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Afro-Colombian welfare: An application of Amarty Sen's Capability Approach using multiple indicators multiple causes modeling - MIMIC

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Afro-Colombian Welfare: An Application of Amartya Sen's Capability Approach Using
Multiple Indicators Multiple Causes Modeling – MIMIC

by

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A thesis submitted in partial fulfillment of the requirements for the degree of
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Modeling

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Dedication

This thesis is dedicated to my husband and daughter, and to my family in Colombia. To them I am in eternal debt for their love and unconditional support. They have been by my side during the good and not so good times, and I am very grateful for being part of their lives as they are part of mine.

It is also dedicated to all my friends because they have been a permanent source of joy, friendship and learning. Finally, it is dedicated to my professors at the Universidad del Valle, Cali-Colombia and at the University of South Florida for sharing their knowledge and passion with me.

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Table of Contents

List of Tables	i
List of Figures	ii
Abstract	iv
Chapter 1. Introduction	1
Chapter 2. Background: Afro-Colombian Living Conditions	6
Chapter 3. Theory And Model Building	18
Race, Racial Discrimination And Poverty	18
Amartya Sen’s Capability Approach	22
Chapter 4. Operationalizing Amartya Sen’s Capability Approach: A Mimic Model Applied To Colombia	31
Data And Conceptual Clarifications	31
Mimic Modeling	34
Path Diagram For Mimic Model Of Latent Capabilities	48
Chapter 5. Results	50
Chapter 6. Conclusions	62
References	65
Appendix A	72

List of Tables

Table 1	Distribution of the Colombian Population by Area and Ethno-Racial Characterization	10
Table 2	Percentages of Poor and Indigent Populations for 2003, by Urban-Rural Areas*	12
Table 3	Percentages of Poor Populations by Urban/Rural and Ethnic Membership base on the QLS 2003	12
Table 4	Educational Level by Ethnic Characterization based on the 2003 Quality of Life Survey	14
Table 5	Variable Description and Measurement	41
Table 6	MIMIC model of Knowledge Capability Achievement: Factor Loadings of the Structural Model	50
Table 7	MIMIC Model of Knowledge Capability Achievement. Factor Loadings for the Measurement Model.....	52
Table 8	MIMIC model of Housing Capability Achievement Factor Loadings of the Structural Model	56
Table 9	MIMIC Model for Shelter Capability Achievement. Factor Loadings for the Measurement Model.....	58

List of Figures

Figure 1	Path Diagram for a general MIMIC model	49
Figure 2	Path Diagram for the Knowledge Capability	55
Figure 3	Path Diagram for the Shelter Capability	59
Figure 4	Distribution of Afro-Colombian Population by their Location on the National Territory.....	72

Afro-Colombian Welfare: An Application of Amartya Sen's Capability Approach Using
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ABSTRACT

This research analyzes welfare conditions of Afro-Colombians vis-à-vis non Afro-Colombians using Amartya Sen's Capability Approach as the theoretical framework, and the latent variable modeling as the empirical method. Multiple Indicators Multiple Causes (MIMIC) models are estimated using data from the Colombian Quality of Life Survey, 2003. Two latent constructs, namely, 'knowledge' and 'being adequately sheltered', represent the two 'Capability' dimensions to be analyzed. Ethnic background appears to have a consistently negative influence after controlling statistically by a set of relevant variables (e.g. being poor, area, marital status, age and gender, among others) included in the models as exogenous "causes" or "determinants" of each capability dimension. This implies that the capability set or the freedom an Afro-descendant enjoys in achieving the life he or she wants in terms of 'knowledge' and 'shelter' is consistently lower than that of a non Afro-descendant (whites and mestizos). As a consequence, achieved welfare or functioning achievement as expressed in terms of aspects such as years of education or

dwelling conditions in the household is and would be consistently lower for individual members of this ethnic group. This evidence points toward the proposition that embedded patterns of racial discrimination are limiting Afro-Colombian capabilities and individual agency, beyond income levels or even access to educational resources. Hence, from a capability perspective removing racial discrimination must be an explicit objective of developmental policy.

Accordingly, national policy must be directed not only to improving access for Afro-Colombians to resources and economic wellbeing, as traditional analysis of class disparity argues, but also toward the nurturing and expansion of the real freedom they have to pursue the goals they value. Thus, development policy in Colombia must altogether work toward the improvement of resource access for Afro-descendants and toward the creation of specific mechanisms to enforce the judicial instruments to fight against racial discrimination. These laws and judicial mechanisms were created to open spaces for political, social and economic participation for this population group on an equal basis, as their fellow citizens of non African descent, and are yet to be fulfilled.

Chapter 1. Introduction

Amartya Sen's Capability Approach has emerged as an alternative framework to long-established economical approaches that seek to analyze individual welfare, poverty and human development (Kuklys 2005; Clark 2005). He develops the Capability Approach, which identifies two elements, *functionings* and *capabilities*, to analyze individual welfare. Functionings represent the achieved welfare of an individual: what a person manages to be or do in the different dimensions of human life. These 'beings' and 'doings' vary in a wide range of aspects from being adequately nourished and in good health to more complex achievements like having self-confidence. Capabilities then, are the set of choices people have or the freedom to choose the life they want. They express the set of available options to the exercise of individual freedom (Sen 1985, 1999). For Sen, freedom is the core aspect of human development, and is determined by evaluating the extent to which a person is able to live the life he or she values and has reason to value; in this manner we can really assess a person's wellbeing. The author conceptualizes human development as "...*the process of expanding the real freedoms that people enjoy.*" (Sen 1999, p 3) and institutional and social arrangement must procure this expansion.

Following Sen's Capability Approach this research analyzes the wellbeing of Afro-Colombians in relation to non Afro-Colombians in order to understand how ethnic

and racial characteristics affect the achievement of welfare for individual members of this ethnic minority. The analysis is made by implementing a Multiple Indicators Multiple Causes (MIMIC) Model to assess capabilities in two dimensions of human welfare, 'knowledge' and 'being adequately sheltered', as latent constructs (Joreskog and Goldberger 1975). The aim of MIMIC is to capture how a set of exogenous variables (e.g. ethnicity, gender, age, or being poor) influence a given capability dimension (e.g. 'knowledge'), which is assessed as an unobserved variable. In turn, that given capability determines specific outcomes or individual functioning achievements (e.g. achieved years of education). These individual functioning achievements are the set of indicators of the given latent construct. A latent variable represents a complex conceptual construct that cannot be measured directly and has to be inferred or approached through a set of observed variables called indicators. Given the multidimensional character of Capabilities as comprising the set of choices an individual has, it is very difficult to measure them directly; thus, we have to rely on a set of observed Functionings or achieved welfare variables to infer the behavior of individual capabilities. For instance, we do not have certainty about the choices a person have when deciding which level of education wants to achieve, all we have is the actual level of education achieved such as a college degree. Thus, by analyzing the interplay of variables such gender, age, ethnicity and income, etc. and the achieved levels of education, one can make some inferences about the individual capability that person enjoys when deciding that a college degree is what he or she wanted.

Since its inception the Capability Approach has been considered abstract reasoning for its difficulty in being implemented (Comim 2001). These ideas are

philosophical and ethical and there are few empirical applications to measure them. New methods are being increasingly used to try to measure such intrinsic ideas and the Multiple Indicators Multiple Causes (MIMIC) model is one such quantitative, statistical technique. MIMIC models were first introduced by Joreskog and Golderberg (1975), and have constituted a common methodology in disciplines such as psychology, econometrics and marketing among others. Recently, authors such as Kuklys (2005), Di Tommaso (2007), Krishnakumar and Ballon (2008), have shown that latent variable modeling, of which the MIMIC model is part, is an appealing framework when assessing Capabilities and Functionings with existing statistical data. The study uses the 2003 Quality of Life Survey (ECV 2003 for its acronym in Spanish)¹ implemented by the National Department of Statistics in Colombia, and calculations were performed using the Statistical Analysis System (SAS), and its procedure Covariance Analysis of Linear Structural Equation (CALIS).

Historically, Afro-Colombians have been marginalized from the benefits of modernity and democracy. Socially excluded, they have the worst living conditions in comparative terms to the rest of the population (Arocha 1998; Urrea et al. 2005; Escobar 2003). They have the highest illiteracy rates in the country, 15.2% against 8.1% of non Afro-Colombians, and health and housing indicators follow the same trend (Urrea et al. 2005). Under standard welfare analysis of group disparities, the deprived conditions of Afro-Colombians have been considered the accumulated result of low income and class disparities. However, the persistence and magnitude of the racial gaps in the country suggest that practices of racial discrimination are limiting Afro-Colombians' individual

1. For practical purposes from now on the survey would be refer as ECV 2003 as its acronym in Spanish.

agency. Consequently, it can be argued that systematical lower capability and functioning achievement for Afro-Colombians in relation to non Afro-Colombians is at large extent due to unyielding social practices of racial discrimination and not only to class differences as has been traditionally argued by social stratification analysis.

As a consequence, this thesis argues that social stratification theory and its concentration on class disparities as the main source of inequality, and income as the main unit of analysis, is limited when assessing racial inequalities. It is asserted that this shortcoming can be overcome by the inclusion of racial discrimination as an explicit category of analysis when assessing racial and ethnic minorities' wellbeing. Thus, the analysis of racial disparities in Colombia requires a multidimensional framework to evaluate the impact that social categorization based on racial distinctiveness has in furthering inequality and impoverishing Afro-descendants. From this perspective, this paper supports the view that Amartya Sen's Capability Approach constitutes an appropriate framework for such an evaluation as it allows for the assessment of the impact that race-based discrimination has over the real freedom an individual enjoys, and in consequence over his/her achieved welfare. Furthermore, this paper agrees, as do other authors (Kuklys 2005; Di Tommaso 2007; Krishnakumar and Ballon 2008), with the idea that latent variable modeling is an appropriate method when assessing Capabilities and Functionings using statistical data such as national surveys. Finally, from the perspective of policy, this thesis concludes that increasing direct political participation, effective enforcement of the rule of law, and affirmative action policies aimed at improving access to education, health and housing, among other things, could constitute an effective mechanism to expand the capabilities of those of African descent in Colombia.

To provide a clear analysis of the Afro-Colombian predicament, this thesis is organized into five parts. The second chapter comprises descriptive statistics of the living conditions of the Afro-Colombian population in relation to non Afro-Colombians: an analysis that gives a panoramic picture of the issue at hand. The third chapter presents a literature review on social stratification theory. I seek to demonstrate that this theoretical framework falls short when assessing racial disparities and that Amartya Sen's Capability Approach allows a more accurate depiction of these harsh inequalities. The fourth chapter illustrates the formal MIMIC modeling and its logic, and also provides a more explicit justification of its use for this study. The fifth chapter presents results and findings. Finally the sixth chapter briefly concludes the entire paper, and the appendix presents a map with the geographical location of Afro-descendants in Colombia.

Chapter 2. Background: Afro-Colombian Living Conditions

Colombia in the wider context of Latin America and the Caribbean has been one of the nations living under the so called myth of racial democracy. This myth is based on the belief that Latin American societies are the product of a harmonious co-existence and mixing of the different racial groups, and therefore these are societies free from racial tensions. The ideal of societies free from racial divisions emerged as a counter discourse against colonial powers in Latin American in the late 1800s. Latin American elites saw in the development of an all inclusive national discourse the power to create compliant societies to forge modern nations. However, as national elites attempt to bring modernity, meaning imposing European models into Latin American nations, they soon realized that their racial composition presented a threat to such process as they saw themselves and were seen as inferior by the ‘white power’ nations, including the United States. Hence, Latin American intellectuals increasingly aware of the international exclusion their nations suffered as a consequence of their ‘ill racial’ composition saw to develop contesting discourses to separate themselves from traditional conceptions of race and nation. It is by 1925 that the Mexican minister of education published a remarkable essay called, *“the cosmic race”*, in which he praises the mixing of races in Latin America as an evolutionary process that had eventually lead to the born of a new race with the best of all races, the cosmic race (Miller 2006). By 1933 another influential work would be published following this same reasoning, *“Casa-Grande & Senzala”* wrote by a Brazilian

cultural anthropologist Gilberto Freyre. This author went beyond the idea of exalting the mixed racial composition of the Brazilian society toward the initial delineation of the myth of racial democracy. The author argues that race was not a categorical division of the Brazilian society given the almost paternalistic relationships established between black and whites since slavery times. Furthermore, in developing the conceptual content of the myth, the author argues that class and not race was the reason for the poverty and systematical exclusion blacks and indigenous peoples suffered (Skidmore 1993; Reiter and Mitchell 2009).

Colombia was not strange to these processes of national and racial identities formation. Furthermore, Colombian elites confront the same exclusionary treatment in the international arena as a consequence of their so called racial inferiority. In this scenario, and given the geographical segregation of blacks and indigenous communities in the country; after the wars of independence, national identity was also forged according to the 'cult to the mestizo nation' or the cult to the mixed race that had the best of all races (Lasso 2006). The cult to the mestizo nation led to development of a national discourse based on the denial of racial categories as the source of social conflict. Public discussions of the topic of race and racial discrimination were forbidden, and any mentioning of it was considered unpatriotic. As the nation was consolidating itself as a modern democratic society, the denial of race was increasingly support in ideas of racial democracy. Nowadays, the myth of racial democracy survives and the Colombian society is still living at great extent in a racial denial (Wade 1993).

