

Subjective well-being and basic needs: Evidence from rural Guatemala

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Abstract

This paper deals with basic needs fulfillment interpreted in a subjective way. We develop a framework in which the basic needs of households in developing areas are valued from a subjective point of view. We estimate how certain indicators and assets influence basic needs perception. We compare income and perceived basic needs poverty measures, finding that they mismatch. We conclude that income-based approaches should be complemented with other indicators such as subjective satisfaction measures to understand development and measure poverty.

Keywords: Subjective well-being, basic needs, poverty, Guatemala, Highlands.

JEL Codes: I31, I32, O13, O18.

1. Introduction

The study of the subjective well-being of individuals is a very new field in economics.¹ Examples of studies on subjective well-being from an economic perspective include Clark and Oswald (1994), Di Tella et al. (2001), Easterlin (1974, 2001), Oswald (1997) and Van Praag et al. (2003). A general survey on happiness research can be found in Kahneman et al. (1999), Frey and Stutzer (2002a, 2002b) and Veenhoven (1993). The study of subjective well-being from an economic point of view aims to seek general patterns of several variables that are hypothesized to affect this valuation. Although these results may be useful for understanding well-being in developing economies,

special care should be taken when extrapolating them to these countries. In this decade, efforts have begun to perform empirical studies related to subjective well-being with particular attention paid to developing economies. Some of the works about this topic are Graham and Pettinato (2001, 2002), Gough and McGregor (2007), Kingdon and Knight (2006), Rojas (2008) and Pradhan and Ravallion (2000). When dealing with rural areas in emerging economies, studies must take into account differences in the determinants of subjective well-being between people from developed and developing economies. Indeed, the well-being of individuals should be considered within the context in which they live. Rural areas in developing countries constitute quite a different context than urbanized areas of developed economies in terms of the commodities they possess, their needs, their livelihoods and the environment.²

Long before the rise of the economics of happiness in developing countries, basic needs strategies of the 1970s attempted to increase and redistribute production with the aim of eradicating deprivation due to the lack of basic goods and services (Streeten and Javed Burki, 1978). Although these strategies were initially considered a useful tool for understanding development, the basic needs approach fell under criticism in the 1980s as a result of some unsettled questions that led to the failure of the approach (Casper, 2007; Stern, 1989 and Streeten, 1984). Some of the problems with this concept had to do with defining basic needs and the level at which these needs should be considered basic, thus questioning the role of decision makers (i.e. researchers or policy makers) in deciding about these needs and determining what constitutes basic needs (Streeten, 1984). Recently, however, the Millennium Development Goals agenda revived the notion of basic needs by identifying targets and constructing indicators to follow up on the fulfillment of needs in the areas of health, education and employment.

The literature on subjective well-being paved the way to asking individuals about their own well-being. In this paper we import this subjective approach into the basic needs framework in order to allow individuals to play a central role in deciding if their basic needs are met and to what degree. By means of econometric techniques, we estimate the set of goods and opportunities that determines this subjective level of satisfaction. Given the emerging literature on subjective well-being and the revival of the basic needs framework in the political agenda, the question arises as to what extent basic needs fulfillment could be related to subjective well-being. We attempt to shed some light on this issue by assuming that basic needs can directly influence subjective well-being and by reshaping the definition of basic needs to account for subjective factors. We hope that by adding a subjective approach to this problem, it will be possible to overcome some of the objective conceptual problems involved in identifying the reasons for meeting basic needs.

Using data from rural Guatemala on the subjective fulfillment of basic needs, we estimate the perceived basic needs of households. The data was drawn from a recent survey conducted in the rural highlands of Guatemala in which respondents were asked to rate the subjective degree of fulfillment of these needs on a scale of 1 to 4. We let the respondents decide and assess to what degree these needs were satisfied. We use econometric methods to find a general pattern of motivations that encourage or discourage the subjective satisfaction of these needs. The motivations consist in a set of economic, social and livelihood-related aspects of their lives, some of which are endemic to the region and not normally used in standard subjective well-being databases. The analysis of subjective well-being has advantages for policy design and the scientific understanding of what affects people's happiness beyond rising income. Estimating satisfiers of basic needs as perceived by the individual has important policy

implications as it provides insight about real life aspects of households that are specific to a given region of study, as well as providing information to policymakers about what individuals actually need. As far as we know, the knowledge of perceived basic needs is new in the literature.

Subjective well-being approaches have been used to measure the perceived poverty line, thus complementing or replacing income-based approaches (Kingdom and Knight, 2006; Pradhan and Ravallion, 2000; Rojas, 2008). In this paper we also propose a simple method of measuring poverty by using the basic needs approach as it is perceived by the household. Therefore we also capture the psychological, demographic and social aspects that are taken into account in subjective well-being approaches by considering an individual or household as poor (extremely or non-extremely) or non-poor. We apply this to the dataset and argue that due to the completeness of the concept, the perceived basic needs approach is more accurate than poverty lines related to income.

The paper is structured as follows: Section 2 deals with the concept of basic needs and well-being and attempts to link the two concepts. Section 3 describes the data and the region of analysis. Section 4 estimates the correlates that affect the perceived basic needs of the household. In section 5 a simple measure of poverty is calculated based on the perceived basic needs approach and compared with an income poverty line. Finally, conclusions are drawn in section 6.

2. Subjective well-being and basic needs

In this section we outline some issues related to subjective well-being as well as the satisfaction of basic needs in developing economies. Our objective is to explore the

theoretical and empirical lessons found in the literature in an attempt to close the gap between both concepts.

