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**Subjective Poverty and its Determinants: an Empirical approach to the
Colombian case**

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Abstract

Colombia has little knowledge about individual welfare perception. Willing to change this fact, this paper aims to study poverty in Colombia from a holistic perspective. By taking three different measurement approaches on poverty using the National Survey of Life's Quality (ENCV-2013). The first approach studies the main social and economic variables that determine subjective poverty by using probit modeling, the second measures poverty through the economic scale of households by multinomial logit modeling and, thirdly, analyzes the indirect effect of timing has on the subjective poverty measure, furthermore, studies how the change on welfare today compared to five years ago affects the perception of poverty. The results indicate that the first and second approach has as main variables which explain subjective poverty, the lack of: income; household ownership; appliances ownership such as: stove, water heating system and washing machine; educational level, living in urban zone, health conditions and employment. The third result shows that homes who perceived themselves as in equal or worse conditions compared to five years ago have a greater probability of being under subjective poverty. Moreover, low socio-economical levels of population weight income as more important to perceive themselves as poor than wealthier socio-economical levels.

Keywords: poverty measurements, subjective poverty, Colombia, income inequality, living conditions, multidimensional poverty.

JEL Classification: I30, I32, I10, I20, I31.

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I. Introduction

From a whole perspective, human poverty could be addressed in a multidimensional way, where there is not only the analysis of the income measurement but also, other indicators which could lead to identify human development, freedoms development and individual rights.

In this sense, it has recently emerged worldwide the study of poverty towards the subjective welfare. For instance, Sen (1999) proposes to consider the human development as a process which allows the expansion of individual freedom with the minimum basic requirements like access to nutrition, prevention of diseases, premature deaths, among others. Likewise, poverty should be considered like an absence of basic capacities and not as inadequate income.

In that order, according to Saunders (2003) there are two different ways in which it can be reflected the meaning of poverty. The first approach is for the ones who study it; the second one is closer to the people who experienced it. The first scheme has dominated the literature and its study has focused on how to configure the poverty line. The second approach is important because examines the poverty impact and its apparent consequences.

In attention to this criteria, the individual perception of poverty turns out to be a relevant topic while measuring it, because there is an inherent subjective and social specificity while calculating the basic needs basket of goods, which determine the monetary poverty line and when the country is relatively unequal regarding incomes.

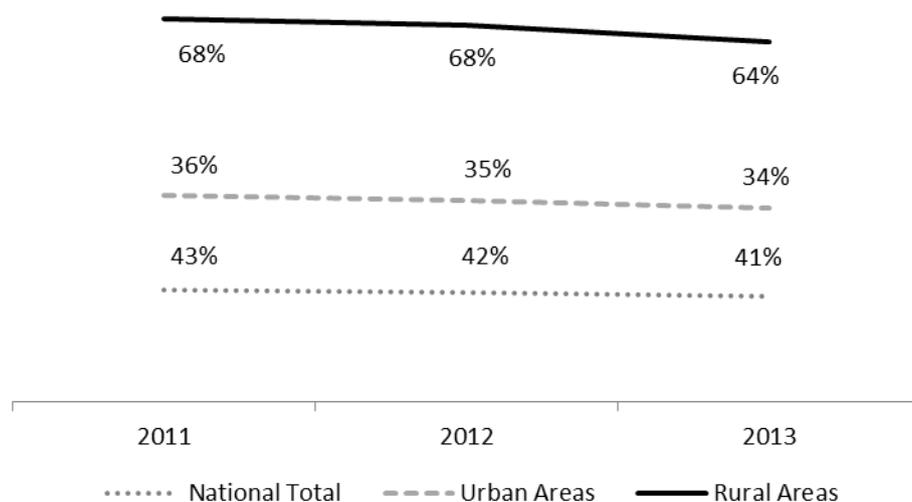
Therefore, it exists two ways to study human poverty and in some way the concept of freedom shortage. The first one is the analysis of objective poverty, which includes measurements like income; the second one corresponds to the subjective poverty examination, which consists in the individual perception of each one's life welfare and income.

Hence, subjective and objective poverty are needed and linked to each other in order to measure the population's welfare. Saunders (2003) shows that poverty definition and measurement cannot be determined independently from the prevailing social conditions. Consequently, poverty is relative in the sense, the resources required to prevent social disadvantages will depend directly from the material circumstances, and this last aspect is consistent with the absolute deprivation of capacities.

For example, Pradhan and Ravallion (2000) point out that psychologists, sociologists and other social scientists have argued circumstances of individuals compared to others, influences the welfare perceptions in any given social group that consider a certain basket of goods as essential to live.

In Colombia, despite the fact poverty perception among households has decreased consistently in the last years, it continuous to be high. For instance, statistics show that wide national poverty perception is around 40.6% in 2013, for the rural areas is 63.8% and for urban populations is 34.2% (Graph. 1).

Figure 1. Percentage of households' heads who perceive themselves as poor.



Source: National survey of quality of life. (Encuesta Nacional de Calidad de Vida- DANE) (2011, 2012, 2013). The results are authors' own estimations.

According to the above and agreeing with Wang et al. (2001), when a considerable proportion of the world's population are poor measured by objective poverty indicators, such as income, most of the time the government and researches focuses on the way to improve the objective welfare. In comparison, when the indicators of poverty using income decrease and the income distribution worsens, the public policy makers will focus more in the evaluation and research of subjective welfare.

In this order of ideas, when studying the individual's well-being and poverty perception Van Praag introduces in 1968 the question of income evaluation, it consists on a survey according to a scale of income asking what range is considered to be "very bad" income and what range "very good" income; at the end, results consists in building an utility function that allows to measure individuals' welfare.

To measure subjective poverty it is important to take into account, when the measurement is done correctly it helps create effective public policy that reduces it, Benfield (2008) considers when analyzing the determinants of subjective and monetary poverty for Jamaica, there are no many differences between the results of this two methodologies; although the author concludes subjective poverty has the same independent variables which impacts on the objective poverty.

Furthermore, the explanation could be found in the household's perception of their vulnerability, adaptive expectations, education's access, labor experience, place of residence, industry or sector who is employed by, the labor's access of children and third age adults and last the sacrifices made in order to have a certain level of consumption and expenditure (Benfield, 2008)

In addition to the above, Bookwalter and Dalenberg (2004) use South Africa's data to estimate subjective poverty line, they find an important difference between the surveyed groups and it socioeconomically status. In other words, for the lowest quartile, transport and housing are most important while determine their welfare's perception. Conversely, for the richest quartile the access to public utilities and services such as: clean water, sanitation, energy, education and health, are relatively more important to them.

This brings us up to the question of what are the implication on public policy, given the fact there are multiple factors impacting people's welfare and are closely related to public goods. Besides, empirical results from measuring subjective poverty could be used to help governments focus and develop their help

programs to increase welfare and improve the individuals living conditions (Bookwalter and Dalenberg, 2004).

With this in mind, this document makes a contribution to the welfare analysis of the Colombian population, owing to the study of poverty from a whole perspective, which takes into account consumption indicators, individual's perception of poverty and determines its close relationship with inequality.

This document is divided in to five sections. The first one presents the state of art related on subjective poverty. Then, the motivation is developed; the third part shows data and methodology used. Later, the empirical results of data modeling are pointed out and finally, the fifth section exposes the principal conclusions.

II. State of the art

In 1776, Adam Smith defined poverty as the lack of certain necessities that by costumes will be indecent for people to live without, even in the lowest social scale. Consequently, in order to make an objective measurement of poverty, an index must be build taking into account information available to quantify how many people are in fact poor.

Therefore, to study the people's levels of poverty is important to combine the subjective and objective analysis, in order to achieve a proper characterization of the households who perceive a lack in human development and well-being. In this way, the measurement and conception of poverty and welfare has evolved over time.

In this sense, for the Spanish case, Bellido et al. (1998) consider poverty as a multidimensional phenomenon, which can be analyzed from three points of view or definitions; the first one, a relative monetary poverty or lack of resources in comparison with the average of the population; the second one, the poverty measure through physical indicators, for example, deprivation of certain material goods and, thirdly, subjective poverty, this last seems to be strongly linked with inequality.

For the perception of poverty, Pradhan and Ravallion (2000) show in their study that subjective poverty lines can be calculated using a simple qualitative evaluation of adequate consumption levels perceived by a sample of households. The authors use information from Jamaica and Nepal for their study, households's head answered if they considered their consumption of food, housing and clothing appropriate to the needs of their family.

Thus, poverty lines show robust results when compared with alternative methods that use other components of expenses. Added poverty rates are rather close to the results obtained using objective measures. However, there are noticeable differences between the geographical and demographic profiles of the sample (Pradhan and Ravallion, 2000).

Empirically, there is a strong relationship between household's income and the perception of poverty, especially in the lower income population when divided by tenths. In this sense, Palomar (2004), examines the relationship between income and subjective welfare of the population and argues that there are two trends in this regard, the first, maintains a strong relationship between the two variables, relationship that is strengthened when the population is poorer. The second trend minimizes this relationship, arguing that a large percentage of happiness cannot be explained by economic variables.

Udaya (2006) explores the subjective and objective conceptions of economic welfare through micro-level surveys and also identifies the characteristics of poverty in Kathmandu. Regarding this, his results suggest that the subjective measurements of households, while integrated with data from income and consumption (objective measurements) results in broader and completer poverty indicators. Which points out that it is feasible to use a multidimensional method that includes subjective poverty to find better indicators of welfare.

In the same way, Guillén-Royo (2008) examines the case of seven Peruvian communities; he analyzes the context of material poverty where consumption and subjective welfare are strongly and positively related. This is usually explained in terms of possibility of meeting basic needs when there is additional expenditure. The results reveal that, in the Peruvian Corridor, consumption has a fuller meaning, beyond the mere satisfaction of the basic needs and there are hedonistic aspects like the consumption's pleasure and the populations concern of being on a better social scale.

In this order of ideas, to have a comprehensive measurement of society's welfare it is essential to counteract the objective levels of poverty with its subjective indicators. To do this, Halleröd (2006) supports the concept of poverty being measured in a subjective way, this could be an accurate method that allows the correlation between the individual's economic circumstances, their particular group's life's decisions and their consumer preferences.