Nevertheless, as many historians and anthropologists have pointed out, there is neither a complete blend of races nor societies free from racial tensions. Racial

democracy may be just an illusion but it is a powerful one (Lasso 2007; Andrews 2004). Its strength can be recognized in that it has served the purpose of purging the topic of race and racial discrimination from political debates. The recent attention directed towards race and racial discrimination has taken place mostly due to international pressures. In this scenario, racial discrimination has never been acknowledged in Colombia; so the precarious conditions, in which ethnic minorities live, have not been linked to its existence and pervasiveness. These precarious conditions have been historically explained mostly by class differences, instead of racial ones, which are explained through a sequence of lower achievement in educational attainment and labor status that in turn determine lower income levels for such individuals.

In the midst of this denial, Afro-descendants, and ethnic minorities in general, in Colombia are the poor among the poorest. They have been historically marginalized and hold lower standards of living in almost all dimensions of human life. Although, there are several possible causes for these disparities, such as a cumulative result of lower income and educational attainment, the persistence and magnitude of these inequalities suggest that there are embedded practices of racial discrimination that are a disadvantage to these subgroups of the Colombian population.

The first event that suggests the existence of racially discriminating practices in Colombia refers to the fact that official statistical data collected in the country have systematically neglected ethnic and racial minorities, including the Afro-Colombian population. Although, this is not an exclusive Colombian phenomenon in the broader set of Latin American countries with ethno-racial minorities; it does raise concerns, since Colombia is home of the second largest black population in Latin America, after Brazil.

For instance, according to 1993 census data, the Afro-Colombian population was around 1.5% of the total population. Later on, according to the 2000 National Household Survey, this population increased to around 17.9% of the total population. More recently, Urrea argued that Afro-Colombians represent between 20% and 22% of the national population: between 8.6 and 9.5 million people (2006). This last statistical account has been widely accepted by the academic community including the Economic Committee for Latin American and the Caribbean (ECLAC), since the data was assessed after using different methodologies and surveys. However, it can be observed that the 2005 Census a total of Afro-Colombian population of 10.3% of the total population (see table 1 below), which is not coherent with the previous number given for 2000 based on the National Household Survey. On this regard, Urrea (2006) explains how different methodologies and survey questionnaires lead to different numbers. Accordingly, variations in data, instead of reflecting real demographic changes, must rather be attributed to unreliable and changing census tools, as well as to widespread tendencies to “whiten” census participants and thus contribute to their invisibility. This invisibility then reinforces the marginalization and exclusion of the Afro-Colombian population. Governmental recognition of their large presence and the discrimination they routinely suffer is a more recent event (Arocha 1998; Urrea 2006; Escobar 2003).

Geographically, Afro-Colombian settlements are located mainly in isolated zones of the Pacific and Atlantic coasts of the country.² The Pacific and the Atlantic coasts are the regions with the largest population of African descent, which by contrast are also the least developed regions of the country. Although these areas are rich in bio-diversity, this

2. See map on appendix A.

richness has become a threat, because it led to the expansion of licit and illicit monocrops such coca and oil palm, often controlled by guerillas or Para-military groups, that degrade both the soil and water sources, and other activities such as logging and mining. These actions often disrupt the natural balance of the territories and increase the risk of natural disasters (Observatory on Racial Discrimination 2008).

The chart below shows the distribution of the Colombian population by ethnic characterization and urban/rural location based on the 2005 Colombian Census. As mentioned above, the total Afro-Colombian population reported by the Census states the percentage as 10.3% out of which 7.4% is urban population and 2.81% is rural population.

Table 1 Distribution of the Colombian Population by Area and Ethno-Racial Characterization

Area	Urban		Rural		Total	
	%	#	%	#	%	#
Non Afro-Colombian	68.5%	28,414,137	21.2%	8795444	89.7%	37,209,581
Afro-Colombian	7.4%	3,085,248	2.81%	1,165,262	10.3%	4,250,509
Total	76.0%	31,499,384	24.0%	9,960,706	100.0%	41,468,384

*Based on 2005 Census Data from: <http://www.dane.gov.co/censo/>

Nonetheless, it has to be clarified that the National Census uses a self-identification question, which has been severely criticized for its lack of reliability given the pressure that societal conditions imposed on the perception of individuals (National Research Council of the National Academies 2004). In the case of Colombia, this is especially important given a social tradition that has historically prized the white race and its cultural expressions. “Blackness” and “Whiteness” are two extremes of a line determining the lower and upper categories of the social continuum. In this scenario,

many people of African descent and Indigenous individuals chose not to identify themselves as members of ethnic and racial minorities, especially in major cities where the strength of the cultural pressure becomes unbearable. As a consequence, official data becomes unreliable, although necessary as there are very few sources of such statistics. Hence, it can be concluded that the consistent efforts of rendering minorities invisible is in itself a strong indicator for the prevalence of racial discrimination.

The second even that suggest the existence of race-based discrimination in Colombia is the precarious conditions in which Afro-descendants live. Traditional poverty and inequality indicators show huge gaps between the Afro-descendant and non Afro-descendant population. This is aggravated by the spatial distribution of the Afro-population, which as mentioned above is mainly located in isolated zones completely vulnerable not only for their lack of infrastructure, but also for the negative impact generated by the presence of illegally armed groups. Moreover, recent waves of migration to cities like Cali, Medellín and Bogotá are the result of forced displacement and extreme conditions of poverty. According to the Consultation on Human Rights and Displacement (CODHES 2008), a Colombian non-profit organization, Afro-Colombians represent about 22.5% of the total displaced population in the country. Thus, for Afro-Colombians, displacement is directly affecting not only their livelihoods but also their ethnic and cultural survival. Forced displacement in the country is generating a spatial redistribution of poverty, as already vulnerable farmers are being violently separated from their traditional livelihoods and must migrate to the urban centers, engorging previously existent urban peripheries of exclusion and misery.

The next two tables present the percentage of population under the poverty line based on the 2003 Quality of Life Survey. Table 2 uses a poverty line of two dollars per capita per day and a indigent line of one dollar per capita per day, which are the thresholds internationally defined by the World Bank. Table 3 uses the poverty line defined by the Colombian National Department of Planning (DNP), which is higher than the one defined by the World Bank.

Table 2 Percentages of Poor and Indigent Populations for 2003, by Urban-Rural Areas*

National Population	Population under PL		Population under IL	
	Urban	Rural	Urban	Rural
Afro-Colombians	43,0%	76,8%	16,7%	46,9%
Indigenous/Gypsies	52,6%	81,0%	22,0%	44,2%
Mestizos/Whites	36,6%	72,6%	13,6%	39,2 %
National Total	37,3%	73,2%	13,9%	40,1%

*(Urrea and Viafara 2007, 60) based on 2003 QLS

Table 3 Percentages of Poor Populations by Urban/Rural and Ethnic Membership base on the QLS 2003

National Population	Population Under PL		
	Urban	Rural	Total
Afro-Descendants	54.9%	73.6%	61.2%
Indigenous	59%	72.3%	66.5%
Non-Ethnic	48.7%	70%	54.1%

*LP=281.479,80

**t-test for sample means differential shows that the mean for the Afro-Colombians is significantly different to that of the non-ethnic population group , significant at the 0.01 alpha level, still they appear to have the same variance.

It is possible to observe that Afro-descendants and indigenous communities are always at the bottom. However, neither the poverty line defined by the World Bank nor

the one defined by the DNP differentiate between rural and urban populations and the specific consumptions necessities they have. Therefore, one must be very careful when analyzing the decreasing percentage of poor people in rural populations when going from table 2 to table 3 with 76.8% and 73.6% respectively. For instance, the threshold of the Colombian poverty line puts more weight on food expenditures in comparison to shelter or clothing; as a consequence, poverty lines are higher for urban populations as these populations spend more of their income on food compared to other items. On the other hand, rural populations have somewhat different necessities as they tend to be a sort of autarchy in terms of their own consumption (they eat what they grow), and spend their cash income in aspects such basic services or transportation.

In terms of health and education, the numbers are not more encouraging. According to the 2005 census, the infant mortality rate among Afro-descendants is nearly twice as high as that of the rest of population: 48.1% and 26.9% per 1000 live births respectively. In addition, the infant mortality rate increases up to 77.5% in the department of Chocó, which is home of about 44.1% of the total Afro-Colombian population of the country³, and where Afro-Colombians made for 89% of its population. The infant mortality rate in Chocó is comparable to that of The Republic of Congo, Ethiopia and Mauritania in Africa, with about 79%, 75% and 75% respectively. Life expectancy for Afro-Colombians is about 66.4 years while for the rest of the population it is around 72.8 years. It also worthy to note that life expectancy is even lower for the Afro-descendants living in the Chocó department, which has consistently lower standards in comparative

3. Long Term Plan for the Black Population, Afro-Colombians, Palenque y Raizal: Proposal y Process 2005 – 2007, National Department of Planning, 2007.

terms, not only with the rest of the population, but also with the Afro-Colombian population located in different regions of the country.

The next table shows educational data, which is strongly correlated with labor status and social mobility⁴. The data present Afro-Colombians behind non Afro-Colombians consistently, and it is especially important to note that college education, which is considered one of the most important contributors to rising out of poverty, is almost three points lower for Afro-descendants in comparative terms with non Afro-descendants with 5.21% and 8.07% respectively.

Table 4 Educational Level by Ethnic Characterization based on the 2003 Quality of Life Survey

Educational Level						
Variable	Afro-Colombians		Non Afro-Colombians*		Total	
	Total		Total			
	#	%	#	%	#	%
None	392,790	12.90%	2,916,190	8.19%	3,308,980	8.56%
Elementary	1,275,566	41.88%	14,460,000	40.62%	15,735,566	40.72%
High-School	1,101,044	36.15%	13,400,000	37.64%	14,501,044	37.52%
Technical	84,527	2.78%	1,387,042	3.90%	1,471,569	3.81%
College	158,788	5.21%	2,872,535	8.07%	3,031,323	7.84%
Graduate	33,031	1.08%	563,966	1.58%	596,997	1.54%
Total	3,045,746	100%	35,599,733	100%	38,645,479	100%

*It excludes indigenous population, which is around 2.16% of the population or 942.115 individuals as estimated by the ECV 2003.

**An equality of variance test was performed yielding a Folded F-statistics of 1.35 with a p-value of <0.0001. Thus, we conclude that the variances of the two subgroups are different.

***The t-test result was equally significant at the 0.01 critical level, hence we conclude that the means for these two groups of the population are in fact different.

4. In Colombia development gaps between urban and rural populations are very high. The fact that the 2003 Quality of Life Survey under represents rural population might cause an overestimation of the educational level for ethnic minorities, indigenous and Afro-descendants, which are mainly rural. Especially the numbers for college and postgraduate education may be evidence of such underestimation.

In addition, according to the 2005 Census data, 11% of Afro-Colombian children did not attend elementary school, while for high school education that percentage went up to 27%. The reasons for school absenteeism range from the lack of money to cover the cost of tuition and materials, to the lack of infrastructure, and to the availability of teachers. These problems persist despite the State's obligation to provide free elementary education up to the fifth grade to the entire population. The inability of the Colombian State to guarantee basic rights to its ethnic minorities contrasts sharply with the country's laws and human rights protocols signed at the international level.

In 1991, Colombia promulgated a new National Constitution⁵ in which ethnic groups and minorities were not only granted special rights as compensation for a history of marginalization, but also as a means of preserving ethnic communities within their own cultural, social and economic structures. In addition to the Constitutional articles, there are three additional legal laws and norms directed towards fighting discrimination, yet the judicial system lacks effective guidelines to comply with these laws⁶. As a result, neither racial discriminators are prosecuted nor are victims redressed. Finally, there are no preventive measures to avert future episodes of racial discrimination (Observatory on Racial Discrimination 2008). Moreover, neither the adoption of the International Labor Organization (ILO) convention about Indigenous and tribal communities⁷ nor the signing of the International Convention on the Elimination of all Forms of Racial Discrimination

5. Afro-Colombians were granted with collective property rights, community-orient development and prior consultation rights, and the right to be free of discrimination in the transitory article 55, later developed in the Law 70, 1993. Comisión Consultiva de Alto Nivel para las Comunidades Negras Subcomisión de Planeación y Desarrollo Ley 70 de 1993 – Decreto 2248 de 1995.

6. Article 13 of the national Constitution, articles 58 and 147 of the penal code, article 48 of disciplinary code for official functionaries, and article 33 of Law 70 of 1993, were introduced into the judicial system to punish acts of discrimination based on race or ethnicity. However as argued by the Observatory on Racial Discrimination (2008, 60) none of them are effectively enforced.

7. It was integrated into the national legislation by the Law 21 of 1991 (Ley 70 de 1993 – Decreto 2248 de 1995).

of the United Nations⁸ have led to any major improvement in the living conditions of the Afro-Colombian population, which points to a weak state, rather unable or unwilling to protect all of its citizens and extent citizenship rights to them.

Nowadays, after more than 150 years after the abolition of slavery, 18 years after the enactment of the 1991 National Constitution and the signing of several international treaties and protocols, Afro-Colombians are still persistently marginalized. Unfortunately, legal recognition of Afro-Colombian rights has not been translated into an effective enforcement mechanism and public policies directed to address the marginalization of Afro-Colombians. This lack of a political and judicial mechanism to guarantee basic and constitutional rights for ethnic minorities in conjunction with the harsh reality of exclusion of Afro-Colombians, points toward the proposition that their marginalization is less the result of social stratification and more one of racial discrimination. This is not to deny that class disparities and inequalities in access to resources have an important share in determining the lower standards of living of those of African descent; what is really argued here is that racial discrimination is an important underlying cause of these precarious conditions as well.

