | $(pw)*_j$ |
| Attock | 206,678 | 1,274,935 | 1,003,843 | 266 | 3,773.85 | 0.10 |
| Layyah | 152,050 | 1,120,951 | 976,748 | 289 | 3,379.75 | 0.09 |
| RahimyarKhan | 3,141,053 | 17,743,645 | 2,524,471 | 246 | 10,262.08 | 0.27 |
| Sahiwal | n.a | 1,843,194 | 1,541,204 | 269 | 5,729.38 | 0.15 |
| Badin | 211,354 | 1,136,044 | 949,556 | 267 | 3,556.39 | 0.09 |
| Mirpurkhas | 148,470 | 905,935 | 605,760 | 251 | 2,413.39 | 0.06 |
| Thatta | 220,068 | 1,113,194 | 988,455 | 259 | 3,816.43 | 0.10 |
| Lower Dir | 76,531 | 717,649 | 673,314 | 241 | 2,793.83 | 0.07 |
| Malakand | 49,330 | 452,291 | 409,112 | 234 | 1,748.34 | 0.05 |
| Kalat | 34,410 | 237,834 | 204,040 | 215 | 949.02 | 0.02 |
| Total | - | 11,943,080 | 9,876,503 | 2,537 | 38,422.46 | 1.00 |

**Table A-1:** *Weighting scheme of sample households. The left part summarises population data from the last available Census of 1998. The relevant weights for the survey are reported in the last column.*

# B Tables

| | | |
|---|---|---|
| Specification error test | | |
| Number of obs | = | 600 |
| Wald $\chi^2(2)$ | = | 127.59 |
| Prob $> \chi^2$ | = | 0.0000 |
| Pseudo $R^2$ | = | 0.1474 |
| Log pseudolikelihood | = | -536.96266 |
| Dependent variable: Overall well-being | | |
| Independent Variable | coef. | Robust Std. Err. |
| -hat | 0.7766***[0.000] | 0.1397 |
| -hatsq | 0.0646[0.126] | 0.0423 |
| /cut1 | 1.5637 | 0.1620 |
| /cut2 | 1.6903 | 0.1653 |
| /cut3 | 1.9438 | 0.1735 |

**Table B-1:** *Specification error test: Baseline Model (1).*
*Notes: *,**,*** denote statistical significance at 10%, 5% and 1% levels; p-values are given in square brackets.*

Marginal effects, ordered probit regression
y = Pr(Overall well-being==1) (predict, p outcome(1))
= 0.50403465
y = Pr(Overall well-being==2) (predict, p outcome(2))
= .05032489
y = Pr(Overall well-being==3) (predict, p outcome(3))
= .09738449
y = Pr(Overall well-being==4) (predict, p outcome(4))
= .34825596

| Outcome: Overall well-being | (1) | | (2) | | (3) | | (4) | |
|---|---|---|---|---|---|---|---|---|
| Variable | dy/dx | Std. Err. | dy/dx | Std. Err. | dy/dx | Std. Err. | dy/dx | Std. Err. |
| Male* | 0.2492*** | 0.0619 | 0.0064 | 0.0042 | 0.0011 | 0.0054 | -0.2567*** | 0.0690 |
| Age | -0.0052 | 0.0280 | 0.0000 | 0.0003 | 0.0003 | 0.0018 | 0.0048 | 0.0260 |
| AgeSquared | 0.00003 | 0.00028 | -2.44E-07 | 0.0000 | -1.69E-06 | 0.00002 | -2.5E-05 | 0.00026 |
| Education | -0.0161** | 0.0076 | 0.0001 | 0.0001 | 0.0010 | 0.0006 | 0.0149** | 0.0071 |
| No. of children | -0.0515** | 0.0251 | 0.0005 | 0.0005 | 0.0033* | 0.0019 | 0.0477** | 0.0232 |
| Unemployed* | 0.1173** | 0.0602 | -0.0019 | 0.0017 | -0.0089* | 0.0058 | -0.1065** | 0.0538 |
| Log of household's income | -0.0149 | 0.0658 | 0.0001 | 0.0006 | 0.0010 | 0.0042 | 0.0138 | 0.0610 |
| Log of relative income | 0.0108 | 0.2974 | -0.0001 | 0.0028 | -0.0007 | 0.0190 | -0.0100 | 0.2757 |
| Couple* | -0.0633 | 0.0684 | 0.0010 | 0.0016 | 0.0047 | 0.0060 | 0.0576 | 0.0610 |
| Health Satisfaction Index: | | | | | | | | |
| 3* | 0.1288 | 0.0812 | -0.0021 | 0.0023 | -0.0099 | 0.0078 | -0.1168 | 0.0720 |
| 2* | 0.1042 | 0.0818 | -0.0016 | 0.0020 | -0.0077 | 0.0073 | -0.0950 | 0.0732 |
| 1* | 0.2249*** | 0.0839 | -0.0062 | 0.0045 | -0.0213* | 0.0119 | -0.1974*** | 0.0696 |
| 0* | 0.5517*** | 0.0256 | -0.0503*** | 0.0134 | -0.1000*** | 0.0188 | -0.4013*** | 0.0271 |
| Region: | | | | | | | | |
| Punjab* | -0.5416*** | 0.0541 | 0.0134*** | 0.0050 | 0.0454*** | 0.0110 | 0.4829*** | 0.0522 |
| NWFP* | -0.0556 | 0.0825 | 0.0002 | 0.0006 | 0.0029 | 0.0034 | 0.0525 | 0.0796 |
| Sind* | -0.2215** | 0.0720 | -0.0024 | 0.0030 | 0.0057 | 0.0040 | 0.2182*** | 0.0763 |