With the foregoing in mind, poverty must be seen as a multidimensional issue. In this sense, Ravallion (2011) indicates it is important to recognize that poverty is not only the low consumption of market goods but there are other products and services that have implications on individual's personal welfare such as education, public services and health.

Therefore, the perception of poverty becomes an instrument to adjust objective poverty, because it allows considering goods and services -which have an impact on welfare- that monetary poverty does not take into account. Ravallion (2012) points out there are two groups of questions to measure subjective poverty; the first group are the questions called economic scale or ladder questions (ELQ) by asking directly if the individual thinks he is poor, if he is satisfied with his life, among other aspects; the second group of questions that measure monetarily subjective poverty, there is a question developed by Van Praag (1968) who asks what is the income that individual's considered absolutely minimum to live or to make ends meets (minimum income question - MIQ-).

To estimate the welfare and subjective poverty of the China's elderly population, Wang et al. (2011) discuss the objective indicators of welfare which includes income and consumption levels and, subjective indicators which show the attitude and mood of people and both represent complementary indicator of poverty. The authors suggest new public policies for China should take into account not only the objective poverty lines but those estimated using subjective methods of welfare and the authors recommend establishing a multidimensional strategic system that points to elderly population and allows poverty reduction through better access to social security.

Subsequently, Smahi et al. (2012) discuss the population's access to financial systems and the subjective poverty in Algeria. They find like Tomlinson et al. (2008) for United Kingdom, that encouraging access to micro-financial channels focusing to this particular population in need, gives them the possibility of undertaking activities or small businesses that generate economic benefits, all this can provide them the necessary resources to make ends meets; hence, the combination of "bottom-up" policies will lead to reduce the level of total poverty.

While analyzing empirically the objective, subjective poverty and income inequality for Colombia, Goldberg and Pavcnik (2007) study the effect of the economic policies for trading liberalization in urban poverty. The main focus of discussion is to establish if these trading reforms contributed to the increase in income inequality observed in many developing countries. The authors found difficulty while estimating real poverty rates, and second, difficulties while identifying the impact on poverty of certain changes in trading policy.

On the other hand, Piñeros and Clavijo (2013) study the relationship between subjective poverty, multidimensional poverty and food security of Colombian's households. Econometric analyses of the research shows the existence of a positive and significant correlation between the perception of household poverty with 12 of the 15 categories which are part of the Index of Multidimensional Poverty (IPM)²; in

² The Index of Multidimensional Poverty –IPM- is one of the official indicators in Colombia which measure the poverty levels of the citizens. It is produced by the National Statistics Administrative Department (DANE) since 2010 and it contains the following indicators: educative conditions, childhood and youth conditions, labor, health, public utilities and housing conditions.

addition, the authors find that income deficiencies may transfer in the inability of households to consume certain goods and basic services such as food and education.

Moreover, to explain subjective poverty in Colombia, it must be taken into account observable characteristics such as scarcity of resources or income, deprivation of property, the condition of health of individuals, years of education, among other similar aspects. All of these variables are needed to know in order to study the perception of poverty in Colombia from a comprehensive perspective.

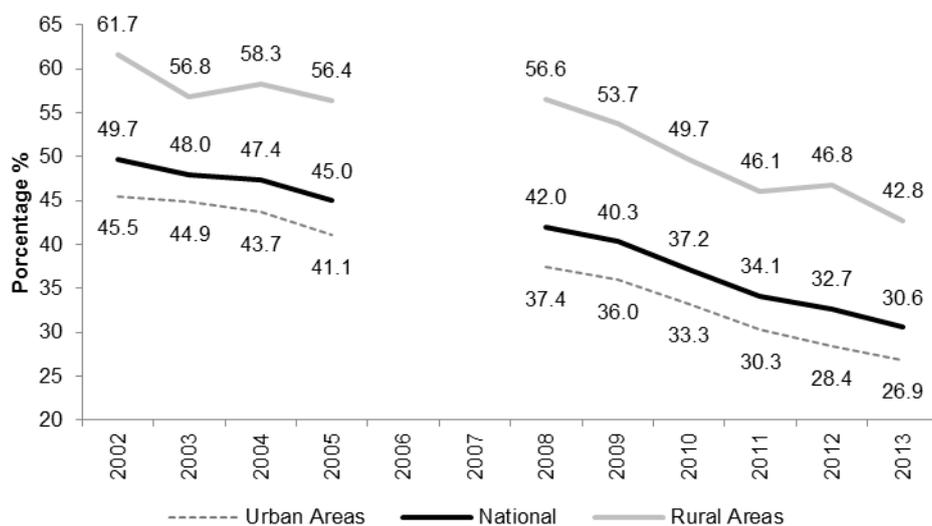
III. Motivation

Poverty is a multiple dimensions phenomenon that must be addressed from a personal perspective. Objective measures of income fall short while studying individual development and their sense of freedom, it is necessary for Colombia to have broader and completer indicators measuring poverty. What is more important, studying the objective determinants of subjective poverty is essential as it allows having a global outlook on the living conditions of the population.

To this end, a series of objective indicators is presented; they allow studying the relationship between objective outlook on individual's material conditions and the population's perception of welfare in order to recognize what are the relevant observable variables that determine poverty's perception.

In this regard, an official assessment at the national level of poverty and indigence has been made in Colombia since 2002; this estimation seeks to observe the evolution of households' welfare from an absolute and objective perspective. Therefore, a poverty line -considered to be the lowest cost per household needed to buy a basket of goods (food and non-food) that allows an adequate standard of living- is measured. In Colombia, figures of monetary poverty present a decreasing behavior and according to the DANE (2013) are the following:

Figure 2. Poverty incidence by geographical areas (2002-2013)³



Source: DANE, Monetary and Multidimensional Poverty in Colombia (2013) press release.

³ There is no data for the years 2006 and 2007 due to the fact MESEP considered that in those years data was insufficient to estimate the numbers, in 2006 for not having information of one of the two surveys for the full year and in 2007 because it corresponded to stabilization of changes and therefore the quality of the information was compromised.

To measure the question of household's economic ladder (ELQ); the National Survey of Life's Quality provided by DANE (2013) asks four questions that seek to measure subjective poverty and household welfare. The first one is: Do you consider yourself poor? second, Does your household's income cover your minimum expenses?; third, In comparison to the household where you grew up, your household lives economically: better, same or worse?; And fourth, Compared to five years ago, this household lives economically: better, same or worse?

For this reason, subjective poverty indicators are relevant in the way it allows to measure the household's welfare perception (Ravallion, 2012). According to the National Survey of Life's Quality (2013) 40.6% of Colombian's household's heads or spouses consider themselves poor.

Following this regard, when studying the economic ladder question (ELQ), and adapting it for the Colombian case; the results show that 68.7% of households who consider themselves poor, their income does not cover their minimum expenses; subsequently 26.1% of households who feel poor, their revenues cover the minimum expenses and last, 8.6% of households who perceive themselves poor, their income covers more than the minimum expenses. Therefore, you can grasp a direct relationship between the perception of poverty in households and their level of income (Table 1).

Table 1. Income level and perception of poverty

<i>Your household income:</i>	Subjective poverty	
	Yes	Not
It is not enough to cover the minimum expenses	68.7%	31.3%
It only reaches to cover the minimum expenses	36.1%	63.9%
It covers more than the minimum expenses	8.6%	91.4%

Source: National Survey of Life's Quality, 2013. The results are authors' own estimations.

While studying the intergenerational welfare on a national level, 54.1% of household's heads or spouses surveyed responded they were better economically compared to the home they were raised at; hence, 35.2% responded they were equal and 10.7% commented they were worse (ENCV, 2013. The results are authors' own estimations).

In fact, 65.1% of household's head or spouse who consider themselves poor feels they are in worse economic conditions with respect to the home they grew up in; 43.5% consider that they are equal and 33.8% responded they are better (Table 2).

Table 2. Development of improved economic conditions, intergenerational and perception of poverty

<i>With regard to the home where you grew up, this home lives economically:</i>	Subjective poverty	
	Yes	Not
Better	33.8%	66.8%
The same	43.5%	56.5%
Worst	65.1%	34.9%

Source: National Survey of Life's Quality, 2013. The results are authors' own estimations.

To study the household's perception on poverty and its relationship with the economic cycle ENCV (2013) questions household's head or spouse if they think their life's level and welfare at home, with respect to what they had 5 years ago is better, same or worse. The results indicate that 62.3% who feel their standard of living is worse than five years ago are also considered poor; 43.6% who feel that their current living standards are equal to the ones they had five years ago are also feeling poor and finally, 31.3% they think are better than five years ago also considered themselves as poor. Moreover, 68.7% of households who responded they are better now than five years ago do not perceive themselves as poor (Table 3).

Table 3. Development of improved recurring economic conditions and perception of poverty

<i>You think that their life's level and welfare of your home, in respect to what you had 5 years ago is:</i>	Subjective poverty	
	Yes	Not
Better	31.3%	68.7%
The same	43.6%	56.4%
Worst	62.3%	37.7%

Source: National Survey of Life's Quality, 2013. The results are authors' own estimations.

In order to characterize the population who consider themselves as poor, six circumstances of households are presented. The first is the area where they live, if it is urban or rural, then, the sex of household's head, the level of education of household's head, the age of household's head, his/her subjective health status and his/her occupational state, these being relevant characteristics that influence the poverty's perception at international level (see Guillén-Royo (2008), Halleröd (2006)), Piñeros and Clavijo (2013), Udaya (2006), Wang et al. (2011), among others).

With this in mind, the psychological traits and sociodemographic characteristics affect poverty's perception (see Lanjouw and Ravallion, (1995), Diener et al. (1999) and Ravallion and Lokshin (2000)). In Colombia 63.8% of people living in rural areas think of themselves as poor compared to 34.2% in the urban area; Additionally, the level of education of household's head strikes widely the perception of poverty, data indicates as the years of education increase perception of poverty decreases, for example, for household's who have up to elementary education 56.9% consider themselves as poor and only 7.2% of household's with graduate education consider themselves poor (Table 4).

