

# **THE DETERMINANTS OF POVERTY IN COLOMBIA: SPECIAL EMPHASIS ON THE RURAL POPULATION**

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## **Abstract**

*Even though Colombia has, in the last few decades, seen a reduction in the total percentage of the population living below the national poverty line, the percentage of the rural population living in poverty remains high. Using the Quality of Life Survey we discuss the determinants of poverty at a household level, as well as their evolution for the ten year period between 2003 and 2013. We specifically assess the determinants of poverty for the rural population of the country given that this population has a higher incidence of poverty. A multivariate regression is conducted to establish the household and regional characteristics important in determining household income.*

*Our findings show that the determinants of poverty vary considerably between the rural and urban areas. For the rural areas, the findings show that the distribution of income and gender inequality remain important variables affecting income. In the urban areas, the number of unemployed individuals in a household is the most important variable that determine income. The dependency ratio and the presence of an individual with a disability is equally important for the urban and rural population.*

*It is important to highlight that the influence on poverty and economic growth of the armed conflict in Colombia is not analysed in this study.*

**Key words:** Determinants of poverty, gender inequality, dependency ratio, household survey, Colombia.

**JEL Classification Numbers:** I25, I32, O130, O540

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## Introduction

According to data from the Quality of life Survey, in the last 10 years the poor population of Colombia has considerably diminished. In 2003, 45.75% of the population lived below the poverty line while in 2013, the poverty rate for the country was just 35.6%<sup>1</sup>. However, the difference between the rural and urban areas remains high. In 2013, 56.5% of the rural population lived below the national poverty line while only 28.2% of the urban population did. The poverty in urban areas has decreased by 12.74 percentage points in the last decade but only by 11.2 in the rural areas<sup>1</sup>. This has led us to question whether the determinants of poverty vary between the rural and urban populations of the country, or whether the levels of these variables greatly differ between areas. Is economic growth not enough to decrease poverty in Colombia? What are the determinants of poverty in the rural and urban areas? What has been the evolution of these variables in the last ten years?

What we want to investigate in this article are the variables that determine poverty at a household level, differentiating between rural and urban areas of the country. Even though there is evidence that the poverty headcount has been reducing, and poverty alleviation remains a priority for the Colombian government, little work has been done to understand the differences between the rural and urban sectors that has led to such variations in the poverty headcount. We attempt to answer the question of how regional and household characteristics in Colombia affect the income of the households, thus their risk of being poor.

To do this, we will use the data available in the Quality of Life Survey, collected by the National Statistics Department of Colombia (DANE). This survey includes variables of the household educational level, labor participation, income, and life conditions. We will analyse the data for the years 2003 and 2013 in order to understand the evolution in this period.

In addition, we will also use information of the macroeconomic context of the country and the different regions given that poverty is a multidimensional phenomenon with several

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<sup>1</sup> Calculated by the author using the Quality of Life Survey data, 2003 and 2013.

causes, A regression model will be used in order to identify the characteristics that explain poverty incidence in the country.

Even though the armed conflict in the country has limited the economic growth and has an impact on poverty rates, this subject will not be treated in this study given its great magnitude and complexity.

The contribution of this paper is to determine the different variables that affect the risk of poverty of a household, as well as the main differences in the level of these variables between the rural and urban sectors for the case of Colombia. We will also include in our analysis the departmental differences in the country, in order to identify if the regional level variables greatly affect poverty incidence. This is important, not only because the rural poverty headcount ratio is almost twice the urban poverty headcount, but because poverty reduction is a goal guided by the government and the United Nations. One of the Millennium Development Goals is to eradicate extreme poverty and hunger in the world. This is not only a guiding principle of the UN's projects but also invites national governments to take part and "help expand hope and opportunity for people around the world"<sup>2</sup>. The results of this investigation should be of particular interest to policy makers given that it provides the main determinants of poverty, as well as a mean to assess the possible impact of a targeted intervention on the welfare of the Colombian population.

This paper is divided in five section. We will start by reviewing the literature on the determinants of poverty in the first section. The second section will explain the theoretical framework and methodology, specifically the regression model used in our investigation. This model will allow us to capture the variables that have a significant impact on the income levels of a household. Section three will describe the data. In section four we will analyse the results. We will summarize and conclude the paper in section five.

## I. Literature review

In this section, we will focus on the theoretical literature and empirical evidence of the determinants of poverty. Firstly, the literature on the development of poverty lines will

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<sup>2</sup> "The Millennium Development Goals Report 2014", United Nations Development Program. July 2014.

be reviewed. Then, we will discuss the variables perceived as being the most important determinants of poverty. Lastly, we will focus on the literature on the subject for the case of Colombia.

It is important to notice that poverty is a multidimensional phenomenon and encompasses many deprivations not captured by income measures alone. However these measures continue to be widely used and part of the literature focuses mainly on a consumption or income definition of poverty<sup>3</sup>. In order to measure the income dimension of poverty, poverty lines are used. These poverty lines can be divided in two: relative or absolute poverty lines. Relative poverty lines are defined in relation “to the overall distribution of income or consumption in a country”<sup>4</sup>. On the other hand, absolute poverty lines are anchored in some absolute standard of what an individual should be able to count in order to meet their basic needs. “For monetary measures, these absolute poverty lines are often based on estimates of the cost of basic food needs, to which a provision is added for non-food needs”<sup>5</sup>. The specific monetary value of this bundle of basic goods is defined as the dividing line between the poor and the non-poor population. The most recent international estimates define *extreme poverty* as living below \$1.25 a day, measured in terms of 2005 PPP dollars and *poverty* as living below \$2 a day. Nevertheless, it is important to understand that since dietary preferences, consumption baskets and cost of living vary across countries, this international standard may not be the most accurate. In order to count for these differences, countries define their own and unique poverty line.

However, poverty lines may not reflect other aspects of poverty such as access to basic health and education services. The availability of public services can also have an impact on poverty status as well as on poverty transmission, even though it is not measured by the poverty lines. In order to include more variables that define whether a household is poor or not, the Oxford Poverty & Human Development Initiative, from Oxford University, created the Multidimensional Poverty Index (MPI). This index identifies multiple

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<sup>3</sup> Perkins et al. “Economics of development”, Chapter 6: Inequality and poverty. Seventh edition, W. W. Norton & Company. 2013.

<sup>4</sup> “Choosing and estimating a poverty line” in Measuring Poverty. The World Bank.

deprivations at the household and individual levels in health, education and standard of living, the same three dimensions used in the Human Development Index<sup>5</sup>.

For the case of the determinants of poverty, these may be divided in four levels. The first level are the regional level characteristics. The relationship of these characteristics to poverty can be country specific, or even specific to a region within a country. “For example, many argue that economic development in Bangladesh is severely retarded due to its susceptibility to annual floods”<sup>6</sup>. Some of the regional characteristics that may impact on the poverty levels are remoteness (since it can cause high transport costs), inadequate public services, political and economic instability, and inequality, to mention a few. In recent works, gender, ethnic and racial inequality have been shown to be a dimension (and more importantly, a cause) of poverty. These social, economic and ethnic divisions are at the roots of many internal conflicts in numerous countries and need to be addressed in order to understand the variations of poverty levels within countries. At the second level, we have the community level characteristics. Within these characteristics, there is infrastructure, availability of schools and medical clinics in the area and proximity to large markets, amongst other variables. There are also the characteristics of the social capital such as the presence of social network and institutions and mutual trust in the community. According to findings from Robert Putnam (1993), in addition to removing social barriers, social capital facilitates coordination and cooperation for mutual benefit at the community level, which can help poverty alleviation. For example, an analysis of poor villages in North India shows that social groups play an important role in protecting the basic needs of poor people<sup>6</sup>. In the third level of the determinants of poverty, there are the household characteristics. According to the literature, characteristics such as the age structure of the household, the size, the gender of the household head and the dependency ratio can have major impacts on income levels as well as on the different dimensions of poverty mentioned by the Multidimensional Poverty Index. Lastly, the fourth level characteristics that are said to have an impact on poverty are the individual characteristics. Attributes such as age, educational attainment, employment status, health and ethnicity may determine poverty.

