POVERTY, REMOTENESS AND SOCIAL MOBILITY OF THE INDIGENOUS POPULATION IN MEXICO

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for the Degree of DPhil in Development Studies

by

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ABSTRACT

The thesis seeks to understand the differences between the indigenous and the non-indigenous populations in Mexico in terms of poverty and to analyse what explains these differences. The thesis departs from the official multidimensional poverty measure that has been adopted in Mexico. The thesis distinguishes from the official results in at least four areas: 1) the main poverty indicator and how it is estimated; 2) a deeper understanding of the indigenous and non-indigenous; 3) the analysis of robustness and redundancy across dimensions and; 4) the use of standard errors to compare groups and across time.

This dissertation then focuses on remoteness, since a high percentage of the indigenous population live in small isolated rural communities, and there is a relationship between the locality size and the standard of living. In order to quantify the remoteness, and to be able to compare indigenous and non-indigenous populations, a measure of remoteness is proposed.

Then also explores how different the social mobility for the indigenous is, compared to non-indigenous. While there are studies that allow comparisons of indigenous and non-indigenous in relation to social mobility, this thesis suggests a measure of absolute social mobility that uses the framework of the Alkire-Foster methodology for multidimensional poverty. Finally, this thesis explores the role of ethnic discrimination using the Oaxaca-Blinder decompositions. Also, an innovative method to study discrimination is also presented, based on the propensity score match techniques.

At the end, this dissertation argues there is a vicious cycle of indigenous poverty in Mexico. In a nutshell, the fact that the indigenous are poorer means they rely more on state intervention while being discriminated against in the labour markets. Discrimination is an incentive to remain geographically isolated and lowers their intergenerational social mobility. As a result, the indigenous live in remote rural localities, where harder and more expensive for the state to reach. Thus, the indigenous have less access to state support.

The thesis follows a mixed-methods approach, that combines quantitative analysis based on information at national level with analysis of data collected during fieldwork in 2011.

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ACRONYMS AND ABBREVIATIONS

ATE	Average Treatment Effect
ATT	Average Treatment effect of the Treated
ATU	Average Treatment effect of the Untreated
APPO	Asamblea Popular de los Pueblos de Oaxaca *(Popular Assembly of Peoples of Oaxaca)*
CDF	Cumulative Density Function
CEEY	Centro de Estudios Espinosa Yglesias
CONAPO	Consejo Nacional de Población *(National Council for Population)*
CONAVI	Comisión Nacional de Vivienda *(National Housing Commission)*
CONEVAL	Consejo Nacional para la Evaluación de la Política Social *(National Council for the Evaluation of Social Policy, in Mexico)*
DOF	Diario Oficial de la Federación *(Official Journal of the Federation)*
EMOVI	Encuesta ESRU de Movilidad Social en México *(ESRU Survey of Social Mobility in Mexico)*
EZLN	Ejército Zapatista de Liberación Nacional *(Zapatista National Liberation Army)*
FGT	Foster, Greer, and Thorbecke Poverty Measures
HDI	Human Development Index
ILO	International Labour Organisation
INALI	Instituto Nacional de Lenguas Indígenas (*National Institute of Indigenous Languages*)

INDEC	Argentinian National Institute of Statistics and Census
INEGI	Instituto Nacional de Estadística, Geografía e Informática *(Statistics, Geography and Informatics National Institute)*
ISM	Index of Social Mobility
MCM	Multiple Correspondence Method
MCS-ENIGH	Módulo de Carencias Socioeconómicas de la Encuestas Nacional de Ingreso y Gasto de los Hogares *(Module of Socioeconomic Deprivations of the Household Income and Expenditure National Survey)*
MPI	Multidimensional Poverty Index
MSMS	Mexican Social Mobility Survey
OPHI	Oxford Poverty and Human Development Initiative
PCM	Principal Components Method
PSID	Panel Study of Income Dynamics
PSM	Propensity Score Match
UBN	Unsatisfied Basic Needs
UNDP	United Nations Development Programme
UNU-WIDER	World Institute for Development Economics Research of the United Nations University
WB	World Bank

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1. Setting the Scene

I disagree with the conviction expressed by some authors that indigenous poverty can be documented and analysed from a single disciplinary perspective and still produce useful results or recommendations.

(Laura Rival, 2007)

1.1 Introduction

Professor Tony Atkinson insisted "Why do you want to write about poverty of the indigenous population in Mexico? What is your motivation? Why did you become interested in this topic?" Up to that point I thought he was questioning the relevance of the study and my answers were limited to arguing in favour of researching more about the indigenous population in Mexico. I was wrong - it was a personal question enquiring about the origin of my interest in the topic rather than an academic question. I was starting my second year as a MPhil student in Economics at University of Oxford and Professor Atkinson had accepted to be my supervisor. It was one of our first meetings. It took me a couple of seconds to have a flashback and realize when and where my interest in the indigenous population had been born. The question was not about the rise of my social awareness or my interest in topics like poverty and inequality. Those where nourished at home, since I was a child, and that is why I decided to study economics for my undergraduate studies when the time came. I also knew about some of the challenges that the indigenous population face from my infancy when my father worked in an area of the federal government in charge of providing public education for indigenous communities. But it was during an assignment in Chiapas as a civil servant when I decided that, if was going to research something, it was going to be about the indigenous population.

It was the beginning of the Vicente Fox administration in 2001 and I was working at the Ministry of Social Development. A few years before, in 1994, the Zapatistas organized an uprising in Chiapas and the area became highly militarized. Fox had promised to solve the Zapatista problem in "five minutes". It was taking longer than that but one of the measures was to transform two military bases surrounding *La Realidad*, the community with the Zapatista headquarters, into facilities for community development. The military bases were handed to the Ministry of Social Development and I was sent there as part of the team to explore the viability of the project in the communities. I had no previous expertise in the field, so my work was more as an observer to inform the General Director back in Mexico City. For two weeks my job was to observe the meetings held in the communities, and to announce that those facilities were not for military use anymore. In order to do that I had to walk a lot. Some of the communities were three or four hours away from the road which meant starting walking at six or seven am to reach the community at ten or eleven am. Then call the meeting, talk to the people, answer their questions and walk back to the road for four more hours. It was really strenuous, but very fulfilling.

During those days I learnt about the geographical isolation of the indigenous communities and their precarious living conditions. I was also able to understand better the causes of the Zapatista uprising. And I noted the fact that the indigenous peoples have different worldviews - a different pace of life – and a life absent of basic services like electricity or tubed water, as well as institutions like social security and public education. And the people were so generous and polite, I hardly believed it. It was amazing how they always offered me a place to sit and a plate of food after those long walks. I was a complete stranger to them and they still welcomed me. Never before in my life had I witnessed anything like that, never before experienced anything like that.

This is the origin of my interest in the topic and the main motivation for me to write this thesis.

Indigenous people in Mexico are commonly considered to be a disadvantaged group and, in general, it is believed that the indigenous are poorer than the non-indigenous. In principle, a thesis that shows that the indigenous are poorer will surprise only a few, despite its relevance. However, most of the studies about the indigenous population's deprivations are focused on the localities where they live, but do not take the individual or the household as a unit of analysis. Yet in doing so, the indigenous population is identified in flawed ways. The first official multidimensional poverty measure in Mexico, with data at household level and able to identify the indigenous population, was released as recently as in December 2009 (CONEVAL 2009). This is because the income and expenditure household survey in 2008, for the first time, included a question to distinguish the indigenous population. No other official poverty figure for the indigenous population, not even the simplest income poverty headcount ratio, had been released before that.

According to the 2009 press release by the National Council for the Evaluation of Social Policy (CONEVAL being its acronym in Spanish), 10.5 percent of the national population live in extreme multidimensional poverty but the figure for the indigenous was 39.2 percent - almost four times larger. Chiapas, Oaxaca, Puebla and Veracruz are some of the states with the highest multidimensional poverty; all of them have a high indigenous population. States with lower levels of multidimensional poverty also have smaller percentages of indigenous people.

This thesis seeks to understand the differences between the indigenous and the non-indigenous populations in Mexico in terms of poverty and to analyse what explains that difference. Three factors will be explored to explain that difference:

1. Less geographical mobility of indigenous communities, not only in terms of relatively less migration to urban economic centres, but also in terms of a relatively greater dispersion across the country and geographical isolation.
2. Slower intergenerational mobility, which means that the non-indigenous children surpass the standard of living of their parents more readily than indigenous children.
3. Ethnic discrimination against the indigenous population.

These three phenomena help to explain the gaps between indigenous and non-indigenous populations. Furthermore, there is a relationship between them. As will be seen by the end of the thesis, some of the dimensions of indigenous poverty require strong state intervention, while in the labour markets the indigenous are discriminated against. Those factors slow down improvements in their living standard and create incentives to remain in their remote localities. The state has a weaker presence in remote areas and it is more expensive for the state to reach them.

In other words, the hypothesis of the thesis is the following: The indigenous population in Mexico is poorer than the non-indigenous population and the poverty gap between indigenous and non-indigenous is explained by more geographical isolation, slower intergenerational social mobility and ethnic discrimination.

The thesis focuses on remoteness, since a high percentage of the indigenous population live in small isolated rural communities, and there is also an inverse relationship between the village size and marginalization. It is thus an objective of this thesis to understand how geographically isolated the indigenous population is, compared to the non-indigenous population, and their reasons for remaining that way, instead of migrating to more urbanized places where better employment opportunities may be found.

The thesis also explores how different the social mobility for the indigenous is, in comparison to the non-indigenous population. Social mobility is a complementary analysis of poverty since, in order to close the gap between indigenous and non-indigenous, the indigenous should improve their living conditions faster than the non-indigenous.

In the case of ethnic discrimination, there have been very few studies of Mexico. Discrimination is a barrier for those who suffer it and in the case of the indigenous population it may interrelate with all previous topics: poverty, social mobility and geographical isolation.

As an introductory chapter, two main issues will be covered here to set the ground for the following chapters. The first issue is to explain the way the thesis is conceptualized, explain its structure and methods, as well as the data collection in the field. The next two sections are precisely about these topics that are the foundations of the thesis. The following section explains the mixed methods approach adopted in the research process, which combined quantitative and qualitative methods. The chapter then goes into the fieldwork data collection, the selection of municipalities and their characteristics, the semi-structured interviews and the survey questionnaire. The second issue to deal with in this chapter is the definition of the indigenous population. There is a section that explains the different ways the indigenous population has been defined and how those definitions are translated into practical methods of identifying the indigenous population for statistical purposes. The closing section focuses on how the indigenous population has been identified in Mexican national statistics.

The thesis has five additional chapters after this introductory chapter: four empirical chapters and then a conclusion. The second chapter analyses the indigenous and non-indigenous population in terms of multidimensional poverty. It starts with a

broad literature review about poverty measures and the available figures for the indigenous population in Mexico. The chapter then explains further the Alkire-Foster methodology and how it is applied in the official measure in Mexico. A section with the main results for the indigenous and non-indigenous population is presented, as well as a section on standard errors and robustness tests. Special emphasis is given to the complementarities between income and non-income indicators. There is also an analysis of how the indigenous poor are distributed geographically in Mexico. A qualitative analysis is presented at the end of the chapter in two sections, one about the multidimensional poverty in the surveyed fieldwork municipalities, and one more about the notion of poverty according to those communities.

Chapter three studies spatial deprivation. Stating with the literature review on geographical isolation, segregation and spatial disparities that serves as a preamble to the presentation of a new index of remoteness. The index is then estimated for the indigenous and non-indigenous populations. A final section uses the data from fieldwork to get a bit deeper into the reasons people have to leave or stay in their communities.

Intergenerational social mobility is studied in chapter four. In this case too, the starting section is a literature review on social mobility measures, followed by a relatively recent study in Mexico that developed a measure of relative social mobility. The next section then introduces a new measure of absolute social mobility based on the Alkire-Foster methodology, but using elements of the relative measure for the Mexican case. The closing section again is the qualitative analysis, based on the fieldwork survey and the semi-structured interviews.

The last empirical chapter studies ethnic discrimination of the indigenous population. The chapter starts with a literature review on discrimination in economics,

then explains the Oaxaca-Blinder decomposition, which is a standard way to measure discrimination in labour markets, and then presents some estimates for the indigenous and non-indigenous populations. Afterwards, an innovative way to estimate discrimination is presented, using the poverty results and a propensity score match. Finally, the qualitative analysis summarizes how discrimination is related to poverty, isolation and social mobility.

The last chapter rounds up things and the vicious cycle of indigenous poverty is explained. It is model to explain why the gaps between indigenous and non-indigenous have persisted. Then a discussion on policy recommendations, which basically support state intervention that empower the indigenous population. The chapter closes with a brief summary of this thesis contributions and areas of further research.

1.2 Literature review on indigenous and non-indigenous comparative studies

In this section a literature review of comparative studies between indigenous and non-indigenous populations is presented. The review is centred on the analysis of poverty and other related socio-economic indicators that adopt an empirical perspective, although some additional literature is also reviewed to indicate the areas that will not be out of the scope in this thesis.

The most important reference in the comparative study of poverty between indigenous and non-indigenous populations is the chapter about Mexico by Alejandro Ramirez (2006) published in the book edited by Gillete Hall and Harry Anthony Patrinos (2006) *Indigenous Peoples, Poverty, and Human Development in Latin*

America: 1994-2004.[1] Using quantitative techniques, Ramirez compares the income poverty rates of indigenous and non-indigenous populations and searches for evidence of ethnic discrimination by decomposing income. He goes beyond income and analyses the educational attainments and health of both groups, among other things. Among the main findings are the following: in 2002 the incidence of extreme poverty was 4.5 times higher in predominantly indigenous municipalities than in non-indigenous ones; in indigenous municipalities 90 percent of the population lived under the moderate poverty line; in terms of discrimination, there is an earning gap of 59 percent between indigenous and non-indigenous workers, in which unexplained factors accounted for 41 percent. Whilst its contribution in the quantification and understanding of the differences between indigenous and non-indigenous in Mexico is significant, the feasible method of identifying the indigenous population was (necessarily at that time) imperfect.

For example, the income survey available at the time did not identify the indigenous population, thus he had to use the percentage of the indigenous population in a municipality as a proxy. Depending on the percentage of the indigenous population, the whole municipality was tagged as indigenous or as non-indigenous, which is something that can work well for homogeneous municipalities where one groups clearly outnumbers the other, but misses all the inequalities within mixed municipalities. Therefore, this method of estimating the indigenous populations relies on some generalizing assumptions that jeopardize the precision of the quantification. Additionally, the income survey is not representative at the municipal level, which

[1] Laura Rival (2007) reviewed this book and pointed its strengths and weaknesses. She is particularly against the way indigenous poverty is approached by the authors and their policy recommendations. She argues that what really matters for indigenous development is sovereignty, institutions, culture and leadership. There is also an older version of that book edited then by Harry Anthony Patrinos and George Psacharopoulos (1994) which may be important for consultation.

leaves the door open for bias if the rural-indigenous municipalities were systematically under-represented in the sample.[2]

In the 2008 edition of the household income survey the identification of the indigenous population became possible for the first time. At that time, I replicated the official income poverty measurement for the indigenous and non-indigenous in a paper that was published in the *Journal of Human Development and Capabilities* (González de Alba 2010). Measurements show that the indigenous are poorer in terms of income, and that income poverty is higher in rural areas, regardless of the poverty line used. For example, in rural areas the headcount ratio with the alimentary poverty line is 51.2 percent for the indigenous group which is 24.9 percentage points higher than the non-indigenous figure. These results, for the first time, offered a precise comparison of the indigenous and non-indigenous populations in terms of income poverty.[3]

Although these are the only references found that address the topic of poverty from a comparative perspective between indigenous and non-indigenous groups, there are a series of references discussing multiple aspects of indigenous well-being or ill-being, based on other socio-economic indicators. For example, there are adapted versions of the Human Development Index (Fernández Ham, Tuirán Gutiérrez, et al. 2006; Cordourier 2010) that directly compares the indigenous and non-indigenous populations, but it is not exactly a study of poverty. These documents report that there is

[2] Furthermore, in a newer book on indigenous poverty with case studies around the world, Hall and Patrinos (2012) report that, in Mexico, the gap between indigenous and non-indigenous in terms of poverty closed between 2006 and 2008, using ENIGH survey data. However, the survey in 2006 did not include the questions to identify the indigenous population.

[3] The paper published was originally as part of my MPhil thesis in Economics in 2009. When the thesis was written the income survey with indigenous data was still not available. Therefore, instead of using the income survey and inferring the indigenous population, I used the census data and inferred the income. A shorter version of the thesis was presented at the Human Development and Capability Approach annual conference in Lima, Peru. When the income survey for 2008 became available the paper was rewritten and submitted for peer review in order to be published.

a gap of 15 percent between the indigenous peoples' HDI and the non-indigenous one which is explained greatly by the income inequality between both groups.

Other reports take the municipality as the unit of analysis, similar to Ramirez's (2006) study of poverty based on the percentage of the population that speaks an indigenous language. For example, a set of indicators with a gendered perspective for the indigenous municipalities (Fernández Ham, Embriz Osorio, et al. 2006) and socioeconomic indicators for indigenous municipalities (Serrano Carreto, Embriz Osorio, and Fernández Ham 2002). In the gender report one of the main findings is the fact that there are more indigenous women than men that cannot speak Spanish (monolinguals) as well as a higher education lag for the indigenous women. In case of the socioeconomic indicators an example of the findings is that in 2000, 25 percent of employed indigenous people do not receive monetary payment, although they could receive payments in-kind or work for self-consumption; 56 percent received a payment up to twice the minimum wage and only 19 percent more than twice the minimum wage.

The number of indigenous people by municipality also served as a threshold to determine the areas of the study in a paper about intergenerational ethnolinguistic transition by Manuel Ordorica, Constanza Rodríguez, Bernardo Velázquez and Ismael Maldonado (2009). The authors argue that discrimination against the indigenous, a lack of opportunities and scarce or no chance of communicating in one's mother tongue, makes the intergenerational transmission of language unnecessary. Also, in terms of ethnic discrimination, a report based on a survey of perceptions of the indigenous population in Mexico found that discrimination against the indigenous population is not among the most important national problems and four out of five people surveyed believed the indigenous are not discriminated against, but two of every three think that

poverty affecting the indigenous population is a more serious problem (Comisión Nacional para el Desarrollo de los Pueblos Indígenas (CDI) 2006).

One of Mexico's most famous poverty-reduction activities has been the conditional cash transfer programme Oportunidades, recently renamed as Prospera. The programme has been a policy laboratory and the object of several studies. From its design in the early nineties, the insigenous population spoted as one with extra barriers to move out of poverty. For example, Santiago Levy (1991) wrote an assessment of the poverty alleviation policies in Mexico which formed the foundations of what became PROGRESA, Prospera nowadays. Without going really deeply into the study of the indigenous population, Levy warned in a footnote *"A potentially important issue in Mexico concerns the fact that some poor families belong to indigenous communities; for some of them language and other dimensions may be barriers to income growth."* (p. 22).

In evaluating the emblematic conditional cash transfer scheme Oportunidades/Prospera, Emanuel Skoufias and Susan Parker (2001) found that children whose fathers speak Spanish were less likely to be in the treatment sample than those whose fathers speak an indigenous language only. Although this finding could suggest that the programme was biased towards the indigenous, it is also true that the indigenous households are in general poorer than non-indigenous ones, as supported by the study of land tenure in Mexico by Finan, Sadoulet and de Janvry (2005) which used the same dataset that was used for Oportunidades' evaluation. The study found that 65 percent of the indigenous households were classified as poor in that sample, compared to 44.5 percent of the non-indigenous ones, supporting the idea that there is a strong link between ethnicity and poverty in rural Mexico.