According to Ravallion and Lokshin (2000) the negative consequences of unemployment and diminished health of people, also affect the perception on welfare. Being unemployed can be considered as a cause of depression and anxiety, and brings within a social stigma in many societies. Thus, the authors found while maintaining the same level of income, be unemployed or in poor health reduces the subjective evaluation of individuals' welfare.

To this respect for the Colombian case, a relationship between subjective poverty is accentuated when the state of health of households is presented; for instance, 69.6% of household who mentioned that his/her health were bad, also consider themselves as poor, while just 21.4% of households whose health is very good are considered poor; also, be unemployed and feel poor has a higher frequency as well, for example 44.9% of households who are unemployed are considered poor, while only 38.5% of households with employment perceive themselves as poor (table 4).

In this sense, Carletto and Zezza (2006) point out unemployment affects people's subjective well-being, because they may feel discouraged about their current situation and their future, therefore this makes them feel worse than those individuals who have similar levels of consumption but are employed.

Table 4. Description of the population according to their subjective poverty's perception

		Subjective poverty	
		Yes	Not
Area	Urban	34.2%	65.8%
	Rural	63.8%	36.2%
Sex (of household's head)	Man	40.8%	59.2%
	Woman	39.9%	60.1%
Education (of the household's head)	Elementary or less	56.9%	43.2%
	Secondary	39.0%	61.0%
	High school	31.7%	68.3%
	Technical or technological	22.4%	77.6%
	University	15.2%	84.8%
	Post-Graduate	7.2%	92.8%
Age groups (of household's head)	≤25	38.8%	61.2%
	26-45	38.3%	61.7%
	46-59	38.8%	61.2%
	60 and +	47.0%	53.0%
Subjective health condition (of household's head)	Very good	21.4%	78.6%
	Good	37.0%	63.0%
	Regular	53.4%	46.6%
	Bad	69.6%	30.4%
Occupational status (of household's head)	Employed	38.5%	61.5%
	Unemployed	44.9%	55.1%
Total		40.6%	59.4%

Source: National Survey of Life's Quality, 2013. The results are authors' own estimations.

On an international perspective, Chant (2009) studies the poverty of women in Africa, Asia and Latin America, finding three important distinctions in the situations faced by men and women. The first is that the majority of the poor population is female; the second is the relative and increasing disproportionality between assets own by women and by men, men being the large properties holders and third, most household's heads have feminized and these homes are typically associated with higher levels of extreme and chronic poverty.

For the Colombian case, while studying the feminization of poverty, table 4 indicates that women as household's heads feel - slightly - on average less poor than households of male headship (39.9% of women as household's head compared to 40.8% of the men as home's head). These data contrast with objective measurements of monetary poverty, which shows that households with female leadership are poorer than men (according to DANE 2013 on their poverty newsletter, 34% of households that have female headship are poor compared with 29% of households with male headship).

While considering the age of household's head and their poverty's perception, it can be pointed out that self-perception of poverty levels are similar for all the age ranges with the exception for homes whose household's head's age is greater than 60 years (table 4). The results are similar to those presented by Wang et al. (2011) for the Chinese case, where the elderly population has levels below the average on: income, consumption, and subjective welfare.

Physical assets and the perception of poverty have a close relationship in the international literature (see Di Tella and MacCulloch (2007)). For Colombia, table 5 shows that there is a strong connection between not feeling poor and the possession of material goods (column 3).

Table 5. Home's assets and poverty's perception.

<i>Which of the following goods or services does this home have?</i>	Subjective poverty			
	Yes		Not	
	<i>Yes</i>	<i>Not</i>	<i>Yes</i>	<i>Not</i>
Clothes washing machine	26.4%	57.1%	73.6%	42.9%
Fridge or refrigerator	34.6%	63.6%	65.4%	36.4%
Gas or electric stove	36.7%	64.4%	63.3%	35.6%
Electric or gas oven	18.2%	46.8%	81.8%	53.2%
Microwave oven	16.7%	46.6%	83.3%	53.4%
Electric water heater system gas or electric shower	15.3%	46.7%	84.7%	53.3%
Conventional color TV	41.2%	38.6%	58.9%	61.4%
TV LCD, Flat Screen or LED	19.6%	48.9%	80.4%	51.1%
Video player (DVD, Blue-ray, other)	28.0%	50.8%	72.0%	49.2%
Sound equipment	29.4%	50.7%	70.7%	49.3%
Air conditioning	23.0%	41.2%	77.0%	58.8%
Fan	41.8%	39.9%	58.2%	60.1%
Digital music, video and image players (MP3, MP4, Ipod)	13.0%	43.7%	87.0%	56.3%
Consoles for electronic games: Play Station, X-box, Wii, PSP, Nintendo, Gameboy, etc.	15.9%	42.9%	84.1%	57.1%
Particular vehicle	15.3%	44.4%	84.7%	55.6%
Motorcycle or scooter	34.1%	42.5%	65.9%	57.5%
Bike	34.5%	43.5%	65.5%	56.5%
House, apartment or farm for recreation	27.4%	41.8%	72.6%	58.2%
Television by subscription cable or satellite dish	29.3%	57.9%	70.7%	42.1%
Digital camera/ video camera	15.7%	47.2%	84.3%	52.8%
Desktop computer	22.3%	47.0%	77.7%	53.0%
Portable computer	18.1%	47.4%	81.9%	52.6%
Tablet	13.5%	43.0%	86.5%	57.0%

Source: National Survey of Life's Quality, 2013. The results are authors' own estimations.

Households that own their property present different behavior in certain social and economic variables compared to those who are tenants. By the way, Rossi and Weber (1996) show evidence there is a disparity between landlords and renters behavior in variables such as: savings capacity, debt pattern, level of personal satisfaction, socialization and even other aspects such as their children's school grades.

The house is an asset that offers services and is a form of investment. Therefore, housing tenure can be closely correlated with the households' poverty's perception and is also presented as a measure of welfare. In this manner, in Colombia there is a clear relationship between feeling poor and housing tenure, for example, 40.9% of households who have own and fully paid for their home are considered poor, 25.4% of households with home ownership and who are still paying for it are considered poor, 35.6% of the people living in lease or sub-lease thought of themselves as poor, 51.8% of households living in a property they do not have to pay for as beneficial owner consider themselves poor, and 63.1% of families that are in fact occupying a home but holding the property without legal title perceive themselves as poor (table 6).

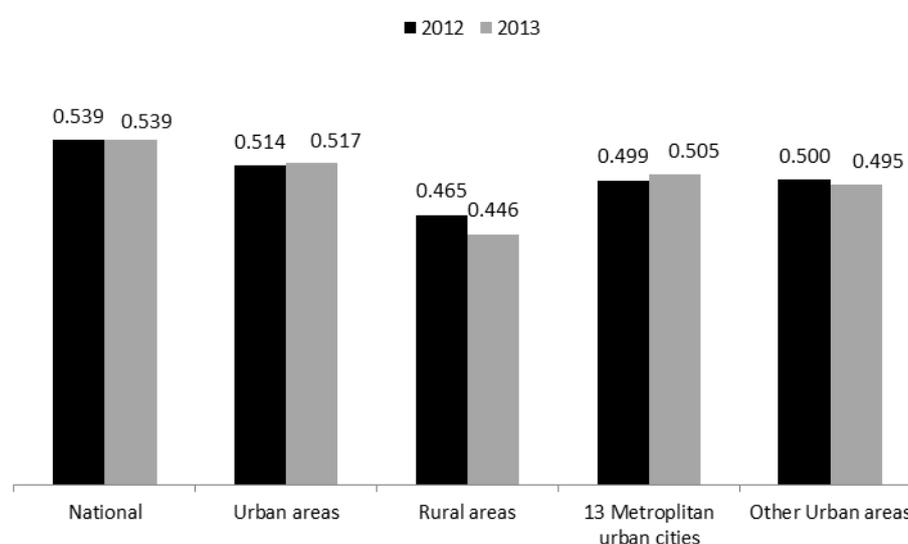
Table 6. Housing tenure and perceptions of poverty

<i>The housing occupied by this home is:</i>	Subjective poverty	
	Yes	Not
Own, fully paid	40.9%	59.1%
Own, they are still paying	25.4%	74.6%
In lease or sub-lease	35.6%	64.4%
With the permission of the owner, without payment of any kind (beneficial owner)	51.8%	48.2%
Possession without legal title (occupant in fact) or collective property	63.1%	36.9%

Source: National Survey of Life's Quality, 2013. The results are authors' own estimations.

Regarding inequality, DANE presented GINI coefficient measurement and its figures for 2013. They stated, "The national income inequality remained constant compared to 2012, registering a coefficient of 0,539 points. There was an increase in the domains of urban areas nation-wide and thirteen areas or biggest cities of Colombia. In the urban areas, the Gini coefficient stood at 0,517, compared to 2012 when it registered 0,514. Besides, the Gini was 0,505 in thirteen areas in 2013 paralleled to 0,499 in 2012" [Taken from the press release of DANE, monetary and multidimensional poverty in Colombia (2013:12)].

Figure 3. Inequality of income (2012-2013)

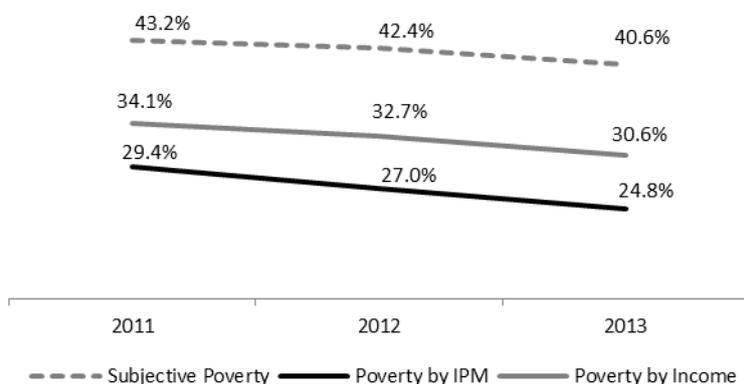


Source: DANE (2013), Monetary and Multidimensional Poverty in Colombia, press release.