To summarize, Colombia is a society in which the historical and social construction of racial identities assigns lower values to individuals of black and indigenous backgrounds. This has its expression in lower standards of living for Afro-Colombians. They still have limited access to education and health care facilities even after legislation to change these conditions. They have higher mortality rates, lower life expectancy. Their cultural and territorial rights are constantly threatened by mainstream

8. New York, March 7, 1966, and ratified in 2004.

development models based upon the over-exploitation of bio-diversity; and by the large presence of armed groups such as guerrillas and paramilitaries. Their vulnerability is endemic to all aspects of human life since they are socially, economically, politically and culturally excluded from Colombian society—they lived as second class citizens. In this scenario, the need to go beyond the myth of racial harmony and to question the explanatory power of traditional analysis of class disparities is evident.

Chapter 3. Theory and Model Building

Race, Racial Discrimination and Poverty

Group disparities have been increasingly studied across academic disciplines and from different perspectives. These studies have been motivated by the existence of pervasive inequalities across racial and ethnic groups around the world (National Research Council of the National Academies 2004). From a sociological perspective, social stratification theory has been the main analytical framework to analyze the impact that group disparities have on individual welfare. This theoretical framework assumes class as the main category of analysis, and uses the educational achievement and employment status of an individual as a tool to understand the dynamic elements that interact in a process of social stratification and mobility (Grusky and Kanbur 2006). These processes are usually divided between social and individual paths of mobility. Mobility in the social space is determined by the extent to which children are able to attain higher educational achievement and occupational status in relation to their parents. Individual mobility is determined more upon personal characteristics such as gender and race (Moynihan Ed. 1969).

A democratic society would then be characterized by individual and social patterns of mobility that do not depend upon the social class of their parents and the ascribe characteristic of an individual, but rather on his/her merits based on his/her

capacity. Equal opportunity access should be a precondition for an equality-based democracy, in which different strata are determined by one's personal abilities. In the absence of such an ideal reality, academics have concentrated their analyses on the impact that class disparities have over the availability and distribution of market-based opportunities for upward social mobility across groups.

Analyses of group disparities (race, ethnicity and gender) in Colombia are mainly concentrated in social mobility and stratification theory. There are a number of studies such as those of Medina (2002), Portilla (2003), Viafara (2005) that analyze group disparities in education and the labor market, and how those impede processes of social mobility for historically disadvantaged groups such as racial and ethnic minorities. Medina (2002) analyzed the differences in the labor supply according to the racial background and gender of the individual, specifically women. He divided the labor supply of women into three categories, independent, wage earner and unemployed, and found that the women of African descent have less time to offer in a working capacity because they have on average more dependent children. Thus, lower labor supply is associated with higher dependency rates (children) and poverty is a likely outcome of such a combination. Nuñez and Ramirez (2002) found that at the micro-level the educational level in the household and the number of children have a significant impact on poverty levels⁹. While a higher educational level decreases the probabilities of being poor, a higher number of dependable children increase it. Hence, people of African descent are more likely to be in poverty and located in the lower strata of the class continuum because they have lower educational attainment, lower labor status, and

9. This study is concentrated on macro-level determinants of poverty, but it includes micro-level factors as they identified causal mechanism from economical aggregates at the macroeconomic level toward economical variables at the microeconomic level.

through these, lower income. Also, Viafara (2005) concluded that in the city of Cali, Colombia, an individual member of a household of African descent with a given socio-economic status (measured as the educational attainment of the head of the household) is more likely to achieve lower occupational status in comparative terms with 'white' or 'mestizo' individuals with the same socio-economic status. According to the author, this illustrates how processes of social mobility are influenced by ascriptive characteristics of the individual and not just by income levels.

Unfortunately, social mobility theories present different shortcomings that should be kept in mind. First, these theories classified people according to their social class, which in turn is determined by the interaction of their achieved schooling, occupational status and income level, in that order, as one causes the other (Grusky and Kanbur 2006). This categorization represents an important flaw when analyzing poverty and inequality given that once an individual moves up in the social strata, which is strictly associated with his/her economic wellbeing; the persistent inequalities associated with race follow them. This means that monetary inequality is reduced and the individual is no longer considered poor or part of the objective population of welfare policy; however, in the case of racial inequalities, racial discrimination does not end once people from ethnic minorities move up in the social strata. On the contrary, even people that are over these income thresholds have to endure discriminating practices across different dimensions of human existence. This is very critical in a country like Colombia where the rule of law is not effectively enforced and racial discrimination is not addressed by judicial mechanism. Thus, people suffering the effects of racial discrimination do not have the means to defend their rights even when they are not considered poor by standard measures.

Second, even when these studies do analyze the role of ascriptive characteristics such as gender or race; concluding that these aspects played an important negative role in the stratification process and the distribution of opportunities for upward mobility among social and ethnic groups; their exclusive focus on resource access as the major source of inequality and poverty reduces the scope of the analysis they can make regarding racial inequalities and discrimination (Blau and Duncan 1967; Schiller 1971). These theories share core aspects with traditional analysis of poverty and inequality in the income space severely criticized by several authors, including Atkinson (1970), Rawls (1971) and Sen (1980, 1985, 1997, 1999). Sen argues specifically in his criticism that the value attached to a given dimension (education and occupation) is supported by its instrumental value as a means of increasing wealth and income. Therefore, aspects such as empowerment, the command of social respect, living without shame, and the fulfillment of one's rights on the basis of one's humanity and citizenship, are not part of the informational basis of these frameworks. As a result, intrinsic values and rights are not considered by themselves, but as mere instruments in the achievement of wellbeing; more exactly in the achievement of economic wellbeing. However, as Amartya Sen (1985, 1997, 1999) has shown, economic wellbeing is just a component of human wellbeing, an important one but nonetheless just a component. Furthermore, the possibility to live a life free from discrimination is a core aspect of human wellbeing, especially for those groups who have had to endure it from historical times to the present and are still suffering the consequences. Such consequences cannot be completely accounted for by analyzing economic wellbeing. Human wellbeing goes well beyond the mere availability of economic resources into the realm of intrinsic freedoms. After all, to determine the

quality of life of an individual or group, we have to know not just how much income a person or group has, but how much of that income contributes to their ability to live a decent life.

For these reasons, this thesis argues that the need to go beyond traditional analyses of group disparities and social mobility theories is unmistakable. The Capability Approach and its human centered perspective allow one to overcome the shortcomings of social stratification theory with respect to the analysis of racial inequalities. Given its multidimensional nature, Sen's theoretical framework can account for the impact that discrimination patterns have over the wellbeing of individual members of racial minorities beyond income levels.

Amartya Sen's Capability Approach

Amartya Sen's Capability Approach is centered on the enhancement of individual freedoms as both the end and means of development. According to Sen, any welfare assessment must account for the process of expanding or constraining individual freedoms. The Capability Approach is based upon the recognition of the multidimensionality of both welfare and poverty, as these are conditions determined by a wide range of factors. He argues that the evaluation of welfare must be examined with respect to the real freedoms people enjoy, and not just with respect to the income they have. The author criticizes standard welfare economic approaches that concentrate their analyses in terms of wealth (opulence, income and/or expenditure) or utility (happiness or human fulfillment). He argues that the analysis in terms of opulence assumes that income

is an end in itself; consequently, it does not account for individual differences when converting income into valuable achievements (Sen, 1985a; 1985b; 1999).

Furthermore, the relation between low income and poverty is instrumental and variable. Instrumental in the sense that there are other factors that influence poverty and income is just one means among others to reduce it. The ability to convert income into better living standards varies greatly among communities and individuals. In addition, as was noted also by Rawls (1971), the analysis of individual welfare in terms of utility does not set apart different sources of satisfaction and distaste, and cannot reflect the intrinsic value of aspects such as human rights. Besides, these traditional frameworks assume that individual rationality is based on self-interest, an assumption that has been widely criticized as people often consider wider concerns when deciding among a set of alternatives (Sen 1985b, 1997, 1999). Sen states that neither utility nor income allows us to evaluate comprehensibly individual welfare and social development.

To fill these theoretical gaps, Sen developed the Capability Approach, which assesses individual wellbeing by considering realized welfare and the freedom to choose among different options in order to reach fulfillment. It identifies two elements, *functionings* and *capabilities*, and their corresponding sets. Accordingly, functioning analysis in the Capability Approach evaluates individually achieved wellbeing by considering a wide range of aspects such as education, employment, health, nutrition, social or political participation, and the way in which these factors interact. Capabilities, in turn, represent the set of options available to the individual to achieve his/her desired level of wellbeing (Alkire 2005; Saith 2001). Sen defines individual agency as “what the person is free to do and achieve in pursuit of whatever goals or values he or she regards

as important” (Sen 1985a, 203); and in his book *Development as Freedom*, he argues that the aim of the development must be the expansion of individual freedoms (1999).

By this definition, the capability set is determined by the extent to which an individual can exercise his/her agency or individual freedom, and the aim of development is to expand said agency. However, not just any increase in the capability set matter or count as an expansion of freedom. In order to be able to achieve a real or effective increase of capabilities, it has to be valued by the individual or group as an increase in their set of choices; otherwise there is no capability expansion even though there are more choices (Alkire, 2005). Hence, individuals must be agents of their own development as they are the ones who must reason and decide what constitutes a valuable end in their lives. Thus, the Capability Approach praises the role that active citizen participation has, as a precondition for the successful development of policy design and implementation. A clear example of this situation is found in the Afro-descendants communities that live in the Atrato river valley in the department of Choco, Colombia. These communities have collective property and prior consultation rights, in addition to the right to chose development projects that are in accordance with their cultural and ethnic survival preferences. However, such as rights are not enforced and these communities in addition to suffer the pressure of violent displacement as a consequence of the armed conflict, are also suffering political pressure to accept unwanted development efforts. Effort such as the harvesting of mono-crops and the over exploitation of the rich biodiversity of the region among other economic initiatives are unwelcomed initiatives for these communities. As a consequence, even though these are efforts labeled under development initiatives that eventually could improve the economic

wellbeing of these communities; they do not represent an expansion of capabilities as these initiatives are actually seen as a threat to their cultural survival (Escobar 2005).

Sen (1999, 10) does not dismiss the instrumental role of different freedoms such as “... (1) *political freedom*, (2) *Economic facilities*, (3) *social opportunities*, (4) *transparency guaranties and*, (5) *protective security*.”; on the contrary, he explains that they interplay a major role in enhancing individual capabilities as they reinforce one another.¹⁰ But Sen goes beyond the widely recognized instrumentality of the different dimensions of human welfare, by arguing that these dimensions also have an intrinsic value, as they are central aspects to the process of human flourishing (Sen 1999; Alkire 2005).

Sen’s Capability Approach considers circumstances such as poverty, political repression, racial and gender discrimination, unemployment, lack of economic, educational or health facilities as capability deprivation. Therefore, from a capability perspective, the persistent deprivation of Afro-Colombians would be as much the result of insidious patterns of racial discrimination as it would be the accumulated result of low income and class disparities. In Sen’s arguments, what matters is the freedom or the effective capability to achieve valuable functionings. These capabilities are determined by the freedom a person enjoys in achieving the life she or he has reason to value, which alludes to the fact that different individuals living in different societies, will have different demands or necessities. In this line of reasoning, income is just one means among others used to expand one’s capabilities and to achieve valuable functionings. Thus, low income is just one reason among many to explain the persistence of group

10. This interconnectedness between the different dimensions of human existence, welfare is also developed as core aspects of the Human Security Approach (Nef 1999).

disparities. The achievement of valuable “beings” and “doings” is highly constrained by factors such as gender, race and ethnic backgrounds, social arrangements as well as disabilities and environmental constraints; moreover, these factors affect greatly the ability to translate income into valuable achievements (Sen 1999, 88). Consequently, when considering a wider range of the aspects influencing human wellbeing, class disparities and income inequality analyses fell short, especially in the case of racial minorities subject to discrimination. These shortcomings can be overcome by analyzing capabilities and functionings as their multidimensional nature allows us to include previously excluded factors when assessing Afro-descendants’ welfare.

In this case, the Capability Approach allows us to analyze the role of race as a socially imposed handicap that reduces the capabilities or freedom of those of African descent. Under the Capability Approach, considering the role that racial discrimination plays in limiting the exercise of individual freedoms for ethnic and racial minorities must be an explicit category of analysis. If race-based discrimination is included as a specific category in the assessment of individual welfare of Afro-descendants, there would probably be a significant increase in poverty levels as measured by this multidimensional approach in contrast to that of the income poverty measures that disregard race. This is explained by the fact that the Capability Approach evaluates more than income when judging welfare conditions. Thus, from a capability perspective, individuals over the poverty line, even located in the middle position of the income deciles, could fall in poverty as they are the subjects of insidious patterns of racial discrimination. Such negative impact cannot be assessed by income level analysis, which in turn, corroborates the pooriness of income-measure based approaches when assessing more subjective but

equally important aspects of human welfare (e.g. empowerment and the ability to command social respect and not just commodities).

Notwithstanding its increasing importance and relevance, the Capability Approach has been severely criticized due to its difficulty when setting it into operation. Some critics have reconstrued its main arguments as theoretical weaknesses. For instance, because the Capability Approach expands the informational basis when evaluating individual welfare, this has been reevaluated as a disadvantage given the difficulty in elaborating on broad theoretical concepts with equally broad empirical significance (Clark 2006; Commin 2001). Furthermore, Martha Nussbaum (2000, 2003) and Severine Deneulin (2004) have labeled Sen's approach as 'incomplete' since it does not claim to be a theory of the good, and hence it does not set normative parameters to guide the enhancement of individual freedoms in a specific society. Nussbaum (2000) drew a set of *central human capabilities* with a heavy Aristotelian influence in order to give Sen's approach the completeness it was lacking. However, Deneulin (2004) argues that although Nussbaum's pragmatic approach achieves the setting of normative boundaries to guide developmental efforts, both Sen and Nussbaum's approaches fall short when determining the mechanism through which individual freedom is to be enhanced. According to Deneulin (2004), Sen's Capability Approach must include in its informational basis what she calls *socio-historical* agency or the socio historical factors affecting individual freedoms in every specific society, and which cannot be reduced to simply individual decisions and actions. Still, Sen (1997, 1999) argues that the evaluation of social arrangement should be made by the final impact these have over an individual,

thus, collectivity is assessed whenever it affects individual freedom because is at the individual level that the change matters.