In the psychology discipline, subjective well-being is the scientific term that refers to individuals' evaluation of their experienced positive and negative affect, satisfaction with life or happiness. Individuals evaluate their level of subjective well-being depending on their circumstances, but also by comparing themselves with others, past experience and future expectations (Frey and Stutzer, 2002b). The study of subjective well-being from an economic point of view aims to seek general patterns regarding the variables that affect it. Subjective well-being in developing countries is a wider concept that connects the debate on definitions of poverty where income or consumption poverty is viewed as human development or social exclusion (Gough and McGregor, 2007: 3). In order to understand well-being in developing economies, results could be imported from data on developed economies. However, special care should be taken given the differences in the conditions that influence happiness in emerging economies and developed economies. In order to account for these differences, effort has begun in this decade to perform empirical studies on subjective well-being which focus on developing economies. An example of these studies include Graham and Pettinato (2001, 2002), Gough and McGregor (2007), Kingdon and Knight (2006), Rojas (2008) and Pradhan and Ravallion (2000).

In developed and developing economies, it is common for the recent literature on subjective well-being to use data obtained by asking people directly about their own subjective well-being with questions like: "All things considered, how satisfied are you with your life as a whole?" and "Taking all things together, would you say that you are: very happy, quite happy, not very happy, not at all happy". A life satisfaction scale would be obtained in the first question, while a happiness scale would be obtained with

the second. Although both concepts, happiness and satisfaction with life, differ in terms of how they are defined, they are sometimes used interchangeably for the sake of simplicity in many studies on subjective well-being related to economics. In the economics of happiness, researchers generally estimate the importance of several variables on reported subjective well-being. This literature normally takes into consideration the following specification:

$$W_i = \beta X_{ni} + \varepsilon_i, \quad (1)$$

where W_i refers to the reported subjective well-being of an individual and X_{ni} is a vector of n variables that are chosen by the researcher to explain the dependent variable. This vector of chosen variables is normally conditioned to data availability, and contains both economic and non-economic variables (Frey and Stutzer, 2002b). The error term ε_i contains the effect of happiness that cannot be explained by these variables.

Datasets including questions on subjective well-being do not normally include other variables or regressors that are more difficult to observe such as the self-esteem of respondents, their optimism, values or intellectual and emotional factors. Variables often studied by psychologists are not normally considered in economic analyses of welfare, therefore becoming unobserved characteristics of individuals.³ A more complex theoretical approach that aims to capture all aspects of well-being is what is known as domains of life. This theory states that life consists of an aggregate construct of many specific domains which determine life satisfaction (Cummins, 1996; Rojas, 2006, 2008; van Praag et al. 2003). The complexity of this framework can be overcome by studying the influence of factors on satisfaction in each domain of life separately. Domain satisfaction covers individual satisfaction with different domains of life such as health, financial situation, job, leisure and house satisfaction. If we consider the

domains of life theory, the vector of variables transforms into the several domains of life that affect the subjective well-being of each individual in the above equation.

In recent years, the basic needs approach has been used as a tool for capturing human development in many investigations (Streeten and Javed Burki, 1978; Isenman, 1980; Javed Burki and Ul Haq, 1981; Hicks, 1982 and Ram, 1982). Under the World Bank program to reduce absolute poverty, efforts to meet basic needs were central in the late 1970s (Javed Burki and Ul Haq, 1981). As discussed above, the basic needs strategy was aimed at increasing and redistributing production with a view to eradicating deprivation due to the lack of basic goods and services (Streeten and Javed Burki, 1978). However, this concept was widely criticized. The criticisms were aimed at a series of questions that still remain unsettled, such as how to define basic needs and at what level these needs should be considered basic. This cast doubt upon the role of decision makers (such as researchers or policy makers) in deciding about these needs and the level at which they should be viewed as being basic. (Casper, 2007; Stern, 1989 and Streeten, 1984). As a result of their high level of subjectivity, these questions remain unresolved. Recently, in the Millennium Declaration of September 2000, the Millennium Development Goals agenda recovered the idea of basic needs by pursuing targets and constructing indicators to follow up the achievements of needs, for example the improvement of child and maternal health, decreasing the proportion of people who suffer from poverty and hunger, ensuring universal primary education and achieving full and decent employment.

Nonetheless, the concept of needs and basic needs continues to escape us. There is little consensus about what “need” means in the economic discipline, while other disciplines like psychology, philosophy and sociology differ in terms of how they interpret the concept.⁴ There is also an inherent subjectivity in the notion of basic needs in all

aspects of life including nutrition, housing and clothing (Pradham and Ravallion, 2000). In order to conceptualize the notion of needs within the framework of this study, we consider basic needs satisfaction in a subjective way as individuals' personal valuation of the fulfillment of what they consider to be their needs. Subjective or perceived basic needs satisfaction can be defined as the perceived satisfaction of individuals regarding the fulfillment of what they need to have a good life. As defined in the literature on subjective well-being, we assume that fulfillment must be achieved in all domains of life. Therefore, if the individual fails in some domain of life like housing, this would be expected to have an effect on general satisfaction with life.⁵ Taking this into consideration, we could define *satisfiers* of basic needs as the hypothesized basket of commodities, characteristics and means that the individual uses to achieve those needs. The scope of basic needs satisfaction is very broad, as it can cover needs from primary education, health care and nutrition to access to water and shelter. These terms are similar to Amartya Sen's capability approach, which provides a more complete approach for measuring poverty by putting the notion of individual freedom at the heart of discussion. In his approach, Sen understands capabilities as the choices that individuals can make according to the characteristics of the commodities they have (Sen, 1983, 1985, 1987, 1999). However, he considers that subjective approaches to address the well-being of individuals are not very reliable since individuals tend to adapt to each burden so as to overlook the burden itself (Sen, 1984). On the other hand, according to recent empirical evidence, the capability approach overlaps with the concept of well-being and needs; finding little robustness in the distinction of commodities, characteristics and capabilities (Clark, 2005). Therefore, although we should be wary of the limitations of adaptation addressed by Sen, the satisfaction of

individuals' needs could be assumed to depend on their commodities, capabilities and perceptions of level of satisfaction.