Moreover, when an objective poverty indicator decreases given the fact income improved in a period of time but then inequality does not change its index, it is crucial to study the household's perception on poverty. It is essential to know since there is an increase on income which allows a reduction of monetary poverty but income inequality remains the same, perhaps the perception of subjective poverty does change by a slight increase while experiencing higher inequality in the urban areas nationwide and in thirteen major cities.

Because of this, subjective poverty is highest among the official measurements on the matter in Colombia. It is a 63.7% higher than poverty by IPM and 32.7% greater than poverty by income (figure 4). Therefore, it is fundamental to study poverty in its subjective dimension, in order to understand in a more complex way how households assess individual's poverty, in this particular case, welfare's perception represents different social realities, which are closely related to inequality.

Figure 4. Objective and subjective poverty measurements at national level



Source: National Survey of Life’s Quality, 2013. The results are authors’ own estimations and DANE (2012-2013), monetary and multidimensional poverty in Colombia press release.

While studying household’s income it could be pointed out the national average is COP\$1,956,200, which matches to approximately USD\$1000 per month. The urban area’s income is 13.0% higher than the national average and in rural areas the household’s average income is 53.8% lower than urban incomes and 47.8% lower than the national level (table 7).

Table 7. Average income per household

	Average income by surveyed households	Average income per person
National’s total	\$1,956,200	\$555,004
Urban	\$2,210,731	\$639,157
Rural	\$1,021,949	\$271,339

Source: National Survey of Life’s Quality, 2013. The results are authors’ own estimations.

About the living conditions among generations and age groups, it is reviewed the fact: as the age increases, it is larger the proportion of people who consider themselves to live economically worse than the home they were raised at. In the case of the elderly, specifically people older than 60 years, 12.7% consider their living situation is worse, being the highest percentage by age’s groups. (figure5).

Figure5. In comparison to the home where you grew up in, this home lives



Source: National Survey of Life’s Quality, 2013. The results are authors’ own estimations.

While comparing well-being’s perception of the current home compared to the one they they grew up in, household’s heads from 25 years to 44 years consider they live in a better or equal way to the home where grew up in with a rate of 92.1% and 91.6%, respectively; the third group of 45 to 59 years, characterized by people who have reached a professional, economic and personal stability, show a 89.7%, in addition the two younger groups follow the same pattern and they have better perception of the living conditions of their current home, all of the above demonstrates the intergenerational group which is most vulnerable to poverty corresponds to senior adults (figure 5).

Descriptive statistics, however, suggest that poverty's perception is accentuated in the tails of the distribution by age. For instance, 41.5% of household's head with less than 25 years old feel poor. Subjective poverty is accentuated in older adults; for the home's head of 60 years and older the sense of poverty raises up to 47.3% (Figure 6)⁴.

Figure 6. Age ranges and subjective poverty.



Source: National Survey of Life's Quality, 2013. The results are authors' own estimations.

According to Ravallion (2012), there is a latent heterogeneity in subjective poverty measurements, this occurs because a number of people with similar characteristics respond differently while evaluating their level of subjective well-being. As a result, these differences cannot be statistically ignored; personality traits and people's mental status, for example when they suffer from depression, these circumstances may largely explain the response's discrepancies. In the same manner, the weights welfare's components receive by each individual are different, for example, people with diseases will give more importance to their level of health than healthy individuals.

For these reasons, it is essential to understand quantitatively the determinants of subjective poverty using appropriate methodologies which enable the identification of relevant aspects of welfare's perception. With this purpose, three quantitative approaches are made: the first seeks to study the determinants of subjective poverty using observable variables through a probit model; the second approach establishes some determinants to study the economic scale of Colombian households and third, it pursues the environment's importance on the poverty's perception assessment, as a result there is an analysis by socioeconomical rank quantifying the individual's welfare in the past. The following section explains in detail the data and the measurement process.

IV. Data and methodology

This section presents the methodology and the data used to study the relationship between subjective poverty and its determining factors. So as to accomplish the task, the first part shows the National Quality of Life Survey (ENCV) of 2013, secondly it presents the data used and sample's selection then, it displays the research's approach on quantitative methodologies.

For this study, ENCV made in 2013 is used, this data base targets to obtain information allowing analysis and comparisons between the socio-economic conditions of Colombian households. This survey has national coverage and has nine domains⁵. This covers various aspects of individuals, including characteristics of their human capital and also socio-demographic variables.

Ten modules of the ENCV (2013) are used. The first module contains the identification and household's descriptions, the B module has the data on housing, C module corresponds to the household's utilities, module D has characteristics and household's composition, module E health, education is in G module, module H takes on labor force, module I has data on information and communication technology, module J

⁴ Annex 1 presents descriptive statistics of the ENCV (2013) in the matter of subjective welfare conditions.

⁵ Bogotá D.C., Antioquia, Valle, Atlantic Region, Eastern Region, Central Region, Pacific Region, San Andrés and Region Orinoco-Amazonia. Additionally, established representativeness for the departments of Guajira, Córdoba, Boyacá, Cauca, Chocó and Nariño (taken from the methodology ENCV (2013) of DANE).

corresponds to the tenure and their housing financial assistance and module K relates to the home's living conditions and goods' possessions. The analysis unit is the household and the sample's selection as follows:

Table 8 Sample's selection

Survey	ENCV 2013
Period	2013
Timing of data	Annual
Unit of analysis	Colombian homes
Years of education	All
Income level	All

There are many factors that help explain the subjective poverty. However, we can only take the observable variables that determine the individual's perception of poverty according to the academic literature. Therefore, three empirical measurements are proposed. The first measurement is a probit model, which studies the determinants of subjective poverty. The general model is presented below:

$$(1) PS_i = \alpha_0 + \gamma_1 \vec{X}_i + \beta_1 I_i + \beta_2 VP_i + \beta_3 A_i + \beta_4 S_i + \beta_5 E_i + \beta_6 ED_i + \beta_7 O_i + \beta_8 ES_i + \varepsilon_i$$

i represent surveyed households and:

- PS_i It is the perception of household poverty, being 1 if the household is considered poor and zero if it is not.
- \vec{X}_i It is a vector of *dummies* variables concerning goods and services the home owns (the goods and services are: washing machine, refrigerator, electric or gas stove, electric or gas oven, microwave, electric or gas water heating system or electric shower, conventional color TV, LCD TV, Flat Screen or LED, video (DVD player, Blue-ray, other), sound equipment, digital music, video and image players (MP3, MP4, IPod), consoles for electronic games: Play Station, X-box, Wii, PSP, Nintendo, Gameboy, etc., particular vehicle, motorcycle or scooter, bicycle, house property, apartment or recreation farm land-lordship, television by subscription, cable or satellite antenna, camera or digital video, computer desktop, laptop, and tablet).
- I_i It is a log of household's average income.
- VP_i It is the degree of ownership of housing where 1 is completely own and paid for and zero if it is own but they are still paying it, lease or sub-lease contracts, living with the permission of the owner without payment of any kind (beneficial owner), possession without title (occupant in fact) or collective ownership.
- A_i It is the area where the house is located where 1 is urban and zero rural.
- S_i It is household's head gender, where 1 is male, 0 female.
- E_i Household head's years of education.
- ED_i It is the household's head age.
- O_i It is the household's head occupational status.
- ES_i It is the household's head health conditions, where 1 is very good or good, and zero is regular or bad.

The second method aims to study the determinants of household's economic scale. The model measured is a generalized ordered logit having as dependent variable the question evaluation if the household's income is enough to cover the minimum expenses or not. Below is the functional form of the model:

$$(2) GM_i = \alpha_0 + \gamma_1 \vec{X}_i + \beta_1 I_i + \beta_2 VP_i + \beta_3 A_i + \beta_4 S_i + \beta_5 E_i + \beta_6 ED_i + \beta_7 O_i + \beta_8 ES_i + \varepsilon_i$$

- GM_i It is the question with multinomial answer where the income of the household; 1 it is not enough to cover the minimum expenses, 2 if it only reaches to cover the minimum expenses and 3 if it covers more than the minimum expenses.
- \vec{X}_i It is a vector of *dummies* variables concerning goods and services the home owns (the goods and services are: washing machine, refrigerator, electric or gas stove, electric or gas oven, microwave, electric or gas water heater or electric shower, conventional color TV, LCD TV, Flat Screen or

LED, video (DVD player, Blue-ray, other), sound equipment, digital music, video and image players (MP3, MP4, iPod), consoles for electronic games: Play Station, X-box, Wii, PSP, Nintendo, Gameboy, etc., particular vehicle, motorcycle or scooter, bicycle, house property, apartment or recreation farm land lordship, television by subscription, cable or satellite antenna, camera or digital video, computer desktop, laptop, and tablet).

- I_i It is a log of household's average income.
- VP_i It is the degree of ownership of housing where 1 is completely own and paid for and zero if it is own but they are still paying it, lease or sub-lease contracts, living with the permission of the owner without payment of any kind (beneficial owner), possession without title (occupant in fact) or collective ownership.
- A_i It is the area where the house is located where 1 is urban and zero rural.
- S_i It is household's head gender, where 1 is male, 0 female.
- E_i Household head's years of education.
- ED_i It is the household's head age.
- O_i It is the household's head occupational status.
- ES_i It is the household's head health conditions, where 1 is very good or good, and zero is regular or bad.

One of the explanations why subjective poverty is higher than objective measurements, regarding the Colombian case these particularity can be due to the fact people assess differently their individual perception on poverty, first, they generally tend to make comparisons between their current circumstances and past ones (see Di Tella and MacCulloch (2004) and Rousseau (2009)) and second, they also make comparisons between their close social circle (see Clark and Shields (2008)).

In this sense, the third model targets to analyze indirectly how inequality affects the Colombians poverty's perception. Given the circumstances Colombia does not have access to micro-level panel data, this relationship between income inequality and the perception of poverty cannot be studied in a direct manner, specifically because it needs a point of comparison such as: neighbors, family members, GDP per capita or personal references.