**Table B-2:** *Ordered probit analysis: Marginal effects, baseline Model (1). Note: 1. *,**,*** denote statistical significance at 10%, 5% and 1% levels. 2. (*) dy/dx denotes discrete change of dummy variable from 0 to 1.*

| | | |
|---|---|---|
| Specification error test | | |
| Number of obs | = | 600 |
| Wald $\chi^2(2)$ | = | 125.50 |
| Prob > $\chi^2$ | = | 0.0000 |
| Pseudo $R^2$ | = | 0.1483 |
| Log pseudolikelihood | = | -536.3563 |
| Dependent variable: Overall well-being | | |
| Independent Variable | coef. | Robust Std. Err. |
| -hat | 0.9316***[0.000] | 0.1763 |
| -hatsq | 0.0520[0.693] | 0.1318 |
| /cut1 | 0.6490 | 0.0865 |
| /cut2 | 0.7759 | 0.0902 |
| /cut3 | 1.0298 | 0.0983 |

**Table B-3:** *Specification error test: Model (2) using dummies for number of children. Notes: *,**,*** denote statistical significance at 10%, 5% and 1% levels; p-values are given in square brackets.*

**Table B-4:** *Ordered probit analysis: Marginal effects, Model (2).*
*Note: 1. *,**,*** denote statistical significance at 10%, 5% and 1% levels. 2. (*) dy/dx denotes discrete change of dummy variable from 0 to 1.*

Marginal effects, ordered probit regression
y = Pr(Overall well-being==1) (predict, p outcome(1))
= 0.50649323
y = Pr(Overall well-being==2) (predict, p outcome(2))
= 0.05041426
y = Pr(Overall well-being==3) (predict, p outcome(3))
= 0.09737584
y = Pr(Overall well-being==4) (predict, p outcome(4))
= 0.34571666

| Outcome: Overall well-being | (1) | | (2) | | (3) | | (4) | |
|---|---|---|---|---|---|---|---|---|
| Variable | dy/dx | Std. Err. | dy/dx | Std. Err. | dy/dx | Std. Err. | dy/dx | Std. Err. |
| Male* | 0.2589*** | 0.0650 | 0.0068 | 0.0045 | 0.0015 | 0.0059 | -0.2672*** | 0.0731 |
| Age | -0.0038 | 0.0287 | 0.0000 | 0.0003 | 0.0002 | 0.0019 | 0.0035 | 0.0265 |
| AgeSquared | 0.00001 | 0.00028 | -1.28E-07 | 0.00000 | -8.36E-07 | 0.00002 | -0.00001 | 0.00026 |
| Education | -0.0167** | 0.0077 | 0.0002 | 0.0002 | 0.0011* | 0.0006 | 0.0154** | 0.0071 |
| No. of children: | | | | | | | | |
| 1* | 0.4966*** | 0.0257 | -0.0504*** | 0.0134 | -0.0976*** | 0.0183 | -0.3486*** | 0.0259 |
| 2* | 0.3346*** | 0.1220 | -0.0209 | 0.0161 | -0.0500* | 0.0296 | -0.2637*** | 0.0802 |
| 3* | 0.2298* | 0.1379 | -0.0075 | 0.0082 | -0.0238 | 0.0200 | -0.1985* | 0.1112 |
| 4* | 0.2089 | 0.1381 | -0.0032 | 0.0034 | -0.0154 | 0.0120 | -0.1903 | 0.1242 |