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<sup>5</sup> “What is the multidimensional poverty index?”, Human Development Reports, United Nations Development Programme.

<sup>6</sup> “Understanding the determinants of poverty”, Poverty Manual. The World Bank, 2005.

For the purpose of this study, we will focus on the regional and household level characteristics. The choice of the regional level characteristics is due to the fact that the purpose of the paper is to understand the variations across regions (specifically the differences between the rural and urban population) that determinate the poverty levels in Colombia. Three of the characteristics that the literature considers most important at a regional level are economic growth, inequality and access to public services. Economic growth is considered by many, the most powerful instrument for reducing poverty and improving the quality of life in developing countries. “Both cross-country research and country case studies provide overwhelming evidence that rapid and sustained growth is critical to making faster progress towards the Millennium Development Goals”<sup>7</sup>. In addition, growth can generate virtuous circles of prosperity and advances in human development. However, inequality in the distribution of income may limit the effects of economic growth in poverty reduction. Inequality does not only limit the participation of the poor populations in economic growth, by taking economic growth only to the richest populations, but also limits the educational and labor opportunities for the poor. Lastly, the provision of public services can have a direct impact on the health of the population, which in turn, influences the education on the young and their productive capabilities. The provision of public services can also represent whether a region is remote or not: for remote regions, a lower level of public service provision can be expected.

On the other hand, amongst the household level characteristics, according to studies made for different countries the size of a household as well as its dependency ratio have positive impacts on poverty, meaning that large households and households with high dependency ratio tend to be poorer than small households. This is due to the fact that in households with many children, larger investments are needed in order to take care, feed and educate every child. Parents may also need to work fewer hours in order to take care of the children. In addition, the gender of the household head plays a significant role due to the gender inequalities that persist today, especially in developing countries. According to the UNDP, even though girls and women have made major strides since 1990, gender inequality

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<sup>7</sup> “Building jobs and prosperity in developing countries”, Department for International Development, UK, 2008.

remains a major barrier to human development. “All too often, women and girls are discriminated against in health, education, political representation, labor market, etc. — with negative repercussions for development of their capabilities and their freedom of choice”<sup>8</sup>. This is the reason why the gender of the household head matters, and why household with women as heads of the households have more barriers to escape poverty. The literature also finds that average educational attainment of the household, health, age and gender play an important role. Like explained previously, women face more difficulties to actively participate in the labor market. Education is said to have negative impacts on poverty, meaning that in general, we can expect lower poverty levels of the highly educated population. This can be explained by the wage premium given to individuals with secondary and tertiary education, compared to those who didn’t finish high school or just completed their primary education. The wage premium leads to education being seen as an investment for the future. **Table 1** shows the level of the private rate of return in education investment. It shows that returns are highest for primary education. This is probably due to the fact that the opportunity cost of attending school in terms of forgone earnings is lowest when attending primary school and rises afterward. Also, some studies suggest that literacy and basic numeracy can have a positive impact on incomes. For governments, making investment in the literacy and numeracy core components of education cannot only be important for economic growth, but can also accelerate progress towards achieving the Millennium Development Goals<sup>9</sup>.

**Table 1:** Returns to investment in education by level, regional averages for 2003 (%)

	Private Rate of Return		
	Primary	Secondary	Tertiary
Low Income Countries	25,8	19,9	26,0
Middle Income Countries	27,4	18,0	19,3
High Income Countries	25,6	12,2	12,4

Source: G. Psacharopoulos and H. Patrinos. “Returns to investment in education: a further update. Education Economics 12, no. 2, August 2004.

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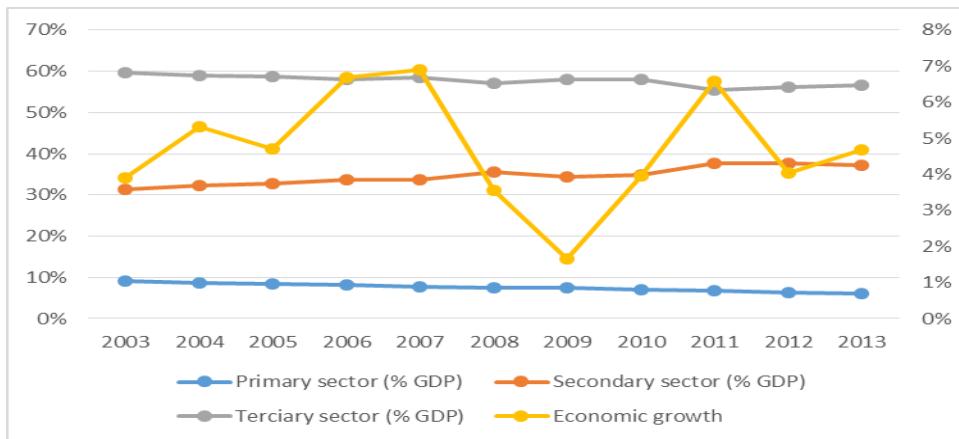
<sup>8</sup> “Gender Inequality Index”, Human Development Reports, United Nations Development Programme.

<sup>9</sup> Oxenham, J. “Returns on Investment in Literacy in Training and Education for Adults – Quantitative Findings” in “Adult Education and Development”, N. 73. 2009

The literature review made for this investigation includes some region and country specific studies on the determinants of poverty. According to the Food and Agriculture Organization of the United Nations, the determinants of poverty in Latin America are highly related to agriculture. This is due to the fact that poverty is highly rural in the region, and that the income in rural areas comes mainly from the agricultural sector. According to the study “Rural poverty in Latin America: recent trends and new challenges” (2000), the most important determinants of poverty in rural Latin America are the lack of access to productive assets, the lack of social spending and the low returns of education in farming.

It is important to keep in mind that the economic growth of the country in 2003 was of 3.92% and 4.68% in 2013. The average economic growth for the period was 4.73%. **Graph 1** shows the participation of the primary, secondary and tertiary sector in the economy as well as the economic growth of the country for the period.

**Graph 1:** Economic growth of the country and participation by sector, 2003-2013

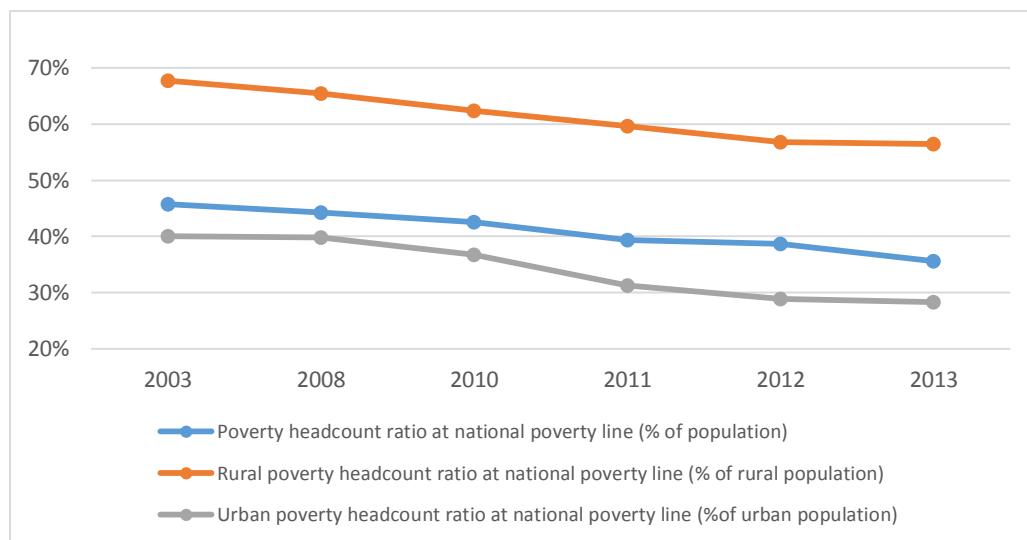


Elaborated by the author using data from DANE

This graph shows that the participation of the agricultural sector has decreased steadily. It started with a participation of 9% in 2003 and ended the period with just 6.1%. The secondary and tertiary sector started the period with a 31.4% and 59.6% participation respectively, and ended with 37.2% and 59.6%. For the case of the economic growth, we see that it has fluctuated during the period. The maximum was achieved in 2007, with a 6.9% growth rate and the minimum was 1.65% in the year 2009. For the case of poverty, it has been constantly decreasing in the last 10 years. Like shown in the **Graph 2**, all the income

poverty measures have decreased significantly during the period 2003 – 2013: the national poverty headcount ratio, rural poverty headcount ratio and the urban poverty headcount ratio (all at national poverty lines).