In a study of child labour, Rosangela Bando, Luis F. Lopez-Calva and Harry Anthony Patrinos (2005) found that child labour is higher for indigenous children, but child labour incidence decreased after Oportunidades/Prospera by 8 percent between 1997 and 2000. In another study, Rosángela Bando and Luis F. López-Calva (2006) found that indigenous children in the programme increased their monitoring visits more than non-indigenous children out of the programme. They also found that there is a significant negative impact for indigenous children in the programme on illness rates and a positive impact on the health status of indigenous adults aged 51 years or older.

The study conducted by Pedro Flores-Crespo (2007) looks at the difference in educational performance between indigenous and non-indigenous children. In his research he reviewed studies that show how students in indigenous schools obtain lower reading and mathematics scores than students at any other type of school, and that compensatory programmes have been ineffective in addressing the inequality in educational attainment between indigenous and non-indigenous children. As an alternative, Flores-Crespo supports affirmative action policies. He assessed a programme for indigenous students in higher education, introduced in 2001 in 11 universities and found that the programme has been successful in increasing the pass rate and the GPA and strengthening the confidence of indigenous students.

Other empirical poverty studies in which ethnicity is at least mentioned include the study of the *ejido* sector in Mexico by Alain de Janvry and Elisabeth Sadoulet (2001). They argue that participation in off-farm activities helps to reduce poverty and contributes to greater equality in the distribution of income. Among their main findings is the fact that adults of indigenous ethnic origin suffer from an educational lag and have less access to off-farm, non-agricultural employment than non-indigenous adults at identical educational levels. In addition, Federico Finan, Elisabeth Sadoulet and Alain

de Janvry (2002) analyse the role of land as an instrument for poverty reduction. They found that ethnicity is an important negative social asset as the marginal value of land for non-indigenous households is on average twice as high as it is for indigenous ones.

One of the main limitations of this thesis is that is not studying land policies and land tenure among the indigenous as a determinant of poverty. Researchers have studied this, for example, in the historical analysis of Roger Plant (1998), he argued that the determinants of indigenous poverty in Latin America are land, labour and markets. In the case of Mexico, Plant says that the development of cash crops, such as coffee, increased the demand for indigenous labour but also increased pressure for their lands. According to Plant, after the Mexican revolution land reform policies ignored the originally indigenous land and distributed in the form of *ejido*.

This thesis does not analyse the productive activities of the indigenous, although it is clear that volatility of crop prices also has an effect in explaining indigenous poverty. The study of César Patricio Bouillon, Arianna Legovini and Nora Lustig (2003) claim that between 1984 and 1992 the decline in the international price of coffee affected severely the indigenous producers.[4]

The study of indigenous and non-indigenous could be approached from the view of horizontal inequalities. Frances Stewart (2002), for example, uses the case of Chiapas to illustrate the horizontal inequalities between indigenous and non-indigenous populations. This is a path the thesis is not taking.

Finally, some literature focuses more on the assimilationist policies addressed to the indigenous. Franz Schryler (1987), for example, in his ethnography of Huejutla discusses *indigenismo* - a term for a piece of public policy that supported assimilation of

[4] There are also some studies of productive alternatives that focus on indigenous communities. Examples of this are the study of natural resource extraction in a Lancandonian rainforest community by Alejandro López-Feldman, Jorge Mora and J. Edward Taylor (2007); farming schools with sustainable technologies in indigenous communities by José López Gaytán, *et. al.* (2008); rabbit meat production in Queretaro by Gómez Gallegos (2008); and ecotourism in Chiapas by Cynthia López (2011).

the ethnic minorities into the mainstream society in Mexico. In his account of the facts, Schryler states that linguistic assimilation did not necessarily diminish economic inequalities or discrimination. Leanne Reinke (2004), also criticized Mexican assimilationist policies regarding the indigenous population, in particular those focusing on education. In place of assimilationist policies, she supports the idea of an education system under the control of the community, with teaching programs relevant to the community and appropriate to the local environment.[5]

Colin Clarke (2000) supports the idea indigenismo has been resisted by the though isolation. In his study of Oaxaca's peasantries, he states that *"Indians endure peasant isolation as a collectivity, from which individuals can escape at will–but at their peril – into the mestizo section of society, a process which usually involves language shift, migration, urbanization, and proletarianization or marginalization"* (p. 3). While the topic could be related to the study of remotes developed later in the thesis, the thesis will not get further into the study of *indigenista* policies.

These references form the basis of this thesis. They have contributed to an understanding of the differences between indigenous and non-indigenous groups, as well as an understanding what has been wrong and right regarding policies to amend the well-being gaps and inequalities between these two groups. However, this thesis is innovative in a number of ways. Firstly, it is based on a multidimensional approach to poverty, an approach that better recognizes the complexities of poverty, its challenges and idiosyncrasies. Secondly, it makes the most of recently available statistical information to accurately study and compare these groups. Although studies based on

[5] Opposed to *indigenista* policies are those supporting indigenous autonomy. The feminist Aida Hernandez (2002) conducted an ethnographic study of Chiapas to study law reforms in Mexico that limited the autonomy of the indigenous communities. For her *"the struggle for autonomy is a struggle against racism of Mexican society, against centralism of State, against international companies pushing agrochemicals, against the political parties that deny any alternative form of constructing democracy, and against the local intermediaries who appropriate the profits and earning of the indigenous peoples"* (p. 94).

municipal percentages and averages led the discussion before, the new datasets allow us to be more precise at household and individual level. Thirdly, while there are quantitative studies and qualitative studies relating to indigenous poverty, only few have adopted a mixed methods approach, and those that do, do so on a small scale. This thesis goes from the general broad results, to the specificities of the fieldwork places and then to particular individual experiences. And finally, one final innovation is the use of multidimensional poverty as a pivot to discuss its relationship with isolation, migration, social mobility and ethnic discrimination.

1.3 Methodologies

This thesis adopted a mixed methods approach, combining quantitative and qualitative methodologies. It follows what John Creswell (2009) calls the sequential mixed method, which starts with either quantitative or qualitative analysis and then confronts those findings with what is shown in the other. For the thesis I decided to use, as the point of departure, the quantitative part, since I am a trained economist, then to engage firstly at the smaller, municipality level, and secondly, at a more detailed individual level in the qualitative analysis.

Both methods are quite different, though not necessarily mutually exclusive. One important distinction between qualitative and quantitative research is not only the use of words and numbers, but also the type of question they both want to answer. Qualitative research is conducted when the questions are open-ended, while the quantitative one is better for closed-ended questions. Conclusions are also achieved in different ways - while the qualitative method is inductive, the quantitative one is deductive. Both methods should not be viewed as polar opposite dichotomies, but

instead as extremes in a continuum where the overall strength of a study using both methods combined is superior to the sum of its parts (Creswell 2009; Tashakkori and Teddlie 2003). In the mixed methods approach creativity is guided by pragmatism: "*For the mixed methods researcher, pragmatism opens the door to multiple methods, different worldviews, and different assumptions, as well as different forms of data collections and analysis*" (Creswell, 2009, 11).

For the study of indigenous peoples, the mixed methods approach has several advantages. For example, Donna M. Mertens (2003) claims that the transformative-emancipatory perspective is very useful for the study of ethnic minorities, people with disadvantages, and marginalized groups, among others, because it places central importance on the lives and experiences of those who suffer oppression and discrimination - whatever the basis of that is. It also explicitly recognizes that certain voices have been absent or misrepresented, and that the inclusion of those voices is necessary for a rigorous research study. Methodologically, the transformative-emancipatory perspective implies *"(a) raising hypothesis concerning the dynamics that underlie the quantitative results, (b) conducting subgroup analysis to look at the differential impact on diverse groups of the study, (c) improving understandings of the results from the perspective of power relationships, and (d) reporting the results in such a way as to facilitate social change"* (Mertens 2003, 155).

For an economist, fieldwork represents a unique opportunity to confront statistical results with specific contextual situations, and to seize the complexity and intimacy of particular cases. The final outcome this thesis may not be as integrated as originally planned and the challenge of combining both methods was also much harder than initially thought. However, the qualitative component of the thesis is very important - it changed the way things were seen as I confronted a reality that was not

evident when dealing with datasets. Methodologies adopted for the thesis are presented next.

Quantitative Methods

Each chapter has an exhaustive literature review and detailed explanation of the quantitative methods; therefore, what is presented here is a summary. In chapter two the Mexican official multidimensional poverty measure based on the Alkire-Foster methodology is used for comparing the indigenous and the non-indigenous populations. The Mexican official national poverty measure is designed *ad hoc* to reflect the local living conditions across states in Mexico. The data source for this estimation is the Module of Socioeconomic Deprivations of the Household Income and Expenditure National Survey (MCS-ENIGH in Spanish), done by the Statistics, Geography and Informatics National Institute (INEGI in Spanish). While multidimensional poverty reaches 42.6 percent of the non-indigenous, this is lower than the 72.5 percent of the indigenous population who are poor. The gap is even wider if we look at extreme poverty since the incidence for the non-indigenous is 7.6 percent compared to 30.7 percent for the indigenous population.

In chapter three, a new index of remoteness is introduced. Indicators previously developed focus on measures of segregation within a locality, but they do not reflect the idea that people are dispersed in small isolated localities. For this reason, a more appropriate measure was developed. Needless to say, the remoteness index is one of the mayor contributions to knowledge of this thesis. The data source in this case is the 2010 population census, done by INEGI, since information for all localities was needed. The main finding is that the indigenous population lives in more remote localities. The value

of the remoteness index for the indigenous population is more than double the value of the index for the non-indigenous population.

For the measurement of social mobility, in chapter four, the Torche-Velez methodology of measuring relative social mobility is modified to the principles of the Alkire-Foster method, to get a measure of absolute social mobility. The data source in this case is the ESRU Survey of Social Mobility in Mexico (EMOVI as is known in Spanish). The empirical finding in this case is inconclusive since two surveys with different ways to identify the indigenous population led to opposite results. When the criterion for being considered indigenous is speaking an indigenous language, i.e. a relatively smaller indigenous population size, absolute social mobility of the indigenous is smaller than the non-indigenous. However, when the criterion is their parents' ability to speak an indigenous language, a relatively larger indigenous population size, then absolute social mobility is bigger for the indigenous.

Finally, for the measurement of discrimination, two methods are used. The first is the Oaxaca-Blinder decomposition, standard in discrimination studies, and the second is a method based on the poverty results using a Propensity Score Match (PSM). Regarding the Oaxaca-Blinder decomposition, an important finding is the relevance of locality size to explain the income/wage gap between the indigenous and non-indigenous populations. On the other hand, the PSM is used to compare the probability of being poor for the indigenous and non-indigenous populations. After controlling for a number of variables, 44.4 percent of the probability gap is attributed to the *treatment effect*, which in this case is being indigenous.

Fieldwork Survey (Ground Reality Check)

Originally, in the transfer paper, there was going to be two ground reality checks, one for social mobility and one for poverty, in different municipalities. This required two questionnaires - one developed by the Oxford Poverty and Human Development Initiative (OPHI) for poverty and one used by the EMOVI for social mobility. But, instead of four municipalities in four different States, fieldwork was limited to only two municipalities in Puebla - one indigenous and one non-indigenous. Thus, OPHI's and EMOVI's questionnaires were merged into one and applied in both municipalities.

The questionnaire covers a huge number of topics: dwelling characteristics, household composition, education, health, income, occupation, access to services, assets, migration, perceptions, indigenous language, as well as some specific questions to identify differences between present and past generations in order to build a social mobility measure. The complete questionnaire can be found in the thesis Appendix. In total, 223 questionnaires were successfully completed - 120 in Coatepec and 103 in San Martín Totoltepec and one questionnaire was incomplete.

Certain important lessons for field researchers were learnt through the elaboration of the questionnaire and the data collection. For example, data collection about income is useless since surveyed respondents under-reported or omitted answering questions regarding income. An important lesson is that collecting income data should be carefully motivated. Another learning experience from collecting data was that the questionnaire was too long for thesis purposes. It required 45 to 90 minutes to complete. In my attempt to collect data from a very broad range of topics ended, with a 19-page questionnaire that made people tired and made the interviewer go too fast to make it as less time-consuming as possible, with some effect on data quality. The sampling method is explained in the next section.

Semi-Structured Interviews

60 semi-structured or semi-standardized interviews (Clandinin 2000; Berg 2004) were conducted during fieldwork. Interviews took place in three states: 32 of them in Puebla, 16 in each survey municipality; 24 in Veracruz and 4 in Chiapas. 65 people took part in those sixty interviews - 32 men and 33 women. In 22 households surveyed, at least one member also participated in an interviews - 12 in Coatapec and 10 in San Martín Totoltepec.

Table 1.1 Summary of Fieldwork Data Collection

State/municipality	Interviews	Survey questionnaires	Survey & Interview
Chiapas	4	-	-
Veracruz	24	-	-
Puebla	32	223	22
Coatepec	16	120	12
San Martín Totoltepec	16	103	10
Total	60	223	22

Source: Own elaboration with fieldwork data, 2011

Age in some cases was estimated by the interviewer and a wide range: 2 were 20 years old or younger, 17 in their twenties, 15 in their thirties, 11 in their forties, 7 in their fifties, 3 in their sixties and their seventies, and one person older than 81. For 6 of them, age was not asked or estimated by the interviewer. In terms of education, 12 of them had no education at all, even though some could read and/or write; 26 had some or all primary school; 7 some secondary or high school; and 16 of them at least some higher education. In 4 cases education was not asked or inferred by the interviewer.

An important issue was the type of the interview. Most of them, 42 to be precise, agreed to have an open interview, which mean their name and their answers could be use without any reserve. On the other hand, 19 of them preferred to remain anonymous, which means their answers could be used but they cannot be identified by name. Finally, two asked for confidential interviews, meaning their named nor their answers could be quoted in the thesis. Two more did not say because they just took part

unexpectedly, for example, by complementing what somebody else was saying in the middle of interview. For 26 participants, 13 in Coatepec and 13 in San Martín Totoltepec, their household was also surveyed.

Data was collected through fieldwork notes supported by audio recordings, when interviewees allowed. The method of selecting interviewees was snowball sampling (Barbour 2008) - usually starting by interviewing the contact person in the community and departing from there to obtain more interviews. Authorities, community leaders and regular men and women were interviewed.

Seven broad topics formed the guidelines for interviews. The first was a demographic profile, of which part was obtained by observation of dwelling characteristics and part by asking or inviting interviewees to talk about things like schooling and health services. The second topic was income and economic activity. The third topic referred to perceptions of human development and poverty, where issues surrounding empowerment and interventions were sometimes brought up. The fourth topic was about isolation and migration experiences. The fifth topic was discrimination. The sixth topic was social mobility and perceptions of progress. Finally, when the conversation allowed, aspirations and perspectives of the future were also discussed, which is also related to social mobility but were forward looking. All these topics were not necessarily covered in all interviews; it depended on how comfortable interviewees felt sharing their stories.

Ethics

The University has a strong commitment to conduct research to high ethical standards and requires that all those carrying out research fulfil their moral and legal responsibilities in to protect the dignity, rights and welfare of participants. In order to

apply the fieldwork questionnaire and conduct the interviews the methodology was approved by the Central University Research Ethics Committee (CUREC).

Also, sheet with information about the research was distributed to the participants with University and DPhil candidate's contact details. The sheet also informed the research's and the motive to be invited. Participant were informed also about:

- The voluntary character of the interview and that they had right to interrupt it withdraw from the study at any time, that is, before, during or after the interview had taken place. Also that there was no penalty in withdrawing from the research.
- That the interview represented no risk for the participant, only some of their valuable time to talk and answer some questions. They were also informed that there was no commitment to talk about something in particular or answer a particular question.
- That being part of the research was not rewarded nor remunerated and that they could request copy of the results.
- The interview could be open, anonymous or confidential. They were informed that an open interview is one in which the participant has no objection that anything you say is made public, including their name; in an anonymous interview, the informant identity would not be disclosed; and a confidential interview is one in which anything the informant said would not appear in the final document.

The participant was also required to sign a consent form, were they could specify the type of interview they wanted and if they had any objections to be recorded and/or photographed.

Limitations

The thesis methodology has some limitations. A first limitation, that is directly a consequence of using a mixed method approach. While the advantages of using both, quantitative and qualitative analysis, especially for a trained economist like me, were explained at the beginning of this section, it is important also to acknowledge the shortcomings. One of them is the time consuming process. Spending time in the field, collecting data and processing it consumes time. A lot of it.

A second disadvantage is that acquiring knowledge implies a learning curve. For someone trained in quantitative methods, getting into qualitative represents a cost, not only in terms of the time needed to learn but also the quality of the analysis. In the attempt to adopt a multidisciplinary perspective, there is a risk of not reaching a good standard in any of them. In this case, the risk was that quantitative analysis could be distracted and lowered in terms of quality, while qualitative analysis could not reach its full potential.

With respect to the qualitative analysis, there are dome limitations that should be mentioned. The obvious would be that findings cannot be generalised to the population. Even in the case of the fieldwork survey, findings are representative only for the municipalities where data was collected. Another one is that quality of the data collected depends greatly on the skills and experience of the researcher. An example of this is the information regarding income in the fieldwork survey. No response and misreporting, as well having no control or verification questions, made the data unusable.

In terms of the quantitative analysis the thesis adopts an empirical approach substantially based on poverty measurement, in particular the Alkire-Foster approach. As mentioned before in the literature review, there are many other views that could have adopted, countless comparisons between indigenous and non-indigenous using indicators that are probably not even mentioned in the thesis. Even for some methods

and selected indicators the thesis could have gone further in some areas. When these are spotted, further research topics are indicated.

1.4 Sampling

Since the nature of the survey exercise in the fieldwork municipality was just to get a taste at local level of how social and economic indicators compared between indigenous and non-indigenous populations, the sampling method was the simplest possible. In this case, simple random sampling without replacement was chosen (Kish 1965). Additionally, the sample size was determined not by the normal approximation to the binomial distribution, as would apply in the case of large populations, but instead by the normal approximation to the hypergeometric distribution. This is because the number of dwellings surveyed was less than 200 in both municipalities. Actually, according to the National Census in 2010, the municipality of Coatepec had 197 dwellings, while San Martín Totoltepec had 163.

The use of binomial distribution for small populations leads to relative higher sample sizes due to the finite population correction, which tends to one in large populations sizes and thus ignored (Lohr 2009). According to Freund (1992), Noble et. al. (2006) and Black (2011) when the sampling fraction is higher than 5 percent of the population, the binomial approximation is no longer appropriate, instead the hypergeometric random variable is adequately approximated by a normal density. The sample size using the hypergeometric distribution, adequate for small populations, is determined by the formula:

$$n = \frac{k^2 N p q}{e^2 (N-1) + k^2 p q}$$

Where n is the minimum number of dwellings to be surveyed, k is the cut-off point on the standard normal curve dictated by the confidence level - most times set at 1.96 for a 95 percent confidence level; p is a planning value for the unknown population proportion that possess the characteristic of interest and $q = 1 - p$. Since p is unknown, $p = q = 0.5$ is assumed to maximize the sample size. The sampling error is given by e, which is usually assumed to be 0.05. The total population size is N, which in this case is: 197 for Coatepec and 163 for San Martín Totoltepec.

Under the assumptions of 95 percent confidence level with a sampling error of 5 percent and given the population sizes in both municipalities, the minimum sample size for Coatepec was 99 and 90 for San Martín Totoltepec.