**Table B-4:** *(continued)*

| Outcome: Overall well-being | (1) | | (2) | | (3) | | (4) | |
|---|---|---|---|---|---|---|---|---|
| Variable | dy/dx | Std. Err. | dy/dx | Std. Err. | dy/dx | Std. Err. | dy/dx | Std. Err. |
| No. of children: | | | | | | | | |
| 5* | 0.1491 | 0.1420 | -0.0035 | 0.0055 | -0.0132 | 0.0161 | -0.1324 | 0.1210 |
| 6* | 0.1105 | 0.1511 | -0.0025 | 0.0054 | -0.0096 | 0.0165 | -0.0984 | 0.1295 |
| Unemployed* | 0.1149* | 0.0604 | -0.0019 | 0.0017 | -0.0089 | 0.0058 | -0.1041* | 0.0538 |
| Log of household's income | -0.0173 | 0.0662 | 0.0002 | 0.0007 | 0.0011 | 0.0043 | 0.0160 | 0.0612 |
| Log of relative income | 0.0275 | 0.2989 | -0.0003 | 0.0030 | -0.0018 | 0.0196 | -0.0254 | 0.2763 |
| Couple* | -0.0682 | 0.0684 | 0.0011 | 0.0017 | 0.0052 | 0.0063 | 0.0618 | 0.0607 |
| Health Satisfaction Index: | | | | | | | | |
| 3* | 0.1331 | 0.0812 | -0.0023 | 0.0024 | -0.0105 | 0.0080 | -0.1203* | 0.0717 |
| 2* | 0.1014 | 0.0826 | -0.0016 | 0.0020 | -0.0076 | 0.0074 | -0.0922 | 0.0738 |
| 1* | 0.2283*** | 0.0838 | -0.0065 | 0.0047 | -0.0221* | 0.0121 | -0.1996*** | 0.0693 |
| 0* | 0.5494*** | 0.0255 | -0.0505*** | 0.0134 | -0.1001*** | 0.0188 | -0.3988*** | 0.0271 |
| Region: | | | | | | | | |
| Punjab* | -0.5413*** | 0.0546 | 0.0137*** | 0.0051 | 0.0461*** | 0.0112 | 0.4816*** | 0.0526 |
| NWFP* | -0.0574 | 0.0836 | 0.0002 | 0.0006 | 0.0031 | 0.0035 | 0.0541 | 0.0806 |
| Sind* | -0.2246*** | 0.0734 | -0.0023 | 0.0031 | 0.0060 | 0.0041 | 0.2208*** | 0.0777 |

**Table B-5:** *Evaluating financial well-being.*
*Notes: *,**,*** denote statistical significance at 10%, 5% and 1% levels; p-values are given in square brackets.*

| Ordered probit regression | Dependent Variable: Satisfaction with | | | |
|---|---|---|---|---|
| | income | | expenditure | |
| Independent variable | Coef. | Robust Std. Err. | Coef. | Robust Std. Err. |
| Male | -0.5428*** | 0.2116 | -0.5736*** | 0.2307 |
| Age | -0.0554 | 0.0665 | -0.0890 | 0.0683 |
| AgeSquared | 0.0005 | 0.0006 | 0.0008 | 0.0007 |
| Years of Education | 0.0327* | 0.0197 | 0.0255 | 0.0195 |
| No. Of children: | | | | |
| 1 | -1.3544*** | 0.3910 | -1.2625*** | 0.4075 |
| 2 | -0.9664** | 0.4285 | -1.1644** | 0.5467 |
| 3 | -0.7074* | 0.3808 | -0.7840** | 0.4063 |
| 4 | -0.4815 | 0.3763 | -0.5477 | 0.4036 |
| 5 | -0.4180 | 0.3809 | -0.4836 | 0.4000 |
| 6 | -0.5291 | 0.3891 | -0.5070 | 0.4207 |
| 7 or more | *Reference Group* | | | |
| Unemployed | -0.1556 | 0.1665 | -0.0840 | 0.1717 |
| Log of household's income | 0.3272* | 0.1718 | 0.4261*** | 0.1687 |