**Graph 2:** Evolution of income poverty measures in Colombia, for the period 2003-2013



**Source:** Elaborated by the author using the Quality of life Survey

At the beginning of the period, the national poverty headcount ratio at the national poverty line was at 45.75% and by the end of the period, it was just 35.6%. This decreasing pattern was followed by both the rural and urban poverty headcount ratio, although the last one has always been at lower levels than the rural poverty headcount. According to a study by Núñez et. al. (2005), the main explanation for the reduction of poverty rates is the decrease of unemployment rates. These authors also found that the household size has a positive impact on household poverty.

On the other hand, according to the National Planning Department (DNP), the departments with higher poverty levels are Chocó, Cauca, Cordoba and La Guajira. Between 2010 and 2012, 2.4 million of individuals were lifted out of poverty and the biggest reduction of poverty rates occurred in the rural areas<sup>10</sup>. However, greater efforts have to be made in order to achieve the governmental goal of diminishing multidimensional poverty<sup>11</sup>.

<sup>10</sup> "Informe de seguimiento de los objetivos de desarrollo del milenio", Departamento Nacional de Planeación, Colombia, 2013.

<sup>11</sup> "Reducción de la pobreza en Colombia: la base para lograr un país más justo", Departamento Nacional de Planeación, Colombia, 2014.

In addition, Rueda and Espinosa (2008) used a probabilistic model to identify the individual characteristics that explain the incidence of the poverty in Cartagena, the main Colombian tourist destination. Their findings are consistent with those given by Núñez et. al (2005) since they also found that the increase of unemployment rates was the main determinant of poverty. For the period between 2002 and 2005, the employment to unemployment ratio of the family was the main determinant of poverty, explaining up to 1.5 times the poverty incidence of the households in the city of Cartagena. This means that, for each additional person that finds a job, the probability of the household to be poor decreases by 150%. They also found that increases in informality created adverse conditions for the poor households and increased their vulnerability. The access to productive assets and the number of children in the household are also given as determinants of poverty. An additional child increases the probability of every person in the household of being poor by a 32%, while the access to productive assets reduces this probability by a 13%.

Given the literature on the determinants of poverty in Colombia, the greatest contribution of this paper is the identification of the determinants that specifically affect rural poverty rates. Using the data available from household surveys, we attempt to identify the differences between rural and urban areas. As stated previously, the literature on the subject for Colombia has been limited to a national level or to a city-level. Since the regional characteristics greatly vary across departments, taking this into account can help us understand the regional differences and create interventions that tackle the barriers for people to get out of poverty.

This study will identify the variables that affect the level of income in a household in order to facilitate the work of the policy makers who are interested in creating interventions to decrease poverty incidence across the country, especially in the rural areas.

## II. Theoretical Framework and methodology

For starters, we will describe two types of multivariate analysis that can be used to find the determinants of poverty. We will then explain thoroughly the method chosen for this investigation, as well as its characteristics. The section will finish by explaining the steps taken in order to undertake this investigation for the case of Colombia.

It is important to highlight that the correlation of two variables does not necessarily implicate that there is a causality relationship between the independent and the dependent variable. For example, the correlation between poverty measures and educational attainment does not necessarily implicate a causality. In order to identify the contributions of different variables to poverty, the most widespread technique is the multivariate analysis, since it takes into account not only one but several variables to define the poverty determinants. We identified the two most widespread multivariate analysis techniques.

The first technique is the multivariate regression. This technique allows to show the correlation of characteristics to poverty, while holding constant all other variables. Usually, scholars use the multivariate regression in an attempt to “explain the level of expenditure (or income) per capita – the dependent variable – as a function of a variety of variables (the “independent” or “explanatory” variables”<sup>12</sup>. The regressions will estimate the partial correlation coefficient between expenditure and the explanatory variable, while holding all other influences constant. It is important to remember that even if the sign and size of the coefficient seems to follow the economic intuition, it is essential to always take the statistical significance of the model and of the coefficients into account.

The second technique that can be used are the probabilistic models. These models give the probability of a household or individual of being poor, according to the level of the independent variables. Probit and Logit models use the binary poverty variable (1 for poor, 0 for non-poor) as the dependent variable, and household, individual, community or regional characteristics as the independent variables. The limitation of this technique is that the information about the depth of poverty is lost given that this model only informs whether a household is poor or not, but not how poor the household is. For this reason, the chosen technique for this investigation is the regression analysis.

The multivariate regression technique is frequently used for determining the variables that affect income at an individual or household level. Amongst the studies that use this technique to study the determinants of poverty, we find Mukherjee and Benson (2003),

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<sup>12</sup> “Understanding the determinants of poverty”, Poverty Manual. The World Bank, 2005.

Fagernäs and Wallace (2007), and Gounder (2012) for the cases of Malawi, Sierra Leone and Fiji, respectively.

This approach is based on modeling the natural logarithm of the per capita income of households, which serves as the household welfare indicator, against a set of household and regional characteristics. The natural logarithm of the per capita income is used instead of the per capita income since it allows to capture the non-linear relationship between variables and will show the approximate percentage change in income for a one unit increase in the independent variables.

The conceptual model can be written as:

$$\ln(y_i) = \beta_R R + \beta_H H + \beta_G G + \sum_{i=m}^{n-1} \beta_{Ei} E_i + \beta_A A + \varepsilon \quad (1)$$

In this model,  $y_i$  is the total per capita income of a household,  $R$  is a set of the regional variables that are going to be used in this investigation: the departmental Gini Coefficient, the departmental economic growth and the access to public services. Let  $X$  be a set of household characteristics. These are: household size, dependency ratio, number of unemployed individuals within a household, number of children, age of the household head, and number of disabled individuals.  $G$ ,  $E$ ,  $D$  and  $A$  be dummy variables. Let  $G$  be a dummy variable, taking the value of 1 if the head of the household is a female, or 0 if it is a male. The variable  $E_i$  represents the educational attainment level of the household head. Let each  $E_i$  be a dummy variable equal to 1 if the household head achieved educational level  $i$ , or 0 if it didn't. In order to avoid perfect multicollinearity, we will exclude the dummy variable that represents that the household head did not achieve any educational level.

On the other hand, let  $A$  take the value of 1 if the household lives in a rural area, and of 0 if the family lives in an urban area. The last variable is essential for us to find the differences of the poverty determinants between the rural and the urban sector. Lastly,  $\varepsilon$  is the error term.

The Ordinary Least Squares (OLS) estimate of this model will provide the value and the sign of the average systematic relationship between household income and the determinants of poverty.

In order to understand the evolution of the determinants of poverty for the period 2003 – 2013, we will run the model for the two years. This will give us a general sense of the size and sign of the evolution of the determinants for the mentioned period.