Therefore, the third measurement aims to study the poverty's perception according to the socioeconomic level of the Colombian population and explores if changes in welfare in contrast to 5 years ago affects the poverty's perception. Like this, the following probit regression is done to every socioeconomic level-status:

$$(3) \quad PS_i = \alpha_0 + \beta_1 I_i + \beta_2 CA_i + \beta_3 A_i + \beta_4 S_i + \beta_5 E_i + \beta_6 ED_i + \beta_7 O_i + \beta_8 ES_i + \varepsilon_i$$

Siendo i los hogares encuestados y donde:

- PS_i It is the perception of household's poverty, being 1 if the household considers itself as poor and zero if it is does not.
- I_i It is a log of household's average income.
- CA_i It is a categorical variable, which responds to the question regarding current household's living level in comparison to what they had 5 years ago and describes living level as better, same or worse.
- A_i It is the area where the house is located where 1 is urban and zero rural.
- S_i It is household's head gender, where 1 is male, 0 female.
- E_i Household head's years of education.
- ED_i It is the household's head age.
- O_i It is the household's head occupational status.
- ES_i It is the household's head health conditions, where 1 is very good or good, and zero is regular or bad.

As a result of described methods, this document researches in a casual manner, the determinants of subjective poverty in Colombia, The results may suggest to policy makers some relative aspects concerning poverty, which will allow them to make an integral assessment of the Colombians living conditions.

V. Results

This section presents the results of the main estimations. In the first part, a Probit model is used to calculate the magnitude and dimension of subjective poverty's determinants, secondly the results of generalized ordered logit model are presented, this model is used to study the factors that explain the household's economic scale and finally, through a Probit model we indirectly analyze how inequality affects households poverty's perception. All of these processes are made to confirm that inequality, material assets, level of education, health and work status help explain Colombians poverty's perception, as individuals make comparisons of its current situation with their environment and their historic way of living.

Determinants of subjective poverty

One of the ways to study subjective poverty is to learn its relationship with material and intellectual assets, this is important to determine the quantitative importance of the explanatory variables. In this sense, the marginal effects indicate that material assets have a negative relationship with poverty's perception. Possession of these assets decreases the likelihood of feeling poor. Within the material assets with an economic and statistical significance stand the: washer, refrigerator, oven, heating water system, LCD TV, flat screen TV or LED, vehicle, owing vacation or recreational home, cable service or TV subscription and video (table 9).

The regression results show that sociodemographic characteristics affect subjective poverty. Consequently, if household's head lives in the urban areas, this household is less likely to feel poor compared to homes located in the rural areas. In addition, the household's average income level negatively affects the poverty's perception

In this regard, the regression's results agree with those presented by Ravallion and Lokshin (2000) who show that poor health and unemployment affect positively individual poverty's perception. In the Colombian case, the results indicate if household's head is working and has good health it is less likely to feel poor.

Table 9 determinants of subjective poverty
(Standard error in parentheses)

Dependent variable: subjective poverty		<i>Probit</i> model
Independent variables		(Marginal effects)
Material assets	Clothes washing machine	-0.193*** (0.041)
	Fridge or refrigerator	-0.156*** (0.032)
	Gas or electric stove	-0.060 (0.056)
	Electric or gas oven	-0.188** (0.054)
	Microwave oven	-0.026 (0.061)
	Electric water heater gas or electric shower	-0.304*** (0.060)
	Conventional colored TV	-0.137** (0.051)
	TV LCD, Flat Screen or LED TV	-0.194*** (0.046)
	Video player (DVD, Blue-ray, other)	-0.125*** (0.293)
	Sound equipment	-0.075** (0.038)
	Digital music, video and image players (MP3, MP4, IPod)	-0.104** (0.080)
	Consoles for electronic games: Play	-0.019

Dependent variable: subjective poverty		<i>Probit</i> model (Marginal effects)
Independent variables		
	Station, X-box, Wii, PSP, Nintendo, Gameboy, etc.	(0.079)
	Particular vehicle-car	-0.102*** (0.008)
	Motorcycle or scooter	-0.024 (0.040)
	Bike	-0.003 (0.038)
	Property on house, apartment or recreational home	-0.119*** (0.003)
	Television by subscription service, cable or satellite dish	-0.141*** (0.041)
	Digital / video camera	-0.175** (0.059)
	Desktop computer	-0.076 (0.048)
	Portable computer	-0.011 (0.054)
	Tablet	-0.040 (0.082)
Income	Average income per household (Log)	-0.632*** (0.102)
Homeownership	1 is own and fully paid and zero the rest	-0.140*** (0.004)
Geographic area	1 is urban and zero rural	-0.065*** (0.001)
Gender of the head of household	1 is male, 0 female	0.125** (0.043)
Education level of household's head	Elementary or less	0.500*** (0.125)
	Secondary	0.332** (0.127)
	High school	0.238*** (0.012)
	Technical or technological	-0.165*** (0.011)
	University	-0.115*** (0.012)
	Post- Graduate	-0.349*** (0.007)
Years of household's head	≤25	-0.120*** (0.009)
	26-45	-0.027*** (0.001)
	46-59	-0.111*** (0.006)
	60 and +	0.213*** (0.004)
The household's head occupational status	Employee	-0.153*** (0.008)
Household's head health condition	1 is very good or good, and zero is regular or bad	-0.268*** (0.004)

*Significant at 10%, ** significant at 5%, ***significant at 1%.

While analyzing the household's head age range and its perception of poverty, the results show a negative relationship between age and subjective poverty, with the exception of household's who's head has 60 years or more and its relationship towards feeling poor is positive. Elderly adults present lower than the average

levels of income, consumption of material assets; therefore, a positive correlation between this age group and feeling poor is current.

These model results suggest a negative relationship between housing tenure and the subjective poverty perception. Home ownership is an asset that offers services and is a form of investment. Therefore, for Colombian households homeownership decreases the perception of poverty since it may be viewed as a measure of welfare (see Rossi and Weber (2006)).

Human capital is one of the significant determinants that affect household's poverty perception. Hence, the results indicate there is a positive relationship between having a level of education up to primary, secondary or high school and feeling poor. Furthermore, by increasing the years of education households tend to have a lower probability of perceiving themselves as poor and the relationship becomes negative; for example, if a household's head has a technical degree, university, or post-graduate it influences in a negative way his subjective poverty (table 9).

While households with female leadership have a greater prevalence in the objective poverty measures such as monetary poverty, descriptive statistics for Colombia show households with female leadership feel slightly less poor than households with male headship (table 4). The model results match the previous premise, because if household's head is male the probability of being poor increases.

Economic scale

The econometric model's dependent variable can take three values which are associated with household's income as follows, the variable has 1 if the household's income is not enough to cover the minimum expenses, takes the value 2 if the household's income is just enough to cover the minimum expenses and 3 if the household's income covers more than their minimum payments. Where the higher the value the variable takes has a better subjective perception of home's income, this is the main reason why we use generalized ordered logit methodology, therefore, and it estimates the model for each classification.

As follows, table 10 shows the marginal effects of the generalized ordered logit. Each column shows the probability given to the explanatory variables to remain in each of the states described previously; the positive sign reflects the effect of stability and permanence and the negative sign shows a shift to the other two states.

In this sense, material assets have negative sign mostly in columns 1 and 2 indicating when having these types of assets it's not likely to remain in those categories. For instance, when homes have tangible belongings it is less likely the household does not cover their minimum expenses. Additionally, column 3 indicates these household's domestic revenues cover more than minimum expenses, material assets have a positive sign in this column, which shows that having a washing machine increases by 21%, the probability to have incomes that are more than sufficient to cover minimum expenses.

In relation to income, the results indicate as incomes increase the probability of being in the category 1 and 2 decreases significantly and being in the 3th category has a positive sign, which reflects a permanent effect towards increasing household's income (table 10).

Table 10. Economic scale (Standard error in parentheses)

Dependent variable: economic ladder		<i>Generalized ordered Logit Model</i> (Marginal effects)		
Independent variables		1	2	3
Material assets	Clothes washing machine	-0.189*** (0.001)	-0.116*** (0.003)	0.210*** (0.006)
	Fridge or refrigerator	-0.143*** (0.003)	-0.032*** (0.000)	0.085*** (0.001)
	Gas or electric stove	-0.229*** (0.009)	-0.112*** (0.003)	0.485*** (0.009)
	Electric or gas oven	0.143 (0.119)	-0.125*** (0.002)	0.350*** (0.007)
	Microwave oven	-0.276*** (0.001)	-0.132*** (0.004)	0.227*** (0.035)
	Electric water heater gas or electric shower	-0.687*** (0.013)	-0.432*** (0.011)	0.101*** (0.002)
	Conventional color TV	-0.073*** (0.001)	-0.127*** (0.002)	-0.243 (0.097)
	TV LCD, Flat screen or LED	-0.318*** (0.008)	-0.213*** (0.003)	0.154*** (0.006)
	Video player (DVD, Blue-ray, other)	-0.094** (0.001)	-0.101*** (0.002)	0.146*** (0.000)
	Sound equipment	-0.190*** (0.002)	-0.112*** (0.001)	0.200*** (0.005)
	Digital music, video and image players (MP3, MP4, iPod)	-0.175*** (0.001)	-0.127*** (0.002)	0.409*** (0.006)
	Consoles for electronic games: Play Station, X- box, Wii, PSP, Nintendo, Gameboy, etc.	-0.412*** (0.003)	-0.345*** (0.003)	0.027*** (0.001)
	Particular vehicle-car	-0.199*** (0.002)	-0.117*** (0.006)	0.493*** (0.003)
	Motorcycle or scooter	-0.325*** (0.004)	-0.278*** (0.008)	0.214** (0.092)
	Bike	0.007 (0.084)	0.234*** (0.001)	-0.046 (0.093)
	Property on house, apartment or recreational home	-0.325*** (0.005)	-0.654*** (0.018)	0.228*** (0.003)
	Television by subscription service, cable or satellite dish	-0.078 (0.080)	-0.189*** (0.005)	0.321*** (0.002)
	Digital / video camera	-0.126*** (0.005)	-0.119*** (0.001)	0.542*** (0.102)
	Desktop computer	-0.038 (0.106)	-0.123*** (0.004)	0.009 (0.100)
	Portable computer	-0.168*** (0.006)	-0.105*** (0.004)	0.542*** (0.100)
Tablet	-0.179*** (0.001)	-0.129*** (0.005)	0.121*** (0.012)	
Income	Average income per household (Log)	-0.765*** (0.009)	-0.687*** (0.012)	0.776*** (0.101)
Homeownership	1 is own and fully paid and zero the rest	-0.248*** (0.001)	-0.235*** (0.009)	0.143*** (0.087)
Geographic area	1 is urban and zero rural	-0.189*** (0.003)	-0.346*** (0.008)	0.275*** (0.001)
Gender of the head of household	1 is male, 0 female	-0.167*** (0.004)	-0.146*** (0.007)	0.079*** (0.000)
Education level of household's head	Elementary or less	0.431*** (0.006)	0.456*** (0.004)	-0.156*** (0.005)
	Secondary	0.371*** (0.001)	0.431*** (0.002)	-0.719*** (0.012)
	High school	0.302*** (0.006)	-0.318*** (0.008)	-0.476*** (0.002)
	Technical or technological	-0.432*** (0.003)	-0.569*** (0.002)	0.339*** (0.018)
	University	-0.577*** (0.002)	-0.653*** (0.006)	0.789*** (0.108)
	Post- Graduate	-0.678*** (0.008)	-0.421*** (0.007)	0.467*** (0.088)
Years of household's head	≤25	0.193*** (0.001)	0.083*** (0.000)	0.042 (0.243)
	26-45	-0.018*** (0.000)	-0.127*** (0.003)	0.229*** (0.012)
	46-59	-0.331*** (0.002)	-0.225*** (0.009)	0.303*** (0.015)
	60 and +	0.456*** (0.004)	0.543*** (0.001)	-0.451*** (0.017)
The household's head occupational status	Employee	-0.238*** (0.004)	0.579*** (0.001)	0.623*** (0.013)
Household's head health condition	1 is very good or good, and zero is regular or bad	-0.430*** (0.007)	0.328*** (0.005)	0.429*** (0.003)