Dwellings were selected through a random draw, although when knocking on doors some people refused or were not present. Sometimes the dwelling next door was asked to participate instead, but sometimes in a second visit the survey interview was possible. The ending result was an oversample of the municipalities with 120 dwellings surveyed in Coatepec and 103 in San Martín Totoltepec. Although very basic and imperfect due to the lack of previous experience in holding surveys, the sample is considered to be good enough to be representative.

1.5 Fieldwork Places

For the qualitative analysis, the main data source was the data collected in Mexico between April and September 2011 through 60 semi-structured interviews as well as 223 fieldwork surveys. Interviews were held in Chiapas, Veracruz and Puebla, while the survey took place in two municipalities in Puebla only; 120 questionnaires

were collected in Coatepec and 103 in San Martín Totoltepec - 223 households in total participated in the survey.

Interviews in Veracruz also covered urban indigenous, to contrast with the perspective of rural indigenous in Puebla, as well as some migrant communities called *jornaleros*. In Chiapas the intention was also to implement the survey in a Zapatista community but unfortunately the different *Juntas de Buen Gobierno*, or Good Government Committees, that were consulted politely denied it for logistical reasons. Only two interviews in Chiapas had the Zapatista perspective, but they refused to be acknowledged as Zapatistas.

Table 1.2 Characteristics of Fieldwork Municipalities

Municipality	Population 2010	Territory (Km^2)	Localities	Indigenous (%)
Coatepec	758	10.22	3	81.53
San Martín Totoltepec	651	12.77	1	4.76

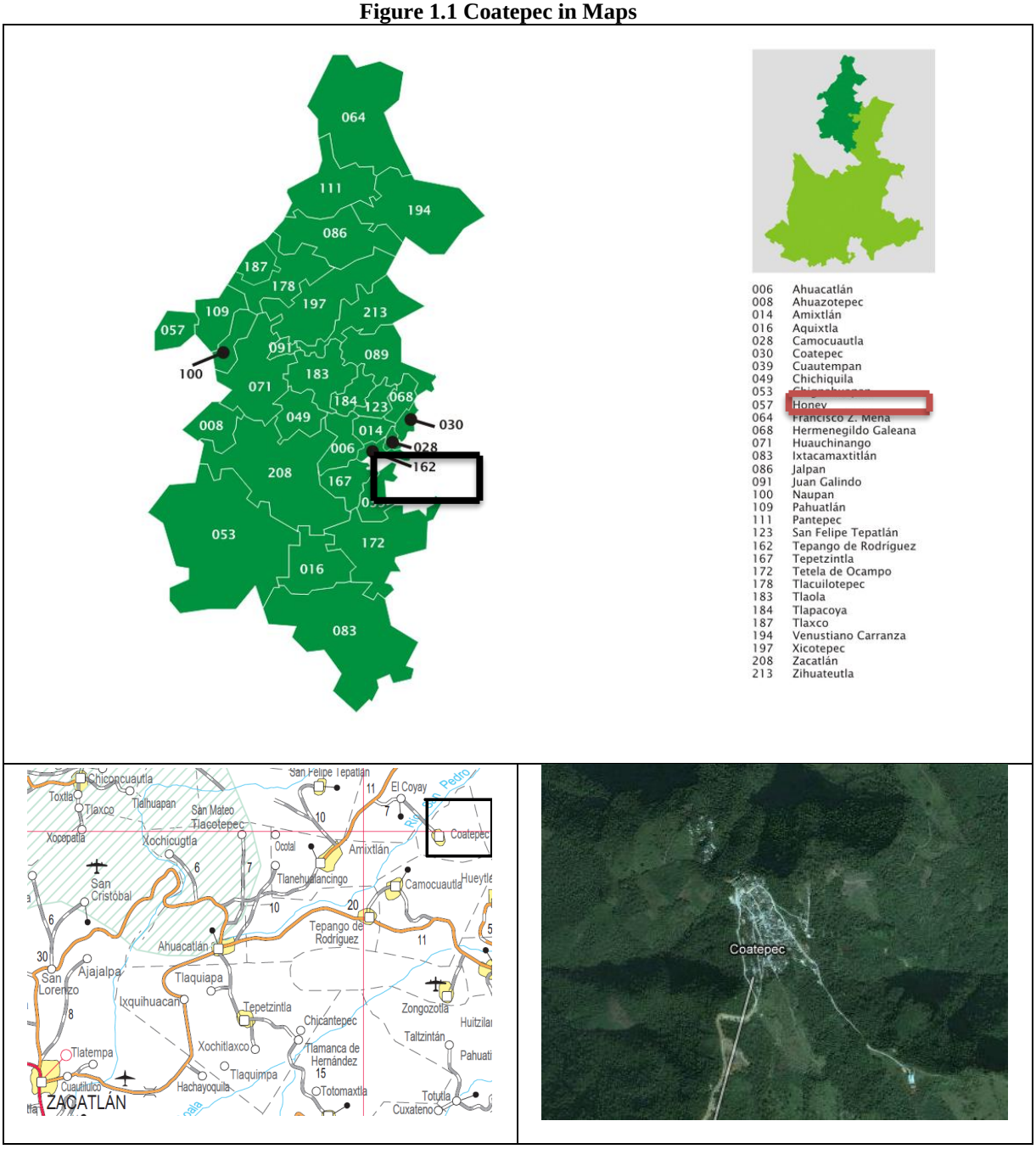
Source: http://www.inegi.org.mx/, http://www.cdi.gob.mx/, http://www.inafed.gob.mx/

Coatepec and San Martín Totoltepec, were selected for their similarities: they are in the same state – Puebla – and they are both rural and small. However, they have an essential difference: Coatepec is a municipality that is predominantly indigenous while San Martín Totoltepec is predominantly non-indigenous. Thus, comparison between Coatepec and San Martín Totoltepec are comparisons between people with very similar characteristics, but distinguishable in terms of whether they are indigenous or not. As can be seen in Table 1.2, according to official figures for 2010, in Coatepec 81.5 percent of the population was considered indigenous, while the figure for San Martín Totoltepec was only 4.8 percent.

The municipality of Coatepec is in the northern region of the State of Puebla. It is located in the middle of rugged mountains that reach up to 900 meters above sea level

but with abrupt descents to 400 meters above sea level. It has an area of 10.2 square kilometres, which ranks 214 out of 217 in size with respect to the other municipalities in Puebla. The vegetation of the municipality has been replaced in its entirety either by coffee plantations on the slopes of cultivated land or grassland in the highlands.

Figure 1.1 Coatepec in Maps



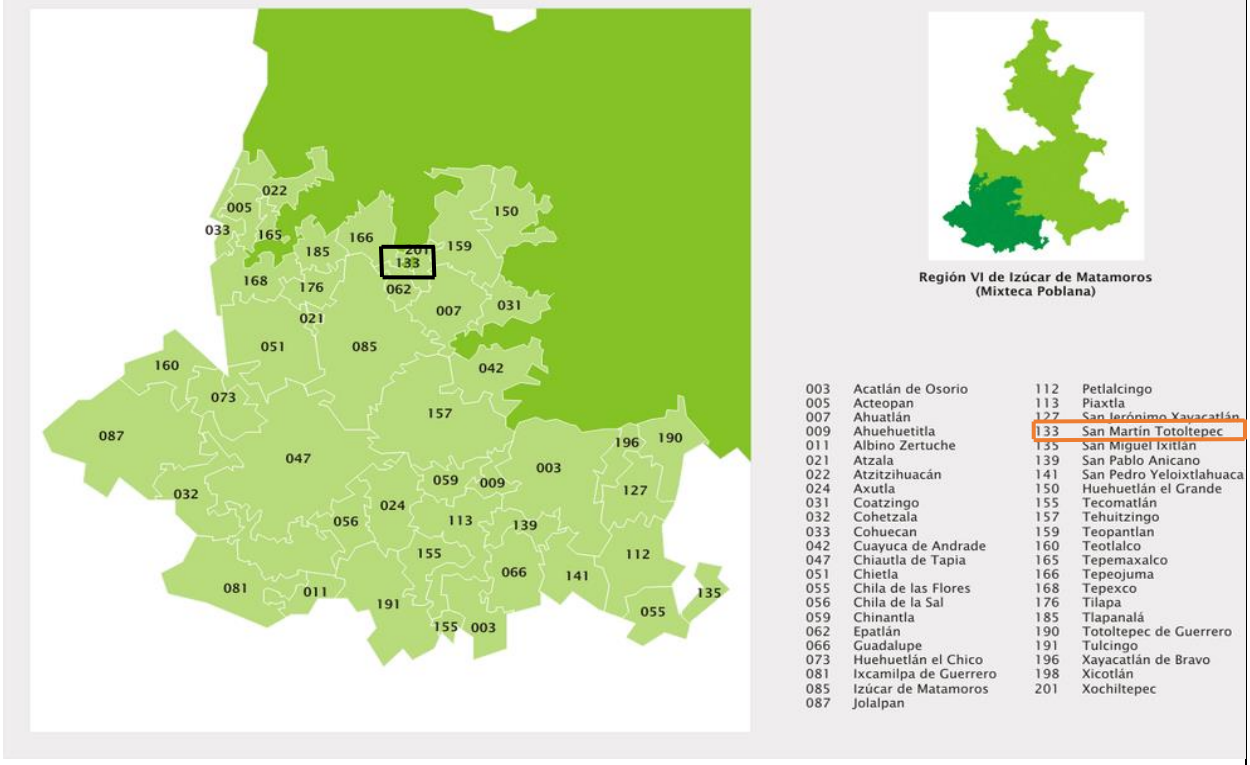
Source: https://es.wikipedia.org/wiki/Regiones_de_Puebla; http://www.sct.gob.mx/; http://maps.google.com/

In 2010, 96 percent of the employed population worked in agriculture and 87.5 percent of them earnt less than twice the minimum wage. Illiteracy rates reached 37.1 percent. This municipality is catalogued with a higher degree of social backwardness[6] - ranking 432 out of 2,466 municipalities nationwide. It is high on the marginalization index[7] - ranking 60th place state-wide and 581th nation-wide. Its indigenous population belongs mostly to the Totonaca ethnic group. The nearest urban centre is Zacatlán and there is only one road to reach Coatepec.

The municipality of San Martín Totoltepec is located in the west central part of the state of Puebla. Its size is 12.8 square kilometres, ranking 213 in Puebla, only one place above Coatepec. It is located at an average altitude of 1,360 meters above level sea and is on a plateau. San Martín Totoltepec and Xochiltepec are adjacent municipalities forming one town. The closest urban centre is Izucar de Matamoros. Its main economic activity is agriculture with the planting of corn, peanuts, beans, onion and chilli. There is also a nearby lagoon that allows fishing for the residents of San Martín Totoltepec. In the marginalization index it is classified as medium for 2010 - ranking 144 in Puebla and 1,201 at the national level. In terms of social backwardness, it ranks 1,700 nationwide. The indigenous population in San Martín Totoltepec is minimal. Despite being small, San Martín Totoltepec is not as isolated as a Coatepec. There is a road that goes through the municipality and continues on both sides. It is also not as hilly as Coatepec and is less rainy.

[6] Social Gap Index 2010, CONEVAL
[7] CONAPO 2010

Figure 1.2 San Martin Totoltepec in Maps



Source: https://es.wikipedia.org/wiki/Regiones_de_Puebla; http://www.sct.gob.mx/; http://maps.google.com/

1.6 Definition of the Indigenous Population

It is more or less expected that every study regarding the indigenous population needs to start by defining who is indigenous. Most definitions of the indigenous population have weaknesses and debateable elements - to the point that even international organizations do not share a single definition, and of course, much less consensus is held by scholars. One important insight about the definition of indigenous

population is given by Scott H. Beck and Kenneth J. Mijeski (2000) who discuss indigenous identity in Ecuador. They argue that indigenous people have mobilized over the past thirty years, partly to reshape their identities, and that three questions are fundamental: who is an indigenous person, what is the process by which individuals come see themselves as indigenous, and what attributes characterize a person as being indigenous. Taking this as a starting point, in this section I will try to explain how definitions of indigenous population are still unclear and very frequently mix and confuse three different elements: the individual process by which someone identifies her or himself as an indigenous; the normative elements that should define who can be considered an indigenous individual or group; and descriptive characteristics of contingent states that the indigenous population lives in or has lived in in the past.[8]

To illustrate how these three elements are combined, it seems plausible to start with a particular definition, for example the one adopted by the International Labour Organisation (ILO), since it is the multinational institution with the oldest record on the subject.[9] In 1957, the ILO adopted the Indigenous and Tribal Populations Convention No. 107, and in 1989 embraced the Indigenous and Tribal Populations Convention No. 169 emphasising respect for the cultures and way of life of indigenous peoples, their right to a continued existence, and to develop according to their own priorities.

Article 1 implicitly defines indigenous when stating that:

"this convention applies to:

[8] This section is a further elaboration on the previous work done for my MPhil Thesis in Economics and the later paper published in Iván Gonzalez de Alba (2010).

[9] ILO's work on the indigenous population started at its foundation in 1919 when was concerned with their role as workers. In 1921 the ILO focused on the native workers which lead to the Forced Labour Convention No. 29 published in 1930. When United Nations was formed in 1945 ILO started working with indigenous issues in a broader sense. Convention 107 was ratified by 27 countries from Americas, South Asia and Africa. During 1960s and 1970s Convention 107 was criticized of integrationist putting the convention under revision to end in 1989 adopting the Indigenous and Tribal Convention No. 169. To date 22 countries have ratified convention 169, including Mexico, and 17 more are still signatories of the former convention 107. The UK has not ratified those conventions yet.

(a) tribal peoples in independent countries whose social, cultural and economic conditions distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations;

(b) peoples in independent countries who are regarded as indigenous on account of their descent from the populations which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonisation or the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions" (International Labour Organization1989).

ILO's definition is probably one of the most popular definitions because it has what seems to be an essential part of any definition of indigenous population: a historical connection to a place. With this in mind, it is easy to see that conquerors, colonisers and new settlers cannot be considered as indigenous population. Having a historical root as an original inhabitant of a certain place is thus a necessary condition for a definition of indigenous population. A second necessary condition is a distinct culture, different from other sections of the national community, with its own traditions and institutions. This point is relevant because in recent times indigenous organizations are working to achieve legal recognition to govern themselves according to their own institutions and traditions.

In spite of the two necessary conditions established clearly in the ILO's definition, it lacks one very important characteristic: agency. Agency can be understood as "the ability to act on behalf of what you value and have reasons to value" according to Amartya Sen, as argued by Solava Ibrahim and Sabina Alkire (2007, 383). Ibrahim and Alkire consider empowerment to be an expansion of agency and, for the purpose of

this paper, defining who has the ability to tell whether someone is indigenous or not is the most important issue.

For example, for Beck and Mijeski (2000) the key to all three questions they put on the table (who is an indigenous, what the process of self-identification is and what characteristics an indigenous person has) is related to who has the power to define what it means to be identified as indigenous. They claim that sometimes identifying an individual as indigenous is a mechanism to dominate a group, but some other times it is a way to assert one's dignity and autonomy as a member of a proud ethnic group. The difference between one way or the other depends on whether someone is voluntarily placed in that category or if someone else, externally, is imposing it.

In the Mexican case, for example, according to Guillermo Bonfil Batalla (1995), one of the most respected Mexican anthropologists, the concept of indigenous was created after the Spanish conquest to refer to an immense variety of cultural groups with different languages, traditions, religions and institutions, but with a common characteristic: namely, that they were conquered. Prior to the Spanish conquest, indigenous groups did not consider themselves to be indigenous; they had, and many of them still have, their own ethno-linguistic identities, different from each other. In this case the concept of being indigenous is intrinsically linked to domination.

On the other hand, for Beck and Mijeski, politically organized groups of indigenous people have changed the meaning of "indigenous". For those groups, indigenous is not a synonym of pre-colonial, pre-Christian, or backward culture. They assert their indigenous identity as a symbol of pride and social struggle. Another study reinforcing this thesis is offered by Todd A. Einsestadt (2006) who argues that the Zapatistas in Mexico favoured the indigenous identity over class identity because of an already-emerging trend that started in 1990s which promoted indigenous rights in

different parts of Latin America, such as in Bolivia and Ecuador. For the author, indigenous identity is a matter of choice, where as other options are not necessarily ethnic related but class related, for example peasant as a social category.[10] The Zapatista movement is an indigenous movement and not a peasant movement because it is beyond the class struggle of left-wing social movements in Latin America.[11]

In his analysis, Einsestadt distinguishes two schools of thought regarding the indigenous identity. The first is the *primordialists*, who argue that ethnic identity is ascribed at birth, as something fixed or given, where choice has nothing to do with it. The second school is the *Latin Americanists* who consider that ethnic identities are flexible and changing rather than given and static. In this case, choice plays an important role in defining an indigenous identity, either to achieve some collective goal or as a part of a dialectic process whereby indigenous identity is malleable and the result of a syncretism of different factors, albeit rooted in strong social, political, and even psychological facts. For Einsestadt, when ethnicity is based on appeals to mobilize groups as much as in objective cultural traits or markers, *Latin Americanist* are *instrumentalists*, but when they refer to a dialectic process they are *constructivists*.

When the definition of the indigenous population ignores the agency of the indigenous to define their own identity, it is an external imposition and, as such, it becomes a symbol of domination. Regardless of the motivation for self-identification as indigenous, being able to exert one's agency to define oneself, and one's indigenous

[10] Amartya Sen (2006) explains how all we have different identities that overlap. For example, Sen argues that he can be "at the same time, an Asian, an Indian citizen, a Bengali with Bangladeshi ancestry, an American or British resident, an economist, a dabbler in philosophy, an author, a Sanskritist, a strong believer in secularism and democracy, a man, a feminist, a heterosexual, a defender of gay and lesbian rights, with a nonreligious lifestyle, from a Hindu background, a non-Brahimin, and nonbeliever in an afterlife (and also, in case the question is asked, non-believer in a "before-life" as well)" (2006, 19). Those identities take different relevance for each of us and the relative weight that each identity has demands reasoning and choice. Although, the choice of a particular identity is also context related.

[11] González et. al. (2013) also group afro-descendants with indigenous in their analysis of social movements in Central America. In this thesis, afro-descendants are not considered indigenous but it is an important ethnic groups that also require further study in Mexico and in Latin America.

identity, is not a necessary condition but a sufficient one in the definition of the indigenous population.

However, people could declare themselves to be, or identify themselves as, indigenous without being one. For example, a rent-seeking person could do it thinking that it could bring some benefit such as getting a position under an affirmative action policy, or a conditional cash transfer that is specifically addressed to the indigenous population. Others could identify themselves as indigenous in solidarity with the oppressed. This is the case of the Zapatista Subcomandante Marcos, since we can tell he is a non-indigenous person, despite the fact he is always wearing a balaclava mask, at least in public. On the other hand, some people could declare themselves to be non-indigenous, even when they are not. This could happen because they do not want to be discriminated against, as part of the assimilation process or because they have lost their sense of belonging to the indigenous community, among other reasons.

In any case, when someone declares him or herself to be indigenous using their free will, there is a sense of belonging. On the other hand, when it is an external entity who decides who is indigenous and who is not, then some could disagree with the group they have been assigned to, creating discomfort, questioning the authenticity of the rule and breaking the sense of belonging.