In order to undertake the investigation, we need to collect data from the household surveys given that they have information about the income levels as well as many household characteristics such as education of the members of the household, size of the household and the area where they live. We also need to collect data for the regional level characteristics that are going to be included in the regression model. We decided to use the national poverty line as the amount defining whether a household is poor or not. The choice of this indicator is due to the fact that it is the benchmark for estimating poverty indicators that is consistent with the country's specific economic and social circumstances<sup>13</sup>.

After specifically describing in the next section the data used in this investigation, we will analyse the results and conclude our work.

### III. Data description

This section will describe the data used in the investigation. We will start by establishing the regional level characteristics used in the model, as well as their basic descriptive statistics and their source. In the second part we will describe the data for the household level characteristics. For all the variables, we will also explain the economic intuition of their use in the model as well as the expected results. Given that part of the investigation consists in running the same model for two different years with the same, the data description in this section will be limited to the year 2013. The sources and variables do not change for the remaining years.

The regional level characteristics used in this model are the following variables: the Gini coefficient, economic growth and access to public services.

**Table 2** shows the data for these three variables for the different departments of the country. The economic growth for each department was taken from the yearly national accounts given by the National Statistics Department of Colombia (DANE). The Gini

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<sup>13</sup> Statistical concept and methodology: poverty headcount ratio at national poverty line (% of population). World Development Indicators, World DataBank.

Coefficient was calculated at a departmental level given the per capita income of the individuals who work and receive a salary, information available in the Quality of Life Survey. For the variable “access to public services”, we chose the access to aqueduct network mainly for two reasons. The first reason is that the provision of other public services such as electricity don’t vary much across regions, being relatively high across the country. The second reason is that lack of aqueduct infrastructure could have several negative consequences for the health of the population.

This table shows that the departmental differences in the Gini Coefficient are quite remarkable. The least unequal department within Colombia is Arauca, with a Gini Coefficient of 0.421, followed by Atlántico (0.453), Caquetá (0.467), Cundinamarca and Sucre with a Gini of 0.469. The department of Chocó is the most unequal with a Gini of 0.603. Chocó is followed by the capital city of the country, Bogotá, and the departments of Caldas and La Guajira, with Gini Coefficients of 0.594, 0.578 and 0.562, respectively. The economic intuition states that poverty incidence will be higher for higher levels of inequality because the increases in average income will be distributed in an uneven matter, and may benefit more the top earners of the country, while the poor won’t receive much of the increase. In addition of having an impact on the income levels, inequality can also make social mobility difficult since it limits the education and employment opportunities of the poor.

On the other hand, high economic growth is associated with poverty reduction. This is due to the fact that increases in GDP per capita typically benefit those below the poverty line as well as those who live above it. For the 2013, the national GDP growth rate was 4.7%. The department with the highest growth was Putumayo with an economic growth rate of 23.5%, followed by Meta (11.1%), Cauca (10%) and Risaralda (7.7%). On the other hand, we have the departments with the lowest economic growth rates: La Guajira, Cesár, Arauca and Chocó. Chocó was the department with the highest negative growth rate: -7.8%, followed by Arauca (-3.5%) and Cesár (-0.3%).

The department of La Guajira had the lowest economic growth rate with a positive sign (0.3%). Not only is Chocó the most unequal department of the country, but this department has also lived a slowdown of the economic activity during the year 2013. This

slowdown can be partly explained by two major events that occurred in the department in that year: the armed stoppage by the FARC in February and a major flooding in March that disrupted the economy. Also, the remoteness of this department, its difficult climate<sup>14</sup> as well as the lack of a proper infrastructure have created insufficient conditions for Chocó to thrive and decrease its poverty incidence. In addition, this department is said to have one of the highest corruption levels of the country, which may deepen the difficulties. According to the non-governmental organization, Transparencia por Colombia (2010), Chocó is one of the departments with the highest risk of corruption in the country. It is essential to understand that growth with high levels of inequality may not generate a high reduction of the poverty measures, since like stated previously, the increases will only benefit a few groups at the top of the income distribution.

**Table 2:** Gini Coefficients, economic growth and access to aqueduct network by region, 2003 and 2013.

	Gini Coefficient		Economic Growth		Access to aqueduct systems	
	2003	2013	2003	2013	2003	2013
Amazonas	0,58	0,501	-1,83%	2,20%	96%**	51,37%
Antioquia	0,589	0,532	3,41%	4,70%	79,50%	82,59%
Arauca	0,502	0,421	-0,65%	-3,50%	97%**	100%**
Archipiélago de San Andrés	0,602	0,547	-3,64%	5,10%	32%	33,93%
Atlántico	0,526	0,453	1,70%	4,90%	56,10%	78,60%
Bogotá	0,547	0,594	4,73%	3,80%	99,80%	98,49%
Bolívar	0,476	0,501	14,49%	5,30%	53,30%	71,89%
Boyacá	0,6	0,526	2,77%	1,40%	71,50%	78,11%
Caldas	0,522	0,578	3,90%	5,80%	76,10%	83,49%
Caquetá	0,508	0,467	8,65%	5,60%	61,89%	56,44%
Casanare	0,57	0,56	-5,17%	5,30%	100%**	100%**
Cauca	0,474	0,534	-0,81%	10,00%	68,45%	84,56%
Cesár	0,439	0,489	10,18%	-0,30%	60,60%	77,08%
Chocó	0,572	0,603	15,24%	-7,80%	47,10%	61,12%
Córdoba	0,552	0,527	7,81%	4,00%	52,50%	63,34%
Cundinamarca	0,484	0,469	3,98%	2,10%	68,50%	77,94%
Huila	0,525	0,548	-2,80%	4,90%	66,10%	70,55%
La Guajira	0,503	0,562	14,58%	0,30%	49,60%	57,38%
Magdalena	0,45	0,474	-0,37%	5,90%	54,70%	72,00%
Meta	0,497	0,473	3,03%	11,10%	57,30%	70,84%
N. de Santander	0,511	0,48	3,56%	5,30%	51,40%	67,70%
Nariño	0,531	0,547	6,93%	6,90%	55,80%	86,55%
Putumayo	0,496	0,483	-4,00%	23,50%	88,17%	96,49%
Quindío	0,504	0,533	-7,49%	1,40%	83%	95,06%
Risaralda	0,514	0,535	4,79%	7,70%	79,10%	90,46%
Santander	0,529	0,492	4,72%	6,10%	71,50%	78,83%
Sucre	0,49	0,469	0,23%	4,80%	65,70%	83,80%
Tolima	0,523	0,516	-0,79%	4,00%	71,10%	68,10%
Valle del Cauca	0,519	0,509	3,39%	4,40%	82,40%	89,17%

Elaborated by the author using data from the National Statistics Department, 2003 and 2013.

\*\*Significant for the departmental capitals

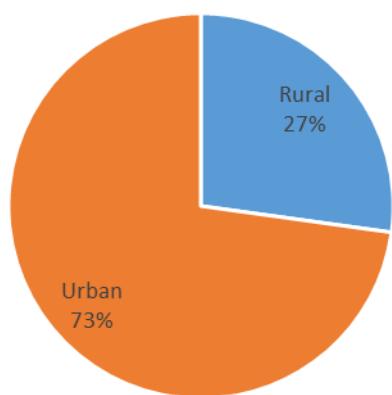
<sup>14</sup> Bonnet, J. "¿Por qué es pobre el Chocó?". Centro de Estudios Económicos Regionales (CEER), Banco de la República, 2007.

Finally, the departments with the highest provision of aqueduct services are Bogotá, Putumayo and the departmental capitals of Amazonas and Casanare. Bogotá has a 98.49% of aqueduct provision, followed by Putumayo with a provision of 96.49%. The departmental capitals of Amazonas and Casanare have a 100% aqueduct provision, according to the sample included in the Quality of Life Survey for 2013. The departments with the lowest percentage of aqueduct provision are the Archipago of San Andrés, Leticia (the capital of Amazonas), Caquetá and La Guajira with 33.93%, 51.37%, 56.44% and 57.38% of aqueduct coverage, respectively.