*Significant at 10%, ** significant at 5%, ***significant at 1%.

In terms of housing, marginal effects indicate as housing tenure increases the probability of being in category 1 and 2 significantly decreases, due to the fact it has a negative sign; in category 3 having the home's property title has a positive coefficient which reflects a permanent effect to stay in that category (table 10).

While studying the geographical area, especially urban and rural, marginal effects show living in urban area reduces the probability of being in category 1 and 2 with a high statistical significance. For its part, living in the urban areas has a positive effect on the category 3 (that is, where revenues reach to cover more than the minimum expenses) showing a permanence effect.

Educational level shows differences among the various categories. For categories 1 and 2 being in primary and secondary schools have positive signs reflecting permanence in those categories. For example, when the individual has primary or secondary education it is more likely household's income does not reach or just reaches to cover the minimum expenses. On the other hand, when having technical, undergraduate or post-graduate education the probability income does not reach or just reaches to cover the minimum expenses decreases. Finally, when having high levels of education it is more probable to have more than enough income to cover minimum expenses.

Moreover, international evidence suggests when individuals get older they have a tendency to decrease their income, health and consumption levels according to (Wang et al. (2011) and Ravallion y Lokshin (2000)). For the Colombian case, the results matches the international evidence, this is because for categories 1 and 2, marginal effects of elderly people surpassing 60 years of age are positive, indicating permanence in the given category, and also the effects are negative for the third category showing for this group it is less likely their income is more than enough to cover their minimum expenses.

Carletto and Zezza (2006) point out that unemployment affects well-being's perception because being unemployed may be discouraging and may affect their position towards the future. The model's marginal effects indicate for category number 1 the effect is negative, showing that being employed decreases the probability income does not reach to cover the minimum expenses. For categories 2 and 3 the effect is positive, reflecting a permanence effect.

Different authors have been given the importance to health condition regarding income generation at home (see Guillén-Royo (2008), Halleröd (2006), Piñeros and Clavijo (2013), Udaya (2006), Wang et al. (2011), among others). The model's results point toward explaining why the first category presents a negative sign, which indicates that good health generates a shift towards other categories, which shows when health is good it is less likely household's income does not reach to cover the minimum expenses; for categories 2 and 3 good health has a positive effect of permanence.

Present and previous living conditions, socio-economic status and subjective poverty

In order to analyze the household's present and previous living conditions, their socio-economic level and their subjective poverty a Probit model is used for each of the socio-economic level of the population. (In Colombia most of the utilities service use an economic differentiated level to charge their prices, therefore status varying from 1 to 6 where 1 and 2 are the most economically vulnerable, 3 and 4 are middle class income families and 5 and 6 corresponds to higher income homes).

According to Rousseau (2009), when assessing subjective poverty respondents tend to make comparisons with respect to their past living conditions (adaptations of income) and also compare their life to others (social comparisons); in this sense, to measure adaptation of income it is necessary to have panel data at microeconomic level and, to study the social comparisons, the researcher must build a reference point in order to compare individuals.

Since we do not have access to micro-level panel data for Colombia, the relationship between subjective income inequality and poverty's perception cannot be studied in a direct manner, specifically because it

needs a point of comparison to do so, such as neighbors, family members, GDP per capita or personal references.

For this research, the explanatory variable used to study the adaptation of subjective income was the question provided by the ENCV (2013), according to which is asked: In comparison to the living conditions presented 5 years ago, this home is currently better, same or worse. Additionally, to study the social comparison, regressions were made by each socioeconomic level according to the status appeared in the household's electrical power bill.

Therefore, this third measurement aims to study the perception of poverty according to the socioeconomic level of the Colombian population and explores if change in well-being with respect to 5 years ago affects poverty's perception. Thus, model's marginal effects are described in table 11.

In this sense, the average income's logarithm for all socioeconomics' levels is significant and negative. While increasing the level of income at home it is less likely the household's head consider themselves as poor; it is important to highlight that the incomes have a higher economic significance for status ranging from 1 to 3 than higher levels (table 11). These results agree with those of Rousseau (2009) who points out that welfare has a concave functional form.

The marginal effects indicate that sociodemographic characteristics do affect the subjective poverty. For instance, if household's head lives in urban areas it is less likely he/she will feel poorer compared to someone who lives in the rural area.

As with previous measurements, marginal effects show individual's poor health and unemployment affects positively their poverty's perception. For all socio-economic status levels, the results indicate if household's head is currently working and has good health it is less likely he/she will feel poor⁶.

⁶ Annex 2 presents a similar methodology to the one presented on the results of table 11, where the same econometric exercise is presented, including the income average socioeconomic level as a variable. The results show as average wage's increase the likelihood of feeling poor decreases.

Table 11. Present and previous living conditions, socio-economic status and subjective poverty
(Standard error in parentheses)

Dependent variable: subjective poverty		<i>Probit</i> model (Marginal effects)					
Independent variables		Socioeconomic level status					
		1	2	3	4	5	6
Income	Average income per household (Log)	-0.462*** (0.013)	-0.416*** (0.001)	-0.321*** (0.027)	-0.231*** (0.012)	-0.256*** (0.041)	-0.214*** (0.004)
Present and previous living conditions	Better	-0.214*** (0.012)	-0.125*** (0.001)	-0.114*** (0.021)	-0.154*** (0.008)	-0.219*** (0.013)	-0.254*** (0.017)
	The same	0.165** (0.098)	0.187*** (0.005)	0.176*** (0.013)	0.111*** (0.021)	0.125*** (0.032)	0.165*** (0.012)
	Worse	0.316*** (0.065)	0.298*** (0.012)	0.341*** (0.014)	0.411*** (0.001)	0.371*** (0.007)	0.286*** (0.001)
Geographic area	1 is urban and zero rural	-0.265*** (0.001)	-0.145*** (0.006)	-0.277*** (0.009)	-0.268*** (0.000)	-0.345*** (0.018)	-0.276*** (0.016)
Household's head gender	1 is male, 0 female	0.123*** (0.001)	0.174*** (0.004)	0.221*** (0.011)	0.287*** (0.007)	0.342*** (0.004)	0.321*** (0.003)
Household's head level of education	Elementary or less	0.114*** (0.009)	0.109*** (0.007)	0.156*** (0.002)	0.287*** (0.019)	0.376*** (0.021)	0.381*** (0.028)
	Secondary	0.119*** (0.012)	0.123*** (0.009)	0.187*** (0.015)	0.225*** (0.021)	0.265*** (0.031)	0.314*** (0.011)
	High school	0.118*** (0.011)	0.223*** (0.021)	0.175*** (0.041)	0.116*** (0.016)	0.315*** (0.009)	0.265*** (0.081)
	Technical or technological	-0.266*** (0.021)	-0.135*** (0.020)	-0.204*** (0.001)	-0.198*** (0.004)	-0.231*** (0.009)	-0.567*** (0.089)
	University	-0.211*** (0.006)	-0.226*** (0.011)	-0.295*** (0.024)	-0.219*** (0.081)	-0.177*** (0.016)	-0.354*** (0.061)
	Post-Graduate	-0.462*** (0.072)	-0.315*** (0.021)	-0.262*** (0.017)	-0.212*** (0.011)	-0.198*** (0.008)	-0.116*** (0.005)
Household's head age	≤25	0.108*** (0.012)	0.121*** (0.031)	0.157*** (0.009)	0.114*** (0.035)	0.227*** (0.042)	0.098*** (0.001)
	26-45	-0.154*** (0.021)	-0.186*** (0.018)	-0.116*** (0.015)	-0.163*** (0.013)	-0.125*** (0.027)	-0.119*** (0.006)
	46-59	-0.286*** (0.012)	-0.172*** (0.023)	-0.189*** (0.019)	-0.103*** (0.021)	-0.115*** (0.023)	-0.214*** (0.002)
	60 and +	0.176*** (0.021)	0.154*** (0.032)	0.152*** (0.012)	0.132*** (0.021)	0.118*** (0.013)	0.121*** (0.009)
Household's head occupational status	Employee	-0.345*** (0.032)	-0.281*** (0.017)	-0.121*** (0.014)	-0.367*** (0.013)	-0.371*** (0.005)	-0.289*** (0.026)
Household's head health condition	1 is very good or good, and zero is regular or bad	-0.163*** (0.012)	-0.131*** (0.003)	-0.126*** (0.011)	-0.312*** (0.021)	-0.252*** (0.017)	-0.235*** (0.014)

*Significant at 10%, ** significant at 5%, ***significant at 1%.