To recapitulate, two necessary and one sufficient condition to define the indigenous population have been identified. The two necessary conditions are: a historical root to being original settlers and a different culture to other segments of society; the sufficient condition is the agency to identify oneself as indigenous. What is relevant to this definition lies in the details because there are other definitions that have reached the same conclusion but they mix and confuse normative characteristics of a definition of indigenous population with descriptive elements that should not be there.

For example, in the introduction of the book edited by Rachel Sieder (2002) she brings up precisely the issue of controversy regarding who is defined as indigenous and sketches three broad criteria: self-definition, subordination to dominant society and historical continuity. The problem with this definition is the inclusion of "subordination to dominant society" because it is confusing the fact that the indigenous culture is different with the fact that it has been historically subordinated to a dominant society. To illustrate this problem, we could imagine a future hypothetical society where the indigenous are not subordinated any longer. Does that mean that they are not indigenous anymore? That they have been finally assimilated completely by the dominant society? Moreover, when Sieder expands regarding the subordination criteria, she argues that indigenous identity is linked to "discrimination by dominant society" and also puts poverty as a "defining feature of indigenous identity" (2002: 2). Does that mean that in order to be indigenous someone has to be discriminated against and poor? I do not think so.

Subordination, discrimination and poverty describe the past and the present of the indigenous population. Those are elements that have shaped the indigenous identity for many of them; and they are factors that most likely have influenced the decision of many people with an indigenous background to deny that background, hide it or make an effort to talk, dress and behave as not indigenous, or, in other words, to be assimilated by the dominant society. Subordination, discrimination and poverty definitely influence the psychological process of forming an indigenous identity that could also play an instrumental role in unifying and giving coherence to, for example, politically organized indigenous movements. Subordination, discrimination and poverty are not constitutive elements of a definition of the indigenous population: they are contingent states; but there are other contingent states, hypothetical at this moment, in

which the indigenous population might not be subordinated, discriminated or poor. Of course there might also be subordinated, discriminated, and poor populations who are not indigenous.

One last definition worth mentioning is the one adopted by the World Bank (WB). The WB published in 1991 the Operational Policy and Bank Procedure on Indigenous Peoples (OD 4.20). It was updated later in 2005 (OP/BP 4.10), but both documents gave the same definition of indigenous peoples:

"for purposes of this policy, the term 'Indigenous Peoples' is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees:

(a) self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;

(b) collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;

(c) customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture, and

(d) an indigenous language, often different from the official language of the country or region" (World Bank 1991; World Bank 2005).

While the WB's definition makes an effort to incorporate agency in self-identifying as indigenous, it also confuses contingent states by describing indigenous realities. In particular, the term *vulnerable* is misplaced, as well as the mention of separate institutions from those of the *dominant* society.

Counting the Indigenous Population

Parallel to the question of who is the indigenous population rests the question of how many indigenous persons are there? Estimating the size of the indigenous population is important for various purposes: to the study of different aspects of indigenous life, to compare with other social groups, to properly address public policies, among others. But counting them implies assuming a practical definition - a rule of thumb by which one person is categorized as indigenous while the other is not. The idea of a practical definition is not to acknowledge the intricate complexities or the subtle details of the indigenous identity, as described in the previous section, but to conceptualize a group of people as a compact set that is closed and bounded. There are at least three ways to get a practical definition of indigenous peoples according to Heather Marie Layton and Harry Anthony Patrinos (2006): self-identification, language use and geographical concentration. These are probably the most common way to identify the indigenous population by scholars and policy makers nowadays, but there have been several other ways used, such as last names, physiognomy and genotype, clothing and shoes, skin colour, birthplace or place of residence.

In general, we could divide practical definitions of indigenous peoples into three categories: self-identification, observer's perception and administrative criterion. Self-identification is the only one that takes into account the fact that being indigenous is mainly a matter of choice. As it was mentioned previously, having the agency to self-identify as indigenous is a sufficient condition for someone to be considered indigenous. In this case, either declaring themselves to be a member of an indigenous community or recognizing the ability to speak an indigenous language are both directly considering people's choice because they, the self-declared indigenous people, could have denied their membership or the ability to speak an indigenous language, except probably in the case of monolingual indigenous speakers. Note that for Layton and Patrinos, self-

identification and language are two different categories, but to me language use is also a form of self-identification as an indigenous individual.

Other ways to categorize someone as indigenous, such as clothing and shoes, skin colour, physiognomy and genotype, are all observers' perception and they involve an element of judgment. This way of identifying the indigenous population has two serious deficiencies. One is that it is an external imposition that, as previously discussed, implies some kind of subordination. The second problem is that it leaves room for discrimination against the indigenous population. Observers' perception no longer used, but it does not mean that it was not important in the past. For example, Susana Schkolnik and Fabiana Del Popolo (2005) studied 15 Latin American countries using methods to identify the indigenous population that included race, colour, clothes, shoes and region, among others. In New Zealand, for example, ethnic membership was recoded in medical files based on the health workers' assessments of the appearance of the service user, as reported by McPherson, Harwood, and McNaughton (2003). And finally, using last names is also an observers' perception since it is the judgment of the observer to decide which last name *sounds* indigenous and which does not. This is the case of Patricia Bustos et al. (2001) study about indigenous and non-indigenous children's growth which considered two indigenous last names as an instrument to identify indigenous children.

The last type of practical definition method is an administrative criterion. Under this method is Layton and Patrinos' geographic location, such as place of residence, but also birthplace. The problem with this method is that it is not only unrelated to the individual process of identification as indigenous, it is not related to the individual at all because it depends on aggregated figures of a geographic area to consider a person as indigenous. This is the case of the so called indigenous municipalities in Mexico, where

if the percentage of the population that speak an indigenous language is bigger than some threshold then it is considered an indigenous area. A lot of studies in Mexico about the indigenous population have been done using this method - defining some areas as indigenous and non-indigenous, and then comparing some indicators' averages to infer differences between the indigenous and non-indigenous populations.[12] The last two type of methods, observer´s perception and administrative criterion, do not take into account the individual process either because their users do not trust or do not care what people have to say about thems, or because they have not been able to find a way to collect that information.

1.7 The Indigenous Population in Mexico

In Mexico, the way to measure the size of the indigenous population has been based on the ability to speak an indigenous language since population censuses with this information have existed, that is 1895.[13] In 1910 a reduction of 12.5 percent is observed, compared to 1900 (Secretaría de Economía 1956). That year the Mexican Revolution started. Another slight decline is shown in the figure for 1950; but sudden increases are also recorded in indigenous statistical history. The figure for 1980 is 66.5 percent higher than 10 years earlier, while the number for 1960 increased 23.8 percent compared to 1950. As a percentage of the total population, the number of indigenous language

[12] Most of official documents analysing the socio-economic conditions of the indigenous population in Mexico take as unit of analysis the municipality. Examples of this are (Serrano Carreto, Embriz Osorio, and Fernández Ham 2002; Fernández Ham, Embriz Osorio, et al. 2006; Fernández Ham, Tuirán Gutiérrez, et al. 2006).

[13] For the MPhil thesis I did a historical review that backs to 1570 and discusses the different hypothesis regarding the size of the indigenous population during the Spanish conquest. For further reference see González de Alba (2009). Aboriginal population of America has been estimated by William M. Denevan (1976) between 8.4 to 80 million people around 1492. For central Mexico estimates reach up to 22.5 million in pre-conquest times (Sanders 1976; Borah and Cook 1963; Layton and Patrinos 2006; Caso et al. 1973).

speakers has reduced from around 16 percent at the beginning of the 20th Century to 7 percent at the beginning of the 21st Century.

Table 1.3 Historical Figures on Indigenous Language Speakers in Mexico

Year	Total Population	5 years and older	Indigenous language speakers	% Indigenous language speakers
1895	12,632,425		*2,096,983*	16.60a
1900	13,607,257		*2,239,755*	16.46a
1910	15,160,377		*1,960,237*	12.93a
1930b	16,552,722	14,042,201	2,251,086	16.03
1940	19,653,552	16,766,660	2,490,909	14.86
1950	25,791,017	21,821,026	2,447,609	11.22
1960	34,923,129	29,146,382	3,030,254	10.40
1970	48,225,238	40,057,748	3,111,415	7.77
1980	66,846,833	57,498,965	5,181,038	9.01
1990	81,249,645	70,562,202	5,282,347	7.49
1995	91,158,290	81,219,337	5,483,555	6.75
2000	97,014,867	85,931,732	6,274,418	7.30
2008c	106,866,209	97,277,680	6,720,690	6.91
2010c	112,590,130	102,293,422	6,601,118	6.45
2012c	117,310,503	107,163,308	6,454,225	6.02

Source: Own elaboration, considering the following notes:
a/ Secretaría de Economía 1956. Italics are own based on percentages in source.
b/ From 1930 to 2000 the source is Valdés 2001. Percent of indigenous language speakers are with respect to 5 years and older population for 1930-2000.
c/ Own calculations based on the National Household Survey of Income and Expenditure (ENIGH in Spanish) 2008-2012. Additionally, there are 180,100 indigenous language speakers who are less than 5 years old in 2008, 179,237 in 2010 and 161,654 in 2012.

My own estimates for 2012, based on ENIGH data, show an increase of 2.9 percent in the number of indigenous language speakers aged 5 years or older since 2000, but in the period 2008-2012 the number of indigenous language speakers shows a negative annual growth rate of -0.01. This belies a smaller negative growth rate than the forecast made by the National Council for Population (CONAPO in Spanish) for the period 2000-2010 (Partida Bush 2005). CONAPO's method estimates an average annual natural growth rate of 1.73 percent of the indigenous population, but a *social growth rate* of -0.38 percent, which they attribute to migration.

However, estimating the growth rate of the indigenous population is more complex than for the population in general or some other segments of the population. Birth rates and migration are not the only elements influencing the population growth; it

is important to bear in mind that being indigenous is mainly a matter of choice. Some parents have stopped teaching the indigenous language to their children because they consider it to be of no use outside of the community. This is more frequent with indigenous migrants from rural areas to the cities who aim to assimilate into the mainstream culture - what Schkolnik and Del Popolo (2005) call *the urbanisation of indigenous people*.[14] On the other hand, some indigenous language speakers deny their ability to speak the language because they are afraid of being discriminated against due to their ethnic background (Fernández Ham, Tuirán Gutiérrez, et al. 2006). As mentioned earlier, it is important to recall that the meaning of being indigenous could have a negative connotation when it is not adopted but imposed.

Classification

The size of the indigenous population in Mexican statistics is estimated based on the number of indigenous language speakers. Indigenous people are all members of indigenous households as well as anyone else who speaks an indigenous language outside the environment of indigenous households. Indigenous households are those whose head, the spouse or any other predecessor (grandparent, great grandparent, etc) of the household is an indigenous language speaker (Fernández Ham, Embriz Osorio, et al. 2006).

In 2012, under this definition, the ENIGH reported 11.3 million indigenous people in Mexico - 9.6 percent of the total population. Almost all indigenous people – 99 percent - belonged to an indigenous household, while the remaining 1 percent

[14] Luz María Valdés (2001) has estimated the annual natural growth rate for the indigenous population to be 4 percent for the period 1970-1995, based on the birth and mortality rates observed in municipalities with strong (that is, 70 percent or higher) indigenous presence. For the same period, the indigenous population grew at an annual rate of 2.3 percent; but, if Valdés estimations are correct, then a rough estimation of the assimilation rate would be the difference between the natural growth rate and the observed population growth rate in the Census, which means an assimilation rate of 1.7 percent.

constituted indigenous language-speakers outside indigenous households. Within indigenous households, not everyone speaks an indigenous language but 6.5 million do. One thing worth noting is that while most figures have grown for the indigenous population, those who spoke only an indigenous language has decreased from one million in 2000 to 610,039 in 2012. One third of the members of an indigenous household who were 5 years old or above did not speak an indigenous language, while another 1.1 million were younger than 5 years old when the ENIGH took place.

In addition to household members who speak an indigenous language, there are 108,519 speakers of indigenous languages outside of indigenous households, in private dwellings. ENIGH do not consider collective dwellings in the survey sample. In sum, 6.6 million people claimed to speak an indigenous language in 2012, which represents 6.1 percent of the total population aged 5 years old or above and 58 percent of the total indigenous population. Indigenous monolinguals, those only speaking an indigenous language, form 9.3 percent of the total indigenous language speakers.

Table 1.4 Indigenous Population in Mexico

	2000	2008	2010	2012
Members of Indigenous Households	**10,044,935**	**11,552,283**	**11,145,921**	**11,210,708**
5 years and older members	8,793,771	10,400,644	10,020,776	10,093,881
Indigenous language speakers	5,835,855	6,720,690	6,601,118	6,454,225
Monolinguals	1,007,803	731,160	652,382	610,039
Spanish speakers	4,828,052	5,989,530	5,948,736	5,844,186
Not indigenous language speakers	2,957,916	3,679,954	3,419,658	3,639,656
Less than 5 years old	1,251,164	1,151,639	1,125,145	1,116,827
Indigenous Language Speakers Outside Indigenous Households	**208,692**	**115,547**	**64,908**	**108,519**
In private dwellings	175,927	115,547	64,908	108,519
In collective dwellings	32,765	.	.	.
Total Indigenous Population	**10,253,627**	**11,667,830**	**11,210,829**	**11,319,227**

Source: CDI for 2000 and own estimations based on ENIGH 2008-2012, collective dwellings were not surveyed.

Indigenous language is a tool for identification, but within the indigenous group, language is anything but homogeneous. As a matter of fact, for the 2010 Census

identified 97 active indigenous languages; 85 were classified as indigenous languages of Mexico, while the remaining 12 were classified as other American indigenous languages.

Table 1.5 Indigenous Language Groups in Mexico, 2010

Indigenous Language	*Speakers*	*Indigenous Language*	*Speakers*
Náhuatl	1,608,339	Kumiai	3,155
Maya	806,511	Chichimeco jonaz	2,496
Mixteco	496,165	Awakateko	2,238
Tseltal	488,770	Guarijío	1,405
Zapoteco	477,070	Pima	1,290
Tsotsil	455,160	Chocholteco/Chocho	1,189
Otomí	294,411	Chontal (unspecified)	752
Mazateco	241,218	K'iche'	706
Totonaco	232,846	Matlatzinca	535
Ch'ol'	215,893	Jakalteko	483
Huasteco	172,433	Kaqchikel	474
Chinanteco	146,068	Tlahuica/Ocuilteco	418
Tlapaneco	135,397	Chuj	416
Mazahua	134,552	Cucapá	359
Mixe	128,415	Tepehuano (unespeficied)	347
Tarasco/Purépecha	125,411	Q'eqchi'	336
Tarahumara	85,755	Pápago	279
Tojolabal	84,522	Ixcateco	263
Zoque	73,979	Texistepequeño	225
Amuzgo	51,503	Qato'k/Motocintleco'	169
Huichol	46,556	Seri	135
Chatino	45,430	Kiliwa	130
Mayo	40,921	Teko	122
Popoluca from the Mountains	35,692	Oluteco	62
Chontal from Tabasco	31,734	Kickapoo	50
Tepehuano from the South	28,936	Paipai	25
Triqui	27,000	Ixil	21
Cora	24,675	Lacandón	7
Huave	19,268	*Mexican Indigenous Language Speakers*	
Popoloca	17,217	*6,878,363*	
Yaqui	14,509		
Cuicateco	12,544		
Pame	12,205	Unspecified indigenous language	109,897
Mam	11,547	Other American indigenous	
Tepehua	10,384	languages	1,100
Tepehuano from the North	8,632	*Indigenous Language Subtotal*	*6,989,360*
Popoluca (Unespecified)	5,569		
Sayulteco	4,603		
Chontal from Oaxaca	4,550		
Q'anjob'al	3,886	Does not speak an indigenous language	104,970,779
		Total	*111,960,139*

Source: Own estimations using the microdata from National Population Census 2010.

The National Institute of Indigenous Languages in México (INALI in Spanish) group them into 68 language groups, with Náhuatl being the most commonly spoken

one, spoken by 1.61 million people according to the 2010 Census. Maya is the second most spoken indigenous language, with more than 800,000 people, followed by the Mixteco, Tseltal, Zapoteco and Tsotsil languages - all with more than 400,000 people speaking them. Another 10 indigenous languages have more than 100,000 speakers: Otomí, Mazateco, Totonaco, Ch'ol', Huasteco, Chinanteco, Tlapaneco, Mazahua, Mixe and Tarasco/Purépecha.

At the other end of the scale, there were 30 languages in the year of reference with 1,000 to 100,000 speakers, among them Tarahumara, Tojolabal and Cora; while 22 further languages were spoken by less than 1,000 people, and five of them by less than 100 people. Lacandón is the least spoken indigenous language with only seven people identified as speakers of it in the 2010 Census. Further detail can be seen in Table 1.5

1.8 Conclusions

Chapter one is a general introduction to this thesis. It had two main goals. The first was to explain the motivation, hypotheses, objectives, structure and methods. The second was to introduce general topics about defining, identifying and estimating the size of the indigenous population in Mexico.

As explained in the introductory section, the thesis seeks to understand the differences between the indigenous and the non-indigenous populations in Mexico in terms of poverty and to analyse what explains that difference. Three factors are to be explored to explain that difference:

1. Less geographical mobility, not only in terms of relatively less migration to urban economic centres but also in terms of a relative greater dispersion and geographical isolation, of indigenous communities.

2. Slower intergenerational mobility, which means that relatively fewer indigenous people surpass the standard of living of their parents.
3. Ethnic discrimination against the indigenous population.

These three phenomena and their inteaction help to explain the poverty gap between indigenous and non-indigenous populations. The thesis has the following hypothesis: The indigenous population in Mexico is poorer than the non-indigenous population and the poverty gap between indigenous and non-indigenous is explained by more geographical isolation, slower intergenerational social mobility and ethnic discrimination.

The chapter then reviewed the literature on indigenous and non-indigenous comparative studies in Mexico. While the review is centred on the analysis of poverty, it goes beyond the realm of economics, since it also covers publications that compare living standards in different disciplines, and includes some ethnographic work. These references form the basis of this thesis. They have contributed to an understanding of the differences between indigenous and non-indigenous groups, as well as an understanding of what has been wrong and right regarding policies to amend the well-being gaps and inequalities between these two groups. However, this thesis is innovative because is based on a multidimensional approach to poverty and it makes the most of recently available statistical information.

Regarding methodologies, a mixed method approach has been assumed, combining qualitative and quantitative methodologies. Quantitative methods are explained in detail in each chapter, while the qualitative analysis is based on the data collected during fieldwork in 2011. 60 semi-structured interviews were held in Chiapas, Veracruz and Puebla, and a survey was fielded in two municipalities. In total, 223

questionnaires were applied successfully - 120 in Coatepec and 103 in San Martín Totoltepec.

Based on definitions of international organizations, an analysis of what is understood to be an indigenous population was also presented in this chapter. The main point is that definitions of indigenous populations very frequently mix and confuse three different elements: the individual process by which someone identifies her or himself as indigenous; the normative elements that should define who could be considered an indigenous individual or group; and descriptive characteristics of contingent states that the indigenous population lives, or has lived in, in the past.

The chapter closes with a historical review of the statistical estimation of the size of the indigenous population in Mexico. Traditionally, and since population censuses started, the indigenous population has been identified according to their ability to speak an indigenous language. In this thesis, indigenous people are defined as members of an indigenous households or able to speak an indigenous language but living outside the environment of an indigenous household. Indigenous households are those whose head, the spouse or any other ascendant is an indigenous language speaker. In 2012, under this definition, the ENIGH reported there to be 11.3 million indigenous people in Mexico, representing 9.6 percent of the total population.