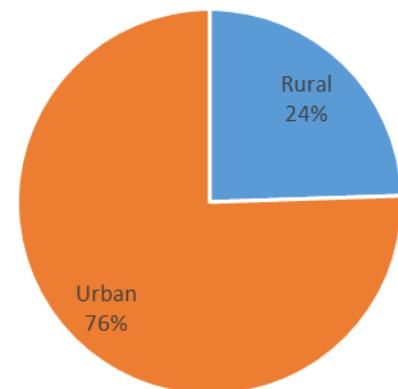
The Quality of Life Survey is representative at a national and departmental level for the years 2003 and 2013. For the case of the Orinoquía - Amazonía region, these surveys were only representative of the population at the departmental capitals. We will now describe the household characteristics used as explanatory variables in the model. The sample size for the survey for the year 2013 is of 21.565 observations at a household level. However, we will be using only 20.878 observations, since they are the only ones including the household monthly income, our dependent variable. The number of used observations for the year 2003 is 20.335 households. **Graph 3** shows that the percentage of the household population living in rural areas was close to 24.5% for the year 2013. For the year 2003, the rural population was approximately 27% of the population of Colombia.

**Graph 3:** Percentage of rural population, Colombia, 2003 and 2013.

Percentage of rural population, 2003



Percentage of rural population, 2013



Elaborated by the author using data from the Quality of life survey, 2003 and 2013.

The most important variable from the Quality of Life Survey is the income per capita variable, the dependent variable for the model. **Table 3** presents the descriptive statistics for this variable.

**Table 3:** Descriptive statistics “Per capita income”, ENCV, 2003 and 2013.

	Variable	Obs	Mean	Std. Dev.	Min	Max
2003	Per_Capita _Income for Rural population	3944	138732,5	333299.7	0	1,5E+07
	Per_Capita _Income for Urban Population	16391	336.368,6	573.782	0	2,2E+07
2013	Per_Capita _Income for Rural population	5113	312270,3	786435	0	3,1E+07
	Per_Capita _Income for Urban Population	15765	663.175,3	1.156.026	0	3,6E+07

The household per capita income level is given in pesos per month and the average income level for the rural population in the sample is 138.732 and 312.270 pesos for 2003 and 2013, respectively. For the urban population, the average income was 336.368 in 2003 and 663.175 pesos per capita in 2013, with a minimum amount of 0 and a maximum per capita income of 36.578.946 pesos (in 2013). Given that for 1.277 observations in 2003 and for 86 observations in 2013 the average household income was equal to zero, these observations will be excluded from our study. For 2013, the national poverty line was 206.091 pesos per capita (DANE) and for 2003, it was 129.576 pesos. **Table 4** summarizes the poverty incidence rates for the population of Colombia.

**Table 4:** Descriptive statistics for the rural and urban poverty rates”, ENCV, 2003 and 2013.

	Variable	Obs	Mean	Std. Dev.	Min	Max
2003	Rural_Poverty	3944	0,67762	0,463012	0	1
	Urban_Poverty	16391	0,39995	0,489910	0	1
2013	Rural_Poverty	5113	0,56562	0,495724	0	1
	Urban_Poverty	15765	0,28259	0,450272	0	1

**Table 4** shows that for 2003, 67.7% of the rural population lived in poverty while 39.9% of the urban population did. For 2013, 56.5% of the rural population in the sample lived under the poverty line while 28.25% lived in poverty in urban areas. This shows the big differences that still exist between the rural and urban areas of the country.

**Table 5** presents the basic descriptive statistics for the household variables used in the model for 2003 and **Table 6** for 2013. **Graph 4** shows the distribution of the households by size in the sample for the year 2013.

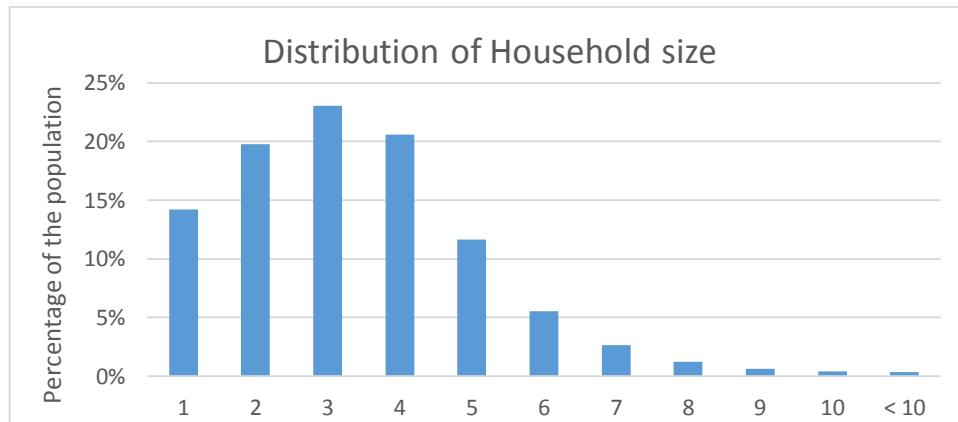
**Table 5:** Descriptive statistics, ENCV, 200

Variable	Obs	Mean	Std. Dev.	Min	Max
Household size	20335	3,786451	1,910533	1	18
Age_Household_Head	20335	47,57424	15,2913	15	99
Female_Household_Head	20335	0,117291	0,465433	0	1
Number_of_Children	20335	2,388506	1,475672	0	15
Individuals with disabilities	20335	0,031049	1734542	0	1
Dependency ratio	20335	0,6848231	0,7201503	0	7
Number of unemployed individuals	20335	0,1270649	0,3985791	0	6

**Table 6:** Descriptive statistics, ENCV, 2013.

Variable	Obs	Mean	Std. Dev.	Min	Max
Household size	20878	3,392302	1,797599	1	19
Age_Household_Head	20878	48,86158	1.594.337	17	102
Female_Household_Head	20878	0,1456078	0.352711	0	1
Number_of_Children	20878	2,135693	1,268794	0	12
Individuals with disabilities	20878	0,0273015	0,1629643	0	3
Dependency ratio	20878	0,6016392	0,6924293	0	8
Number of unemployed individuals	20878	0,0846088	0,2172673	0	7

**Graph 4:** Distribution of household size in the sample for the ENCV, 2013



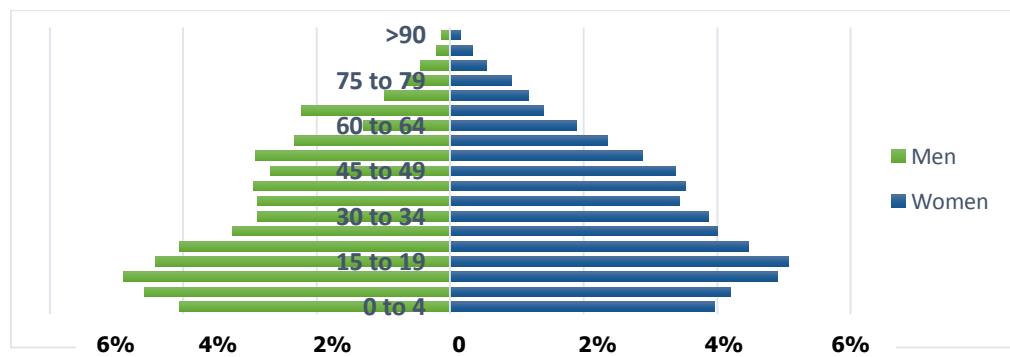
Elaborated by the author using data from the Quality of life survey, 2013.

For 2013, the average household size is of 3.4 individuals per household for the sample. This graph shows that 57% of the households in the sample have 1, 2 or 3 members,

with 3 members having the highest percentage (23.03%). The percentage of household with 8 or more members is almost negligible (with only 2.58% of the sample). According to the literature, household size has a negative impact on the average income of a household.