Despite these critiques, the Capability Approach has constituted itself as a leading theoretical framework when analyzing individual welfare. Authors such Alkire (2005), Kuklys (2005), Krishnakumar and Ballon (2008) and Di Tommaso (2007) found the approach useful, and identified different methods to implement it. Alkire (2005) evaluates the expansion of capabilities among Pakistani women part of an (OXFAM) program directed to increase the participation of women in income earning and empowerment. She combined economic analysis of cost-benefit with qualitative analysis of participatory developmental policies, in order to define and evaluate the expansion of capabilities. She used both microeconomic and qualitative data to assess the real expansion of capabilities. However, qualitative data at the micro level presents critical problems when generalizing findings given its usually reduced scope, and the fact that the researcher is the gatherer of the data, and thus making it more subjective. In addition, this type of data is more detailed and its collection is more time consuming. Hence, the cost of collection, analysis and reporting of findings is higher and this represents a giant obstacle in having it collected in a systematical way, given the scarcity of funds for such enterprise.¹¹ As a consequence, there has been not only an increasing awareness of the need to collect capability data in a systematical way, but also the need to use existing data to analyze capabilities (Seth 2009).

The use of the “latent variable method” to operationalize the Capability Approach has steadily gained prominence in its application. Several authors have applied this

11. John Gerring, *Case Study Research* (Cambridge: University Press, 2007).

methodological approach when implementing the Capability Approach with significant results. For instance, Kuklys (2005) used latent variable modeling to evaluate the welfare conditions of the disabled population in England. She makes an inter-temporal comparison of Sen's functioning achievements in health and housing between 1991 and 2000. Her work concluded that disabled people in England are even poorer when analyzed under the Capability Approach, given their personal handicaps when converting income into valuable achievements. In addition, Di Tommaso (2007) assesses children's welfare in India using longitudinal data and structural equation modeling. Her document identifies three capabilities: "bodily health", "senses imagination and thoughts", and "leisure activities and play" as key aspects of children's welfare. The study found that among other factors, gender is a key aspect in children's welfare since boys have a higher possibility to access education. Also, Krishnakumar and Ballon (2008) applied the same methodology to Bolivia, identifying two key capabilities as latent constructs: Knowledge (being able to be educated), and living conditions (being able to be adequately sheltered). They use variables such as years of education and dwelling conditions of the house as indicators of the knowledge and shelter capabilities respectively. In addition, they hypothesized causal relationships between a set of exogenous variables such ethnicity, gender and age and the latent capabilities. Among their findings, this study found that belonging to an indigenous group played a key role in determining children's welfare in Bolivia, having a consistently negative impact.

In conclusion, several authors mentioned have applied the Capability Approach, using latent variable as empirical method with significant results to their specific cases. They have shown that given the complex nature of Capabilities, its empirical application

requires a methodological approach flexible enough to capture their complexity, and latent modeling has shown itself a useful method for such a task. Its methodological refinement allows for the capturing of the complex nature of capabilities, using common statistical data, such as national census, which in turn are more reliable, less costly and widely available. Thus, the decision to use MIMIC modeling with existing data to apply the Capability Approach to the case of Colombia has some practical reasoning behind it. These reasons are the availability of data and the exploratory nature of this study, as there almost no studies that analyze racial inequalities in Colombia from a multidimensional perspective.

Chapter 4. Operationalizing Amartya Sen’s Capability Approach: A MIMIC Model Applied to Colombia

Data and Conceptual Clarifications

The data used to estimate the Multiple Indicators Multiple Causes (MIMIC) model comes from the 2003 Quality of Life Survey (ECV 2003 in Spanish) executed by the National Department of Statistics of Colombia (DANE in Spanish). The survey defined nine geographical regions: Antioquia, Atlántica, Valle, Pacífica, Central, Oriental, Bogotá D.C., Orinoquia-Amazonia, San Andrés y Providencia. It is based on direct interviews with all people older than 18 years in a household, and it is representative at the national level with a sample of 24,090 households and 85,145 individuals. However, the survey undervalued the Afro-Colombian population for two reasons though it is more problematic with the indigenous population. One is that the ethnic and race variables were taken as equivalents. The other is that Amazonas, Arauca, Caquetá, Casanare, Guainía, Putumayo, Vaupés y Vichada were all regions in which rural areas were not interviewed; so there is an undervaluation in terms of rural population in general, and of ethnic minorities specifically since these are mainly rural communities. Nonetheless, it has been widely used for its completeness regarding information about living conditions and its representativeness at the national level.

It is necessary to clarify that although the selection of the different “capabilities” is supported by different theoretical approaches and previous studies, there are other

capability dimensions that cannot be analyzed given data constraints. For example, in the 2003 Quality of Life Survey there is no information regarding political and community participation, which are factors widely recognized as important dimension of human welfare. In addition, the sample is not representative at the state level, thus it is impossible to make analysis and comparisons with the department of Chocó. This could constitute a rich scholarly exercise that could allow to make inferences including variables of geographical segregation since about 45% of the Afro-descendant population is located in this zone.

Also, it is important to note that there are intrinsic limitations when assessing racial discrimination by fitting a statistical model to available data. For instance, omission of relevant variables and sample bias may occur making the inference of race-based discrimination controversial.¹² However, this type of data provides reliable information on different outcomes by groups, that together with a careful contextual and statistical analysis, allow the inference of possible causal factors and mechanisms that disadvantage a specific group, including the role of race. The analysis of group disparities using statistical methods and available data must deduce that discrimination is present, by determining if a specific outcome would have been different if an individual would have been from another gender, race or ethnicity. If the results show that the impact of race is still significant after the other variables have been held *ceteris paribus*¹³; there is a high probability that racial discrimination is taking place and is disadvantageous to a given population group (National Research Council of the National Academies 2004, 5).

12. For a more detail discussion of these issues see National Research Council of the National Academies (2004) Chapter Seven.

13. Ceteris Paribus equals in this context statistical control.

For analytical purposes, this study uses the definition of race and racial discrimination given by the National Research Council of the National Academies in its book report *Measuring Racial Discrimination*. In this report, race is defined as "...a subjective social construct based on observed or ascribed characteristics that have acquired socially significant meaning" (2004, 2). Also, racial discrimination is defined in two components: "(1) differential treatment of the basis of race that disadvantages a racial group and (2) treatment on the basis of inadequately justified factors other than race that disadvantages a racial group – differential effect." (2004, 4). Finally, the calculations were performed using the Statistical Analysis System (SAS) and its procedure Covariance Analysis of Linear Structural Equation (CALIS) which is used to implemented analysis of covariance structures, path analysis and linear structural equations. Since the majority of indicators and exogenous variables were dichotomous or categorical, the estimation method used was Weight Least Squared¹⁴, is a distributional, assumption free method, meaning that it does not assume normality of the observed variables, used to estimate the set of parameters implied by the model. It uses a weighted sum of squatted residual matrix to minimize the discrepancy between the sample covariance matrix, S , and the model implied covariance matrix, Σ ¹⁵.

Although latent variable modeling is being increasingly used in the empirical application of the Capability Approach, it is necessary to mention that the method has its shortcomings. In first place, since it is a statistical technique of confirmatory character the possibility to test new hypothesis about causal relationships is limited. This represents

14. "The default weight matrix for weighted least-squares estimation is an estimate of the asymptotic covariance matrix of the sample covariance or correlation matrix. In this case, weighted least-squares estimation is equivalent to Browne's (1982, 1984) asymptotic distribution-free estimation." (SAS Corp. 1999).

15. In this case the weighted matrix to fit the data was about forty pages; thus for spacing and practical considerations it would not be presented in a paper as part of the results, but the information would be available on request.

an important shortcoming in terms of the operationalization of the Capability Approach due to the intrinsic incompleteness of the framework in need of exploring new paths and hypothesis testing as the framework evolves. In second place, these methods do not allow the quantification of latent constructs; it just allows to infer its behavior from the set of observed indicators. In this case we cannot quantify a Capability Set, how many opportunities or choices a person's enjoy in a given dimension. However, this does not demerit the usefulness of the approach as it does allow the quantification of causal factors of Capability expansion or contraction. Finally, while the approach presents fine qualities regarding the application of the Capability Approach; it suffers the vast limitation of the lack of pertinent statistical data. Although this is not a specific problem of the approach, it does limit its scope of analysis.

MIMIC Modeling

Latent variable¹⁶ modeling is a much more robust approach than regression, although it is a member of the General Linear Model (GLS) family of which multiple regressions is a part. Regression analysis is a statistical method to analyze data aimed at predicting a criterion variable in terms of a set of explanatory variables. The idea is to maximize the portion of the variance of the dependent variable explained by the set of independent variables. However, while regression cannot introduce measurement errors on individually observed variables explicitly, latent modeling allows for such approximation. In a regression model, achieved years of education would be considered an explanatory variable free from error, and the model would yield a composite measure

16. For more detailed information on these methods see Schumacker (2004), Bollen and Davis (2009), and Krishnakumar and Nagar (2008).

of error of the complete set of explanatory variables. By contrast, latent variable methods allow one to realize to what extent the variable ‘years of education’ measures the knowledge level of an individual. Since such measurement could have an error associated with the quality of education that the individual actually received, this method allows us to account for that error. In addition, this approach presents different options for handling missing data; it allows one to analyze the influence of intervening variables, and also it allows for testing for misspecification of problems all in one (Schumacker 2004; Garson 2008).

MIMIC models were developed by Jöreskog & Goldberger (1975), and is part of this much larger family of statistical techniques called latent variable methods, which combine path analysis and confirmatory factor analysis techniques. Path Analysis is a statistical technique use to decompose the relationships between a set of variables, which can be independent, intermediary and dependent¹⁷. It is considered an extension of the regression model because it analyzes the impact that intervening variables have in the relation between independent and dependent variables. Furthermore, in path analysis, a variable can be independent, dependent or both. Neither an intervening variable nor a variable that is both dependent and independent can occur in regression analysis (Garson 2008). Confirmatory factor analysis, in turn, is a statistical technique directed toward identifying if a set of variables, called indicators, to measure a latent construct or unobserved variable. In factor analysis, the idea behind a latent construct is that its complexity makes its direct observation impossible, and it is necessary to rely on a set of

17. Path analysis is often called causal analysis, but this name is explained more by the relationships hypothesized by the researcher than by the statistical outcome of the technique. This technique tests the significance of the correlation matrix of the data, given the models specified and compared by the researcher, and which must be supported on firm theoretical grounds and previous research (Schumaker 2004; Kline 2005; Garson 2008).

indicator variables to infer its behavior. In our case, a confirmatory factor analysis example would be just the relationship between the latent capability and its corresponding indicators, without the exogenous causes. These two techniques, path analysis and confirmatory factor analysis, share the basic assumption that the model specified and tested by the researcher must be firmly grounded in theoretical and previous research assumptions (Schumaker 2004).

Contrary to factor analysis, MIMIC modeling allows for the inclusion of a set of observed variables as exogenous causes of the latent construct. In this sense, the latent construct can be depicted as an intervening variable between the exogenous causes and the observed indicators, as path analysis does but only with observed variables. Similar to path analysis and factor analysis, MIMIC modeling is confirmatory rather than exploratory as it assumes that the relations between the indicators, the exogenous causes, and the latent variables are supported by theory and previous research.

Capabilities are the set of choices from which each individual chooses to achieve certain levels of welfare in each dimension of human life. These Capabilities are determined by individual and contextual characteristics, and in turn, they determine the achieved welfare or deprivation of an individual (functioning achievement) in the given dimension. It must be noted that different functioning levels can be associated with the same level of freedom or capability; as each individual may or may not choose to exercise their individual agency in achieving a given level of wellbeing. Nevertheless, from a capability perspective, the fact that there is freedom to choose is what constitutes real development (Sen 1990, 1999). For instance, in the case of knowledge: two persons A and B may have the possibility to study at a public or private university to achieve a

professional level of education. After five years A graduated and B did not. It is clear then that although both enjoy the same capability set, their choices differ, and their level of achieved welfare or functioning varies too. In this case, individual A chose to exercise his/her freedom by graduating while individual B chose a different option.

From an empirical perspective, assessing how much freedom a person enjoys, when deciding which level of welfare or functioning achievement he or she wants, represents a major task. The Capability set is determined by the interaction of a wide range of aspects, and modeling such complexity requires a sophisticated methodology. ‘Latent Variable Modeling’, from which Multiple Indicators Multiple Causes (MIMIC) modeling is part, has shown itself to be a useful tool in this matter (Kuklys 2005, Di Tommaso 2007, Krishnakumar 2007).

As mentioned above, the aim of MIMIC modeling is to estimate the relationship between a set of exogenous variables (e.g. gender, ethnicity, poverty, etc.) one or more unobserved variables called “latent” (e.g. Knowledge Capability), and one or more indicators (e.g. years of education, literacy, practical education, etc). Both, the exogenous causes and the set of indicators are observed variables. Hence, the set of exogenous variables influence the latent construct; and in turn, the latent variable influences the indicators. This is accomplished by the analysis of covariance structures between the different variables endogenous and exogenous, and the latent construct. Thus, it is clear

that there is need of a high correlation between the variables, although not as high as to not allow the estimation of parameters¹⁸.