2. Multidimensional Poverty

Researchers should be looking for what is accurate, not for what is surprising!
(Alberto Alesina, 2002)

2.1 Introduction

A woman in Chiapas, who asked to remain anonymous, shared an anecdote with me. It was not her own, it was the story of someone she knew: a Mazahua woman who had struggled a lot to get a university degree. The Mazahua woman finally got a job at the university where she studied but her wage was lower than the others because she was, "a woman, indigenous, shortish and swarthy", my informant explained. "As a society, we are responsible for this", she added.

A few weeks later, back in England, a friend asked me about my thesis and, after my shortest possible answer he asked: "Why do you want to show something that everybody knows?" This was not the first time someone had asked me this. I have asked myself the same question, and the best possible answer for me is because indigenous peoples have been colonized, exploited, excluded and discriminated against for centuries; because most policies have tried to westernize the indigenous, persuading them to adopt the language, the clothes, the beliefs and more, of the mainstream society. And this is not in the past, it is still happening and, as my informant said, we are responsible as a society. If this is still happening, it is because we have not done enough, discussed enough, studied this enough. Nor have we found ways to redress material deprivations without blighting the positive features of indigenous communities.

The indigenous population was not identified in Mexico's income household survey before 2008. Before that, relatively few studies of income poverty in Mexico

contained an analysis of indigenous and non-indigenous populations, and the strength of those studies was limited by data constraints.[15] Nowadays, new and more powerful analyses are possible, using more sophisticated methodologies, and for the first time using improved data. This chapter takes, as its starting point, the multidimensional poverty measure that was adopted by the Mexican government as the official poverty measure. The Mexican multidimensional poverty measure represents a breakthrough that has been acknowledged internationally, for example, by the Multidimensional Poverty Peer Network[16] and has become a useful tool for planning, policy making and monitoring.

The agency in charge of estimating the measure is the National Council for the Evaluation of Social Development Policy (CONEVAL). To date, CONEVAL has published results for four years: 2008, 2010, 2012 and 2014.[17] All of them report indigenous poverty, however until very recently, in 2014, CONEVAL reported poverty only for speakers of indigenous language and non-speakers of indigenous language. This notion excluded many people from being considered indigenous, in particular household members who did have not the ability to speak an indigenous language, either because they were too young or because they never learnt it. Furthermore, there was an age group, infants, that spoke neither an indigenous language nor Spanish, leaving them without membership of the indigenous or non-indigenous groups.

[15] As mentioned in Chapter 1, in the book edited by Gillete Hall and Harry Anthony Patrinos (2006) *Indigenous Peoples, Poverty, and Human Development in Latin America: 1994-2004*, the Mexican chapter by Alejandro Ramirez (2006) offers a considerable amount of information about indigenous poverty in Mexico. However, since the income survey does not identify the indigenous population a percentage of the indigenous population in a municipality was used to infer all the analysis. Another problem is that the income survey is not representative at municipality level.

[16] http://www.mppn.org/participants/mexico/

[17] In June 2015 released the report for 2014, while the aggregated poverty measures are estimated for the whole period, 2008-2014, the rest of the analysis uses 2012 data since fieldwork was conducted in 2011, closer to the 2012 reports.

In 2014, however, CONEVAL published a book on indigenous poverty in Mexico using their results for 2012 (CONEVAL 2014). The book centres the discussion on how the indigenous population is identified in Mexico. Since then, their statistics are presented for indigenous and non-indigenous populations using the same definition used in this chapter. A household is defined as indigenous if the head, spouse or any grandparent of the household speaks an indigenous language. The indigenous population comprises then, members of indigenous households and indigenous language speakers out of indigenous households.[18]

A better and deeper understanding of the differences between the indigenous and the non-indigenous populations is required to inform effective poverty reduction as well as anti-discrimination strategies. This chapter aims to elaborate more extensively than CONEVAL has done to date on the level and composition of indigenous poverty. Even these descriptive findings will contribute to a greater understanding of indigenous poverty in Mexico and in so doing, methodologies will be applied that can be used in the future to track the evolution of indigenous poverty in Mexico and elsewhere.

Therefore, this chapter adopts and adapts CONEVAL's multidimensional poverty measure, seeking to extend the discussion on indigenous poverty CONEVAL's data has made possible, and motivating others to join. At the same time, this chapter goes further into the analysis of multidimensional poverty in Mexico than published literature has to date (not limited to indigenous comparisons). For example, CONEVAL does not probe the association, similarity or redundancy of indicators in the multidimensional poverty measure, while this chapter discusses precisely that in section 2.5. Robustness issues are also discussed more extensively, in particular the analysis for

[18] Please note since 2009 this thesis has been planned and thought using the definition of the indigenous population just described. At that moment, the differences in the way the indigenous population was identifies was something that distinguished CONEVAL's poverty results and this thesis'.

all possible values the poverty cut-off, with CONEVAL's dimension weighting structure and also assuming equal weights. Income stochastic dominance is also studied, which is beyond CONEVAL's scope.

An important difference between CONEVAL's poverty figures and this chapter's is the way the aggregate poverty measure is estimated. While CONEVAL concentrates on headcount ratios and the average number of social deprivations, without taking into account income deprivation, in this chapter the ultimate measure is the adjusted headcount ratio (M_0) considering all dimensions, including income.

Another distinctive value-added of this chapter is that it critically explores design issues, such as indicator selection, using qualitative data. As explained in the first chapter, the thesis follows a mixed method approach. Later in the chapter, data collected during fieldwork is discussed putting the multidimensional poverty measure in a much smaller geographical scale, when estimating poverty not at national level but only for fieldwork municipalities, and also complementing the study of indigenous and non-indigenous poverty with qualitative analysis, for example, discussing different notions of poverty. This is also something that CONEVAL has not done yet.

This chapter, as the first empirical chapter in the thesis, sets the basis for the following chapters by telling a detailed, rigorous, and comprehensive story of the differences between indigenous and non-indigenous populations in Mexico, which subsequent chapters will probe with new methodologies. The key element of this chapter is to see how most of poverty dimensions require state intervention in order to be satisfied. The fact that the indigenous are poorer in these dimensions means that they rely more on state intervention and support.

The following section will review the literature regarding poverty measurement, followed by the Alkire-Foster methodology that CONEVAL adopted. The chapter explains then the indicators and cut-offs used in the measure, followed by a section about income and non-income deprivation results. Later a discussion about broad results in terms of identification and aggregation of multidimensional poverty is followed by the analysis of standard errors and robustness tests. One more section sees the geographical distribution of the poor.

The continues into the mixed-methods analysis primary fieldwork data, using both quantitative and qualitative methodologies. The analysis is done using the material from sixty interviews in three states: Chiapas, Veracruz and Puebla; and the fieldwork survey that took place in two municipalities in Puebla: Coatepec and San Martín Totoltepec. There is another section presenting a summary of the similarities and differences in terms of poverty between the indigenous and the non-indigenous populations. Finally, the last section contains a summary of the chapter and its findings.

2.2 Literature Review for Poverty

Reviewing the literature about poverty could take the whole thesis and even then might not be enough to summarize it.[19] Given the limited space here I am going to

[19] Even the concept of poverty is a contested one. For example, Arturo Escobar (1995) argues that the term poverty was an invention to justify intervention in the name of development and Majid Rahnema (1993) says that there may be as many poor and as many perceptions of poverty as there are human beings. While he acknowledges that the whole idea of poverty is based on the lack of something necessary, he asks "What is necessary to whom? And who is qualified to define that?" (1993, 159). Nevertheless, Amartya Sen would argue against those who claim that the exercise of measuring poverty is primarily subjective. In several places he has quoted both Adam Smith and Karl Marx to say that the elements necessary for subsistence, in a certain place and at certain moment in time, are more or less known. Furthermore, even while there is some ambiguity in a description of what poverty is, it does not make it a prescriptive act (Sen 1982, 17–18).

address only two issues regarding poverty which are essential for my thesis. The first one refers to income and multidimensional poverty measures. This is because part of the thesis will compare poverty measures between indigenous and non-indigenous populations in Mexico. The second is a quick review of the population of the ____ approach in Latin America.

With respect to the evaluation of poverty, as Amartya Sen (1976) suggested, it can be broadly divided into two steps. The first step is identification, that is, of who is to be considered poor and who is not. This step regularly takes the form of selecting a threshold which is the tool to decide whether someone is poor or not. The second step is aggregation, which refers to how certain characteristics are put together in order to assess the level of poverty in a certain community. When the assessment of poverty in a community relies on income, the threshold is known as the poverty line and how information about people's income is aggregated is what defines the income poverty index.[20]

Probably the most widely used income poverty measures is the family of poverty measures created by Foster, Greer and Thorbecke (FGT) (1984). This is due to its versatility, since depending on the value of the poverty aversion parameter α, the measure can represent the simplest headcount ratio, if $\alpha=0$; the normalised poverty gap, or the per capita income gap, when $\alpha=1$; or a measure for the severity of poverty when $\alpha=2$, because when the household income gap is squared poorer households weigh more in the aggregated index.

[20] There is a great debate about where a poverty line should be set. For instance: whether it should be set on the basis of consumption or income; whether the recipient unit should be individual, household, per capita or adult equivalent; whether there should be only one poverty for all, or whether it depends on the region, for example, urban and rural poverty lines. Should the poverty line be an absolute number only adjusted in time with inflation, or a relative parameter, such as half the median income (or a hybrid of absolute and relative such as weakly relative). If it is absolute or hybrid, what should be the method to determine it. This list is not exhaustive but the issues are well-known. A good introduction to this topic can be found in Gary S. Fields (2001).

The general formula of the FGT index is:

$$FGT_{\alpha} = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)^{\alpha}$$

where N is the total population, z is the poverty line, y_i is the income of household and *i* and *q* is the number of people under the poverty line. The FGT satisfies different properties, or axioms, depending on the value of α, and there seems to be some trade-off between simplicity and desired properties, but those axioms will not be discussed here. Instead, it is important to offer an alternative perspective to approaching the issue of poverty measurement and that is Atkinson's (1987) stochastic dominance principle.

This principle allows comparisons between different income distributions for a wide range of poverty lines, using the cumulative density function. If the cumulative density function for distribution A is at least as high as for distribution B for all values of *z* from z^{min} to *z**, where z is the poverty line, z^{min} is minimum poverty line and *z** is highest poverty line to be considered, then A first order dominates distribution B. This is a way to solve the conundrum as to which poverty line to follow and to obtain an unambiguous decision regarding income poverty of two different income distributions. When cumulative density functions cross, second and third order dominance can also be estimated.[21]

Multidimensional poverty measures follow more or less the same logic but there is a dual cut-off method of identification, as expressed by Sabina Alkire and James

[21] First order dominance implies second and third order; and second order imply also third but not the other way around. Stochastic dominance is also called *poverty orderings* by James Foster and Anthony Shorrocks (1988) who study the properties of the FGT measure for a range of poverty lines. They also found that the ordering associated to FGT_2 is equivalent to the a censored generalized Lorenz ranking, as it is very well explained by Amartya Sen and James E. Foster (1997). However, Atkinson's proposition is less restrictive because there is no need to specify a particular poverty measures, tackling both problems at the same time.

Foster (2007; 2011a).[22] The first vector of cut-offs provide the thresholds for each dimension in order to identify whether a person is deprived in that dimension. The second cut-off refers to the number of dimensions in which a person must be deprived to be considered poor, when dimensions are equally weighted, otherwise it is the weighted sum of dimensions. The dual cut-off, also known as the counting approach, is an alternative to other identification methods for multidimensional poverty measures, such as the unidimensional, union and intersection approaches. In the unidimensional approach, achievements in all dimensions are aggregated first at individual level (no deprivation cut-offs are fixed) and then the poverty threshold is set for the resulting unidimensional aggregated indicator. In the union approach, deprivation in any dimension is sufficient for a person to be considered poor, while in the intersection approach the person needs to be deprived in all dimensions.[23]

According to the Alkire-Foster methodology, before aggregating, deprivation is identified for every person in all dimensions and then, after choosing the second cut-off in *k* number of dimensions, those deprived in less than k dimensions are considered non-poor. The headcount ratio is similar to the one-dimensional case - the number of poor over the total population (H). However, the methodology allows us to estimate also the average poverty gap (A) or the average percentage of deprivations the poor suffer, as well as the adjusted headcount ratio, that is H times A, which is the final poverty measure.

[22] There are other approaches to the issue of multidimensional poverty measures, for example, François Bourguignon and Satya Chakravarty (2002; 2003) and Jean-Yves Duclos, David E. Sahn and Stephen D. Younger (2006) work on the multidimensional extension of the FGT measure as well as multidimensional stochastic dominance. However, since for the thesis the aim is to use only the Alkire-Foster methodology, and given the limited space in the thesis, I am not going to elaborate further on those other approaches. Alkire et. al. (2015) present an overview of methods for multidimensional poverty assessment, in chapter 3, and a review of counting approaches in chapter 4. A previous revision of literature of multidimensional poverty measures was done by Sami Bibi (2005).

[23] See A.B. Atkinson (2003) for a more detailed discussion.

This methodology has gained worldwide recognition, for example, the Mexican government adopted it as the official methodology to measure multidimensional poverty, and the new Multidimensional Poverty Index (MPI) presented since 2010 by the United Nations Development Programme (Alkire and Santos 2010; United Nations Development Programme 2010) follows this methodology as well. Regional MPIs are being developed as well. For Latin America, Maria Emma Santos et. al. (2015) published a report with a regional MPI. Furthermore, an MPI will be part of the indicators to monitor target 1.2 in the Sustainable Development Goals (SDGs) for the post-2015 development agenda.[24]

It is important to mention that the counting approach, on which the Alkire-Foster methodology is based, has been widely applied around the world. In Latin America and Europe, in particular, research and policy has been informed by counting approaches.[25] In Europe, Townsend (1979) used twelve dimensions to study poverty in the United Kingdom: diet, clothing, fuel and light, home amenities, housing conditions and facilities, home surrounding environment, work conditions, family support, recreation, education, health and social relations. Subsequent work about poverty and social exclusion was inspired and motivated by Townsend's seminal work.

On the other hand, in Latin America, the counting approach had its roots in the basic needs approach developed in the 1970s and popularized by the Economic Commission for Latin America (ECLAC or CEPAL in Spanish) as the unsatisfied basic needs (UBN). Multidimensionality of poverty was acknowledged in the region and the UBN became the mainstream assuming as the main reference the study conducted by

[24] See *Transforming our Lives* (the SDG document) and the UN statistics division website: http://unstats.un.org/sdgs/

[25] Alkire et. al (2015) reviews empirical implementations and summarize the how counting approaches developed in these regions.

the Argentinian National Institute of Statistics and Census, INDEC in Spanish (INDEC 1984).

In Mexico, Julio Boltvinik assumed the leadership of the UBN approach, proposed the so called *integrated method* to measure poverty (Boltvinik 1992; 1995; 1996) and became an academic referent for it. His method was not adopted as official by the Mexican government, however, as a congressman in the Chamber of Deputies from 2003 to 2006, he successfully promoted the Social Development General Law, enacted on January 2004, which commanded the adoption of a multidimensional poverty measure in Mexico.[26]

Once the social development Law was enacted, CONEVAL was created in 2005 and a process of deliberation to discuss the new multidimensional poverty measure started. Five methods were presented and discussed as part of the selection process, and published later in the book *Medición Multidimensional de la Pobreza en México* (Boltvinik et al. 2010). The multidimensional poverty method adopted by CONEVAL followed mainly Foster´s (2010) suggestions and the algebra proposed by Alkire and Foster (2007) for multidimensional poverty measurement, which will be explained in the next section.[27]

[26] See the reference Cámara de Diputados del H. Congreso de la Unión (2004) or consult the Law in http://www.diputados.gob.mx/LeyesBiblio/pdf/264.pdf. Also, a discussion about the Law can be found in Boltvinik (2006).

[27] Before CONEVAL´s multidimensional method was released, they only measured income poverty for a set of three different poverty lines: alimentary, capability and patrimony. However, their multidimensional poverty measure is not actually the first one done by the Mexican government, nor even the first one to be commanded by Law. In addition to the unsatisfied basic needs measures, there is at least one prior exercise of measuring multidimensional poverty called Global Poverty Index-Deprivation Mass. This method is the one used to distribute the federal infrastructure fund between states and municipalities and its method was published in the Fiscal Coordination Law (Ley de Coordinación Fiscal) December 29, 1997 (DOF 1997).

2.3 The Alkire-Foster Methodology

While this section is focused on explaining the Alkire-Foster methodology for multidimensional poverty measurement, it is important to spend some time discussing its advantages and motivations. Sabina Alkire et. al. (2015) have mentioned motivation to focus on multidimensional poverty measures and analysis in three different sources: normative, empirical and policy.

The normative source is basically an ethical motivation, in order to have a measure that reflects in a more comprehensive way the social phenomenon of poverty. When poverty is understood as shortfall of well-being and well-being is acknowledged to be a notion that goes beyond income. Alkire et. al. explain the ethical motivation for multidimensional poverty measures is based on Amartya Sen's approach that argues poverty should be seen as deprivation in the space of capabilities. Capabilities have intrinsic and instrumental values, which means they are *ends* and not only *means* of living.

Regarding the empirical motivation, Alkire et. al. analysed whether monetary poverty measures could be assumed as good proxies of other dimensions of poverty and they found large mismatches. They also studied how GDP growth fails to reflect poverty reduction in its many dimensions and how monetary measures of poverty do not necessarily identity as poor the same social group as multidimensional measure do. The third motivation source for Alkire et. al. is to inform policy. Measures that follow the Alkire-Foster methodology can be decomposed by population groups or regions, broken down by indicator or dimension and can be applied areas where income is less relevant like child poverty or women's empowerment.

One important motivation of multidimensional poverty measures, with a strong policy application, is the fact that some markets are imperfect or incomplete. Maria Emma Santos and Sabina Alkire (2011) have said that important needs are not satisfied by the markets, for example, a family with income above the poverty line who is not able to meet some basic needs due to lack of public services such as health or education – e.g. in remote rural areas. In such cases, they mention, provision of certain goods and services rely on the state and other non-market institutions. Non-monetary dimensions in multidimensional poverty measures are frequently those depending in state intervention.

Later in this chapter, it is going to be shown how the indigenous how greater deprivations in dimensions were state intervention is important. However, before showing the results, the dimensions and the comparative analysis of indigenous and non-indigenous populations, it is necessary to set the basics of the measurement.

The method was developed under the philosophy of Amartya Sen's capability approach in order to create, "a coherent framework for measuring poverty in the multidimensional environment that is analogous to the set of techniques developed in unidimensional space" (Alkire and Foster 2011a, 476). More specifically, the Alkire-Foster measures expand the family of income poverty measures FGT (Foster, Greer, and Thorbecke 1984) to more than one dimension. One important difference is the identification of the poor. As mentioned previously, Amartya Sen (1976) himself divided the measurement of poverty in two steps: identification and aggregation. In the first step, the poor are identified from the general population, while in the second, aggregation step an index is constructed to have a summarized figure. In the case of income poverty, the identification relies on setting a poverty line, which serves as the threshold to say who is poor and who is not.

In the Alkire-Foster measures there are a set of dimensional thresholds or cut-offs, but there is also a second cut-off for the number of deprivations that a person has to have in order to be considered poor. The cut-off of dimensions is summarized by Atkinson (2003) as a counting approach, which includes the intersection approach and the union approach, or something in between. As explained earlier, the union approach is when a person is considered poor if a deprivation is shown in at least one of any of the dimensions measured. The intersection approach, on the other hand, is when a person is considered multidimensionally poor only if they are is deprived in all dimensions.