**Table B-5:** *(continued)*

| Ordered probit regression | Dependent Variable: Satisfaction with | | | |
|---|---|---|---|---|
| | income | | expenditure | |
| Independent variable | Coef. | Robust Std. Err. | Coef. | Robust Std. Err. |
| Log of relative income | 0.4816 | 0.6905 | 0.5014 | 0.6951 |
| Couple | 0.0978 | 0.1741 | 0.0600 | 0.1816 |
| Health Satisfaction index: | | | | |
| 4 | *Reference Group* | | | |
| 3 | -0.2383 | 0.1902 | -0.2678 | 0.1824 |
| 2 | -0.1207 | 0.1967 | -0.0231 | 0.1953 |
| 1 | -0.1651 | 0.2213 | -0.0987 | 0.2178 |
| 0 | -1.5871*** | 0.3416 | -1.4108*** | 0.3177 |
| Region: | | | | |
| Punjab | 1.3073*** | 0.1444 | 1.3593*** | 0.1484 |
| NWFP | -0.2809* | 0.1604 | -0.1118 | 0.1501 |
| Sind | *(dropped)* | | | |
| Baluchistan | *Reference Group* | | | |
| /cut1 | -2.4251 | 2.2049 | -2.1088 | 2.2152 |
| /cut2 | 1.0449 | 2.1940 | 0.8925 | 2.2007 |
| /cut3 | 2.8372 | 2.2031 | 2.9559 | 2.2169 |

**Table B-5:** *(continued)*

| Ordered probit regression | Dependent Variable: Satisfaction with income | | Dependent Variable: Satisfaction with expenditure | |
|---|---|---|---|---|
| Log pseudolikelihood | -446.98337 | | -432.94983 | |
| Obs | 600 | | 600 | |
| Wald $\chi^2(12)$ | 382.10 | | 340.14 | |
| Prob $> \chi^2$ | 0.0000 | | 0.0000 | |
| Pseudo $R^2$ | 0.1866 | | 0.1907 | |
| | Dependent Variable: Satisfaction with income | | Dependent Variable: Satisfaction with expenditure | |
| .linktest | Coef. | Robust Std. Err. | Coef. | Robust Std. Err. |
| -hat | 0.8943*** | 0.1595 | 0.9116*** | 0.1454 |
| | [0.000] | | [0.000] | |
| -hatsq | 0.0597 | 0.0866 | 0.0603 | 0.0928 |
| | [0.491] | | [0.516] | |
| /cut1 | -2.3990 | 0.1329 | -2.0829 | 0.1260 |
| /cut2 | 1.0312 | 0.0834 | 0.8931 | 0.0803 |
| /cut3 | 2.8298 | 0.1484 | 2.9661 | 0.1684 |

**Table B-5:** *(continued)*

| | Dependent Variable: Satisfaction with | | | |
|---|---|---|---|---|
| | income | | expenditure | |
| .linktest | | | | |
| Log pseudolikelihood | -446.80168 | | -432.76776 | |
| Obs | 600 | | 600 | |
| Wald $\chi^2(12)$ | 170.43 | | 164.82 | |
| Prob > $\chi^2$ | 0.0000 | | 0.0000 | |
| Pseudo $R^2$ | 0.1869 | | 0.1911 | |
| . test | $\chi^2(6)$ | 27.92 | $\chi^2(6)$ | 25.13 |
| (using dummies for No. of children) | prob>$\chi^2$ | 0.0001 | prob>chi2 | 0.0003 |

**Table B-6:** *Ordered probit analysis: Marginal effects, financial well-being metric.*
*Note: 1. *,**,*** denote statistical significance at 10%, 5% and 1% levels. 2. (*) dy/dx denotes discrete change of dummy variable from 0 to 1.*

**Outcome: Satisfaction with income**

Marginal effects, ordered probit regression

y = Pr(Satisfaction with income==1) (predict, p outcome(1))

= 0.00032308

y = Pr(Satisfaction with income==2) (predict, p outcome(2))