Analyzing household's head age ranges and their poverty's perception, the results point to a negative relationship between age and feeling poor, with the exception of households whose head is less than 25 years old or greater than 60 years old, this last case shows a direct and positive relationship between age and subjective poverty for all economic levels.

Human capital is one of the significant determinants which affect poverty's perception. In this sense, the model shows there is a positive relationship between having a level of education up to elementary, secondary or high school and feeling poor. Furthermore, by increasing the years of education the household tends to have a lower probability of being poor and the relationship becomes negative; for example, if the home has a

technical degree, University, or Post-graduate this affects in a negative way the subjective poverty, so they do not consider their household as poor (table 11).

It is important to know while studying human capital by socioeconomic status, the poverty's perception increases in significance when there is a high socioeconomic level and their education does not surpass elementary school. Moreover, something similar happens when there is postgraduate education level, because the lower the socioeconomic level status is most likely not to feel poor.

While households with female leadership have a greater incidence in objective poverty measures such as monetary poverty, descriptive statistics for Colombia show that households with female leadership feel slightly less poor than households with male headship (table 4). The model results match the previous premise since, if the head of household is male the probability of being poor increases.

All of this indicates there is a significant relationship between poverty's perception and income's adaptive theory, using the question: In comparison to the living conditions presented 5 years ago, this home is currently better, same or worse. In addition, while comparing socio-economic status results, they present similar behavior than those showed nationwide with the exception of age range and educational level.

VI. Conclusions

Economic literature usually concentrates on investigating poverty through objective indicators, it is frequent these studies may not capture the subjective dimension of poverty and welfare. For this reason, policies that counteract poverty only consider income as relevant variable, but ignore other ones which affect the welfare's level of the population under study. In response to this, this document proposes to study the subjective poverty and additionally, compares this measurement with objective indicators of material welfare and social capital; highlighting inequality's perception as a fundamental factor to explain the high proportion of household's head or spouses who feel poor.

Subjective poverty is defined by the people who respond they consider themselves as poor or also respond to the question of income on an economic scale. For this reason, any attempt to define and measure poverty implies a judgmental assessment, about what constitutes good or bad living conditions. This document examines subjective poverty since it considers studying individual's self-perception is less imperfect and helps to form a more comprehensive judgment.

Little is known in Colombia about households' perception of welfare. Usually people's actions are motivated by their perceptions, which do not necessarily correspond to the same reality for all. Thus, some households classified as not poor according to the criteria of expenditure or their income (objective measurements), may feel poor. Similarly, families who are considered poor by objective monetary indicators, they can perceive themselves as non-poor.

Now, subjective poverty's measure captures additionally to household's income, comparison families make on their living conditions and their relationship with social environment; which, as explained above is not only linked to monetary income. In fact, measurements of subjective poverty in this document have higher values than the ones thrown by objective measurements of income. This difference requires further analysis and its causes can provide new alternatives to counteract poverty focusing on the living conditions and welfare for the most vulnerable population.

In this order of ideas, this document has three goals, the first is to explain which factors help explain subjective poverty; the second seeks to study what determines the economic scale of households and the third, pursues to explain the correlation between inequality and poverty's perception, specifically, one of the reasons why subjective poverty is higher than objective measures in Colombia could be explained because people while evaluating their individual poverty's perception generally tend to make comparisons and particular judgments on their condition.

Referring to the first objective, the document concludes low levels of income, unemployment and low level of education contribute to increase household's poverty perception. Due to the high rate of inequality in Colombia absolute increases in individual's income may not be sufficient to improve subjective poverty. It is essential to study the relative position of their income.

Secondly, the factors which explain the economic scale of households have similar results when compared with the first objective just mentioned. The probability that a home does not have enough income to cover the minimum expenses or that such income is just enough to cover the cost of the home, increases significantly when the following socio-demographic conditions occur: If they have low income; If they do not have on property certain assets as: washing machine, water heating system and stove; If they do not have home ownership; If they locate in rural areas; If their education's level is elementary or secondary; If they have deficiencies in their health conditions; If they are 60 years old or older, and if the household's head is unemployed. All these variables increase the likelihood of staying in their category, which corresponds to households that have income that barely meets or fail to meet their minimum expenses.

Finally, while analyzing the relationship between poverty's perception and inequality, subjective poverty by socioeconomic level conclude two important points. First, the income has a greater weight on welfare's perception for the lower level status and lower weight for the people of greater wealth. On the other hand and in harmony with the above, there is a significant relationship between poverty's perception and the adaptative income theory, using the question: In comparison to the living conditions presented 5 years ago, this home is currently better, same or worse. To compare the living standards of households before and now, homeowners who believe they are equal to the last condition are likely to be perceive in poverty, this corresponds from 11% to 16%, and for households who feel in worse conditions now than before the probability of being perceived as poor increases and ranges from 28% to 41%.

In this sense, it is pending to conduct a research on the adaptative income over time and how increases in income and inequality may affect the measurement of subjective poverty and how the income levels exhibit social comparisons in Colombia.

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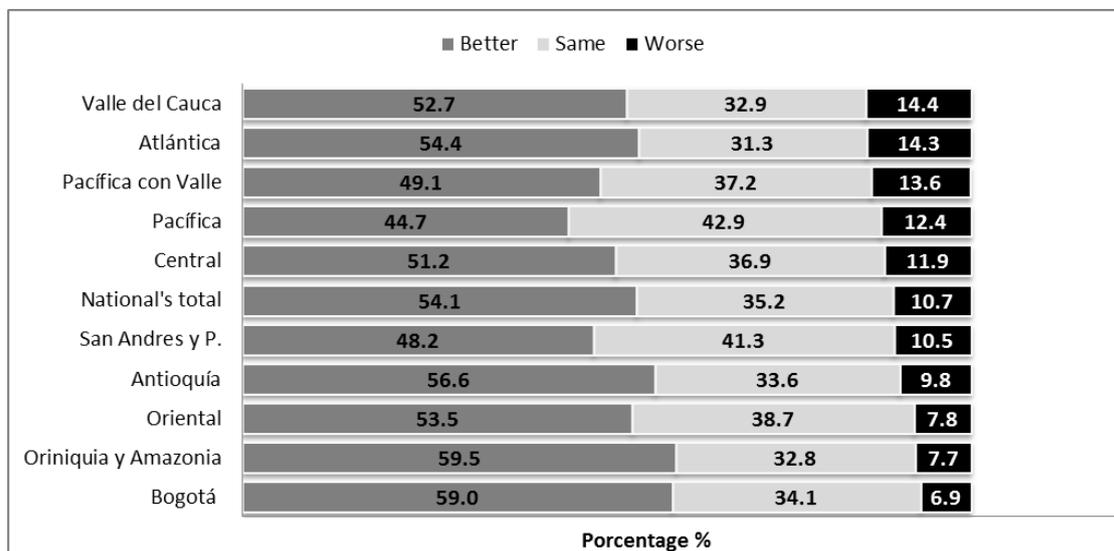
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Annexes