The average age of the household head is 48 years old, while the minimum is 17 years old. The economic intuition states that this variable will be positively correlated with the income per capita since younger individuals tend to have lower educational levels and experience, comparing to older individuals. However, a threshold should exist where the age of the household head becomes negative for the household income. The maximum for the sample is 102. At 102 years of age, individuals don't participate in the labor market and usually are need to be taken care of. According to the data, approximately for 14.5% of the cases, the household head is a woman. According to the World Economic Forum, gender inequality has been steadily decreasing in the country. However, gender inequality remains an important issue given the fact that the female unemployment rate is still higher than the male unemployment rate (15% vs 9% in 2013)<sup>15</sup>. In addition, women in Colombia continue to earn less money than men for similar jobs. Given this, we expect that the fact that the head of a household is a female will have negative repercussions in household income. **Graph 5** presents the age and gender structure of the population, with the population pyramid for the year 2013. The left side of the pyramid shows the percentage of men in each age group (as a percentage of the total population) and the right side shows the percentage of women in each age group.

**Graph 5:** Population Pyramid for Colombia, 2013



Elaborated by the author using data from the Quality of life survey, 2013.

<sup>15</sup> "The Global Gender Gap Report: 2013", World Economic Forum, 2014.

Notice the bulge in the area of the 10 – 14 and 15 – 19 age groups, with the percentages reducing steadily as the age increases. This matches an early stage 4 of the demographic transition, when fertility rate have started to decrease. For the case of the number of children, the average household has 2 children, with a few households from the sample having up to 12 children. According to the literature, higher number of children will have a negative impact on per capita income since higher amounts of money will be needed to educate and nourish these children. Lastly, 2.73% of the households in the sample have a member with a permanent disability. According to the World Health Organization, people with disabilities suffer from poorer overall health, lower educational achievements and fewer employment opportunities than individuals without a disability. Those are the reasons why we believe that the number of disabled individuals in a household may have a negative impact on household income.

Furthermore, we have the dependency ratio and the unemployment rate of a household. The dependency ratio is the ratio of individuals who do not participate in the labor market (individuals younger than 15 and individuals older than 64) to those individuals aged between 15 and 64 years, the working age population. As this ratio increases, the pressure for the productive population of the household increases. The economic intuition states that this would lead to lower income levels, thus to an increase in poverty. The unemployment rate has a similar effect since it increases the pressure on the employed members of the household. **Table 6** shows that the dependency ratio averages 60% of dependency, with a really high maximum of 800%. The average unemployment rate for this sample is 8.46%, with a maximum of 100%, meaning that no one in the household has an employment. Comparing these variables to the level for 2003, there is a significant decrease of the household size, the number of children in a household (thus the dependency ratio), and the number of unemployed individuals in a household.

**Tables 7 and 8** shows the distribution of the sample by educational attainment of the household head. In 2013, 62% of the household heads have a primary level education or none education. Only 12.7% successfully finished their tertiary education and just 2.2% their

postgraduate studies. In comparison to 2003, this shows an increase of the percentage of the population that achieved secondary, tertiary and postgraduate education.

**Table 7:** Distribution of achieved school level of the household head, 2003

Educational Attainment	Freq.	Percent.	Cum.
No educational level achieved	1.966	9,7%	9,7%
Primary Education	13.848	68,1%	77,8%
Secondary Education	1.771	8,7%	86,5%
Tertiary Education	2.318	11,4%	97,9%
Postgraduate Education	413	2,0%	100,0%
<b>Total</b>	<b>20.335</b>	<b>100,0%</b>	

**Table 8:** Distribution of achieved school level of the household head, 2013

Educational Attainment	Freq.	Percent.	Cum.
No educational level achieved	2.092	10,0%	10,0%
Primary Education	10.850	52,0%	62,0%
Secondary Education	4.822	23,1%	85,1%
Tertiary Education	2.655	12,7%	97,8%
Postgraduate Education	459	2,2%	100,0%
<b>Total</b>	<b>20.878</b>	<b>100,0%</b>	

#### IV. Results and analysis

In order to establish the regional and household level variables that affect the income level of a household, we ran the following regression for the household surveys:

$$\ln(y_i) = \beta_R R + \beta_H H + \beta_G G + \sum_{i=m}^{n-1} \beta_{Ei} E_i + \varepsilon \quad (1)$$

In this equation, the dependent variable  $y_i$  corresponds to the household per capita income, while R are the regional level variables. H represents the set of household level independent variables, G takes the value of 1 if the head of the household is a female, or 0 if it is a male, and E is the educational attainment of the household head. The first step to identify the determinants of poverty was running the regression for the total sample. We then ran a separate regression for the rural population and a separate regression for the urban population; this in order to test for structural changes between areas. To determine whether the value of the coefficients is significantly different, we use the Chow-Test. The null

hypothesis of this test is that the model presents structural stability for the two subgroups of the population. **Table 9** exhibits the results of this test for the years 2003 and 2013.

**Table 9:** Results of the Chow Test for the years 2003 and 2013.

	RSS_total_sample	RSS_rural	RSS_urban	F*	P(F*>F(15,N1+N2-k))	Decision
<b>2003</b>	20.519	16.944	17.328	-	543	0,000
<b>2013</b>	50.749	7.642	42.239	24		0,000

The results of the Chow Test reject the null hypothesis at a 1% significance level. This validates our hypothesis that the determinants of poverty are different for the urban and rural populations. The results of the regressions are shown in **Table 10**.

**Table 10:** Determinants of poverty for the rural and urban population in Colombia, 2003 and 2013.

Dependent Variable: In_Household_Per_Capita_Income	2003			2013		
	Total	Rural	Urban	Total	Rural	Urban
<b>Regional Variables</b>						
Gini Coefficient	-3.082 (-4,79)***	-9,208 (-5,05)***	-2,439 (-2,83)**	-1,295 (2,66)**	-1,822 (-2,75)**	-1,103 (3,28)**
Economic growth rate	2,291 (5,32)***	1,599 (2,24)**	1,36 (2,29)**	-1,012 (-3,09)**	-3,406 (-5,44)***	-0,257 (-0,34)
Public Services	3,673 (27,81)***	2,298 (3,04)**	2,576 (14,76)***	0,005 (-0,07)	0,261 (-1,24)	0,035 (-0,33)
<b>Household variables</b>						
Household Size	0,101 (26,03)***	0,087 (12,05)***	0,106 (23,69)***	0,0604 (4,93)***	0,0027 (-0,15)	0,078 (5,28)***
Number of Children	-0,117 (-10,88)***	-0,078 (-4,06)***	-0,107 (-9,41)***	-0,241 (-14,25)***	-0,076 (-2,95)**	-0,279 (-13,39)***
Dependency Ratio	-0,142 (-13,65)***	-0,13 (-6,51)**	-0,128 (-10,72)***	-0,115 (-5,93)***	-0,119 (-3,95)***	-0,103 (-4,36)***
Number of individuals with disabilities	-0,026 (-0,70)	0,106 (-1,19)	-0,051 (-1,26)	-0,681 (-9,02)***	-0,869 (-7,79)***	-0,596 (-7,31)***
Number of Unemployed Individuals	-0,121 (-1,25)	-0,81 (-0,16)	-1,55 (-3,26)***	-2,775 (-29,34)***	-0,544 (5,10)***	-1,543 (-29,07)***
<b>Head of the Household Variables</b>						
Age of the Household Head	0,004 9,29)***	-0,0003 (-3,80)***	0,006 (11,76)***	0,0012 (2,2)**	-0,001 (-0,23)	0,0026 (3,7)***
Female Household Head	-0,057 (-3,97)***	-0,21 (-5,68)***	-0,064 (-4,13)***	-0,271 (-8,11)***	-0,508 (-8,74)***	-0,289 (-7,46)***
Primary Education	0,514 (19,53)***	0,174 (4,07)***	0,567 (15,12)***	0,144 (4,11)***	0,179 (3,69)***	0,098 (2,20)**
Secondary Education	1,117 (31,21)***	0,823 (5,82)***	1,144 (26,39)***	0,59 (14,57)***	0,438 (5,44)***	0,466 (9,49)***
Tertiary Education	1,426 (42,96)***	0,703 (7,28)***	1,477 (34,79)***	1,296 (27,55)***	0,917 (8,70)***	1,144 (20,76)***
Postgraduate Education	1,873 (44,83)***	1,767 (6,69)***	1,89 (38,65)***	1,982 (72,83)***	1,779 (9,20)***	2,9493 (20,13)***
Number of observations	<b>20.335</b>	<b>3.944</b>	<b>16.391</b>	<b>20.878</b>	<b>5.113</b>	<b>15.765</b>
Adjusted R-Squared	<b>0,3462</b>	<b>0,1879</b>	<b>0,2753</b>	<b>0,2531</b>	<b>0,1236</b>	<b>0,1562</b>