= 0.52300195

y = Pr(Satisfaction with income==3) (predict, p outcome(3))

= 0.444576

y = Pr(Satisfaction with income==4) (predict, p outcome(4))

= 0.03209897

| Outcome | (1) | | (2) | | (3) | | (4) | |
|---|---|---|---|---|---|---|---|---|
| Variable | dy/dx | Std. Err. | dy/dx | Std. Err. | dy/dx | Std. Err. | dy/dx | Std. Err. |
| Male* | 0.0003* | 0.0002 | 0.2105*** | 0.0773 | -0.1513*** | 0.0467 | -0.0595* | 0.0338 |
| Age | 0.0001 | 0.0001 | 0.0220 | 0.0264 | -0.0181 | 0.0217 | -0.0040 | 0.0049 |
| AgeSquared | 0.0000 | 0.0000 | -0.0002 | 0.0003 | 0.0002 | 0.0002 | 0.0000 | 0.0001 |
| Education | 0.0000 | 0.0000 | -0.0130* | 0.0078 | 0.0107* | 0.0065 | 0.0024 | 0.0015 |

**Table B-6:** *(continued)*

**Outcome: Satisfaction with income**

| Outcome | (1) | | (2) | | (3) | | (4) | |
|---|---|---|---|---|---|---|---|---|
| Variable | dy/dx | Std. Err. | dy/dx | Std. Err. | dy/dx | Std. Err. | dy/dx | Std. Err. |
| No. of children: | | | | | | | | |
| 1* | 0.0195 | 0.0194 | 0.3787*** | 0.0450 | -0.3667*** | 0.0601 | -0.0315*** | 0.0082 |
| 2* | 0.0066 | 0.0085 | 0.3199*** | 0.0969 | -0.2958*** | 0.1007 | -0.0307*** | 0.0088 |
| 3* | 0.0021 | 0.0025 | 0.2639** | 0.1267 | -0.2310** | 0.1166 | -0.0350** | 0.0150 |
| 4* | 0.0007 | 0.0008 | 0.1886 | 0.1438 | -0.1564 | 0.1200 | -0.0329 | 0.0257 |
| 5* | 0.0008 | 0.0012 | 0.1622 | 0.1421 | -0.1386 | 0.1255 | -0.0244 | 0.0187 |
| 6* | 0.0013 | 0.0018 | 0.2012 | 0.1372 | -0.1752 | 0.1249 | -0.0273* | 0.0155 |
| Unemployed* | 0.0002 | 0.0003 | 0.0616 | 0.0656 | -0.0512 | 0.0554 | -0.0106 | 0.0107 |
| Log of household's income | -0.0004 | 0.0003 | -0.1299** | 0.0683 | 0.1068* | 0.0563 | 0.0235* | 0.0134 |
| Log of relative income | -0.0006 | 0.0009 | -0.1912 | 0.2742 | 0.1572 | 0.2250 | 0.0347 | 0.0506 |
| Couple* | -0.0001 | 0.0003 | -0.0387 | 0.0687 | 0.0322 | 0.0576 | 0.0067 | 0.0115 |
| Health Satisfaction Index: | | | | | | | | |
| 3* | 0.0003 | 0.0004 | 0.0940 | 0.0743 | -0.0785 | 0.0630 | -0.0159 | 0.0121 |
| 2* | 0.0002 | 0.0003 | 0.0478 | 0.0776 | -0.0396 | 0.0651 | -0.0084 | 0.0129 |
| 1* | 0.0002 | 0.0004 | 0.0652 | 0.0867 | -0.0545 | 0.0740 | -0.0110 | 0.0134 |
| 0* | 0.0319 | 0.0247 | 0.4021*** | 0.0294 | -0.4004*** | 0.0442 | -0.0336*** | 0.0086 |
| Region: | | | | | | | | |
| Punjab* | -0.0044** | 0.0021 | -0.4737*** | 0.0461 | 0.3922*** | 0.0414 | 0.0859*** | 0.0194 |
| NWFP* | 0.0005 | 0.0004 | 0.1099* | 0.0613 | -0.0934* | 0.0539 | -0.0169** | 0.0088 |

**Table B-6:** *(continued)*

**Outcome: Satisfaction with expenditure**

Marginal effects, ordered probit regression

y = Pr(Satisfaction with expenditure==1) (predict, p outcome(1))