The Alkire-Foster method allows for both the union and intersection approaches, and also permits analysts to define a poverty cut-off as being any weighted sum of deprivations *k* between union and intersection. Formally, using a similar notation to the one specified by Sabina Alkire and James Foster (2011a): n is the total number of individuals; $d \geq 2$ is the total number of dimensions, assumed to be more than one; $y_{ij} \geq 0$ is the non-negative achievement of individual i in dimension j, and thus $i = 1,2,\dots,n$; and dimensions $j = 1,2,\dots,d$; $z_j > 0$ is the strictly positive deprivation cut-off of dimension j; $w_j > 0$ is the strictly positive weight for dimension j, noting that the sum of weights must be equal to the total number of dimensions $\sum_1^d w_j = d$; c_i is the weighted sum of deprivations for individual i; k is the poverty cut-off or the weighted sum of deprivations required to be considered poor that can take any positive values up to d, which means $k \in (0, d]$, or $[1, d]$ when dimensions have equal weights.[28, 29]

[28]Alternatively, it is possible to express k, c and w as proportions, if divided by d.

[29] A particular case of unequal weights is what Alkire and Foster call *nested* weights, for example, if one dimension is could be considered more relevant and take fifty percent of the total weight, while the rest of dimensions take an equal shares of the remaining half. This case of nested weights is relevant because it is adopted for the official Mexican measure.

An individual i is considered to be poor when the observed weighted sum of deprivations is at least as high as the poverty cut-off, which means $c_i \geq k$. In the intersection approach k is the total number of dimensions, $k = d$, while in the union approach $k = 1$ when dimensions have equal weights or the lowest possible weight a dimension can take for unequal weights, $k = w_{min}$.

The general formula of the Alkire-Foster measure is then:

$$M_\alpha = \frac{1}{nd}\sum_{i=1}^{n}\sum_{j=1}^{d} w_j \left(\frac{z_j - y_{ij}}{z_j}\right)^\alpha I_i(c_i \geq k)$$

Where $I_i(c_i \geq k)$ is a function that takes value of one for those who are identified as poor and zero for those who are not, while the parameter α is a sensitivity parameter in the fashion of the one-dimensional poverty measure FGT (Foster, Greer, and Thorbecke 1984).[30] The simplest aggregation for the Alkire-Foster measure is the M_0, which can be expressed also as the product of two partial indices: the headcount ratio H and the average proportion of deprivations of the poor A. The first, the headcount ratio, is simply the number of poor over the total population, $H = \frac{q}{n}$, where q is the number of people who are poor, or $q = \sum_{i=1}^{n} I_i(c_i \geq k)$. The average proportion of deprivations across the poor is the sum of all deprivations amongst the poor $c_i(k)$, divided by the number of the poor. Therefore, formally it is expressed as $A = \frac{1}{q}\sum_{i=1}^{n} c_i(k)$. When $\alpha = 0$ the Alkire-Foster measure is known as the adjusted headcount

[30]The Alkire-Foster measure can be expressed in matrix form as $M_\alpha = \mu(I(k)g^\alpha) = \mu\left(g^\alpha(k)\right)$ or the mean of the *censored* matrix of deprivations $g^\alpha(k)$of $n \times d$, which is the product of the $I(k)$ vector of $1 \times n$, with element with value one for those who are identified as poor and zero for those who are not and the matrix of deprivations for the whole population g^α. When $\alpha = 0$ the matrix of deprivations $g^0 = [g_{ij}^0]$ has only 0 or 1 elements. The element g_{ij}^0 is equal to 1 when the individual i has an achievement lower than the cut-off for the dimension j, that is $g_{ij}^0 = 1$ if $y_{ij} < z_j$; and takes a value of 0 when the achievement is at least the cut-off value, or $g_{ij}^0 = 0$ if $y_{ij} \geq z_j$. Under this context, the term *censored* refers to the subset of those who are poor.

ratio measure and can be expressed as $M_0 = HA$. And $c_i(k)$ reflects the deprivation scores of the poor, much in the same way as the notation $I_i(c_i \geq k)$.

While M_0 is as far as this chapter goes in terms of poverty measure, the Alkire-Foster methodology has a much further reach. For example, when only cardinal variables are considered then it is possible to estimate the adjusted poverty gap (M_1) or the adjusted FGT measure (M_2). However, these measures for higher values of α demand all dimensions to be cardinal, that is, variables for which the magnitude of differences in values is meaningful, but many multidimensional poverty measures, such as CONEVAL's, include ordinal or categorical variables for which gaps and squared gaps have no meaning.

2.4 The official multidimensional poverty measure in Mexico

On December 10, 2009 CONEVAL released a multidimensional methodology to measure poverty (CONEVAL 2009; 2010). As mentioned earlier, the adoption of a multidimensional approach to poverty measurement responds to what the Social Development General Law commands CONEVAL to do. The Law defined a set of eight indicators that should be considered in the official poverty measure, which were grouped in what CONEVAL defines as two dimensions: economic well-being and social rights.[31]

The economic well-being dimension has only one indicator - current income - while the social rights dimension has six indicators: education shortfall, health access, social security, dwelling space and materials, dwelling services and food access. A

[31] CONEVAL's measure actually considers seven indicators, the eight, social cohesion is reported separately using the Gini coefficient as the proxy to it.

person is considered to be poor when he or she is deprived in at least one indicator in both dimensions - economic well-being and social rights. As there is only one indicator – income poverty – for economic well-being, every poor person must be income poor. In terms of social rights, if a person has a deprivation in any of the six indicators then they are considered to be deprived in the social rights dimension. Thus within the social rights dimension, the measure follows a union approach. Alternatively, one could describe the identification as having a poverty cut-off *k* of strictly greater than 50 percent of the weighted deprivations. CONEVAL's measure then follows a structure of nested weights, as was explained before, in which income deprivation weights fifty percent and the six social rights indicators weight an equal share of the remaining half – or 1/12 each.[32] There is also a concept of extreme multidimensional poverty. An individual that shows deprivation in food-poverty income and experiences deprivations in any three of the social rights, is then considered extremely poor.

The unit of measurement is the individual, although some of the indicators are household based, such as income. The indicators and their thresholds were taken from, or at least motivated by, legal statutes. Thus, most indicators are legal entitlements, although several are also functionings or resources. The rest of this section will briefly describe each of the seven indicators.

Economic well-being – resource and functioning

This dimension is measured by the required income needed to buy a set of basic items, including, but not limited to food. Equivalent to an income poverty line, in the

[32] Sabina Alkire and James Foster (2009) axiomatization note on CONEVAL's poverty measure mention that weights and identification step are justified and aligned to their objectives for measuring poverty, as well as heir conception of social dimensions as human rights.

official Mexican measure is the well-being line. Alternatively, there is also a minimum well-being line which is the cost of a food bundle only. The minimum well-being line is the income threshold for multidimensional extreme poverty. The estimated cost of the food bundle is based on nutritional recommendations, which is then translated into caloric requirements.[33]

Based on the household expenditure and frequency of food items purchased, as well as a sophisticated method to estimate the calorie intake of the household, a coefficient of energetic adequacy is estimated, which is simply calories consumed in the household over calories required. If the coefficient is less than one then the calorie intake is lower than the calories required. Once the specific percentile for which the coefficient is equal to one is found in both rural and urban areas, it is used to create a population reference stratum. The stratum goes from percentile 32 to 51 in rural areas and from percentile 40 to 61 in urban areas.

Table 2.1 Economic Well-being Lines per Equivalent Adult per Month

	In Mexican pesos, August 2012	In British pounds August 2012 (@20.6883 pesos per pound)
Basic Rural	$800.26	£38.68
Basic Urban	$1,125.42	£54.40
Standard Rural	$1,489.76	£72.01
Standard Urban	$2,328.65	£112.56

Source: CONEVAL (2012); exchange rates from www.oanda.com

Based on the food items bought by each population reference stratum, food bundles are created for rural and urban areas and their respective costs to set the basic well-being lines. The rural basic well-being line is £30.68 per month, per equivalent adult, while the urban line is £54.40.[34] For rural areas the income line is something like a pound per day, while for urban areas it is less than one and a half pounds per day. The standard well-being lines were estimated by analysing the inverse of the Engel

[33] The method to estimate the basic well-being and standard well-being lines is summarised here. For further references please refer to CONEVAL (2010).

[34]Taking the average exchange rate reported in OANDA (http://www.oanda.com/currency/historical-rates/ consulted on June 16th, 2015) which in August 2012 was 20.6883 Mexican pesos per British pounds.

coefficient, also known as the Orshansky coefficient, for the population reference stratum that was mentioned before, as well as applying an *ad hoc* methodology considering preferences and elasticities of consumption for non-food items. The standard well-being lines are £72.01 for rural areas and £112.56 monthly per capita which is equivalent to about £2 a day for rural areas and a bit more than £3 a day for urban areas.

To identify those with economic well-being deprivation, or income deprivation, CONEVAL takes into account the household's total current income - monetary and non-monetary. This includes work payments and other work benefits, independent work including self-consumption – items produced by and for the household – property rents, monetary transfers and payments and transfers in kind. Then an adult equivalence scale is used to divide the household income and compare that figure to the corresponding well-being line. If the adjusted income per equivalent adult of the household is less than the well-being line, all members of the household are considered deprived in terms of economic-well-being. This rule does not apply to all other deprivations, which are, in general, estimated on an individual basis.

Education – legal entitlement, resource and functioning

The educational gap (shortfall) is measured as a combination of enrolment and schooling, depending on the person's age. Those between 3 and 15 years old are considered deprived in education if they do not attend a formal education institution, unless they have already finished compulsory secondary school. Those 16 years old and above are considered deprived in education if they do not have a minimum schooling, but the threshold depends on when they were born since in the past only primary

education was compulsory. Those born before 1982 are considered deprived if they have less than 6 years of schooling, while those born in 1982 and later are considered deprived in education if they have less than 9 years of schooling.

Access to Health Services – legal entitlement

The health dimension is also based on individual rights, in this case the right to be part of the national health system. Therefore, someone is deprived in health if they do not have access or entitlement to healthcare at a public or private medical institution.[35]

Access to Social Security – legal entitlement

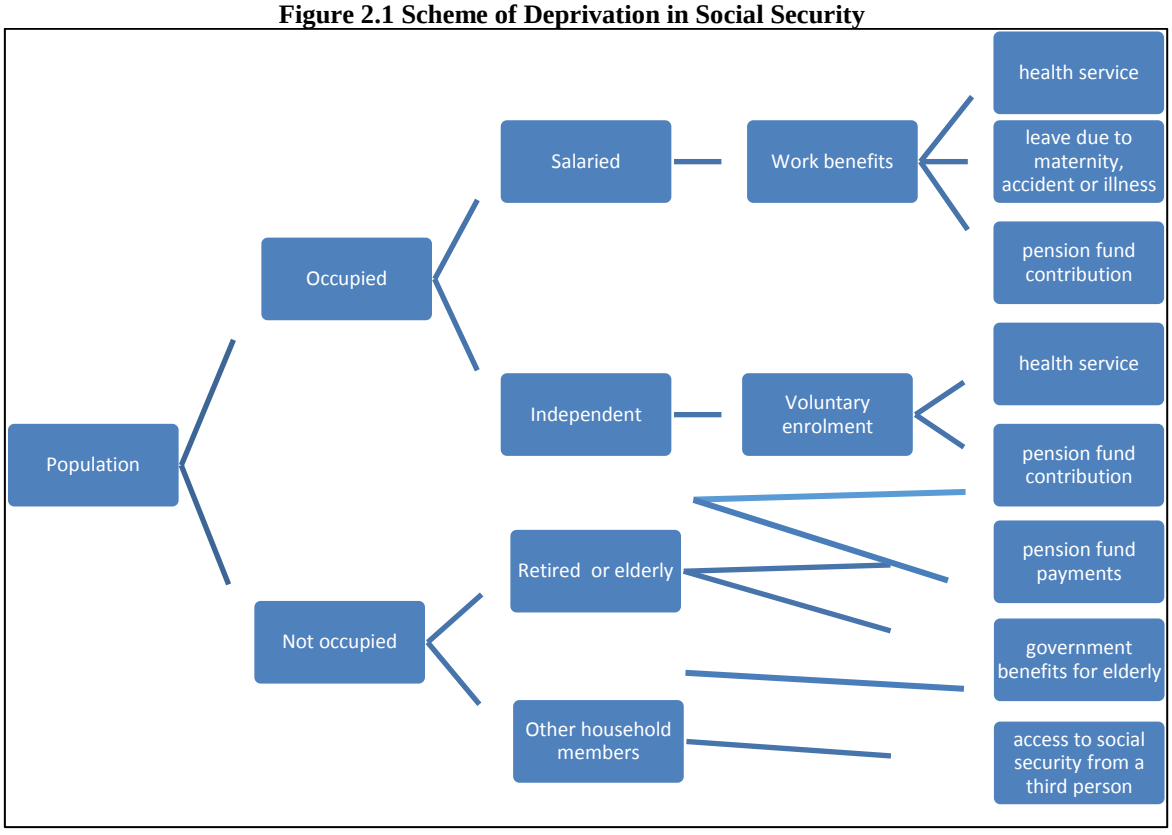
The social security indicator in CONEVAL's measure is complex; the deprivation definitions and thresholds vary for salaried workers, independent or non-salaried workers, retired people, and other household members. Salaried workers are considered to be deprived of social security if they lack any of the following work benefits:

- Health care
- Paid leave due to maternity, illness or accident
- Pension fund (contributive)

[35] Membership of a public or private health institution does not actually measure people's health state, only access to a health service. Examples of health oriented indicators could be life expectancy, infant mortality, morbidity incidence or anthropometric nutritional measures, among many others. For references on health equality and how to measure it see (Evans 2001; S Anand 2002; Sudhir Anand and Hanson 1997).

For those who are independent or not salaried, the criteria changes a bit since their enrolment in social security services is voluntary. Therefore, they are considered deprived if they do not have a voluntary enrolment in health services and pension funds. Retired or elderly people are considered deprived if they do not have pension payments or do not receive benefits from governmental programmes for the elderly. Finally, other household members are considered to be deprived if they do not have access to social security through other household members, specifically access to health services. See figure 2.1 for an illustration of the social security deprivation scheme.

Figure 2.1 Scheme of Deprivation in Social Security



Source: Own elaboration with CONEVAL's (2010) specifications.

The social security indicator is completely based on legal entitlements and overlaps with the health access indicator. Except in the case of the retired and elderly,

there is an overlap with the health indicator, since not being deprived in terms of social security means one is not deprived in terms of access to health.

Quality and space of dwelling –legal entitlement, resource

A person is considered to be deprived if he or she lives in a dwelling with any of the following characteristics: earthen floor; roof of cardboard or waste material; walls of mud, wood sticks, bamboo, palm, laminate of metal, cardboard or asbestos or waste material; or if the ratio of people to rooms is higher than 2.5. This indicator is based on the Constitution which states the right to a *vivienda digna* – a worthy dwelling might be the closest translation. However, characteristics of a worthy dwelling are not outlined in any Law. Hence, thresholds are based on recommendations from the National Housing Commission (CONAVI).

Access to basic services in the dwelling– legal entitlement and resource

The second dwelling indicator refers to services such as water, electricity, drainage and cooking fuel. Under CONEVAL specifications, a person is deprived in dwelling services if any of the following apply: access to water is through a well, surface water, tanker truck, or from other dwelling or public tap; has no drainage or flushes to a lake, river or cliff; has no electricity; cooking fuel is wood or charcoal with no chimney. As with dwelling materials and space, the indicator is based on recommendations from CONAVI, instead of legal specifications.

Access to food – legal entitlement and functioning

This indicator is based on the rights of children to satisfy their alimentary needs established in the Constitution, as well as international agreements on food security that cover the whole population. An apparently increasingly popular methodology is used to estimate a scale of food insecurity.[36] The algebra to estimate the scale is quite simple. There are twelve questions relating to food security that are answered with either yes or no. Each yes values 1 and each no answer values zero and they are added together to see how many positive answers a household has. If the household has no members under 18 years old then only the first six questions apply. Depending on the number of positive answers, the members of a household are considered to have either: no food insecurity, slight food insecurity, moderate food insecurity or severe food insecurity –according to Table 2.2. A person is considered to be food deprived if he or she faces a severe or moderate degree of food insecurity.[37]

Table 2.2 Household Level of Food Security for Each Number of Positive Answers

Level of Food Insecurity	HH with only adults	HH with members under 18 years old
No insecurity (food security)	0	0
Slight insecurity	1, 2	1, 2, 3
Moderate insecurity	3, 4	4, 5, 6, 7
Severe insecurity	5, 6	8, 9, 10, 11, 12

Source: CONEVAL

[36] Applied in Mexico by Melgar-Quiñonez, Zubieta, Valdez, Whitelaw and Kaiser (2005) in Jalisco, Mexico and by Parás and Pérez-Escamilla (2002) in Mexico City. As explained Melgar-Quiñonez and Hacket (2008) and Pérez-Escamilla and Segall-Correa (2008), the methodology is a direct measure centred on people´s experiences. This method has its origin in a research conducted in the 1980s by the University of Cornell where the so called Cornell scale was first generated. The method and scale was later adopted and modified by the US Department of Agriculture to create the Household Food Security Supplemental Module. This module has been adopted and modified to be applied in several places of Latin America and it is part of the official multidimensional poverty measure in Mexico. For further reference of this method and its applications please see also El-Ghonemy (1993), Bickel et al. (2000), W. L. Hamilton, Cook and others (1997) and Moncada (2006).

[37] All questions start by giving a time span of three months in the past and if, due to lack of money or resources: 1. Has any adult had a food intake based on only **few types of food**? 2. Has any adult **skipped a meal** (breakfast, lunch or dinner)? 3. Has any adult **eaten less than what they think they should**? 4. There was **no food at home**? 5. Has any household member felt **hunger** but did not eat? 6. Has any household member eaten only once a day or **did not eat** in an entire day? 7. Has any non-adult had a food intake based on only **few types of food**? 8. Has any non-adult **eaten less than what they should**? 9. You had to **reduce the amount of food** to a non-adult? 10. Has any non-adult felt **hungry** but did not eat? 11. Has any non-adult **gone to bed hungry**? 12. Has any non-adult member eaten only once a day or **did not eat** in an entire day?

2.5 Income and Non-Income Indicators: Association and Redundancies

A first descriptive step towards indigenous and non-indigenous comparisons, is to look at the headcount ratios for all seven indicators, which are shown in Table 2.3. As would be expected, the indigenous group has higher uncensored headcount ratios for all seven indicators.

Table 2.3 Uncensored (raw) Deprivation Headcount Ratios for Each Indicator, 2012

	Total (100%)	Non-Indigenous (90.4%)	Indigenous (9.6%)
Economic well-being	51.64	49.19	74.56
Moderate income dep.	*31.59*	*31.54*	*32.07*
Extreme income deprivation	*20.05*	*17.65*	*42.49*
Education	19.24	17.65	34.17
Health access	21.54	21.24	24.32
Social security	61.23	59.11	81.11
Dwelling materials & space	13.55	11.33	34.36
Dwelling services	21.21	17.1	59.75
Access to food	23.32	22.12	34.54

Source: Own estimations using ENIGH-MCS-CONEVAL 2012 data.