As mentioned above, some of the problems of basic needs arise from the subjectivity involved in defining what needs are basic to and to what degree these needs are achieved. There are no objective criteria to define the content of the satisfiers and the fulfillment of basic needs as they vary depending on geographical region, anthropological and cultural aspects, as well as social and psychological factors. As defined here, our approach to subjective or perceived basic needs is wider than commodities-based approaches and aims to overcome the problems found in objective basic needs for the following reasons. First, the notion of an individual's basic needs should depend on the objectives and desires of that individual, taking into consideration surrounding circumstances. Therefore, subjective basic needs, conditioned by the circumstances surrounding the individual, centers on the individual himself, placing him or her at the core of the study. This is similar to Rojas' (2007, 2008) concept in which he considers the well-being of each person rather than well-being as defined by an external agent. According to this approach, the researcher takes a secondary role, granting respondents the authority to determine their own level of well-being. By doing so, individuals have the freedom to define their basic needs. As Streeten (1984) pointed out, the freedom to define one's needs should be a basic need. Secondly, the focus on basic needs, which is similar to subjective well-being analyses, contemplates all the essential aspects of an individual's life, while taking into account the complexity and completeness of life domains in the analysis. Thirdly, it helps to overcome the problems of considering objective basic needs from the viewpoint of the researcher and the policymaker. The determination of satisfiers that allow people to fulfill their needs is enriched by what people think they need, taking into consideration their own

circumstances and mental states. Therefore, satisfiers acquire an instrumental consideration.

Satisfaction or fulfillment should depend on the context in which people dwell including aspects such as culture, their capacity to use the set of satisfiers, and psychological factors. Psychological factors motivate people to perceive in a more optimistic or pessimistic way, and condition the perception of these basic needs. These perceptions will determine an individual's subjective well-being. By asking about basic needs satisfaction, as we do here, we *might reduce*, but not omit, the unobservable psychological effects that are found in the econometric regressions of equation (1) as we giving this question a more materialistic meaning. Indeed, by inquiring about perceived basic needs we are not asking respondents to make an overall assessment of their lives,, but instead to estimate the achievements they can pursue according to the commodities and opportunities in their own context.

3. Data and variables

a) The dataset

This paper uses data from an original field work study conducted by the Food and Agriculture Organization (FAO) and the Ministry of Agriculture, Livestock and Food in Guatemala (MAGA) in the departments of San Marcos and Quetzaltenango in the Guatemalan Highlands during June and July 2005. According to the classification of the World Food Programme and the Ministry of Agriculture of Guatemala (PMA-MAGA, 2002), the majority of rural households in both departments have high poverty rates. Nevertheless, this fact contrasts with some successful experiences in adopting, producing and commercializing non-traditional crops (Goldín, 2003).⁶ The rural households in San Marcos suffer from higher poverty rates, while households in

Quetzaltenango have successfully adopted and commercialized non-traditional exports. Quetzaltenango has better access by road than San Marcos, but is at a greater risk of natural disasters (PMA-MAGA, 2002; World Bank, 2004).

More than 65 per cent of the workforce in Guatemala is dedicated to the informal sector, with the poor accounting for a higher percentage of this sector. The informal sector is most prevalent among the self-employed working in agriculture (Vakis, 2002). Most of the households in rural areas of northern Guatemala cultivate their own land and sell surplus produce in the marketplace, thus ensuring their food security in some cases (von Braun et. al, 1989). Many of the household members that grow these crops (and others that do not) devote much of their time to cultivating their fields.

The data include 378 observations from 8 different villages located in four different municipalities. Households were selected using a simple random sampling procedure. Villages with more than 75% of urban households were rejected. Based on the maps of the selected village, groups of 6 households were identified and numbered. These groups were finally used to randomly select the final sample. The sample size is acceptable for inference in rural Quetzaltenango and San Marcos. More about the fieldwork specification can be found in Guardiola (2006) and García et al. (2008).

In order to analyze perceived basic needs, the household is taken as the unit of analysis as defined in the database. Therefore, we consider the household as a unit of welfare maximizers rather than the individual. Policy design is household-centered in rural areas of Guatemala, therefore information obtained by considering households instead of individuals should be more useful for development projects in the area.

b) The variables

In order to design the questionnaire, key respondents were asked about the factors or variables that, in their view, could be significant in satisfying the basic needs of the area

studied. This differs from usual happiness datasets, in which a standard questionnaire is employed for all countries being queried. The use of an ad hoc questionnaire which captures the main characteristics of the population being interviewed has immediate advantages, but also has its limitations. The main advantage is for policy making given that the analysis of key variables takes into account the influence of each variable on individual perceived basic needs. It would be of great help in policy formulation to create a conceptual framework in which it would be possible to attach greater importance to directly related variables and lend less importance to inversely related variables in basic needs participation. Limitations arise from the greater time and funding needed to design the questionnaire.

To define the dependent variable, respondents were asked the following question: “To what extent do you think that your household is able to satisfy all the basic needs of its members, considering basic needs as all that you need to have a satisfactory life?”⁷ Respondents had to evaluate the degree of fulfillment they considered necessary to have a satisfactory life. Therefore, this question is open to interpretation by the member of the household, and the interviewer makes no initial assumption about what the respondent considers to be a satisfactory life for his or her family. Fulfillment was scored on a scale of one to four, considering the following statements: (1) the household to which you belong is far from achieving its basic needs; (2) the household does not achieve all its basic needs, but only a few are not attained; (3) only the basic needs that the household requires are satisfied; (4) the household achieves its basic needs well or very well.

Several sets of variables have been introduced in order to identify the factors that determine basic needs fulfillment.