Elaborated by the author using data from the Quality of life survey, 2013.

\*\*\*Significance at the 1%; \*\* Significance at the 5%; \*Significance at the 10%.

According to the results for the year 2013, the following variables are considered to be determinants of the household income level: the Gini Coefficient of the department where the household lives, the number of children, the presence of unemployed and disabled individuals within the household, the dependency ratio, and the gender and educational attainment of the household head. In addition, for the rural area the coefficient of the economic growth rate is negative and significant at the 1% level.

As expected, the Gini Coefficient has a negative impact on household income, especially in the rural areas. This is due to the fact that inequality limits the role that economic growth plays in poverty alleviation in two ways. For starters, the initial level of inequality may limit or drive the opportunities of the poor population in terms of access to good education, healthcare and nutrition, not only in terms of income distribution. This will lead to higher inequalities of income distribution. Secondly, “the income poverty elasticity varies systematically with the level of inequality”<sup>16</sup>, meaning that the worse the distribution of income is, the lower will the share of additional income that goes to the poor.

The coefficient for the Gini is -1,822 and -1,103 for the rural and urban areas, respectively, significant at the 5% level. This means that an increase of 0.01 in the Gini Coefficient will decrease household per capita income by 1.82% in the rural areas and by 1.1% in urban areas. We believe that the effect is higher for the rural population given that job opportunities are limited, and since agriculture is the main source of income, changes in the distribution of the agricultural income will affect a high percentage of the population. Economic growth had also a negative impact on household income in the rural areas in the year 2013, with a coefficient of -3.4, meaning that a 1% increase in the GDP, will decrease household income by 3.4%. The sign of this coefficient can be explained by the fact that the participation of the agricultural sector has been decreasing in recent decades, passing from 15% of the total GDP in 1992, to just 6% in 2013 (see **Graph 1**). This explains why the rural population does not participate in economic growth as much as the urban population and how economic growth has benefited the urban sector more than the rural.

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<sup>16</sup> Naschold, F. “Why inequality matter for poverty”, Overseas Development Institute, 2002.

Other important determinants of poverty are the gender of the household head and presence of a member with a disability in a household. According to the results, a household with a female head is expected to have a 50.8% less per capita income than a household with a male head, in a rural area. For the urban area, the difference between incomes according to the gender of household head is 28.9% less for females. In Colombia, women earn 0.57% of the amount the male counterpart earns for a similar work (World Economic Forum, 2014) and their participation in the labor market is still limited. In addition, violence and the rise of the internally displaced persons has intensified these discriminations and gender inequalities, which increases the vulnerability of women and young girls. An example of this is that internally displaced girls are more likely to drop out of school to help their mothers take care of the household and are more vulnerable to adolescent pregnancies (CODHES, 2012). The difference of the coefficient between areas can be explained by the fact that in rural areas women have less access than men to productive resources such as land and financial services<sup>17</sup>. Political factors and traditions have also influenced the persistence of gender inequalities in the rural areas. The lack of education plays an important role, since in 2007 only 39.3% of the rural area in Colombia had a tertiary education institution (Ministry of Education, 2008). Given that education not only empowers women but limits the discrimination from men, it is an essential tool to decrease gender inequalities. To finish, “there is evidence that, globally, women benefit less from rural employment, whether in self- or wage-employment, than men do”<sup>18</sup>.

For the case of a member of the household with a disability, the model estimates that this will decrease average household income by 86.9% and by 59.6% in rural and urban areas, respectively. An individual with a disability often faces social marginalization and has limited education and employment opportunities. In spite of the existence of laws that protect individuals with disabilities, this population still faces great barriers that limit their participation in the community life and in the economy of the country<sup>19</sup>. Disabilities are thus often associated with a poverty trap; individuals with disabilities have barriers to access healthcare, education, and employment, which in turn leads to limited income and healthcare.

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<sup>17</sup> “Gender and rural development”, Federal Ministry for Economic Cooperation and Development, Germany, 2012.

<sup>18</sup> “Gender equality in the rural sector: The ever present challenge”, International Labor Organization.

<sup>19</sup> Gómez, J. “Discapacidad en Colombia: Reto para la inclusión en Capital humano”, Colombia líder, 2010.

The difference of the coefficient for rural and urban areas can be explained by the presence of NGOs that focus on educating and empowering people with disabilities in the urban areas. Also, given that agricultural work is highly physical, individuals with physical limitations may have difficulties to find jobs in this sector, and their productivity may be considerably lower than productivity of individuals without disabilities.

There is also the dependency ratio; we have that an increase of 100% of the dependency ratio will decrease the household per capita income by 11.9% for the rural areas and by 10.3% in the urban areas. The definition of the dependency ratio being the percentage of people under 15 and people over 64 years in relation to the percentage of working age individuals in a household, we have that the number of children and elderly in a household may increase the risk of poverty. Since people under 15 and over 64 are economically dependent of the working age population (individuals between 15 and 64 years), the pressure of higher expenses will go only to a portion of the household. A 100% increase of the dependency ratio is equal to an additional dependent individual for every working age person in a household.

A high dependency ratio can also lead to a poverty trap. With a high number of children in a household, the amount of investment needed in order to educate and give an adequate healthcare to every child, rises considerably. A poor household may not be able to invest the minimum amount needed to break the poverty trap. This will lead to children having low levels of education, low human capital and lower opportunities to participate successfully in the labor market. In order to break this particular poverty gap, it is essential to decrease the fertility rates of the overall population. With fewer children per family, the investments in each one of them can be higher and, this way, children will be able to achieve higher levels of education.

On the other hand, a high number of unemployed individuals also increases the risk of poverty in a household. It is interesting to notice that the coefficient of the number of unemployed individuals is higher for the urban than for the rural areas. An additional unemployed will decrease the per capita household income by 54% in the urban areas and by 150% in the rural areas. Given that agriculture is the main source of income in the rural

sectors and that, in many cases, these activities are carried out by family members or members of the community, unemployment rates may have a limited impact on income in those areas. On the other hand, in the cities, formal employment is one of the few ways to earn a living, thus unemployment debilitates an individual as well as a household.

Finally, we have the educational attainment level of the head of the household. By leaving out the dummy variable “No educational level achieved”, the coefficients of the education levels “Primary”, “Secondary”, “Tertiary” and “Postgraduate” can be read in comparison to the households where the household heads have no achieved level of education. The coefficients for the four educational levels are significant at the 5% level for both rural and urban areas for the year 2013. As expected, each educational level gradually increases the per capita income in a household. In the rural areas, for a household with its head having achieved primary education, a rise of 17.9% in the per capita income is expected. If the household head has achieved secondary education, the per capita income of the household will be 43.8% higher compared to the one from households with its head having no education. For the head of the household with tertiary and postgraduate education, the expected difference is 91.7% and 178%, respectively. The same pattern follows for the urban population, although the differences tend to be higher, except for the primary education, for which the coefficient is 0.098. This states that the returns on higher education in the rural areas are lower than for the urban areas. Secondary and higher education is not specialized in agriculture, so people dedicated to agriculture don't gain much by having the knowledge given by this educational levels. Their productivity does not change at a high level, especially since agriculture in Colombia remains technologically behind compared to developed countries. This is the main reason why the returns on education are not as high in the rural areas.