Uncensored headcounts (sometimes called 'raw') apply to the whole population, while censored headcounts are the ones that show the percentage of the population who are poor and deprived in each indicator. Both groups show the same peaks for social security and economic well-being; although for the indigenous segment of the population, deprivation headcount ratios reach 81.1 percent and 74.6 percent respectively, which is considerably higher than that observed for the non-indigenous population.

On the other hand, the greatest gap between the indigenous and non-indigenous is observed in dwelling services – 42.6 percentage points – as well as income deprivation, where the difference between one group and the other is 25.4 percent points. The gap for dwelling materials and space is also high, the indigenous headcount

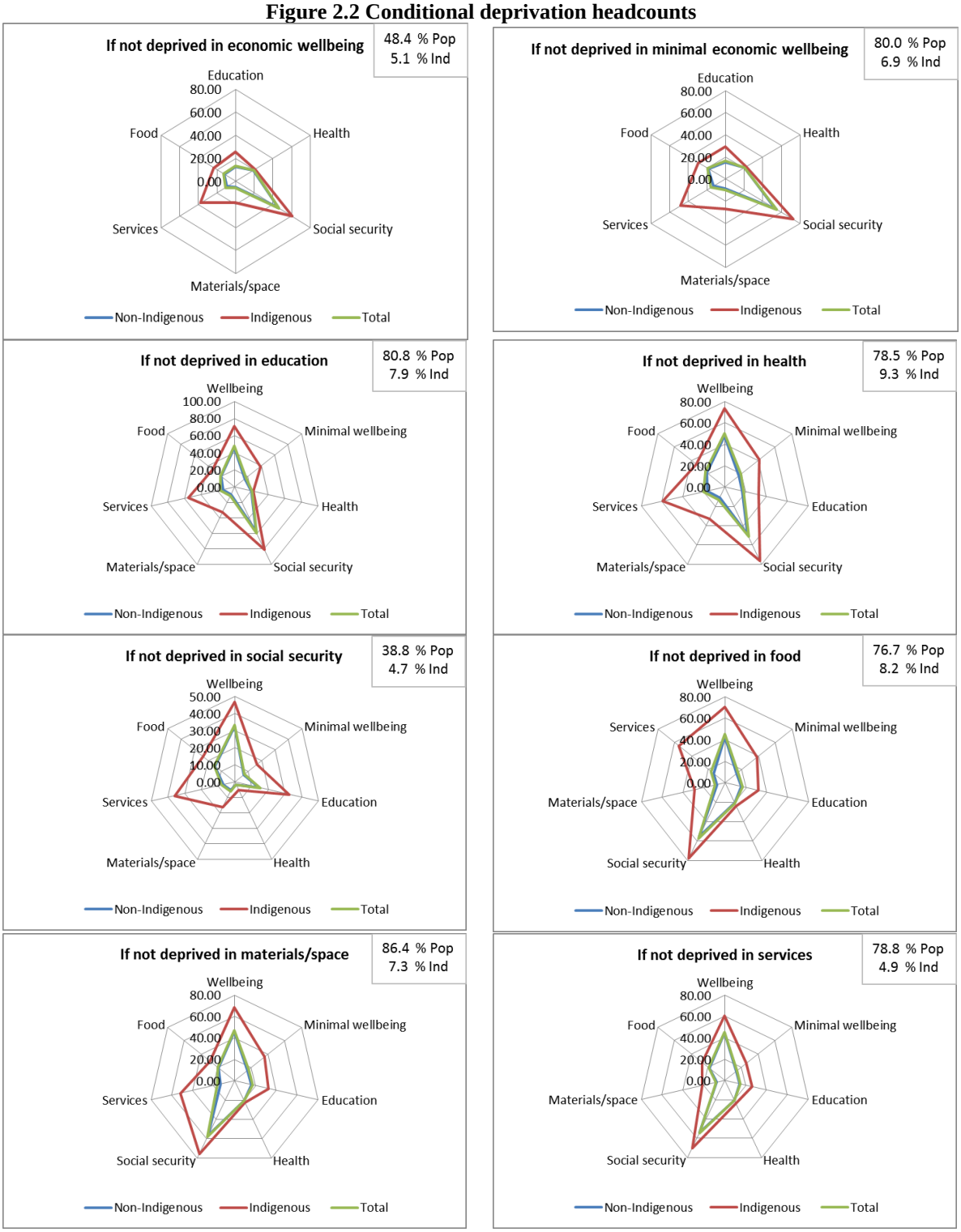
ratio is more than three times higher than the one for the non-indigenous. It is in health access where the difference is minimal, mainly due to the government's programme *Seguro Popular* (Popular Insurance) that provides basic health care for the poor. For food access and education shortfall, differences between groups are also considerable.

One way of studying the way these dimensions complement or overlap with each other is by fixing one dimension as not deprived and then looking at the other deprivations' headcount ratios. Figure 2.2 shows deprivations' headcounts in radius charts for those who are not deprived in one dimension. Boxes in the upper-right hand corner of each radius show the percentage of the total population in that category, as well as the share of the indigenous population. For example, the first one refers to those who are not deprived in economic well-being, which is 48.4 percent of the total population, of whom 5.1 percent are indigenous. The red (outer) lines represent headcounts for the indigenous population. Blue and green (inner) lines are practically overlapping and represent the non-indigenous and total populations, respectively.

The share of indigenous population is greater for those who are not deprived in health, while the smallest indigenous share can be observed in those who are not deprived of social security and dwelling services. Confirming what was shown previously, in the radius charts, it is possible to see that health is the dimension where the indigenous and non-indigenous populations are closest. Also, it is easy to see in the radius charts that the "shape" of poverty, shown in the polygons, is similar for both groups but the indigenous polygon is always bigger. The polygons have constant peaks in social security and economic well-being. Dwelling indicators, services and materials/space, are the indicators where the gaps between indigenous and non-indigenous are bigger. While the previous results offer an idea of how each dimension informs the multidimensional poverty measure, there are methodologies that have been

developed to assess the extent of association, similarity, or redundancy across indicators. A particular redundancy measure proposed by Alkire et al. (2015) is presented next, alongside a simple correlation for comparison.

Figure 2.2 Conditional deprivation headcounts



Source: Own estimations using ENIGH-MCS-CONEVAL 2012 data

As is well-known, correlation between two dichotomous variables is simply the product of matches, when both variables show deprivation or non-deprivation, minus the product of mismatches, when one variable shows deprivation while the other doesn't, divided by the square root of the product of marginals, the headcount ratios of those deprived and non-deprived for each dimension. This is estimated using the Cramer's V correlation coefficient, but may not be a precise metric for assessing the similarity among indicators (Alkire et al. 2015).

Table 2.4 shows the Cramer's V correlation coefficient between indicators of the multidimensional poverty measure. The highest correlation is between economic well-being and minimal economic well-being. This is mechanical since one is a subset of the other, although when one is used in the poverty measure, the other is not. Thus, the *real* highest correlation is between access to health care and deprivation of social security, followed by the correlation between deprivations in dwelling's materials and space, and dwelling's basic services.

Table 2.4 Cramer's V Correlation Coefficient Between Indicator of the Multidimensional Poverty Measure

Deprived in:	Deprived in:						
	Economic Well-being	Minimal Economic Well-being	Education	Health Access	Social Security	Dwelling materials & space	Dwelling services
Minimal Economic Well-being	0.4845						
Education	0.1504	0.1428					
Health Access	0.0527	0.0487	0.0464				
Social Security	0.2948	0.2531	0.0798	0.3821			
Dwelling materials & space	0.2208	0.2113	0.1241	0.0393	0.1780		
Dwelling services	0.2448	0.2792	0.2105	0.0305	0.2543	0.3026	
Food Security	0.2401	0.1970	0.1096	0.0182	0.1539	0.2011	0.1933

Source: Own estimations using ENIGH-MCS-CONEVAL 2012 data

In the case of social security and health, both indicators are closely related. As a matter of fact, as seen in Figure 2.2 if someone is not deprived in social security, it is almost impossible to be deprived in access to health. An exception would be a retired person with a non-contributive pension but without *seguro popular*. Dwelling indicators

are also related and, even when there is no overlap, as in the case of social security and health, a dwelling in precarious conditions easily has deprivations of both types.

A way to see more precisely whether information in one dimension is duplicating information present in another, in that precisely the same persons are deprived in both, is to use the redundancy measure proposed by Alkire et. al. (2015). The redundancy measure, or overlap picture, in Table 2.5 shows the matches between deprivations as a proportion of the minimum marginal rates. For example, redundancy between economic well-being and minimal economic well-being is 100 percent, since there is a clear overlap between the two - one is included in the other. Also, the highest redundancy is again between social security and health, for the reasons previously explained. As a matter of fact, social security is the indicator with the highest redundancies in general, since it is the indicators with the highest uncensored headcounts. It is worth noting that other than the high redundancy with social security, deprivation in health is the one with lowest redundancy of all.

Table 2.5 Redundancy Measure Between Indicators of the Multidimensional Poverty Measure

Deprived in:	**Uncensored headcount ratios**	Deprived in:						
		Economic Well-being	Minimal Economic Well-being	Education	Health Access	Social Security	Dwelling materials & space	Dwelling services
Uncensored headcount ratios		**51.64**	**20.05**	**19.24**	**21.54**	**61.23**	**13.55**	**21.21**
Minimal Economic Well-being	**20.05**	1.0000						
Education	**19.24**	0.6704	0.3176					
Health Access	**21.54**	0.5667	0.2554	0.2545				
Social Security	**61.23**	0.7514	0.8586	0.6920	0.9676			
Dwelling materials & space	**13.55**	0.7951	0.4141	0.3159	0.2562	0.8314		
Dwelling services	**21.21**	0.7522	0.4401	0.3884	0.2396	0.8512	0.5246	
Access to food	**23.32**	0.7340	0.3995	0.3282	0.2479	0.7484	0.4480	0.3907

Source: Own estimations using ENIGH-MCS-CONEVAL 2012 data

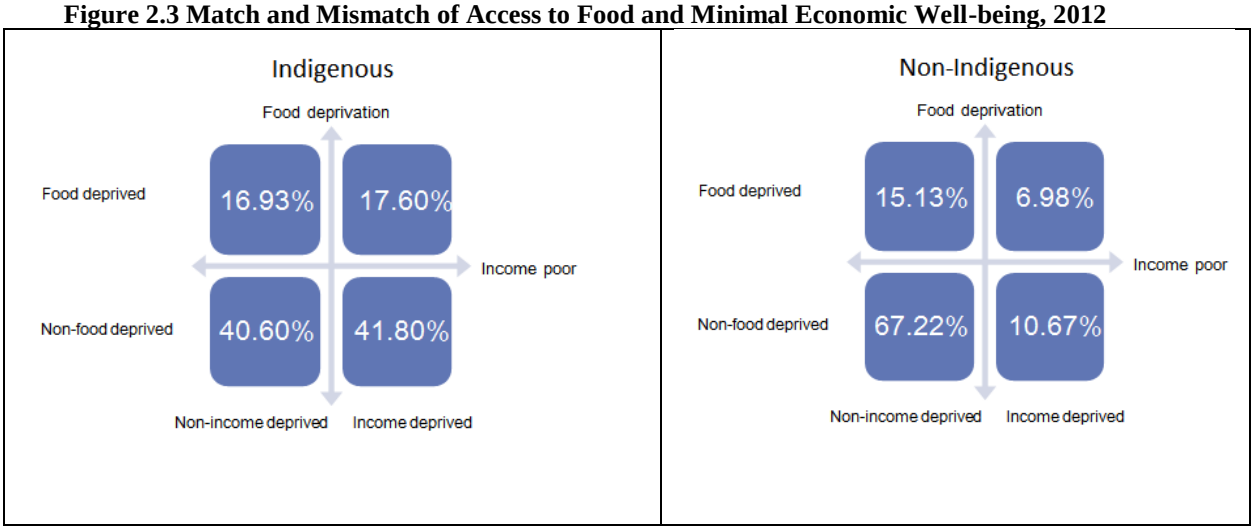
A special case is the redundancy between food insecurity and economic well-being, in particular with minimal economic well-being. As mentioned before, the minimum well-being line is the cost of a basic food bundle. Therefore, it could be expected that deprivation of food and minimal economic well-being would measure

more or less the same thing, which would create a high redundancy between these two indicators. However, this is not the case; the redundancy between access to food is higher with the standard economic well-being line than the minimum economic well-being, which is counterintuitive. Recall that 20 percent of people are deprived by in minimum economic well-being whereas 23.3 percent are food insecure. But rather than being the same, in fact, only 40 percent of people who are deprived by the minimum economic line are also food insecure. Redundancy of access to food is higher with social security, the standard economic well-being line and dwelling materials and space.

Furthermore, the graphs shown in Figure 2.2 do not suggest a strong overlap between monetary and food-security dimensions. There is neither a drop in the food deprivation headcount ratio for those who are not deprived in basic economic well-being, nor is the headcount ratio lower for those who are not deprived in access to food.

If basic income deprivation and food deprivations were equivalent, in a map with both deprivations represented, see Figure 2.3, it would be expected that the percentages in the downward diagonal boxes would be close to zero, while the upward diagonal would add close to 100 percent. However, this is not the case - 25.8 percent of the non-indigenous and 41.8 percent of the indigenous population have mismatch in those deprivations. In the case of the non-indigenous, 15.1 percent are food deprived but not minimal income deprived and 10.7 percent are deprived in basic income but not food deprived; while for the indigenous population, 16.9 percent are food deprived but not minimal income deprived and 24.9 percent have an income inferior to the minimum well-being line, but are not food deprived. The indigenous higher mismatch could be explained by a relatively higher share of households assuring their food intake without having to buy their food, for example, by growing their own food in self-consumption activities, although this requires further study.

Figure 2.3 Match and Mismatch of Access to Food and Minimal Economic Well-being, 2012



Source: Own elaboration based on ENIGH-MCS-CONEVAL 2012 data

On the other hand, assuming that income and food insecurity are not related at all would also be a mistake. Average current per capita income lowers as levels of food security increase, as can be seen in the last column of Table 2.6.

Table 2.6 Minimal Economic Well-being Headcounts for each Level of Food Insecurity& Average Per Capita Income, 2012

Level of food insecurity	Minimal economic well-being deprived			Average Per Capita Income
	No	Yes	Total	Mexican pesos of August 2012
Food security	49.21	6.86	56.07	4,175.27
Slight	15.44	5.17	20.61	2,202.33
Moderate	9.34	4.31	13.65	1,776.18
Severe	5.97	3.70	9.67	1,580.23
Total	79.96	20.04	100.00	3,190.33

Source: Own estimations using ENIGH-MCS-CONEVAL 2012 data

Before continuing onto the identification and aggregation steps of multidimensional poverty, it is worth mentioning that the fact that the indigenous population is systematically more deprived than the non-indigenous population can at least be partially explained by the fact that they are also relatively more concentrated in rural areas. Using the example of food insecurity, as presented in Table 2.7, it is possible to see that 41.9 percent of the non-indigenous population has some degree of food insecurity, while for the indigenous the figure is much higher, at 63.3 percent. Additionally, about 79.4 percent of the non-indigenous live in urban areas, while the

figure for the indigenous is much smaller, at only 52.7 percent. However, 16.6 percent of the indigenous population in rural areas has a severe level of food insecurity and 12.5 for the non-indigenous. This means that while the rural aspect is important, it does not fully explain the difference.

Table 2.7 Percentage of the Population by Levels of Food Security/Insecurity 2012 (%)

Level of food insecurity	Total Population			Indigenous			Non-Indigenous		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
None (security)	46.51	9.56	56.07	21.45	15.26	36.71	49.19	8.95	58.14
Slight	14.15	6.46	20.61	13.75	15.01	28.76	14.19	5.55	19.74
Moderate	9.57	4.08	13.65	10.44	9.23	19.67	9.47	3.53	13.01
Severe	6.58	3.09	9.67	7.01	7.85	14.86	6.53	2.58	9.11
Total	76.81	23.19	100.00	52.65	47.35	100.00	79.39	20.61	100.00

Source: Own estimations using ENIGH-MCS-CONEVAL 2012 data

2.6 Multidimensional Poverty: Identification and Aggregation

As previously explained, in CONEVAL's measure the poor are identified as those who are poor in both dimensions: economic well-being and social rights. This means that the multidimensional poor are those who are deprived in income and at least one of the six social rights. Within the poor there is another category, the extreme poor. The extreme poor are identified as those who are deprived of basic (or minimal) income and at least three of the six social rights. Those who are poor but not extremely poor are called moderate poor. People not deprived in social rights but deprived in economic well-being are considered income vulnerable, whilst those deprived in at least one social right but not in income are considered to be social deprivation vulnerable. The remaining are the non-poor and non-vulnerable.

Table 2.8 Percentage of the Population by Condition of Deprivation, according to CONEVAL's Multidimensional Poverty Measure 2012

	Total	Non-Indigenous	Indigenous
Multidimensional poor	45.48	42.60	72.45
Moderate poor	35.65	35.00	41.75
Extreme poor	9.83	7.60	30.70
Social rights vulnerable	28.57	29.46	20.21
Income vulnerable	6.16	6.60	2.11
Non-poor, non-vulnerable	19.79	21.34	5.23

Source: Own estimations using ENIGH-MCS-CONEVAL 2012 data

Table 2.8 shows the percentages or headcount ratios for the different conditions of deprivation. In the Table it is possible to see the magnitude of the difference in terms of the incidence of multidimensional poverty for both groups, which is much greater between for indigenous - 72.5 percent compared to 42.6 percent for the non-indigenous. In terms of extreme poverty, the incidence is four times higher for the indigenous than for the non-indigenous. On the other hand, the indigenous have lower percentages than the non-indigenous in social rights vulnerable, income vulnerable and the non-poor/non-vulnerable categories. Hence, the indigenous percentage is relatively greater for extreme poverty and relatively smaller for vulnerable and non-poor categories.

In terms of aggregation, the headcount ratios shown are already part of the partial indices of the Alkire-Foster multidimensional measures. The other partial index is the average proportion of deprivations among the poor, estimated as the weighted sum of deprivations of the poor over the total number of deprivations. CONEVAL's multidimensional poverty measure has two broad dimensions - economic well-being and social rights, weighing 50 percent each. Each of the social indicators obtain equal weights of 1/12 each so that the six social rights add up to 50 percent. In terms of the notation presented earlier in which the weights sum to the number of indicators (which is seven), the weight assigned to income is then 3.5 out of 7, while each of the social rights then have a weight of 7/12 or approximately 0.5833. The poverty cut-off could be

thought of as k=49/12 or approximately 4.0833 or 58 percent.[38] The cut-off for extreme multidimensional poverty, for those deprived in at least 3 social rights and minimal or basic income, could be written as k=5.25 or 75 percent.

In 2012, the average weighted sum of deprivations or intensity among the indigenous poor was 5.3 of the 7 deprivations, and 4.8 for the non-indigenous poor, while 4.9 was the figure for the whole population. As a percentage, the average intensity deprivations A for the indigenous poor was 75.4 percent while for the non-indigenous was 68.7 percent. The adjusted headcount ratio M_0– which can be expressed as the product of the headcount H times the intensity among the poor A – was 0.546 for the indigenous, while the non-indigenous figure was 0.293. To provide an intuition of the magnitude of the differences (not yet considering standard errors), the official poverty measure shows that multidimensional poverty was 86.5 percent higher for the indigenous than for the non-indigenous when measured with M_0. The difference between indigenous and non-indigenous was even greater for extreme multidimensional poverty: M_0 for extreme poverty is about 4.1 times higher – 312 percent more – among the indigenous.