Economic variables

First, we focus on characteristics of household income:

- *Logarithm of annual household income.* The annual household income is calculated as the sum of the annual wages of all members of the family, annual profits from agriculture and annual remittances (quetzals/year).⁸
- *Relative household income.* This measure is calculated as the difference between the logarithm of annual household income and the logarithm of the mean of annual household income by community (Dynan and Ravina, 2007).
- *Respondent's contribution to household income.* To measure the contribution of the respondent to family income, we calculate the division between the respondent's wage (quetzals/day) and the sum of family wages (quetzals/day).
- Dummy indicating if the *family receives remittances.*

Additionally, we add two variables which reflect the economic characteristics of the household:

- Dummy indicating if *the family owns a car.*
- *Quality of the house.* During the survey, the respondent was asked about the quality of the roof, walls and floor of the family house. Respondents can answer on a scale of one to four, with one corresponding to the lowest quality and four to the highest quality. The index of house quality was calculated as the mean of these three questions.

Livelihood variables

Although closely related to the economic variables, special attention was paid in this research to the labor and crop market opportunities of the household that are endemic to the region of study as well as other directly related assets such as time devoted to farming.

- *Respondent time in his/her own field* (hours/day).
- *Family time in their own field* (hours/day).
- Dummy about if the *family cultivates non-traditional products* (NTP).
- *Quantity of land they own* measured in cuerdas.⁹
- Dummy about if *family hires workers to work in family field*.
- *Number of outside jobs held by family members* (not related to agriculture).

Social variables

The survey contains some social questions:

- *Respondent's age*.
- Dummy indicating if the *respondent is male*.
- *Place in family tree*. With this variable we differentiate if the respondent is the head of the household, the spouse or a descendant (children or grandchildren).
- Dummy indicating if the *respondent is educated*. During the survey, respondents were asked about their educational level and the educational level of all the members of the family. The educational level is very low in these departments of Guatemala. 78.5 per cent of the respondents do not have any education. For this reason, we create a dummy to show if the respondent has any type of education, even at the primary level.
- *Number of household members*.
- Dummy about if the *family is a single-parent family*.

4. Estimation on the perception of basic needs satisfaction

In this section we estimate how the selected satisfiers of the household influence the perception of basic needs satisfaction. The variables listed in the previous section are used to explain this influence. Although their importance may vary between households, our intention is to find a general pattern. To do so, an ordinal regression model was estimated.¹⁰ The results are presented in Table 1, where the dependent variable is the proxy for perceived basic needs.¹¹ The results are divided into three different regressions: one including economic aspects, and the other two which refer to livelihood and social aspects, respectively. We find no major differences between the sign and the significance of the variables included in the models. The results of the estimation and some specifications of the variables are discussed below based on the model that includes the three types of variables.

Insert Table 1 here

a) Economic variables

According to the literature on happiness, subjective well-being increases with absolute income but at a diminishing rate, all remaining constant (Frey and Stutzer, 2002b). Drawing from this literature, we could expect income to have the same effect on perceived basic needs. However, since rising income means that people can have more assets as they progress through the life cycle, it could also mean that when their income rises, this higher income becomes a need in order to obtain certain assets that people may consider to be basic for their needs. In other words, if they want (or need) more, the perceived income that richer people need for fulfilling their needs could be greater than people with a lower income. We test income in our regression in two different ways by introducing the total income of the household on the one hand, and by introducing individual contribution to income on the other. For household income, we use the

logarithm of income. For individual income, we calculate the ratio of the respondent's income to the total household income. The results indicate that household income does not play a significant role in explaining subjective basic needs.¹² As regards the influence of the amount of money earned by the respondent relative to the household income, it is found to be positive and significant. This can be explained by the psychological aspects of individuals regarding their contribution to the household.

The influence of relative income on subjective well-being has been tested in happiness literature (see for example Clark and Oswald, 1994; Dynan and Ravina, 2007; Luttmer, 2005; McBride, 2001). Some of these works suggest that happiness functions should be dependent not only on absolute income, but also on relative income. The early literature on basic needs equally highlights the importance of the relative component of poverty in determining the composition of the basket of satisfiers, and as a possible problem in defining the package of satisfiers (Streeten and Javed Burki, 1978). We check if relative income has any relationship to perceived basic needs. Individuals can compare their income to that of others and think that their income is not enough to satisfy all they need. The relative income measure included in our analysis checks if a similar effect can be produced on perceived basic needs by comparing the income of each household with the income of others living in the same community. According to our results, relative income is not significant. This result is consistent with McBride (2001) in the context of subjective well-being in that relative income effects may be smaller in subjective well-being at low income levels. The levels of income of the sample analyzed here is quite low if we take the country as a whole.

Remittances, which should be positively related to income, do not affect the perceived basic needs. Money sent by a member of the household living abroad can help the household to pursue its basic needs. However, it can also involve the opportunity cost of

pursuing activities that can positively influence basic needs fulfillment. The quality of the house and owning a car show a positive and highly significant relationship with perceived basic needs satisfaction as we expected.

b) Livelihood variables

For households that cultivate their own land, access to basic foodstuffs is guaranteed, therefore ensuring food security. Cultivating one's own land could reduce the risk of food shortages as individuals are not subject to market variations in food prices. Guaranteed access to food should be a basic need satisfier for the household. However, the time devoted to cultivating land could be a sign of the inability to pursue other opportunities that could be considered basic for the household. In our model, the hours respondents devoted to farming their land are positively related to perceived basic needs, but the influence of total household labor in the field on basic needs perception is insignificant.

To assess the relationship between household agricultural labor and household income, we regress the logarithm of annual household income with several family characteristics and goods. As can be observed from the coefficient in Table 2, household agricultural labor does not contribute to generating income. In fact, it tends to reduce it. This makes sense for the subsistence agriculture engaged in by some households in the sample. Producing their own food (normally maize and beans) does not guarantee money unless the households sell their surplus produce on the market, which is often not the case. This is more likely for those that produce non-traditional crops as a livelihood.