Given its robustness in relation to regression, path analysis, and factor analysis techniques, MIMIC modeling is a suitable methodology to implement the Capability Approach. Specifically, the use of MIMIC modeling to estimate the ‘Shelter’ and ‘Knowledge’ Capabilities is justified because Capabilities are the set of choices from which an individual selects what he or she wants to achieve in a given point in time. What a person manages to ‘be’ or ‘do’ at that point is a functioning or achieved welfare (e.g. elementary school), but that level of achieved welfare is not saying much about the freedom that person enjoyed--the choices he or she had in the Capability set--when achieving a specific level of welfare in the given dimension. Individual capabilities are very complex constructs that do both influence and are influenced by a wide range of aspects. This complex nature of Capabilities makes almost impossible to observe them directly. By modeling capabilities as unobserved constructs in a MIMIC model, it is possible to account for both the factors determining the set of choices or the freedoms a person enjoys, and the functioning achievement that they attained given that capability set. In this case, by assessing the ‘Knowledge Capability’ as a latent construct in a MIMIC model it is possible to account for the influences that variables such as gender or ethnicity has over the Capability Set, while at the same time it is possible to identify the impact on the realized welfare of an individual given a unit change in the Capability Set.

18. There is not clarity regarding the impact that the lack of independence between explanatory variables, that is Multicollinearity, would have in the estimation of Structural Equation Models. Some authors have argued this is a robust approach in the presence of such, yet research on this area is still very incipient (Grewal et. Al. 2004).

The next table shows the different variables and dimensions used to apply to this scholarly study. It identifies the set endogenous indicators and exogenous causes linked to the latent constructs. For instance, the set of exogenous causes (e.g. gender, ethnic membership, being poor, etc.) influence the knowledge capability or the freedom a person enjoys when deciding which level of knowledge he or she wants to have. In turn, the latent capability is inferred by a set of indicator variables such as achieved years of education, which would reflect changes in the capability dimension. Thus, when there is a factor constraining the freedom to choose the knowledge level an individual wants to achieve, this would be reflected in lower outcomes in the given dimension. This proposition has an intuitive meaning since it is logical to expect that in a given dimension of human welfare, lower outcomes are associated with lower levels of freedom or less options to choose the life one wants. In addition, the two dimensions of human welfare analyzed here were chosen for both their intrinsic and instrumental value as they are widely recognized as important dimensions to promote human development and individual welfare. The knowledge capability, for instance, represents the possibility of being educated given certain individual and environmental characteristics such as age, gender, race, marital status and the availability of institutional arrangements that allows people to increase their critical thinking abilities. This capability is translated into the functioning space as having more years of education or more practical on the job training. Finally, being properly sheltered is not only an integral part of human wellbeing, but also an instrumental factor contributing to health outcomes. Living in an overcrowded environment, a lack of drinking water, and unsafe construction materials are factors highly correlated with a number of health deficiencies. Furthermore, there is a high

correlation between each dimension and other dimensions of human welfare not analyzed as each capability is analyzed separately. However, given the exploratory character of this study, and the lack of pertinent data these interactions are not analyzed here. This exercise constitutes a much larger and complex future study.

Table 5 Variable Description and Measurement

Latent Variables or 'Capabilities'	Functionings or Achieved Wellbeing (Observed Indicators)	Variable Measurement	Individual Characteristics (Exogenous Causes of Capabilities)	Variable Measurement	Household Characteristics (Exogenous Causes of Capabilities)	Variable Measurement
Shelter	Dwelling Conditions of the Household	Categorical Variable (-1=low/0=middle/1= high quality)	Age	Discrete	Risk (Household locate in a risk zone flooding, landslides , overflow, geological faults, etc)	Dichotomous (1=yes/0=no)
	Basic Services Conditions (Electricity, water, waste management and sanitary infrastructure)	Categorical Variable (-1=low/0=middle/1= high quality)	Gender	Dichotomous (1=Male/0=Female)	Area	Dichotomous (1=Rural/0=Urban)
	Overcrowding (More than three persons per room)	Dichotomous (1=yes/0=no)	Female Head of Household	Dichotomous (1=yes/0=no)	Famishing (Not having at least one out of three meals a day given monetary constraints)	Dichotomous (1=yes/0=no)
Knowledge	Illiteracy	Dichotomous (1=yes/0=no)	Ethnicity	Categorical (1=Non/2=Afro/3=Indigenous)	Crime Victim (Last twelve months)	Dichotomous (1=yes/0=no)
			Civil Status	1=Married/2=Widowed/3=Divorced/4=single	Income Decile	1 to 10
	Finished Years of Educations	Ordinal	Being Poor (LP)	Dichotomous (1=yes/0=no)	Disaster (Household victim of natural disasters)	Dichotomous (1=yes/0=no)
	Technical education for work	Dichotomous (1=yes/0=no)	Working status	Dichotomous (1=yes/0=no)	Property of the House (own, rent, hypothecc)	Dichotomous (1=yes/0=no)

The estimation of a MIMIC model is made up of two parts: First, the measurement model, which links each “Capability” (‘Knowledge’ and ‘Shelter’) to its corresponding set of indicators or observed variables (e.g. years of education for the ‘Knowledge Capability’). This relationship is explained by factor loadings or validity coefficients that tell the extent to which a given indicator is able to measure the corresponding latent variable. Factor loadings have a similar interpretation to that of a beta weight in regression analysis¹⁹, thus, a standardized factor loading would tell us how much an indicator would change, given a one unit change in the latent construct. In addition, each indicator includes a measurement error that explains the portion of the indicator that is measuring something else, other than what the latent variable is supposed to measure. Second there is the structural part of the model that represents the relationships between the latent construct and the exogenous causes. Such relationships are also explained by factor loadings, which in this case illustrate the change in the particular “Capability” given a unit change in a specific exogenous cause (e.g. race), holding the rest of variables constant. In the structural part of the model, the exogenous variables are assumed to be free from measurement error, but each latent capability has an associated disturbance term, which is supposed to measure the unexplained variance of the latent variable due to omitted causes (Bollen and Davis 2009; Schumaker and Lomax, 2004).

Following Bollen and Davis (2009) notation the MIMIC model for both the ‘Knowledge’ and ‘Shelter’ Capabilities is formally represented as follows:

19. In regression analysis beta weights are the regression coefficients estimated from the standardized data, and are used to compare the relative importance of the different explanatory variables. A beta weight expresses the average change in the dependent variable when the independent variable changes one standard deviation from its mean, holding all other independent variables constant or at their means (Garson 2008, 2009).

$$\eta = \Gamma x + \zeta \quad (1)$$

$$y = \Lambda_y \eta + \varepsilon \quad (2)$$

Where (1) represents the structural part of the model that depicts the relationships between each latent capability η (Knowledge and Shelter) and the exogenous variables (e.g. race, age, marital status); Γ is the matrix of factor loadings (beta weights) and ζ is the vector of disturbances. This equation measures the impact exogenous variables such as gender or race have on each capability dimension, while the disturbance term captures the portion of the capability that is not being explained by those variables. Equation (2) is the measurement part of the model that depicts the relationships between the latent variable η and each of its corresponding indicators y 's. These relationships are explained by the corresponding matrix of factors loadings Λ_y that give the expected change in the indicators, given a unit change in the latent variable. For instance, if the Knowledge Capability (the freedom an individual has to attain a given level of knowledge) is contracted given a unit change in one of the external causes, the indicator variables (e.g. years of education) would be reduced as to reflect such a reduction in the latent construct. Finally, ε gives the measurement error term for each indicator variable, which accounts for the portion of the indicators that are measuring something else other than the latent construct.

The measurement part of the model (2), takes into account the different indicator metrics. As there is a combination of continuous, categorical and dichotomous variables there is a need to specify non linear relationships when either a categorical or

dichotomous variable is presented. Hence, if an indicator y_j is measured as a continuous variable, the equation (2) represents directly the relationship with the latent construct. On the other hand, following Muthén (1983, 45) and Krishnakumar and Ballon (2008, 996) the relationship in the measurement model (2) with dichotomous or categorical indicators is best expressed as follows:

- y_{ij} Represents a dichotomous variable in the indicators vector. For instance, living in an overcrowd household or not, where i identifies the individual and j the indicator. The correspondence between the indicator and the latent variable introduces a latent response variable \tilde{y}_{ij} such as that:

$$\tilde{y}_{ij} = \lambda_j y_i + b_j x_{ij} + \varepsilon_i \quad (3)$$

$$\text{Where } \tilde{y}_{ij} = \begin{cases} 0 \\ 1 \end{cases}$$

This means that if \mathcal{Y}_i in (3) in this case represents the latent capability dimension for *shelter* increases, and an individual located in an overcrowded household could move to a non overcrowded household as a result of the increase in the capability dimension; such change is measured as going from $\tilde{y}_{ij} = 1$ to $\tilde{y}_{ij} = 0$, in which case the factor loading λ_j (beta weight) would present a negative sign.

- In the case of an ordered categorical indicator \mathcal{Y}_j with C categories, which will vary from 0, 1 to $C-1$; for instance, years of education, which in our case goes from 0 to 21, we have the next expression:

$$\tilde{y}_{ij} = \lambda_j y_i + b_j x_{ij} + \varepsilon_i \quad (3)$$

Where $\mathcal{Y}_{ij} = C$ for $\tau_{cj} < \tilde{y}_{ij} \leq \tau_{c-1j}$ and $c = 0, 1, 2 \dots C - 1$

$$\tau_{0j} = -\infty \quad \text{and} \quad \tau_{c-1j} = \infty$$

This means that if \mathcal{Y}_i in (3) is changed to represent the latent capability dimension for *knowledge* increases, an individual with say $C=5$ (5 years of education) could increase to $C=6$ or more, as the result of the increase in the capability dimension. Such change is measured as going from $\tilde{y}_{ij} = 5$ to $\tilde{y}_{ij} = 6$, in which case the factor loading (beta weight) would present a positive sign depicting the positive relation between the Capability dimension and the corresponding indicator.

Latent class involves the analysis of variance/covariance structures.²⁰ This means that although latent modeling can analyze means structures in specific models its primary aim is to assess the strength of the relationship between a given set variables and to explain as much as possible their variability (Kline 2005). This analysis is

20. It is possible to have an intuitive meaning of *analysis of covariance structures* if we remember the relations behind the *squared multiple correlation coefficient*, R^2 , in Multiple Regression analysis. The R^2 tells how much variance in Y is explained, predicted and accounted for by the set of explanatory variables X_1 and X_2 . For instance, for one dependent variable and two predictors, the R^2 is:

$$R^2 = \beta_1 r_{y1} + \beta_2 r_{y2}$$

Where β are the beta weights and their formal representation is as follows: $\beta_1 = \frac{r_{y1} - r_{y2}r_{12}}{1 - r_{12}^2}$ and

$$\beta_2 = \frac{r_{y2} - r_{y1}r_{12}}{1 - r_{12}^2}, \quad \text{and} \quad r_{y1}, r_{y2} \quad \text{and} \quad r_{12} \quad \text{are the bivariate correlations among the explanatory and criterion}$$

variables. From here, it is possible to understand that regression analysis estimates a set of parameters (beta weights), from the correlations among the variables, which in turn serve to construct the *squared multiple correlation coefficient* to explain as much variance as possible on Y given the correlation of the set of predictors X. Latent variable models develop this same type of analysis but for latent and intervening variables (combination of path and factor analysis).

accomplished through the estimation of the model implied variance/covariance structure (Σ) composed in our case of three covariance structures, and which is later compare to the sample covariance structure (S), to determine how well the model explains the variability patterns of the data. If the difference between these two structures, the sample and the model implied variance/covariance terms, is small enough; the model is say to be a reasonable depiction of the phenomenon analyzed, and inference would be reliable.

The first two variance/covariance terms we need to define are, one for the exogenous variables, denoted as Φ , and one for the disturbance terms, denoted as Ψ , as follows:

$$\Gamma\Phi\Gamma' + \Psi \quad (5)$$

This expression represents a matrix array of variance/covariance terms that measure the strength of the relationship between the set of exogenous variables (e.g. gender, race, marital status and region) plus the variance of the disturbance term, which as mentioned above is the portion of variance of the latent construct that is not explained by the set of exogenous variables.

Second, from the measurement model we have the variance/covariance term of the measurement errors, denoted as Θ . These are the terms that designate the portion of the indicator variables that are measuring something else other than the associated latent capability and this matrix represent the covariance among them.

Finally, with the above two expressions it is possible to construct the overall covariance structure of the specified model (Σ):

$$\Sigma = \Lambda_y (\Gamma \Phi \Gamma' + \Psi) \Lambda_y' + \Theta_\varepsilon \quad (6)$$

This structure is the general expression of the variance/covariance term for the MIMIC model of latent Capabilities. After this structure has been estimated, it is compared to the variance/covariance structure of the sample, and if the difference is close to zero the model presents a good fit, and allows the make reasonable inference from the phenomenon at hand.