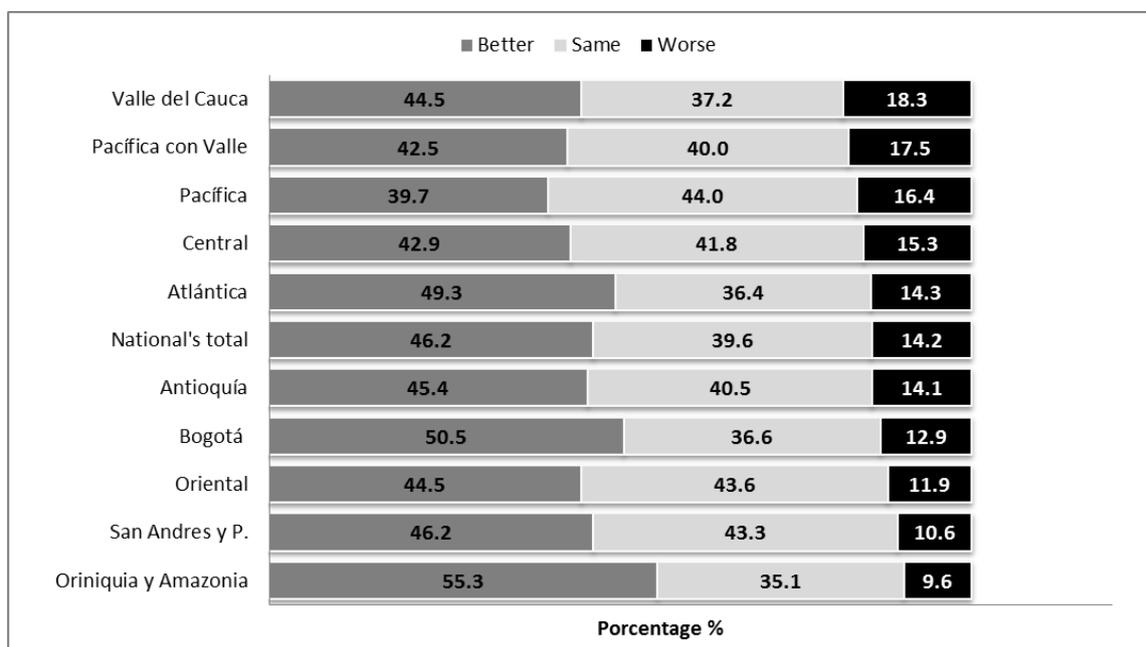
Annex 1

Figure7. Comparing to the home you grew up, this home lives



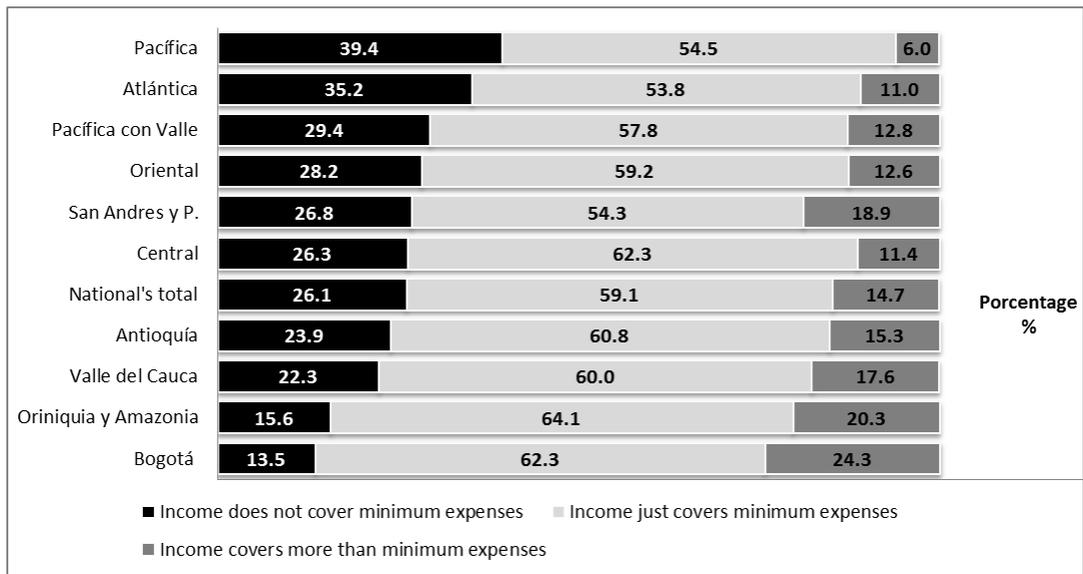
Source: National Survey of Life's Quality, 2013. The results are authors' own estimations.

Figure8. Present living conditions compared to the ones you had 5 years ago



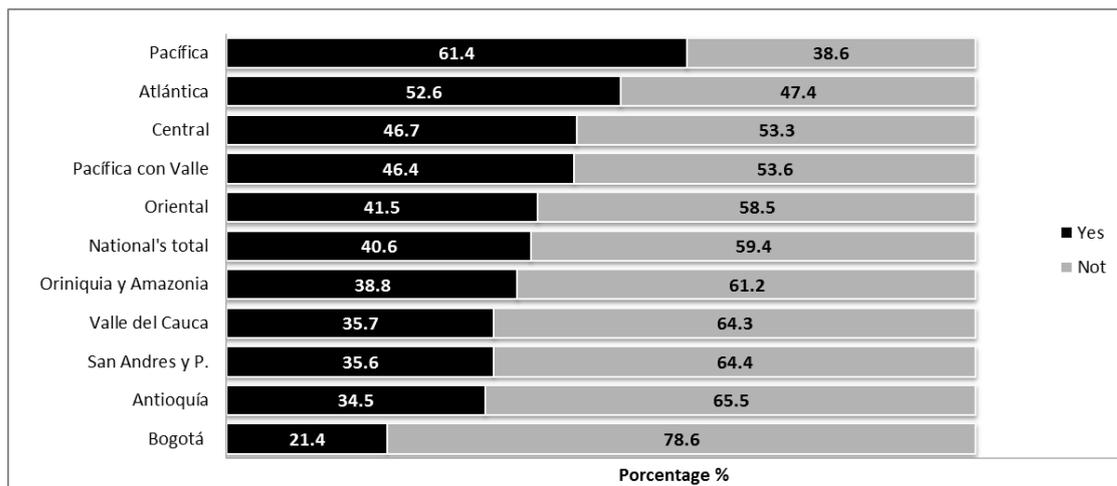
Source: National Survey of Life's Quality, 2013. The results are authors' own estimations.

Figure9. Perception of household's income



Source: National Survey of Life's Quality, 2013. The results are authors' own estimations.

Figure 10. Poverty's perception



Source: National Survey of Life's Quality, 2013. The results are authors' own estimations.

Annex 2

This annex presents a fourth measure aiming to study the poverty's perception according to the socioeconomic level of the Colombians, the main purpose is to study if changes in welfare compared to 5 years ago affects poverty's perception, also two modifications are made concerning the third measurement, the first change is taken income allocation as proposed by MESEP⁷ and the second one corresponds to the addition of a distance of income's variable regarding the status average. Consequently, for each socioeconomic level or status the following probit regression is run:

$$(1) PS_i = \alpha_0 + \beta_1 I_i + \beta_2 CA_i + \beta_3 A_i + \beta_4 S_i + \beta_5 E_i + \beta_6 ED_i + \beta_7 O_i + \beta_8 ES_i + \beta_9 IP_i + \varepsilon_i$$

Siendo i los hogares encuestados y donde:

- PS_i It is the perception of household poverty, being 1 if the household is considered poor and zero if it is not.
- I_i It is a log of household's average income.
- CA_i It is a categorical variable, which responds to the question regarding current household's living level in comparison to what they had 5 years ago and describes living level as better, same or worse.
- A_i It is the area where the house is located where 1 is urban and zero rural.
- S_i It is household's head gender, where 1 is male, 0 female.
- E_i Household head's years of education.
- ED_i It is the household's head age.
- O_i It is the household's head occupational status.
- ES_i It is the household's head health conditions, where 1 is very good or good, and zero is regular or bad.
- IP_i It is a log rate of household's average income regarding the methodology proposed by MESEP over the household's average income by socioeconomic level.

⁷ Joint data mission for employment, poverty and inequality series (MESEP) makes a methodological proposal for income allocation for households who reported zero as income. The mission seeks to detect if the income declared as zero is real through a non-parametric discriminant analysis by socioeconomic level and then an income allocation is made through the Hot-Deck methodology. You can find the methodological document in following page: www.dane.gov.co

Table 12. Present and previous living conditions, socio-economic status, income and subjective poverty
(Standard error in parentheses)

Dependent variable: subjective poverty		<i>Probit</i> model (Marginal effects)					
Independent variables		Socioeconomic level					
		1	2	3	4	5	6
Income	Average income per household (Log)	-0.361*** (0.011)	-0.316*** (0.001)	-0.111*** (0.018)	-0.111*** (0.011)	-0.156*** (0.031)	-0.113*** (0.003)
	Average household income over the average income of the socioeconomic level (Log)	-0.231*** (0.003)	-0.279*** (0.005)	-0.231*** (0.001)	-0.159*** (0.001)	-0.106 (0.093)	-0.056 (0.033)
Present and previous living conditions	Better	-0.113*** (0.011)	-0.115*** (0.001)	-0.113*** (0.011)	-0.153*** (0.008)	-0.119*** (0.011)	-0.153*** (0.018)
	The same	0.165** (0.098)	0.188*** (0.005)	0.186*** (0.011)	0.111*** (0.011)	0.115*** (0.011)	0.165*** (0.011)
	Worse	0.116*** (0.065)	0.198*** (0.011)	0.131*** (0.013)	0.311*** (0.001)	0.181*** (0.008)	0.186*** (0.001)
Geographic area	1 is urban and zero rural	-0.165*** (0.001)	-0.135*** (0.006)	-0.188*** (0.009)	-0.168*** (0.000)	-0.135*** (0.018)	-0.186*** (0.016)
Household's head gender	1 is male, 0 female	0.111*** (0.001)	0.183*** (0.003)	0.111*** (0.011)	0.188*** (0.008)	0.131*** (0.003)	0.111*** (0.001)
Household's head level of education	Elementary or less	0.113*** (0.009)	0.109*** (0.008)	0.156*** (0.001)	0.188*** (0.019)	0.186*** (0.011)	0.181*** (0.018)
	Secondary	0.119*** (0.011)	0.111*** (0.009)	0.188*** (0.015)	0.115*** (0.011)	0.165*** (0.011)	0.113*** (0.011)
	High school	0.118*** (0.011)	0.111*** (0.011)	0.185*** (0.031)	0.116*** (0.016)	0.115*** (0.009)	0.165*** (0.081)
	Technical or technological	-0.166*** (0.011)	-0.115*** (0.010)	-0.103*** (0.001)	-0.198*** (0.003)	-0.111*** (0.009)	-0.568*** (0.089)
	University	-0.111*** (0.006)	-0.116*** (0.011)	-0.195*** (0.013)	-0.119*** (0.081)	-0.188*** (0.016)	-0.153*** (0.061)
	Post-Graduate	-0.361*** (0.081)	-0.115*** (0.011)	-0.161*** (0.018)	-0.111*** (0.011)	-0.198*** (0.008)	-0.116*** (0.005)
Household's head age	≤25	0.108*** (0.011)	0.111*** (0.011)	0.158*** (0.009)	0.113*** (0.015)	0.118*** (0.031)	0.098*** (0.001)
	26-45	-0.153*** (0.011)	-0.186*** (0.018)	-0.116*** (0.015)	-0.161*** (0.011)	-0.115*** (0.018)	-0.119*** (0.006)
	46-59	-0.186*** (0.011)	-0.181*** (0.011)	-0.189*** (0.019)	-0.101*** (0.011)	-0.115*** (0.011)	-0.113*** (0.001)
	60 and +	0.186*** (0.011)	0.153*** (0.011)	0.151*** (0.011)	0.111*** (0.011)	0.118*** (0.011)	0.111*** (0.009)
Household's head occupational status	Employee	-0.135*** (0.011)	-0.181*** (0.018)	-0.111*** (0.013)	-0.168*** (0.011)	-0.181*** (0.005)	-0.189*** (0.016)
Household's head health condition	1 is very good or good, and zero is regular or bad	-0.161*** (0.011)	-0.111*** (0.001)	-0.116*** (0.011)	-0.111*** (0.011)	-0.151*** (0.018)	-0.115*** (0.013)

*Significant at 10%, ** significant at 5%, ***significant at 1%.