Insert Table 2 here

To shed some light on this result we revised the literature about non-traditional crops. There is debate about the convenience of non-traditional crops for small farmers in Latin America. The fact that these crops are labor intensive, which is an asset for

families with many members, and the possibility of maintaining control over one's land are some of the advantages. This contrasts with disadvantages such as strict quality standards and market imperfections (Carletto et al., 1999; Carter et al., 1996; Collins, 1995; Hamilton and Fisher, 2003; von Braun et al., 1989). The estimations of von Braun et al. (1989) indicate that the adoption of non-traditional products has a positive influence on nutrition in Guatemala, due to the diversification of the diet and the positive income effect. In our estimation in Table 1, the variable which indicates that a large amount of non-traditional products has been adopted is non-significant and therefore has no influence on perceived basic needs satisfaction. However, as expected, it is highly significant in explaining household income (Table 2), suggesting that non-traditional crops and income are correlated to each other, but each of them is not correlated to perceived basic needs.

To better understand the relationship between agricultural labor and subjective basic needs, we introduce an interaction between the hours that household members devote to cultivating their own land and the production of non-traditional crops. These products are labor intensive (Carletto et al., 1999; von Braun, 1989), thus justifying the creation of this interaction. Figure 1 jointly plots the probability of the household being far from achieving their basic needs over the time the family devotes to its own land, distinguishing if the family cultivates non-traditional products or not. The figure clearly indicates that the probability of being far from achieving basic needs is increasing with a higher slope for households that do not cultivate non-traditional products. If not enough time is devoted to cultivating them, the above relationship is inverse, where this level is 3.65 hours. In the figure we can see that increasing the hours devoted to cultivating one's own land has a negative impact on perceived basic needs achievement, but is greater in the case of households that do not grow non-traditional products. This

could be a sign of the lack of opportunities for pursuing other activities like outside paid jobs or education.

Insert Figure 1 here

The amount of land individuals own is also positively related to perceived basic needs (Table 1). However, this variable is not significant for explaining income (Table 2). From the results, we can induce that land could be a basic needs satisfier, but is not an income generating asset in itself. Factors such as the time devoted to land, the quality of land and the availability of technology such as irrigation are determinants in the area for the household to sell surplus (García et al., 2008; Guardiola, 2006).

We could be tempted to expect high significativity from the variable that indicates number of members in the household that have outside jobs (meaning that they do not work on their own land). Testing for this variable in the model reports no significant impact on subjective basic needs (Table 1). A reasonable argument for this is that in the area where data were gathered, opportunities to work outside one's own land are few and found normally in the informal sector (Vakis, 2003). The conclusion we can draw from this result is that working on land that is not their own in the informal job market does not lead to a greater fulfillment of their basic needs than other factors. However, the relationship between the number of outside jobs and household income is positive and significant (Table 2), therefore contributing to the generation of income but not to the fulfillment of basic needs. Unfortunately, we are unable to make a deeper analysis of this aspect due to lack of information on total amount of time devoted to outside jobs in the database.

c) Social variables

The age and gender of the respondents are not significant for explaining their perception of the basic needs satisfaction of the household. However, the place individuals occupy

in the family tree is important. The perceptions of the head of the household and the spouse are worse than those of their descendants. This means that a more pessimistic attitude regarding basic needs fulfillment can be attributed to those at the top of the family tree. The number of family members is inversely related to basic needs satisfaction.

Education can serve to access better job positions and higher income. Additionally, as pointed out by Sen (1997), education can be beneficial for an individual by increasing their capabilities: reading, communicating, being able to choose in a more informed way and so on. The education of the respondents as an indicator shows a positive role in their perception of the basic needs satisfaction of the household.

5. Income poverty and perceived basic needs poverty

Very few attempts have been made to measure poverty in terms of perceived utility or perceived welfare. Some studies have demonstrated that in developing countries subjective well-being poverty and income poverty are not closely related, giving more importance to this kind of studies.¹³ Others have shown that these measures are mismatched and criticize income-based approaches. A reasonable explanation for this is that income does not take into account the full range of aspects that characterize an individual. According to Rojas (2006), individuals experience poverty from a subjective well-being approach if they have low life satisfaction. This contrasts with the usual concept of poverty from the viewpoint of income or consumption, which considers that individuals experience poverty if their income or consumption is below some defined poverty line. In this paper we reshape the concept within the subjective basic needs framework, defining subjective poverty in terms of the respondent's perception about the level of satisfaction of the basic needs of the household. Therefore,

we determine those households that consider that they do not achieve their basic needs to be reported poor. The possible responses were a) far from achieving basic needs (extremely reported poor); b) almost achieving basic needs (reported poor) and c) and just achieving or achieving well the basic needs that the household requires.

Insert Table 3 here

According to this classification (Table 3), there are 269 (=117+152) reported poor households (71.2%), 117 reported extremely poor households and 152 reported poor households. Households whose members earn less than 2 dollars per day are determined as income poor, distinguishing between extreme income poor (less than 1 dollar) and extreme poor (between 1 and 2 dollars). There are 312 (82.5%) income poor households, 201 extreme poor households and 111 poor households. There are many more extreme income poor families than reported extreme poor families (201 vs. 117). The same happens with non-extreme poor comparisons, but these differences are not so great (111 income poor vs. 152 reported poor). Additionally, there are 52 (=34+18) extreme reported poor households [44.4% of them (=52/117)] but no extreme income poor households, and 85 (=54+31) households considered income poor [78% (=85/109)], but not reported poor. In order to measure “agreement” between the two classifications, we use the Kappa indicator. The kappa equals one means perfect agreement and equals zero if the classification is not better than a random classification. In this case, the value of the Kappa indicator is 0.036 and is not significantly different from zero (p-value=0.294) in statistical terms.