In addition, the following stochastic assumptions must be met in order to estimate the model:

$$E(\zeta) = 0, \quad \text{Expected value of disturbance must be zero}$$

$$E(\varepsilon) = 0, \quad \text{Expected value of measurement error must be zero}$$

$$Var(\varepsilon) = \Theta, \quad \text{Variance of } \varepsilon \text{ must be } \Theta$$

$$Var(\zeta) = \Psi, \quad \text{Variance of } \zeta \text{ must be } \psi.$$

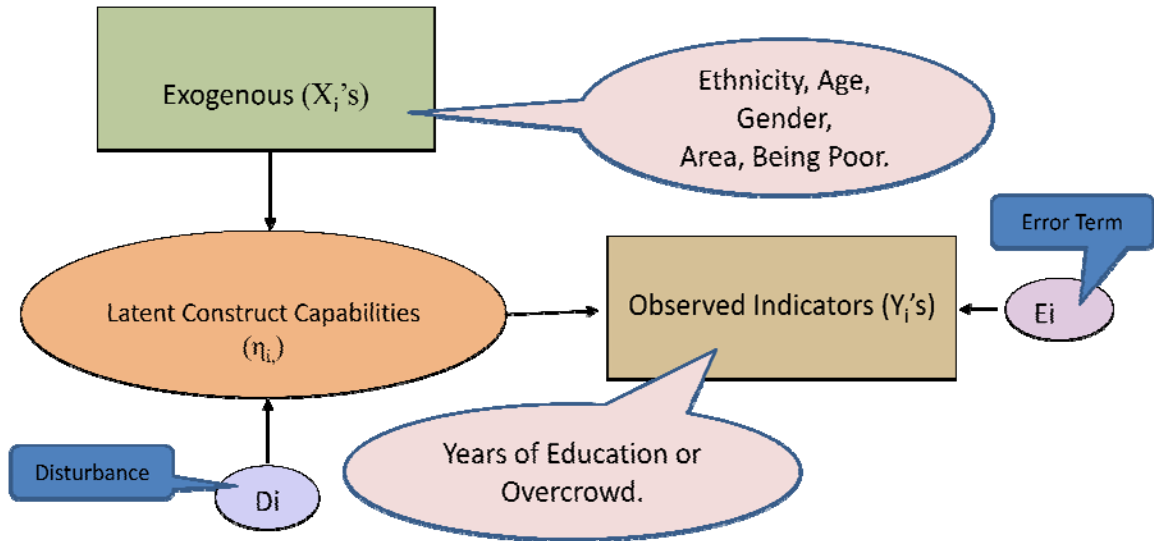
Concretely, the estimation of a MIMIC model implies that the previous set of variance/covariance structures allow for the estimation of a set of parameters that denote the relationship between a given set of variables, similar to beta weights in regression analysis. Once these parameters are estimated from the specified model, a sample variance/covariance structure is composed and is compared to the population matrix to

assess the extent to which the model specified by the researcher fits the data and allows one to make reasonable inferences.

Path Diagram for MIMIC Model of Latent Capabilities

By academic consensus, latent variable models are expressed graphically using path diagrams, which is also a more pedagogical approach to the understanding of this type of theoretical model. Their general aim is to show graphically the causal relationships between the variables in a given model. Path diagrams have several rules or customary representations: Firstly, latent variables are represented with circles or ellipses; secondly, exogenous causes and observed variables are represented as squares; thirdly, disturbances from the latent constructs and errors from the observed variables are drawn as small circles; and finally, arrows depict causal relationships. A one-headed arrow expresses a one way causal relationship and a two-headed arrow expresses a reciprocal relationship between any pair of variables.

Figure 1 Path Diagram for a general MIMIC model



This path diagram describes the relationships modeled in a MIMIC model of latent Capabilities. It is argued that the exogenous variables are influencing the Latent Capability, and at the same time the latent Capability determines the welfare a person is able to achieve in the given dimensions, for instance, achieved level of education. In addition, the error term E_i gives the portion of the indicators that are measuring something else other than the corresponding latent construct, while the disturbance term gives the portion of the latent Capability that is not caused by the exogenous variables.

Chapter 5. Results

Integrating the theoretical approach and the statistical method, one can now present the estimated results and their corresponding analysis. The next chart shows estimated results for the factor loadings of the structural model for the knowledge capability. These factor loadings composed the matrix B in equation (1), and estimate the relationship between the exogenous causes and the latent construct. In other words, they estimate the influence that personal and household characteristics have over the freedom a person enjoys in achieving the level of knowledge he or she wants.

In addition, it is important to note that the sample size for this analysis is reduced from 85.145 individuals to 77.369 individuals given that there is not information on education for children under five years old. Also, as it was mentioned above, for practical reasons, just the significant parameters at the 0.01 and 0.05 critical level are presented.

Table 6 MIMIC model of Knowledge Capability Achievement: Factor Loadings of the Structural Model

Exogenous Causes	Capability Dimension		
	Knowledge		
	Standardized C.	U. Coefficient	S. Error
Gender	-0.0853	-0.083	0.00315
Ethnic	-0.0368	-0.358	0.00276
Poor	-0.2721	-0.2648	0.00305
Urban/Rural	-0.2432	-0.2367	0.00272
Working	0.3232	0.3145	0.0303
Famishing	-0.0327	-0.0318	0.00282

The table presents the standardized coefficient and the unstandardized coefficient with its corresponding standard errors (standardized coefficients do not have standard errors). For comparison purposes the standardized coefficients are commonly used. They are interpreted in a similar manner to regression coefficients. For instance, all other things being equal, a statistically significant negative coefficient on a dichotomous indicator implies a lower mean value of the knowledge capability for the groups identified by the exogenous indicator (Harrington 2009). The results for the MIMIC model of the knowledge capability show that the variables with higher explanatory power are, being poor, area and working status, with factor loadings of -0.2721, -0.2432 and 0.3232 respectively. Here, a factor loading of -0.2721 indicates that a one unit change, which means going from non poor to poor, produces -0.2721 standard units of change from its mean in the latent factor when controlling by the rest of explanatory variables. Then, being poor and being in rural areas reduce significantly the freedom a person enjoys when choosing the level of knowledge he or she wants to attain; while working status has the contrary effect.

The factor loading for ethnic membership, although it is low, is statistically significant at the 0.05 alpha level, and implies that when holding all other variables constant, Afro-Colombian (and Indigenous) people would have a lower freedom for achieving the knowledge they want in relation to the reference group: non Afro-descendants. This can be expressed by saying that being black or indigenous is an individual characteristic that by itself reduces the set of choices people have. Furthermore, if the negative impact of being located in rural areas is summed up to

indicate negative influence of ethnic background, it is possible to observe that the vulnerability of peoples of African descent is endemic.

In addition, it is important to highlight the negative impact that gender has on the knowledge capability. If one recalls from table 4 that gender is measured as a dichotomous variable with 1 being male and 0 being female; the negative coefficient implies that males have lower capability achievement than females. This could be explained by the fact that in Colombia school enrollment rates for girls are higher than that of boys, which could be due to the nature and magnitude of child labor in the country. Boys are usually sent into the labor market at an earlier stage of their life than girls. However, gender bias is still strong, but is more easily detected in the intra-household distribution of chores, and labor markets studies where income gaps persist between males and females.

Subsequently, we present the results obtained for the measurement part of the model (2) that depicts the relation between the latent construct and its corresponding indicators. The chart below illustrates the relationship between the latent knowledge capability and its functioning indicators assessed by the corresponding factor loadings. Again standardized coefficients are analyzed for comparison purposes.

Table 7 MIMIC Model of Knowledge Capability Achievement. Factor Loadings for the Measurement Model

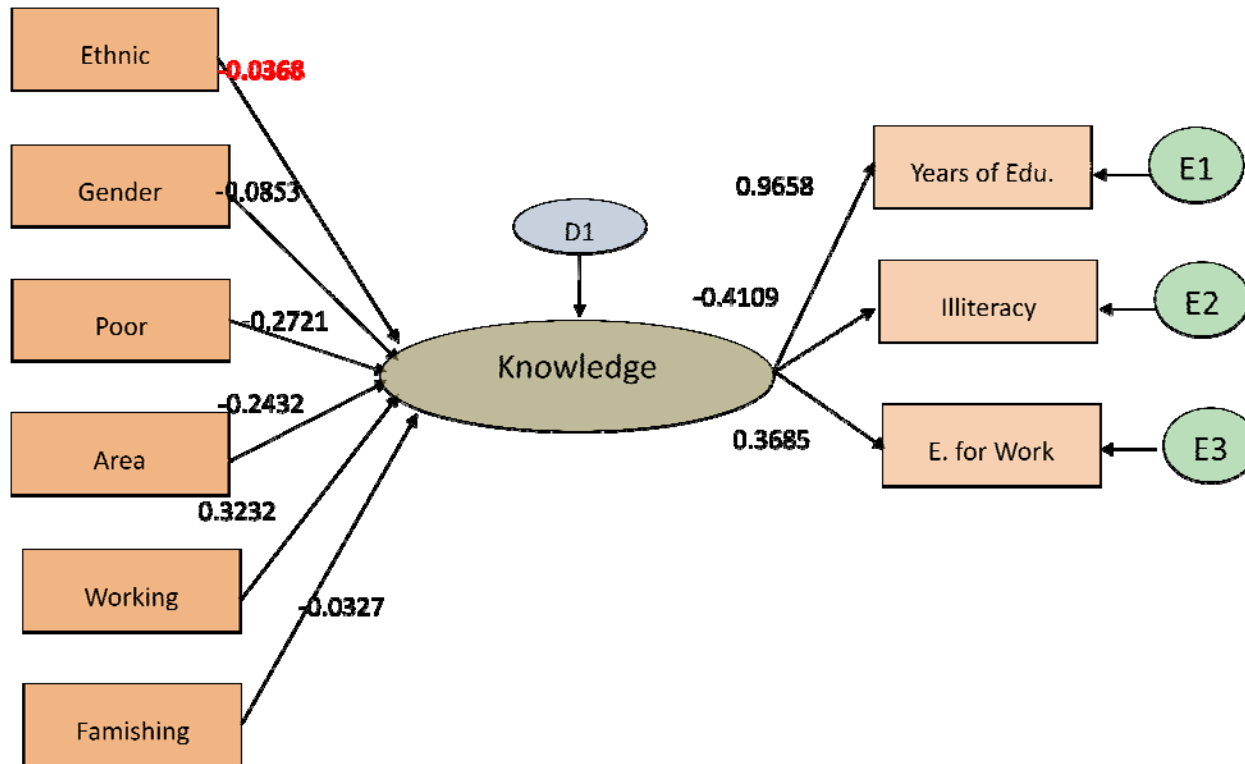
Knowledge Capability	Standardized C.	Coefficient	S. Error
Years of Education	0.9658	1.0	
Illiteracy Rates	-0.4109	-0.4222	0.0059
Technical Edu. For Work	0.3685	0.3787	0.00529
R2	0.3184		

In this case what these loadings tell us is the standard unit change of the indicator variable from its mean for each unit change of the latent construct. For instance, when there is an increase in the knowledge capability by finding a job or moving to urban areas—as the results explained before show—the achieved years of education would increase in 0.95 standard units from its mean. However, the contrary holds true also; if being a member of an ethnic minority decreases the freedom a person enjoys in attaining certain levels of knowledge, achieved years of education would be consistently lower in this segment of the population as it has been the case historically for Afro-Colombians. Given the observed indicators in the case of the Illiterate rates the sign of the coefficient is consistent with the metric of the variable as this measures illiteracy as 1 and literacy as 0. Thus, an increase in the knowledge capability would decrease illiteracy by 0.4109 standard deviations from its mean, all others being constant. In this case, these results show that the freedom Afro-descendants enjoy in choosing their knowledge level has been historically lower than that of mestizos and whites. Not just for the fact of being poor as has been traditionally argued, but also for the fact of being black. They have been unable to attain higher levels of education as the result of cumulative effects of poverty and racial discrimination.

When fitting a statistical model to a data set it is important to analyze how appropriate the fit statistics are, which tells the degree to which the model specified by the researcher is representing the given data properly (Schumacker and Lomax 2004). For this model fit indices appear well behaved, with the exception of the χ^2 index, which is too large. However, many authors have pointed out that a combination of reasonable

indices by other measures allow one to pass over this chi squared as it is very sensitive to large sample sizes, which is the case with this example. The rest of indices perform reasonably well, which means that they are in the thresholds defined by the literature on this type of model. For instance the Root Mean Square Error of Approximation (RMSEA) is 0.0443 (RMSEA<0.06); Confidence limits for RMSEA are 0.0410-0.0443. The Comparative Fit Index (CFI) is 0.9819 (CFI>0.95); McDonald's (1989) measure of centrality is a fit index t-scaled to call between 0 and 1 (the closer to one the better fit the model has), and in our case is 0.9882. The Normed Fit Index (NFI) is 0.9818 (NFI>0.95). In sum, the usefulness of fit statistics illustrates that the MIMIC model for the knowledge capability is appropriate for the data, and allows one to assure that the inference made regarding the impact, that the set of exogenous variables on the knowledge capability has, is reliable enough; including the analysis made on the basis of the negative impact that ethnicity membership has over the given capability. The next path diagram (see literal C, chapter IV) illustrates the relationships identified in the MIMIC model for the knowledge capability, which were explained by the previous analysis of factor loadings.

Figure 2 Path Diagram for the Knowledge Capability



As for the results of the structural part of the MIMIC model for the Housing Capability, the next table shows the factor loadings of the structural model or the relationships between the latent construct and its causal factors. Similar to the knowledge capability, standardized coefficients (which have no standard errors) and non standardized coefficients with their corresponding standard errors are shown.

Table 8 MIMIC model of Housing Capability Achievement Factor Loadings of the Structural Model

Exogenous Causes	Capability Dimension		
	Housing		
	Standardized C.	Coefficient	S. Error
Ethnic	-0.1696	-0.1561	0.00307
Poor	-0.0398	-0.0367	0.00441
Deciles	0.259	0.2716	0.00512
Area	-0.5658	-0.5209	0.00478
Risk	-0.127	-0.1169	0.0029

Similarly to the interpretation of the factor loadings of the exogenous variables on the knowledge capability, all the coefficients are significant at 0.01 alpha level, but the coefficient for the poor variable becomes significant at the 0.05 alpha level. What is possible to observe here, is that all coefficients have significant impact over the latent capability, and the variable which has the higher explanatory power is the variable area, which is measured as 0 for urban and 1 for rural areas (see table 4). Area has a standardized factor loading of -0.5658 which means that, when holding all other variables constant, going from urban to rural changes the housing capability negatively -0.5658 standard units from its mean. This is not surprising since our indicators are mainly indicators that refer to infrastructure; not only private infrastructure but also public ones,

and rural areas have a significant backwardness in relation to urban areas in terms of infrastructure. The second explanatory variable with high factor loading is income deciles. This is also not surprising since this capability is highly correlated with the availability of economic resources—the higher the decile the better the infrastructure available. The coefficient for the variable risk, which expresses the location of a household in a geographical area vulnerable to natural disasters, presents a logical result. Thus, being located in a risk zone decreases the housing capability by 0.127 standard units from its mean, when holding all the other variables constant.