= 0.00161063

y = Pr(Satisfaction with expenditure==2) (predict, p outcome(2))

= 0.52052488

y = Pr(Satisfaction with expenditure==3) (predict, p outcome(3))

= 0.46081717

y = Pr(Satisfaction with expenditure==4) (predict, p outcome(4))

= 0.01704732

| Outcome | (1) | | (2) | | (3) | | (4) | |
|---|---|---|---|---|---|---|---|---|
| Variable | dy/dx | Std.Err. | dy/dx | Std.Err. | dy/dx | Std.Err. | dy/dx | Std.Err. |
| Male* | 0.0016** | 0.0007 | 0.2202*** | 0.0829 | -0.1810*** | 0.0595 | -0.0409 | 0.0268 |
| Age | 0.0005 | 0.0004 | 0.0350 | 0.0269 | -0.0317 | 0.0243 | -0.0038 | 0.0032 |
| AgeSquared | 0.0000 | 0.0000 | -0.0003 | 0.0003 | 0.0003 | 0.0002 | 0.0000 | 0.0000 |
| Education | -0.0001 | 0.0001 | -0.0100 | 0.0077 | 0.0091 | 0.0070 | 0.0011 | 0.0009 |
| No. of children: | | | | | | | | |
| 1* | 0.0444 | 0.0405 | 0.3400*** | 0.0377 | -0.3677*** | 0.0704 | -0.0167*** | 0.0058 |
| 2* | 0.0344 | 0.0440 | 0.3362*** | 0.0679 | -0.3533*** | 0.1075 | -0.0173*** | 0.0061 |
| 3* | 0.0096 | 0.0101 | 0.2822** | 0.1241 | -0.2706** | 0.1265 | -0.0212** | 0.0098 |
| 4* | 0.0036 | 0.0037 | 0.2112 | 0.1502 | -0.1928 | 0.1380 | -0.0219 | 0.0171 |

**Table B-6:** *(continued)*

**Outcome: Satisfaction with expenditure**

| Outcome | (1) | | (2) | | (3) | | (4) | |
|---|---|---|---|---|---|---|---|---|
| Variable | dy/dx | Std.Err. | dy/dx | Std.Err. | dy/dx | Std.Err. | dy/dx | Std.Err. |
| No. of children: | | | | | | | | |
| 5* | 0.0040 | 0.0053 | 0.1835 | 0.1430 | -0.1719 | 0.1382 | -0.0156 | 0.0111 |
| 6* | 0.0048 | 0.0067 | 0.1899 | 0.1452 | -0.1797 | 0.1429 | -0.0150 | 0.0099 |
| Unemployed* | 0.0005 | 0.0010 | 0.0330 | 0.0672 | -0.0300 | 0.0617 | -0.0034 | 0.0066 |
| Log of household's income | -0.0022* | 0.0013 | -0.1675*** | 0.0664 | 0.1517*** | 0.0604 | 0.0180** | 0.0089 |
| Log of relative income | -0.0026 | 0.0038 | -0.1971 | 0.2733 | 0.1785 | 0.2475 | 0.0212 | 0.0302 |
| Couple* | -0.0003 0.0011 | | -0.0235 | 0.0711 | 0.0214 | 0.0649 | 0.0024 | 0.0073 |
| Health Satisfaction Index: | | | | | | | | |
| 3* | 0.0016 | 0.0015 | 0.1043 | 0.0701 | -0.0956 | 0.0651 | -0.0103 | 0.0070 |
| 2* | 0.0001 | 0.0011 | 0.0091 | 0.0767 | -0.0082 | 0.0697 | -0.0010 | 0.0081 |
| 1* | 0.0006 | 0.0014 | 0.0387 | 0.0850 | -0.0353 | 0.0784 | -0.0040 | 0.0080 |
| 0* | 0.0582 | 0.0375 | 0.3541*** | 0.0285 | -0.3946*** | 0.0505 | -0.0178*** | 0.0061 |
| Region: | | | | | | | | |
| Punjab* | -0.0169*** | 0.0061 | -0.4774*** | 0.0450 | 0.4399*** | 0.0439 | 0.0545*** | 0.0160 |
| NWFP* | 0.0007 | 0.0010 | 0.0437 | 0.0584 | -0.0400 | 0.0539 | -0.0044 | 0.0056 |

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