Insert Table 4 here

We repeat the study distinguishing only between reported poor and income poor households, but not extreme levels. In Table 4 we show the classification table of the two categories. If the household is far from achieving its basic needs or almost achieves

them, we say that the household is reported poor. 42 households are considered reported poor [15.6% of them (=42/269)], but not income poor; and 85 households are considered income poor [27.2% (=85/312)], but not reported poor. Although not extremely high, these percentages again lead us to conclude that both measures classify differently. The value of the Kappa indicator is 0.073 and is not significantly different from zero (p-value=0.137) in statistical terms either.

6. Conclusions

In this paper we have dealt with basic needs satisfaction from a subjective point of view, aiming to incorporate the analytical framework of economics of happiness into the basic needs framework. In the literature on basic needs and subjective well-being we find little connection between these two branches. We aim to close the gap between these two concepts in order to pursue two objectives. First, to overcome some of the problems regarding basic needs that arise from the subjective manner of defining these needs and the level at which they are achieved. There are no objective criteria for defining the content of satisfiers and basic needs fulfillment as they vary among geographical regions and depend on anthropological and cultural aspects, as well as social and psychological factors. We aim to solve these problems by asking individuals about their perceived basic needs, therefore incorporating subjectivity into the estimation of basic needs. Secondly, we test this approach using data from rural Guatemala in order to assess the implication of this approach for understanding development and defining poverty.

We compare this subjective measure with the objective characteristics or commodities of households in order to determine how they affect this perception and identify satisfiers. Some satisfiers such as livelihoods which differ from the cultivation of the

household's own land seem to contribute little to perceived basic needs, although they generate income. Absolute and relative income-related variables are not found to be significant in the probability of increasing perceived basic needs, while satisfiers of basic needs are not necessarily income generators. For instance, the variable related to the cultivation of one's own land seems to decrease the perception of basic needs fulfillment. This perception is lower if individuals cultivate non-traditional crops. However, those who do cultivate non-traditional crops are more bound to generate income than households that do not cultivate this type of crop. Additionally, the amount of land does not contribute to generating income in itself, but can be considered a basic need satisfier. On the contrary, assets like remittances do contribute to generating income, but are not perceived as a basic need.

We also compare a created perceived basic needs poverty measure with an income poverty measure. Some tests indicate that the basic need poverty measure and the income poverty measure do not classify in the same manner. From our comparison of subjective poor and income poor, we concluded that income measures overestimate the number of poor households. More sharply, the measure of income tends to overestimate extreme poor compared to the subjective indicator. This divergence between both measures and the differences in the results of estimating income and basic needs perception leads us to conclude that both concepts are very far from being equivalent. Subjective basic needs poverty seems to be a better measure than income poverty, as the former captures all the domains of life considered by the individual, and takes into consideration other factors such as culture and geographical and psychological factors. Discussions on this topic should therefore centre more on subjective approaches rather than on income-based ones.

We consider that the results from a subjective point of view can contribute to the objective interpretation of development within basic needs approaches, such as the Millennium Development Goals on the United Nations agenda. Research into and monitoring of the achievement of these goals can be completed by taking into account people's perceptions about achieving all that they need for their life. Some questions that remain open for further research are: "To what extent is there a gap between perceived basic needs and basic needs satisfaction as considered by alternative conceptual models and policymakers?", and "To what extent are the concepts of subjective well-being and basic needs empirically related?"

References

- Barham, B., Clark, M., Katz, E. and Schurman, R. Nontraditional agricultural exports in Latin America. *Latin American Research Review*, 27 (2), 1992, 43-82.
- Carletto, C., de Janvry, A. and Sadoulet, E. Sustainability in the diffusion of innovation: smallholder non-traditional agro-exports in Guatemala. *Economic Development and Cultural Change*, 47 (2), 1999, 345-369.
- Carter, M. R., Bradford L. Barham, and Mesbah, D. Agricultural export booms and the rural poor in Chile, Guatemala, and Paraguay. *Latin American Research Review*, 31 (1), 1996, 33-65.
- Casper, D. Conceptualizing human needs and human well-being. In Gough, I. and McGregor, A. (Eds.). *Wellbeing in developing countries: From theory to research* (pp. 259–280). Cambridge: Cambridge University Press. 2007.
- Collins J.L. Farm Size and Non traditional Exports: Determinants of Participation in World Markets. *World Development*, 23 (7), 1995, 1103-1114.

- Clark, A. E. and Oswald, A.J. Subjective well-being and unemployment. *Economic Journal*, 104, 1994, 648–659.
- Clark, D. A. Sen's Capability Approach and the Many Spaces of Human Well-being. *The Journal of Development Studies*, 41(8), 2005, 1339-1368.
- Cummins, R. A. The domains of life satisfaction: An attempt to order chaos. *Social Indicators Research*, 38, 1996, 303–332.
- Di Tella, R., MacCulloch, R.J., Oswald, A.J. Preferences over Inflation and unemployment, evidence from surveys of subjective well-being. *American Economic Review*, 91, 2001, 335–341.
- Dynan, K. E. and Ravina, E. Increasing Income Inequality, External Habits, and Self-Reported Happiness. *American Economic Review*, 96(2), 2007, 189-94
- Easterlin, R.A. Does economic growth improve the human lot? Some empirical evidence. In: David, P.A., Reder, M.W. (Eds.), *Nations and Households in Economic Growth* (pp. 89–125). New York: Academic Press. 1974.
- Easterlin, R.A. Subjective well-being and economic analysis, a brief introduction. *Journal of Economic Behavior and Organization*, 45, 2001, 225–226.
- Frey, B. S. and Stutzer, A. *Happiness and Economics: How the Economy and Institutions Affect Human Well-Being*. Princeton: Princeton U. Press. 2002a.
- Frey, B.S. and Stutzer, A. What Can Economists Learn from Happiness Research? *Journal of Economic Literature*, 40, 2002b, 402–435.
- García, C., Guardiola, J. and Herbás, C. Logistic Evolutionary Product-Unit Neural Networks: Innovation Capacity of Poor Guatemalan Households. *European Journal of Operational Research*, 195 (2), 2009, 543-551.