However, what is more important is the size, sign and significance of the coefficient for ethnic background, which implies that when holding all other variables constant, going from non Afro-descendant to Afro-descendant decreases the housing capability in -0.1696 standard units from its mean. These results suggest that after weighting the impact that being poor (having lower income) and being located in rural areas have over the freedom a person enjoyed in achieving his or her valued level of knowledge and shelter, there is still a persistent negative impact associated with the ethnic background of the individual. Afro-descendants have consistently lower freedom in choosing the levels of welfare they want and have reason to value in both the housing and knowledge dimensions; not only for their condition of poverty and their mainly rural location, but also because they are black.

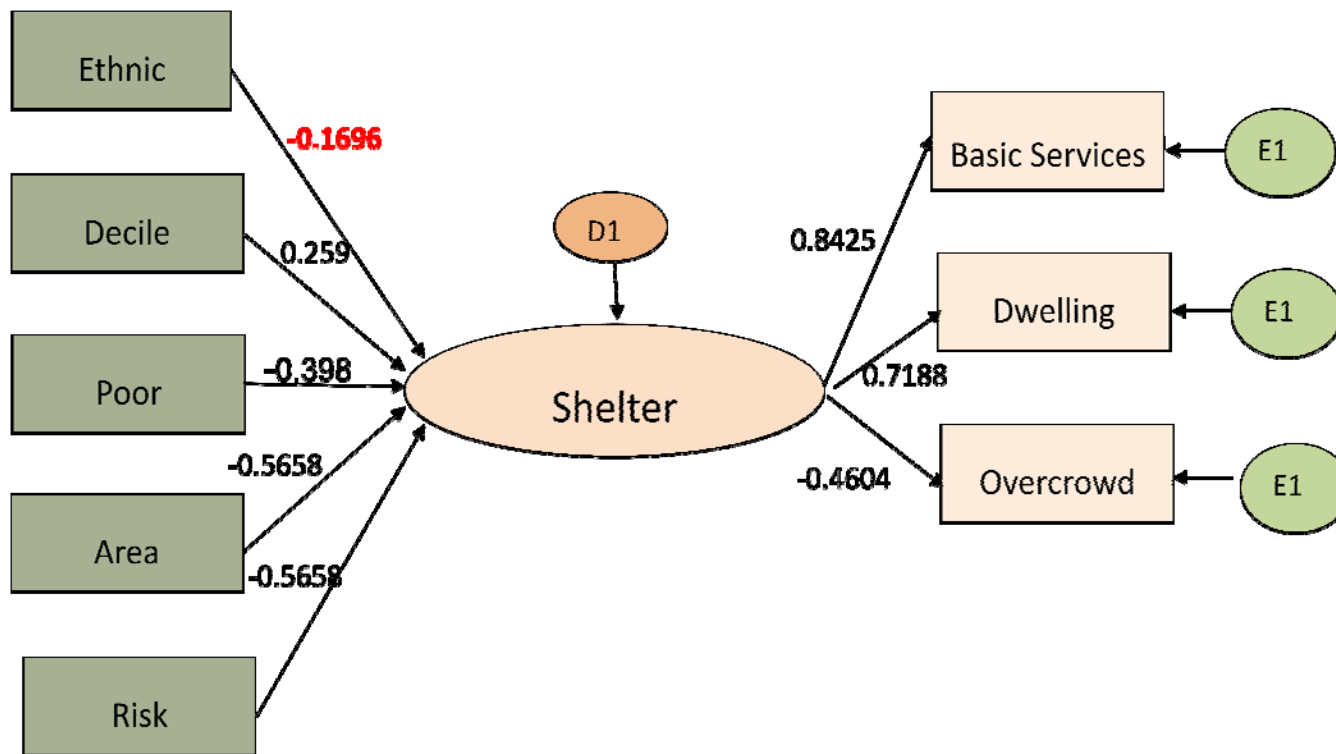
Similarly to the results presented for the knowledge capability, table eight shows the results for the measurement model part of MIMIC for shelter capability.

Table 9 MIMIC Model for Shelter Capability Achievement. Factor Loadings for the Measurement Model

Housing Capability	Standardized C.	Coefficient	S. Error
Basic Services	0.8425	0.9150	0.00693
Dwelling	0.7188	0.7807	0.7807
Overcrowd	-0.4604	-0.5	
R2	0.7249		

The factor loadings or standardized coefficients for the measurement part of the MIMIC model for the housing capability show that an increase of one standard unit in the housing capability would increase the availability of basic services by 0.8425 standard units from its mean. Thus, if an individual moves from rural to urban areas or from risk zones to zones free from risk of natural disasters, his or her capability or freedom to attain higher levels of welfare in the housing dimension increases. Whereas the loading for overcrowding depicts the opposite relation, that an increase in the housing capability by one standard unit would have a decrease in the overcrowding variable of -0.4604 standard deviations from its mean. Hence, having more space or less people living in the same household would determine higher levels of achieved welfare in the shelter dimension. Finally, the next diagram depicts the relationships estimated by the model.

Figure 3 Path Diagram for the Shelter Capability



In addition, as the R^2 for this model is higher showing a highly explanatory power, one has the result that the fit indexes reflect such power. The RMSEA is equal to $0.01008 < 0.06$; CFI equal to $0.9921 > 0.95$; NFI equal to 0.9920 . McDonald's (1989) is equal to 0.9504 and NFI equal to 0.9920 .

To summarize, it is possible to observe that after controlling by relevant individual, household and external factors such location, the coefficient for ethnic membership is significant and negative. This implies that at any average level of the knowledge and shelter capability dimensions, Afro-descendants in Colombia enjoy less freedom in achieving a wanted quality of life. Also, it is important to highlight that, after having included outcome variables from a social mobility perspective such as working status and being poor as exogenous causes of capabilities, ethnic background continues to be significant. This suggests that in fact there is a component in welfare analysis of racial gaps in Colombian that cannot be assessed from class disparity approaches and their specific concentration on income-based measures. This is paramount to saying that from a Capability Approach perspective, individual freedoms for Afro-Colombians are being constrained by race-based discrimination. Consequently, it is their freedom and agency which must be enhanced and not merely through the access to resources that they have. This is not to deny the importance and instrumentality that the command over resources has in supporting the achievement of welfare. What is really important is to support the argument that there are other aspects of welfare that cannot be accounted for solely by income and resource access measures (Robeyns 2003). Finally, although one cannot identify the specific causal mechanisms by which race-based discrimination is taking

place, these results, also support the argument that more reliable and systematical collection of data of ethnic and racial minorities across dimensions is needed.

Chapter 6. Conclusions

For Sen (1999), poverty can be a ‘trap’ in which those who do not have access to education, health and food, are unable to overcome their precarious circumstances. Also, Duncan (1969) argues that poverty is not a phenomenon that affects different social groups alike; on the contrary, historically marginalized social groups are affected in greater proportions by lack of access to resources such as education, health and employment opportunities. Specifically, this author argues that: “...Negroes are poor mainly because they are ‘Negroes’ and are defined and treated as such by our society and their poverty stems largely not from the legacy of poverty but from the legacy of race” (p. 87). Consequently, black people have less possibility to prevail over conditions of poverty and exclusion because social practices of racial discrimination persist and are rooted in every day social interaction. Furthermore, racial discrimination prevents the achievement of welfare not only to those below poverty lines, but also to those who are not under considered poor by income poverty measures.

From this perspective, the descriptive analysis of this study in conjunction with the results of the empirical application of the Capability Approach, suggest that racial discrimination plays an important role in limiting Afro-descendants capabilities or individual freedom. Although, cumulative effects of class disparities play a major role in determining their lower outcomes as the loadings for the poor and the income decile variable shows; cumulative effects of racial discrimination are taking place as well, as

suggests by the factor loading of the ethnic variable. Furthermore, the analysis of group disparities based merely on social stratification theories that uses income-base measures as their main explanatory variable is hindering the political debate regarding the impact that racial discrimination have on individual welfare. Furthermore, this analysis is also misguiding the design and implementation of public policy toward the mere increases of resource access. Wider considerations regarding human flourishing are not considered. For instance, political participation on an equal basis, the importance of commanding social respect on the basis of one's citizenship and the possibility to claim justice when one's rights are violated are important missing aspects of the evaluation of Afro-descendants welfare. These missing aspects cannot be properly account for by standard analysis of welfare measured as income levels.

As a consequence, the multidimensional nature of the Capability Approach calls for the recognition and analysis of racial discrimination as a separate dimension when assessing human welfare of individuals member of ethnic and racial minorities, in this case of Afro-Colombians. This inclusion would result in more accurate design of public policy toward the expansion of freedoms and not just of resource access. From this perspective, the social and political denial of the very existence of the phenomenon is limiting the collection of relevant data and the design of relevant public policy directed to address it. Thus, a good starting point toward the expansion of Afro-Descendants freedom in Colombia would be end of the state of denial in which the society has lived regarding the existence of racial discrimination and the major role that it has played in the marginalization of this group. In addition and on urgent basis, more emphasis must be placed on the judicial and legal enforcement mechanisms to prevent and punish racial

discrimination practices. Without them, the guarantee of basic and constitutional rights for Afro-Colombians is an unreachable goal, and they would continue living as an underclass in the midst of modernity.

References

- Alkire, S. 2005. *Valuing freedoms: Sen's Capability Approach and Poverty Reduction*. Oxford University Press, USA.
- Anand, S., and A. K Sen. 1994. *Human Development Index: Methodology and Measurement*. United Nations Development Programme (UNDP).
- Andrews, George Reid. 2004. *Afro-Latin America, 1800-2000*. Oxford University Press US.
- Arndt, C., H. Strotmann, and J. Volkert. Dynamic Aspects of Capability Deprivation on the micro-level an Empirical Esessment for Germany using the SMOP Method.
- Arocha, J. 1998. Inclusion of Afro-Colombians: Unreachable National Goal? *Latin American Perspectives*: 70–89.
- Ballet, J., J. L Dubois, and F. Mahieu. 2007. Responsibility for Each Other's Freedom: Agency as the Source of Collective Capability. *Journal of Human Development-Basingstoke*- 8, no. 2: 185.
- Barbary, O., H. F Ramirez, and F. Urrea. 2002. Identidad y ciudadanía Afro-Colombiana en la región Pacífica y Cali: Elementos estadísticos y sociológicos para el debate de la 'cuestión negra' en Colombia. *Estudos Afro-Asiáticos*.
- Bello, Á, and M. Rangel. 2002. La equidad y la exclusión de los pueblos indígenas y Afro-Descendientes en América Latina y el Caribe. *Revista de la CEPAL* 76: 39–54.
- Bharadwaj, A. S, V. Sambamurthy, and R. W Zmud. 1999. IT capabilities: theoretical perspectives and empirical operationalization. In *Proceedings of the 20th international conference on Information Systems*, 378–385.
- Grewal, Rajdeep, Joseph A. Cote, and Hans Baumgartner. 2004. Multicollinerarity and Measurement Error in Sitructural Equation Model: Implications for Theory Testing. *Journal of Marketing Science* 23(4), 519-529.
- Bhattacharya, J. Analyzing Women Well-being Data with a MIMIC Model: A District-level study in West Bengal, India.