After having examined the determinants of rural and urban poverty in Colombia for 2013, we will now analyse the changes of these determinants for the period between 2003 and 2013.

The first difference in the poverty determinants for the years 2003 and 2013 is that the model used for the year 2003 suggests that economic growth had a positive effect on both

rural and urban household incomes. The coefficient for economic growth being 1.59 and 1.36 for rural and urban areas, respectively. This means that an increase of 1% in the growth rate of the department will increase the household income by 1.59% and by 1.36% in rural and urban areas, respectively. The coefficient for the Gini also varies greatly between years, especially for the rural areas. For the year 2003, a decrease in 0.01 of the Gini Coefficient was expected to increase 9.2% the household income in the rural areas. The third big difference that we found for these years is that the variable “Public services” is significant at the 5% lever for both areas in 2003, while it was not significant for the year 2013. A one percent increase in the provision of public services increases per capita income by 2.29% and by 2.57% in rural areas and urban areas, respectively. Given that the provision of public services such as sewage systems has increased significantly in the last 10 years, this is partly explained. For the year 2003, approximately 56% of the households had a proper sewage system while in 2013, 75.9% of the population had access to this service. It is also important to notice that an inadequate sewage system is correlated to the provision of other services such as a proper transport infrastructure and healthcare institutions, and a lack of this service could jeopardize the health of the population and decrease their productivity.

The other main differences that we can see between the models for the year 2003 and 2013 are the coefficients of the educational attainment level and the dependency ratio.

For the case of education, even though each level continues to rise the per capita income of the household at a higher rate than the previous level, the percentage in which they do so is higher at the beginning of the period (2003). This is especially truthful for the urban areas. As seen on **Table 10**, a household with its head having achieved primary education in 2003, can expect a rise of 56.7% in the per capita income, compared to the 9.8% expected for the year 2013. This difference persists throughout all the educational levels, except for postgraduate education. This can be explained by the fact that in 2003, a lower percentage of the population had achieved primary and secondary education so, by achieving this educational levels, individuals could gain a competitive advantage and be more successful in the labor market. Their productivity will considerably rise compared to those individuals without any education, which would in turn, increase their salaries. As explained by Ramírez

and Téllez (2006), the number of students enrolled in primary education for 1958 was about 1.2 million students. For the year 1968, about 4 million children were enrolled in primary school. Given the fact the average household head is about 45 years old in the two samples, this difference in the enrollment numbers of primary students can explain the difference of the coefficients.

Lastly, the dependency ratio coefficient for the year 2003 is higher for all the areas than the one for the year 2013. For example, a 100% increase of the dependency ratio will decrease per capita income by 128% in 2003 for the urban areas, while the same increase will diminish the per capita household income by 103% in 2013. This can be explained by the changes in the average household size. For the year 2003, the average household was composed by 3.39 individuals while for 2013, the average household size was 3.79 individuals.

## V. Conclusions

The motivation for this paper started by the realization that even though the poverty rates in Colombia have considerable decreased in the past decades, the inequalities between the rural and urban areas remains high. In 2013, 46.8% of the rural population was considered to be poor while only 28.4% of the urban population lived below the urban poverty line. Therefore, we wanted to analyse the dynamics that have made it difficult for the poor living in rural areas to be integrated in the economic growth of the country. Using the data available for the Quality of life Survey for the years 2003 and 2013, we used a multivariate regression to identify the determinants of poverty for the rural and the urban population at a household level.

For the rural areas, the income distribution and the dependency rate are found to be the most important variables that affect income. A high level of inequality and a high dependency rate lead to lower levels of income, thus to a higher risk of being poor. Like stated in the literature review, economic growth will be a limited tool in reducing poverty if it is accompanied by an increasing inequality. Income inequality does not only limit the participation of the poor population in the economy of a country, but also reduces education and employment opportunities, creating a poverty trap. In addition we found that gender

inequality is another highly important poverty determinant for the rural areas. This can be explained due to the fact that women continue to earn less than men and have lower access to productive resources such as land and credits.

Even though the gender of the household head and the income distribution can have a negative impact on urban income, their importance is not as big as for rural areas. The most important determinant for the urban areas is the number of unemployed individuals. Also, the dependency ratio was shown to negatively impact household income. A high dependency ratio limits the investments that a household is able to make in the education and health of children, thus limiting their opportunities for the future.

The presence of an individual with a disability in a household decreases income in both urban and rural areas, and is likely to create poverty traps. This is due to the fact that individuals with disabilities tend to achieve lower levels of education. This limits their participation in the labor market and their capability to obtain high salaries.

The findings of this investigation state that public policies need to focus especially on reducing gender inequality, the fertility rates of the country and the barriers that individuals with disabilities face in order to successfully reduce poverty rates.

We consider that the population with disabilities has been largely overlooked in the development agenda of governments throughout the world, especially in developing countries. In order to reduce poverty rates, it is mandatory that this population is included in the economic growth and social dynamics of every country. The government of Colombia needs to create educational programs that give this population the opportunity to be included in the labor market, in order to finish the vicious circle created by poverty. It is also important to invest in the social capital of these individuals; they need to be included in the decision making processes of the country.

On the other hand, we recommend that governmental policies focus on family planning programs in order to diminish the dependency ratio of the families, especially in the rural areas. As fertility rates fall, the number of working age individuals increases relative to the rest of the population, laying the foundations for the “demographic dividend”. As the

dependency ratio falls, more investments can be done in the education of every child, thus increasing the skills and human capital of children. In addition, increasing education also has shown to diminish fertility rates, especially female education. “Providing girls with an education helps break the cycle of poverty: educated women are less likely to marry early and against their will; less likely to die in childbirth; more likely to have healthy babies; and are more likely to send their children to school”<sup>20</sup>.

This is one of the many reasons why the Colombian government should focus on improving education in the country. In addition to expanding the coverage of education so it reaches the rural areas, the quality in the country needs to improve substantially. As evidenced by the results for the Programme for International Student Assessment (PISA) for 2012, the quality of secondary education in Colombia falls far behind from the one given in OECD countries. Thus improving coverage is not enough; policies need to focus on improving the quality of education given by public institutions.

Finally, the conflict that the country lives limits the participation of the rural populations in the economy as well as in the decision making process. According to a study by Ibàñez and Moya (2009), the armed conflict in the country has led to the abandonment of approximately 6.3 million hectares due to the displacement of people, as well as the decrease of productive investments in the land. This has decreased the growth of the agricultural sector as well as the income of the population living in rural areas. In addition, the fight against the guerrillas has decreased the investments in education and health and of the government, which multiplies the negative effects of violence<sup>21</sup>. The consequences of the armed conflict on poverty rates were not accounted for in this study due to its complexity.

A possible extension of this study is to introduce the effects of the armed conflict in the poverty rates of the rural areas. These effects are not limited to the economic losses of the agricultural sector but must include the losses in the overall economic growth of the country as well as the amount of lost Foreign Direct Investment. In doing so, the effects of an eventual ending to the armed conflict in the country may be calculated as well as their impact on poverty rates.

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<sup>20</sup> “Girl’s education and gender inequality”, UNICEF, 2014.

<sup>21</sup> “Cifras de la guerra en Colombia, 2011”, en Revista Supuestos. Facultad de Economía, Universidad de los Andes. Edición N. 8, Abril 2013.

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