- Graham, C., Eggers, A., & Sukhtankar, S. Does happiness pay? An exploration based on panel data from Russia. *Journal of Economic Behavior & Organization*, 55, 2004, 319–342.
- Graham, C. and Pettinato, S. Happiness, Markets and Democracy: Latin America in Comparative Perspective. *Journal of Happiness Studies*, 2, 2001, 237–268.
- Graham, C. and Pettinato, S. Frustrated achievers: winners, losers and subjective well-being in new market economies. *Journal of Development Studies*, 38(4), 2002, 100-140.
- Goldín, L. Procesos globales en el campo de Guatemala: Opciones económicas y transformaciones ideológicas, FLACSO, Guatemala. 2003.
- Gough, I. and McGregor, A. (Eds.) *Wellbeing in developing countries: From theory to research* (pp. 259–280). Cambridge: Cambridge University Press. 2007.
- Guardiola, J. El impacto del tratado de libre comercio CAFTA en la seguridad alimentaria de Guatemala. PhD Thesis. Universidad de Córdoba-ETEA. 2006.
- Hamilton, S. And Fisher, E.F. Non-traditional agricultural exports in Highland Guatemala: Understandings of risk and perceptions of change. *Latin American Research Review*, 38 (3), 2003, 82-110.
- Hicks, N.L. Sector Priorities in Meeting Basic Needs: Some Statistical Evidence. *World Development*, 10(6), 1982, 489-499.
- Isenman, P. Basic Needs: The Case of Sri Lanka. *World Development*, 8, 1980, 237-258.
- Javed Burki, S. and Ul Haq, M. Meeting Basic Needs: An Overview. *World Development*, 9, 1981, 167-182.
- Kahneman, D.; Diener, E. and Schwarz, N. (ed). *Well-Being: The Foundations of Hedonic Psychology*. New York: Russell Sage Foundation. 1999.

- Kingdon, G. and Knight, J. "Subjective well-being poverty vs . Income poverty and capabilities poverty?," *Journal of Development Studies*, 42(7), 2006, 1199-1224.
- Luttmer, E. F. P. "Neighbours as Negatives: Relative Earnings and Well-Being." *Quarterly Journal of Economics*, 120(3), 2005, 963–1002.
- McBride, M. Relative-income Effects on Subjective Well-being in the Cross-section, *Journal of Economic Behavior and Organization* , 45, 2001, 251-278.
- Oswald, A.J. Subjective well-being and economic performance. *The Economic Journal* 107, 1997, 1815–1831.
- Pradhan, M. and Ravallion, M. Measuring poverty using qualitative perceptions of consumption adequacy. *The Review of Economics and Statistics*, 82(3), 2000, 462–471.
- PMA-MAGA. Cartografía y análisis de la vulnerabilidad e al inseguridad alimentaria en Guatemala. Ciudad de Guatemala: PMA-MAGA. 2002.
- Ram, R. Composite indices of physical quality of life, basic needs fulfillment, and income: A 'principal component' representation. *Journal of Development Economics*, 11(2), 1982, 227-247.
- Rojas, M. Well-being and the complexity of poverty: A subjective well-being approach. In M. McGillivray, & M. Clarke (Eds.), *Understanding human well-being* (pp. 182–206). Tokyo: United Nations University Press. 2006.
- Rojas, M. The complexity of well-being: A life satisfaction conception and a domains-of-life approach. In Gough, I. and McGregor, A. (Eds.), *Wellbeing in developing countries: From theory to research* (pp. 259–280). Cambridge: Cambridge University Press. 2007.
- Rojas, M. Experienced Poverty and Income Poverty in Mexico: A Subjective Well-Being Approach. *World Development* , 36(6), 2008, 1078–1093.
- Sen, A. Poor, Relatively Speaking. *Oxford Economic Papers*, 35, 1983, 153-169.

- Sen, A. Rights and capabilities. Resources, Values and development. Oxford: Basil Blackwell. 1984.
- Sen, A. Commodities and capabilities. Amsterdam: North Holland. 1985.
- Sen, A. The standard of living. Cambridge: Cambridge University Press. 1987.
- Sen, A. Editorial: Human Capital and Human Capability. *World Development*, 25(12), 1997, 1959-1961.
- Sen, A. Development as freedom. Oxford: Oxford University Press. 1999.
- Streeten, P. Basic Needs: Some Unsettled Questions. *World Development*, 12(9), 1984, 973-997.
- Streeten, P. and Javed Burki, S. Basic Needs: Some Issues. *World Development*, 6(3), 1978, 411-421.
- Stern, N. The economics of development: A survey. *Economic Journal*, 99, 1989, 597-685.
- VAKIS, R. *Guatemala: Livelihoods, Labor Markets, and Rural Poverty*. Background paper for Guatemala Poverty Assessment (GUAPA). Washington D.C.: World Bank. 2002.
- Van Praag, B. M. S., Frijters, P. and Ferrer-i-Carbonell, A. The anatomy of subjective well-being. *Journal of Economic Behavior & Organization*, 51(1), 2003, 29-49.
- Veenhoven R. Happiness in Nations, Subjective Appreciation of Life in 56 Nations 1946-1992. Rotterdam: Erasmus University. 1993.
- Von Braun, J., Hotchkiss D. and Immink M. Non-traditional export crops in Guatemala: Effects on production, income, and nutrition. Research Report 73. Washington D.C.: IFPRI. 1989.
- World Bank, Guatemala poverty assessment. Washington D.C.: World Bank. 2004.