- Bollen, K. A, and W. R Davis. 2009. Causal Indicator Models: Identification, Estimation, and Testing. *Structural Equation Modeling: A Multidisciplinary Journal* 16, no. 3: 498–522.
- Clark, D. A. 2005. The Capability Approach: Its Development, Critiques and Recent Advances. *Global Poverty Research Group*: 3.
- Consultoria para los Derechos y el Desplazamiento (CODHES). 2008. Afrocolombianos Desplazados. Un Drama sin Tregua.
http://www.codhes.org/index.php?option=com_content&task=view&id=157
- Cohen, G. A. 1993. Amartya Sen's Unequal World. *Economic and Political Weekly* 28, no. 40 (October 2): 2156-2160.
- Comim, F. 2001. Operationalizing Amartya Sen's Capability Approach. Paper presented at the Conference Justice and Poverty: Examining Amartya Sen's Capability Approach, 5-7 June, Cambridge, United Kingdom.
- CONPES. 2004. *3310 de 2004 - Política de Acción Afirmativa para la Población Negra o Afro-Colombiana*. DNP.
- Cossio, F. V, P. Murillo, P. M.M Zapata, M. E.B Rendón, E. R Ariza, S. General, M. M Bohórquez, et al. Documento Propuesta para la Formulación del Plan Integral de Largo Plazo Población Negra/Afro-Colombiana, Palenquera y Raizal.
- DEFINICIONES, O. Y. 1991. La Ley 70 de las Comunidades Negras. *América Negra*: 197.
- Deneulin, Séverine. 2006. *The Capability Approach and the Praxis of Development*. Basingstoke [England]: Palgrave Macmillan.
- Deneulin, Séverine, Mathias Nebel, and Nicholas Sagovsky. 2006. *Transforming unjust structures*. Springer, July 19.
- Di Tommaso, M. L. 2007. Children Capabilities: A Structural Equation Model for India. *Journal of Socio-Economics* 36, no. 3: 436–450.
- Duncan, D. O. 1696. Inheritance of Poverty or Inheritance of Race? in Moynihan, D. P. and C. S. Schelling (eds.). 1969. *On understanding poverty; perspectives from the social sciences*. New York, Basic Books.
- Escobar, A. 2003. Displacement, Development, and Modernity in the Colombian Pacific. *International Social Science Journal* 55, no. 175: 5–5.
- Evans, P. 2002. Collective Capabilities, Culture, and Amartya Sen's Development as

- Freedom. *Studies in Comparative International Development (SCID)* 37, no. 2: 54–60.
- Garson, D. 2008. Path Analysis. From *Statnotes: Topics in multivariate Analysis*. Retrieved March 25, 2009. <http://faculty.chass.ncsu.edu/garson/PA765/path.htm>
- Gasper, D. 2004. *The Ethics of Development*. Edinburgh University Press Edinburgh.
- Gerring, John. 2001. *Social Science Methodology*. Cambridge University Press.
 ———. 2007. *Case Study Research*. Cambridge University Press.
- Grace Miller, M. 2004. *The Rise and Fall of the Cosmic Race. The Cult of Mestizaje in Latin America*. University of Texas Press.
- Harrington, D. 2008. *Confirmatory Factor Analysis*. Oxford University Press.
- Hicks, D. A. 2002. Gender, Discrimination, and Capability: Insights from Amartya Sen. *The Journal of Religious Ethics*: 137–154.
- Hogan, D. P, and D. L Featherman. 1977. Racial stratification and socioeconomic change in the American North and South. *American Journal of Sociology* 83, no. 1: 100.
- Jöreskog, K. G, E. B Andersen, P. Laake, D. R. Cox, and T. Schweder. 1981. Analysis of Covariance Structures [with Discussion and Reply]. *Scandinavian Journal of Statistics*: 65–92.
- Jöreskog, K. G, and A. S Goldberger. 1975. Estimation of a Model with Multiple Indicators and Multiple Causes of a Single Latent Variable. *Journal of the American Statistical Association*: 631–639.
- Kakwani, N., and J. Silber. 2008. Introduction: Multidimensional Poverty Analysis: Conceptual Issues, Empirical Illustrations and Policy Implications. *World Development* 36, no. 6: 987–991.
- Kline, Rex B. 1998. *Principles and Practice of Structural Equation Modeling*. Methodology in the social sciences. New York: Guilford Press.
- Krishnakumar, J. 2007. Going Beyond Functionings to Capabilities: An Econometric Model to Explain and Estimate Capabilities. *Journal of Human Development* 8, no. 1: 39–63.
- Krishnakumar, J., and A. L Nagar. 2008. On Exact Statistical Properties of Multidimensional Indices based on Principal Components, Factor Analysis, MIMIC and Structural Equation Models. *Social Indicators Research* 86, no. 3: 481–496.

- Krishnakumar, Jaya, and Paola Ballon. 2008. Estimating Basic Capabilities: A Structural Equation Model Applied to Bolivia. *World Development* 36, no. 6 (June): 992-1010.
- Kuklys, W. 2005. *Amartya Sen's Capability Approach: Theoretical Insights and Empirical Applications*. Springer Verlag.
- Lasso, Marixa. 2007. *Myths of harmony. Race and Republicanism during the Age of Revolution, Colombia, 1795-1831*. University of Pittsburgh Press.
- Majumdar, M., and S. Subramanian. 2001. Capability Failure and Group Disparities: Some Evidence from India for the 1980s. *Journal of Development Studies* 37, no. 5: 104-140.
- Marasinghe, M. G, and W. J Kennedy. 2008. *SAS for Data Analysis: Intermediate Statistical Methods*. Springer Verlag.
- Martinetti, E. C. 2000. A multidimensional assessment of well-being based on Sen's functioning approach. *Rivista Internazionale di Scienze Sociali* 2: 207-239.
- Medina, C. A. 2002. Oferta laboral en Colombia de acuerdo al color de la piel. *Cede, Facultad de Economía, Universidad de los Andes*.
- Moynihan, D. P. and C. S. Schelling (eds.). 1969. *On understanding poverty; perspectives from the social sciences*. New York, Basic Books.
- MULTICULTURAL, H. U.N.A.N.P.Y. DEPARTAMENTO NACIONAL DE PLANEACION.
- Muthen, B. 1983. Latent Variable Structural Equation Modeling with Categorical Data. *Journal of Econometrics* 22, no. 1.
- National Research Council of the National Academies. 2004. *Measuring Racial Discrimination*. Washington, D.C: National Academies Press.
- Nef, Jorge, and International Development Research Centre (Canada). 1999. *Human Security and Mutual Vulnerability*. IDRC.
- Nelson, E. 2008. From Primary Goods to Capabilities: Distributive Justice and the Problem of Neutrality. *Political Theory* 36, no. 1: 93.
- Nussbaum, Martha C. 2000. *Women and Human Development: the Capabilities Approach*, Cambridge: Cambridge University Press.
- Nussbaum, M. C. 2003 .Capabilities as Fundamental Entitlement: Sen and Social Justice. *Feminist Economics*, 9(2-3), 33-59.

- Nussbaum, M. C, and A. K Sen. 1993. *The quality of life*. Oxford University Press, USA.
- Oaxaca, R. L, and M. R Ransom. 1999. Identification in Detailed Wage Decompositions. *Review of Economics and Statistics* 81, no. 1: 154–157.
- Observatory on Racial Discrimination. 2008. *Racial Discrimination and Human Rights in Colombia. A Report on the Situation of the Rights of Afro-Colombians*. Ediciones Uniandes, Bogotá.
- Portilla, D. A. 2003. Mercado Laboral y Discriminacion Racial. Una Aproximación para Cali. Junio , Documento CEDE, Universidad de los Andes.
- Quinonez, S. A. 2007. Los Afrocolombianos: Entre la Retorica del Multiculturalismo y el Fuego Cruzado del Destierro. *The Journal of Latin American and Caribbean Anthropology* 12, no. 1: 213–222.
- Rawls, J. 1971. *A Theory of Justice*. Cambridge, Mass., Belknap Press of Harvard University Press
- Reiter, Bernd and Gladys Mitchell (Eds). 2009. Brazil's New Racial Politics. Lynne Rienner Publisher. (Grewal, Cote and Baumgartner 2004)
- Rivas, N. Y, T. H Saa, and C. E Agudelo. 2000. Impactos de la Ley 70 y Dinámicas Políticas Locales de las Poblaciones Afrocolombianas: Estudios de Caso. *Documento de Trabajo* 50. Universidad del Valle: Facultad de Ciencias Sociales y Económicas
- Rivera, F. 2001. Migrantes y racismo en América Latina: dimensiones ocultas de realidades complejas. *Versión final de investigación encomendada por el Instituto Interamericano de Derechos Humanos y el BID*. Quito.
- Robeyns, I. 2003. Sen's Capability Approach and Gender Inequality: Selecting Relevant Capabilities. *Feminist Economics* 9, no. 2: 61–92.
- Roche, J. M. 2008. Monitoring Inequality among Social Groups: A Methodology Combining Fuzzy Set Theory and Principal Component Analysis. *Journal of Human Development* 9, no. 3: 427–452.
- Saith, R. 2001. Capabilities: the Concept and its Operationalisation. *QEH Working Paper Series* 66, Queen Elizabeth House, University of Oxford.
- Schiller, B. R. 1970. Stratified Opportunities: The Essence of the " Vicious Circle". *American Journal of Sociology*: 426–442.
- . 1971. Class discrimination vs. racial discrimination. *The Review of Economics*

and Statistics: 263–269.

- Schumacker, Randall E. 2004. *A Beginner's Guide to Structural Equation Modeling*. 2nd ed. Mahwah, N.J: Lawrence Erlbaum Associates.
- Seth, S. 2009. Collecting capability data on the basis of existing surveys: The case of India. (Publish in *Maitreyee*, the tri-annual e-bulletin of the Human Development and Capability Association, June)
- Sen, A. 1976. Poverty: an ordinal approach to measurement. *Econometrica: Journal of the Econometric Society*: 219–231.
- . 1979. Equality of what? The Tanner Lecture on Human Values. *Stanford University, May 22*: 1979.
- . 1990. Development as Capability Expansion., in Keith Griffin and John Knight (eds), *Human Development and the International Development Strategy for the 1990s*, London: Macmillan, pp. 41.58.
- . 1985a. Well-being, agency and freedom: the Dewey lectures 1984. *The Journal of Philosophy*: 169–221.
- Sen, A. K. 1985b. *Commodities and capabilities*. North-Holland Amsterdam.
- Sen, A. K, and J. E Foster. 1973. *On economic inequality*. Oxford University Press, USA.
- Sen, A. K. 1999. *Development as Freedom*. 1st ed. New York: Knopf.
- Skidmore, Thomas E. 1993. *Black into White: Race and Nationality in Brazilian Thought*. Duke University Press, reprinted.
- Telles, E. E. Incorporating Race and Ethnicity into the UN Millennium Development Goals.
- Urrea, F. 2006. La Población Afrodescendiente en Colombia. *Los Pueblos Indígenas y Afrodescendientes en América Latina y el Caribe*. Santiago de Chile: CEPAL.
- Urrea, F., C. Viáfara. 2006. Efectos de la Raza y el Género en Logro Educativo y Status Socio-Ocupacional para Tres Ciudades de Colombianas. *Revista Desarrollo y Sociedad, segundo semestre 2006*:115-163.
- Urrea, F., C. Viáfara, H. F Ramírez, and E. Gómez, S. Vélez y F. Ruiz. 2005. Pobreza y Grupos Étnicos en Colombia: Análisis de sus Factores Determinantes y Lineamientos de Política para su Reducción, *Informe final presentado al Departamento Nacional de Planeación, DNP*.

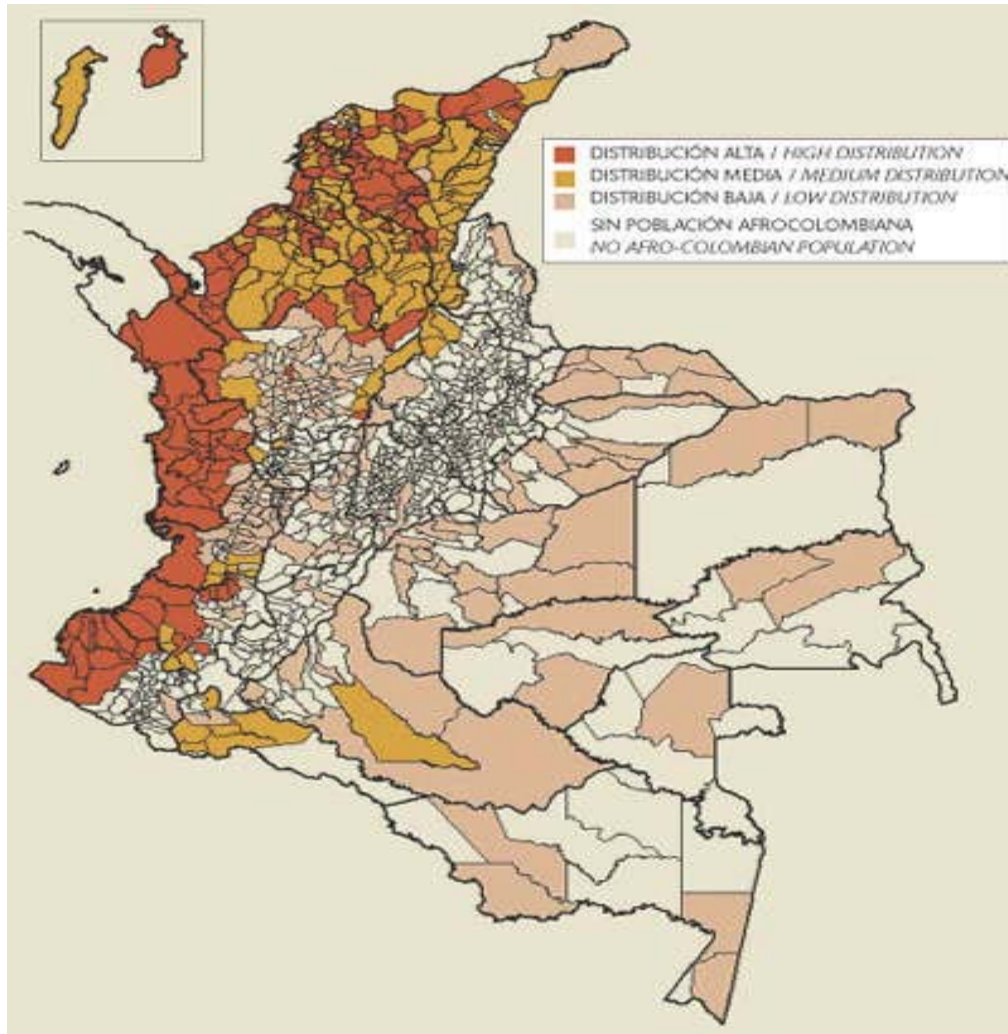
Wade, P. 1995. The Cultural Politics of Blackness in Colombia. *American Ethnologist*: 341–357.

———. 2002. Introduction: the Colombian Pacific in perspective. *Journal of Latin American Anthropology* 7, no. 2: 2–33.

Wainryb, Cecilia, Judith G. Smetana, and Elliot Turiel. 2007. *Social development, social inequalities, and social justice*. CRC Press, October 1.

Appendix A

Figure 4 Distribution of Afro-Colombian Population by their Location on the National Territory²¹



21. Observatory for Human Rights in Colombia. Information Source: Official Map of the Territorial Agencies – IGAC National System of Information for Lands of Black Communities – Technical Commission Law 70 of 1993. National Plan for the Development of the Afro-Colombian Population, DNP, 8.