Table 1. Ordered Logit Regression (Dep. var. = Perceived basic needs)

	Economic, livelihood and social	Economic and livelihood	Economic
Log(household income)	0.397 (0.263)	0.101 (0.250)	-0.231 (0.231)
Relative household income	-0.342 (0.265)	-0.072 (0.253)	0.237 (0.238)
Respondent's contribution	0.586* (0.343)	0.526** (0.274)	0.543** (0.267)
Remittances	0.064 (0.268)	0.164 (0.256)	0.257 (0.244)
Family owns car	1.608** (0.774)	1.933** (0.750)	2.571*** (0.723)
Quality of house	1.150*** (0.304)	1.238*** (0.299)	1.185*** (0.288)
Respondent's time in field	0.136*** (0.049)	0.107** (0.043)	
Family's time in field	-0.015 (0.012)	-0.016 (0.011)	
NTP	0.089 (0.260)	0.209 (0.257)	
Amount of land owned	0.051*** (0.014)	0.054*** (0.014)	
Family hires workers	-0.410 (0.328)	-0.320 (0.325)	
Number of outside jobs	-0.058 (0.112)	-0.050 (0.103)	
Respondent's age	0.013* (0.008)		
Respondent is male	-0.061 (0.458)		
Head of the household	-1.115*** ^a (0.459)		
Spouse	-0.846* ^a (0.463)		
Single-parent family	-0.442 (0.455)		
Respondent is educated	0.660** (0.017)		
People in household	-0.092* (0.050)		
Log-Likelihood	-409.795	-419.597	-430.824
N	369	369	369

* p<0.10, ** p<0.05, *** p<0.01; standard errors in parenthesis

^a Descendant as reference

Table 2. OLS Regression (*Dep. var.* = $\ln(\text{household income})$)

	B	Standard errors
Constant	6.527***	0.282
Family's time in own field	-0.028**	0.012
NTP	1.571***	0.327
Amount of land owned	0.019	0.017
Family hires workers	0.305	0.433
Number of outside jobs	1.312***	0.117
Household owns a car	0.756	0.918
Sample size	378	
R squared	0.307	

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

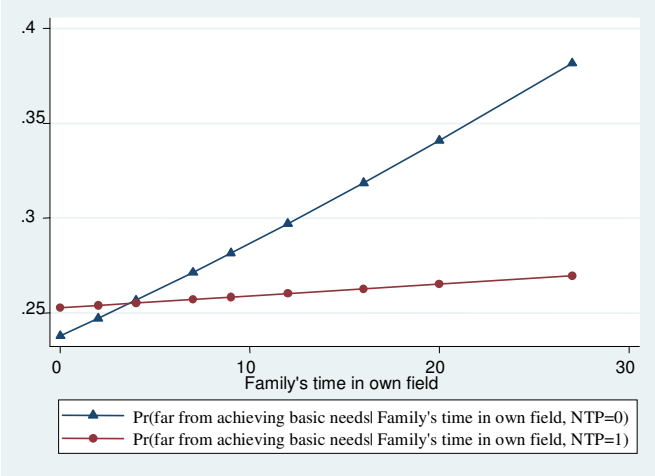
Table 3. Reported poor vs. Income poor

		Daily income			
		Less 1\$	1\$-2\$	More 2\$	Total
		(Extreme)			
Reported satisfaction	Far (Extreme)	65	34	18	117
	Almost	82	46	24	152
	Just or well	54	31	24	109
Total		201	111	66	378

Table 4. Reported poor vs. Income poor

		Income poor		
		0	1	Total
Reported poor	0	24	85	109
	1	42	227	269
Total		66	312	378

Figure 1. Probability of far from achieving basic needs with respect to time devoted to own land and non-traditional production



NOTES

¹ In order to simplify the concepts, we use the terms happiness, subjective well-being and life satisfaction interchangeably.

² Graham and Pettinato (2001) compared happiness in Latin America to happiness in Russia and the United States. They concluded that the sociodemographics of happiness in Latin America are similar to Russia and the United States. However, these results are difficult to generalize in rural areas. The data was drawn from the Latinobarómetro, which has a sharp urban bias for the years analyzed (see footnote 9 in the study cited).

³ Some works that include panel data use the estimation of the error in previous time or different steps in time in order to explain the unobservable part. For instance, Graham et al. (2004) use the residual of an initial regression in order to capture this psychological element of happiness and test the causality between happiness and other factors such as income and health. Van Praag et al. (2003) estimate satisfaction with several aspects of life from a vector of explanatory variables. They then take the residuals of this estimation and use them in a general satisfaction equation to control for these unobservable variables and avoid endogeneity bias.

⁴ A complete set of definitions of needs in developing countries and their relationship with other concepts related to human development can be found in Casper (2007).

⁵ Estimations by Rojas (2008) find that the bivariate correlations between satisfactions in life domains are positive, showing that in the aggregate these satisfactions tend to move in the same direction.

⁶ Non-traditional crops are agricultural products that are adopted in order to accumulate capital by selling the products on international markets. Guatemala and other Latin American countries have experienced a rapid growth of these products since the late 1970s. More about these crops in Latin America can be found in Barham et al. (1992) and Carter et al. (1996). For Guatemala, see Carletto et al. (1999), Goldín (2003), Hamilton and Fisher (2003) and von Braun et al. (1989).

⁷ In this research we use the concepts of household and family interchangeably.

⁸ The quetzal is the national currency of Guatemala. In 2005, 1 dollar was equivalent to approximately 7.5 quetzales.

⁹ The *cuerda* is a unit of land in Guatemala. One *cuerda* is equivalent to 400 square metres.

¹⁰ We use the negative log-log function as a link function because the lower categories in the dependent variables are more probable.

¹¹ Dummy variables for the department and the communities were tested and found to be insignificant. We do not report their values.

¹² Rojas (2008) points out that income should not play an important role in subjective approaches, as they take into account several domains of life. Furthermore, Rojas (2006) found no correlation between SWB and income.

¹³ This was demonstrated by Kingdom and Knight (2006) with data from South Africa, Rojas (2008) with data from México and Pradham and Ravallion (2000) with data from Jamaica and Nepal.