Table 2.9 Alkire-Foster Results for CONEVAL´s Multidimensional Poverty Measure, 2008-2014

Multidimensional Poverty												
	Indigenous				Non-Indigenous				Total			
Year	2008	2010	2012	2014	2008	2010	2012	2014	2008	2010	2012	2014
A	0.7886	0.7645	0.7537	0.7514	0.7129	0.6960	0.6873	0.6786	0.7257	0.7071	0.6974	0.6900
H	0.7114	0.7458	0.7245	0.7327	0.4140	0.4305	0.4260	0.4320	0.4455	0.4619	0.4548	0.4617
M_0	0.5610	0.5702	0.5461	0.5506	0.2951	0.2997	0.2928	0.2931	0.3233	0.3266	0.3172	0.3186

Extreme Multidimensional Poverty												
	Indigenous				Non-Indigenous				Total			
Year	2008	2010	2012	2014	2008	2010	2012	2014	2008	2010	2012	2014
A	0.8447	0.8274	0.8161	0.8186	0.8111	0.8020	0.8000	0.7929	0.8219	0.8102	0.8049	0.8014
H	0.3220	0.3378	0.3070	0.3189	0.0810	0.0782	0.0760	0.0710	0.1065	0.1041	0.0983	0.0955
M_0	0.2720	0.2795	0.2506	0.2610	0.0657	0.0627	0.0608	0.0563	0.0875	0.0843	0.0791	0.0765

Source: Own estimations using ENIGH-MCS-CONEVAL data, various years

[38] Precisely the same set of people would be identified as poor and the same H, A and M_0 would obtain with a poverty cut-off anywhere in the range $50\% < k \leq 58\%$.

For both subgroups, indigenous and non-indigenous, the average intensity of poverty had a slight declining tendency in the period 2008-2014, whether for the regular multidimensional poverty measure or the extreme one. Point estimates of headcount ratios of standard poverty, on the other hand, do not have a tendency in either group, indigenous or non-indigenous, while the headcount ratio for the non-indigenous extreme poverty, and also for the total population, declines over time. However, changes over time in headcount ratios for both groups are not statistically significant, with a 95 percent confidence, for either moderate or extreme poverty. It is safe to say then, that there are not significant changes over time in terms of headcount ratios for both groups.

However, the gap between indigenous and non-indigenous is considerable and statistically significant. The gap is narrower for the average number of deprivations for the extreme poor, as only 1.6 percentage points divides the indigenous from the non-indigenous in 2012. But in terms of the headcount ratio, around 30 percentage points of difference separate both groups in the standard measure and around 24 percentage points in the case extreme poverty. Even considering the lower bound for the indigenous and the upper bound for the non-indigenous, in a 95 percent confidence interval for the headcount ratio estimates, the minimum gap between indigenous and non-indigenous is 26.4 percentage points for standard poverty and 19.5 percentage points for extreme poverty, both in 2012. Therefore, the M_0 shows no sign of getting closer for the indigenous and non-indigenous.[39]

[39] Figures in Table 2.9 are slightly different from CONEVAL's. In their case, they do not present M_0 for subgroups and their estimated A do not take into account economic well-being. For standard poverty, the average proportion of deprivations they report for 2012 is 2.4 over 6 is 0.4, while their M_0, without income, is 0.18. For them, the average number of deprivations in social rights of the poor fell 8.5 percent from 2010 to 2012 in CONEVAL's report, but only 1.4 percent if income is taken into account. The M_0 decrease in the same period is also attenuated when income is considered.

Dimensional Contributions

One of the characteristics of the Alkire-Foster methodology for measuring multidimensional poverty is the possibility of measuring an indicator's contribution to poverty. Table 2.10 shows the contributions for indigenous and non-indigenous. As would be expected, the income indicator has the highest contribution to poverty for both groups and for extreme and standard poverty. This is because income weights one half in the measure and is a condition to be considered poor. Due to the measure's design requiring every person to be income-deprived, the contribution of income is actually far more than its weight of 50 percent. Income contribution is slightly lower for extreme poverty, though. In both cases, the contribution of income indicators are lower for the indigenous, because social deprivations are higher thus more important to explain indigenous poverty.

Table 2.10 Indicator's Percentage Contributions to Multidimensional Poverty Measure, 2012

Deprived in	Poverty Indicators		Extreme Poverty Indicators	
	Non-Indigenous	Indigenous	Non-Indigenous	Indigenous
Economic Well-being (income)	72.8	66.3	62.5	61.3
Education	3.2	4.2	4.9	5.1
Access to Health	3.3	2.9	4.2	3.5
Social Security	10.2	10.0	10.0	9.8
Dwelling Materials & Space	2.5	4.5	5.0	6.0
Dwelling Basic Services	3.5	7.7	6.8	9.0
Access to food	4.5	4.4	6.7	5.3

Source: Own estimations using ENIGH-MCS-CONEVAL 2012 data

The second highest contribution is social security - for both social groups and both moderate and extreme poverty. Deprivation of basic dwelling services is the third most prevalent indicator for the indigenous in both moderate and extreme poverty, as well as the third highest contributor among the non-indigenous extreme poor, although this is very similar to access to food. The lowest contribution varies, for example, for the non-indigenous poor, it is dwelling materials and space, but it is education for the

non-indigenous extreme poor. For the indigenous poor and extreme poor, the indicator with the lowest contribution to their poverty is access to health.

Decompositions

Poverty and extreme poverty indicators are different for indigenous and non-indigenous. The Alkire-Foster methodology allows decompositions to go deeper into analysis. Table 2.11 presents a series of decompositions - for urban and rural areas, by locality size, by gender and age group as well as participation in the labour force.

Table 2.11 Decomposition of Poverty Indicators for Indigenous and Non-Indigenous, 2012

	Poverty Indicators						Extreme Poverty Indicators					
	Non-Indigenous			Indigenous			Non-Indigenous			Indigenous		
	H	A	M_0	H	A	M_0	H	A	M_0	H	A	M_0
Urban-Rural												
Urban	0.3888	0.6727	0.2616	0.6530	0.7330	0.4786	0.0525	0.7944	0.0417	0.2125	0.8103	0.1722
Rural	0.5693	0.7256	0.4131	0.8041	0.7726	0.6212	0.1665	0.8069	0.1343	0.4123	0.8194	0.3379
Total	0.4260	0.6873	0.2928	0.7245	0.7537	0.5461	0.0760	0.8000	0.0608	0.3070	0.8161	0.2506
Locality Size												
100,000+	0.3137	0.6611	0.2074	0.5115	0.7114	0.3639	0.0309	0.7874	0.0243	0.1038	0.8100	0.0841
15,000-99,999	0.4626	0.6803	0.3147	0.6112	0.7311	0.4469	0.0699	0.7997	0.0559	0.1632	0.8164	0.1332
2,500-14,999	0.5891	0.6890	0.4059	0.7873	0.7451	0.5867	0.1144	0.7980	0.0913	0.3224	0.8093	0.2609
Less than 2,500	0.5693	0.7256	0.4131	0.8041	0.7726	0.6212	0.1665	0.8069	0.1343	0.4123	0.8194	0.3379
Total	0.4260	0.6873	0.2928	0.7245	0.7537	0.5461	0.0760	0.8000	0.0608	0.3070	0.8161	0.2506
Gender												
Male	0.4224	0.6897	0.2913	0.7164	0.7546	0.5406	0.0763	0.8016	0.0612	0.3018	0.8174	0.2467
Female	0.4294	0.6849	0.2941	0.7322	0.7530	0.5513	0.0757	0.7986	0.0604	0.3119	0.8150	0.2542
Total	0.4260	0.6873	0.2928	0.7245	0.7537	0.5461	0.0760	0.8000	0.0608	0.3070	0.8161	0.2506
Age Group												
0< and ≤ 11	0.5266	0.6806	0.3584	0.8012	0.7403	0.5931	0.0997	0.7920	0.0790	0.3439	0.8039	0.2764
12 ≤ and ≤ 20	0.4496	0.6891	0.3098	0.7394	0.7533	0.5570	0.0769	0.8014	0.0617	0.3099	0.8209	0.2544
21 ≤ and ≤ 39	0.4030	0.6907	0.2784	0.6938	0.7560	0.5245	0.0707	0.8043	0.0568	0.2806	0.8237	0.2311
40 ≤ and ≤ 64	0.3500	0.6916	0.2421	0.6586	0.7721	0.5085	0.0621	0.8034	0.0499	0.2929	0.8219	0.2407
65 or more	0.4271	0.6811	0.2909	0.7271	0.7500	0.5453	0.0728	0.8030	0.0585	0.3097	0.8107	0.2511
Total	0.4260	0.6873	0.2928	0.7245	0.7537	0.5461	0.0760	0.8000	0.0608	0.3070	0.8161	0.2506
Participation in the Labour Force												
Out of the L.F.	0.4282	0.6823	0.2922	0.7411	0.7549	0.5594	0.0745	0.8003	0.0596	0.3272	0.8190	0.2680
Employed	0.3524	0.6957	0.2452	0.6630	0.7646	0.5069	0.0600	0.8076	0.0484	0.2729	0.8240	0.2249
Unemployed	0.5748	0.7024	0.4038	0.6646	0.7597	0.5049	0.1188	0.8021	0.0953	0.2740	0.8411	0.2305
Total	0.4260	0.6873	0.2928	0.7245	0.7537	0.5461	0.0760	0.8000	0.0608	0.3070	0.8161	0.2506

Source: Own estimations using ENIGH-MCS-CONEVAL 2012 data

In terms of urban and rural areas, it is possible to see that rural areas have higher poverty indicators - for both indigenous and non-indigenous. Rural areas are those with a population of less than 2,500 people, while urban areas are those with a population of 2,500 people or more. The gap between rural and urban areas is even higher in for extreme poverty indicators and reaches a peak in the case of non-indigenous population. The M_0 is three times higher in rural than in urban areas for non-indigenous extreme poor, and almost double for the indigenous.

When poverty indicators are decomposed by locality size it is possible to see more detail in urban areas. There is an inverse relationship between the locality size and the M_0 - the bigger the city the smaller the M_0. For the non-indigenous, in standard poverty, the M_0 is double in localities between 2,500 and 14,999 people, than in localities of 100,000 people or more. This inverse relationship in the case of the indigenous is less pronounced since the indigenous are also very poor in large cities. For example, in cities of 100,000 people or more, the M_0 for the indigenous in standard poverty is 0.3639, while for the non-indigenous it is 0.2074 - a considerable difference.

In terms of gender, contrary to what might be the expected result, gender differences are not that big. For both indigenous and non-indigenous, and standard and extreme poverty, male and female populations have similar indicators. This is probably influenced by dimensions of poverty that are designed at household level, not individual, as is the case for income, both dwelling dimensions and access to food, while access to health services and social security are indicators where disparities within the household are unlikely.

While there is not much difference between men and women, there is a difference by age group. The poorest group are children under 12 years old, followed by the elderly who are defined as those aged 65 years or older. There is actually a decline

in poverty as the age group gets older and rises again among the elderly. This is observed for the indigenous and non-indigenous in standard poverty, and for the non-indigenous in extreme poverty. Meanwhile, the indigenous extreme poor have the minimum M_0 for the age group between 21 and 39 years old.

One more interesting decomposition is by activity in the labour force. It is interesting because there is a clear difference between indigenous and non-indigenous. While the poorest non-indigenous, moderate and extreme, are unemployed, the poorest indigenous, moderate and extreme, are those who are out of the labour force. This is a topic that requires further research, but a starting point could be that a relatively higher percentage of indigenous households are involved in self-consumption activities, which are not paid and thus statistically classified as out of the labour market.

2.7 Standard Errors and Robustness Tests

In this section the robustness of the multidimensional poverty measure, as well as the results for the indigenous and non-indigenous populations are examined in terms of their significance and robustness. First, standard errors are shown for point estimates to see whether differences between indigenous and non-indigenous are significant. Then robustness of results are compared under different values of k, assuming equal weights for all dimensions. Then, keeping the original weights, the analysis shows how poverty indicators change according to different k cut-offs. Values of M_0, as well as income dominance, are explored and, finally, the special case of those who are social rights vulnerable, deprived in any of the social rights but are not income deprived, is studied at the end of the section.

Table 2.12 Point Headcount Ratio Estimates and Lower Upper Bound Estimates for 95 Percent Confidence

	Non-Indigenous				Indigenous			
	Point	Std. Err	Lower	Upper	Point	Std. Err	Lower	Upper
Economic well-being	0.4919	0.0052	0.4818	0.5021	0.7456	0.0119	0.7223	0.7689
Basic economic well-being	0.1765	0.0041	0.1685	0.1845	0.4249	0.0166	0.3924	0.4574
Education	0.1765	0.0028	0.1710	0.1819	0.3417	0.0083	0.3254	0.3579
Health	0.2124	0.0030	0.2066	0.2183	0.2432	0.0099	0.2236	0.2627
Social security	0.5911	0.0047	0.5819	0.6003	0.8111	0.0085	0.7944	0.8279
Materials and space	0.1133	0.0033	0.1068	0.1198	0.3436	0.0139	0.3163	0.3708
House services	0.1710	0.0067	0.1579	0.1841	0.5975	0.0194	0.5594	0.6356
Food access	0.2212	0.0038	0.2137	0.2287	0.3454	0.0133	0.3193	0.3715
Poor	0.4260	0.0052	0.4158	0.4362	0.7245	0.0122	0.7006	0.7485
Extreme poor	0.0760	0.0029	0.0702	0.0817	0.3070	0.0155	0.2766	0.3375
Social rights vulnerable	0.2946	0.0039	0.2869	0.3024	0.2021	0.0101	0.1824	0.2218
Income vulnerable	0.0659	0.0018	0.0624	0.0695	0.0211	0.0030	0.0153	0.0269
No poor, no vulnerable	0.2134	0.0037	0.2061	0.2207	0.0523	0.0045	0.0435	0.0610

Source: Own estimations with CONEVAL data

The difference between indigenous and non-indigenous populations is statistically significant for every indicator at 95 percent (see Table 2.12). Even for the health access deprivation indicator there is no overlap between the confidence intervals, although figures for the indigenous and the non-indigenous come nearest here. It is worth mentioning that to estimate these intervals the variable ‘state’ was used instead of the original strata (as explained below), which was created as a combination of state (32) and seven locality sizes, resulting in 311 strata.

There are 7,239 primary sampling units in the survey, but when the population is divided between indigenous and non-indigenous the original stratification lead errors due to stratum with single clusters. State was used as the best proxy for the original strata. The effect in terms of the intervals is minimal and it only leads to a slightly wider interval. Since with the estimated confidence intervals there is no overlap, then it is safe to say that the difference is significant.

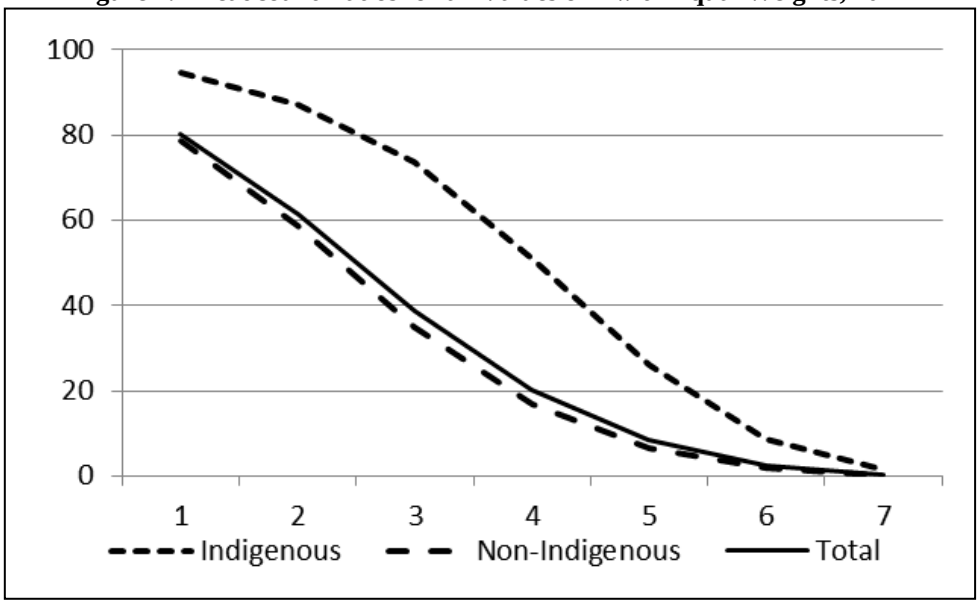
Table 2.13 Headcount Ratios for all Values of k with Equal Weights, 2012

k-value	Non-Indigenous				Indigenous			
	Point	Std. Err	Lower	Upper	Point	Std. Err	Lower	Upper
1	78.66	0.37	77.93	79.39	94.78	0.45	93.90	95.65
2	58.75	0.51	57.75	59.75	87.26	0.78	85.74	88.79
3	35.04	0.54	33.98	36.11	73.73	1.18	71.41	76.05
4	16.86	0.44	16.00	17.71	51.12	1.47	48.24	54.01
5	6.44	0.25	5.95	6.94	26.06	1.25	23.62	28.51
6	1.74	0.10	1.54	1.94	8.54	0.66	7.24	9.84
7	0.25	0.03	0.20	0.31	1.45	0.21	1.04	1.85

Source: Own estimations with CONEVAL data

Given the fact that the indigenous population is more deprived in all dimensions, any non-negative combination of weights for those dimensions will result in a higher headcount ratio for the indigenous population than for the non-indigenous. For example, assuming that all seven indicators had the same weight just for illustrative purposes, we can estimate the headcount ratios for all possible values of k from one to seven. Table 2.13 shows results for the indigenous and the non-indigenous populations, and these are represented graphically in Figure 2.4.

Figure 2.4 Headcount Ratios for all Values of k with Equal Weights, 2012



Source: Own estimations with CONEVAL data

For all values of k, the multidimensional headcount ratio of the indigenous population is higher than for the non-indigenous, including $k = 1$ – the union approach – and $k = 7$ – the intersection approach. With the union approach, the headcount ratio is 94.8 percent for the indigenous compared to 78.6 percent for the non-indigenous. Under the intersection approach, the headcount ratio for the non-indigenous is 0.25 percent, but for the indigenous it is more than five times higher at 1.4 percent. Furthermore, since there is dominance for the headcount ratio, there is also dominance for the M_0 measure (Lasso de la Vega 2009; G. Yalonetzky 2011; Alkire and Foster 2011a; Alkire and Santos 2014). This means that the difference between indigenous and non-indigenous in terms of multidimensional poverty is robust to changes in weights and the poverty cut-off *k*.

With the original weights structure, Table 2.14 shows multidimensional poverty headcount ratios and adjusted headcount ratios for all possible k values, from only one social deprivation, $k = \frac{7}{12}$, to deprivation in income plus all six social rights, $k = 7$. Values of k are shown as fractions with the common denominator 12 for simplicity. For all k the indigenous headcount ratio is higher, although the indigenous participation in total headcount ratio increases for higher k-values. The table has four sections: the upper one refers to poverty results when there is no income deprivation, the second section to poverty results with the standard economic well-being line, and the third section to poverty results with the minimum well-being line. Thus, the shaded area in the middle and bottom sections represents those who are considered poor and extreme poor by CONEVAL. Finally, the fourth section refers to those who are vulnerable, that is, deprived in social rights but not in income, or deprived in income but not in social rights. This section of the table also shows those who are deprived in social rights and income, but not in minimal income.

Table 2.14 Headcount Ratios and Adjusted Headcount Ration for all Relevant Poverty Cut-Offs (k values)

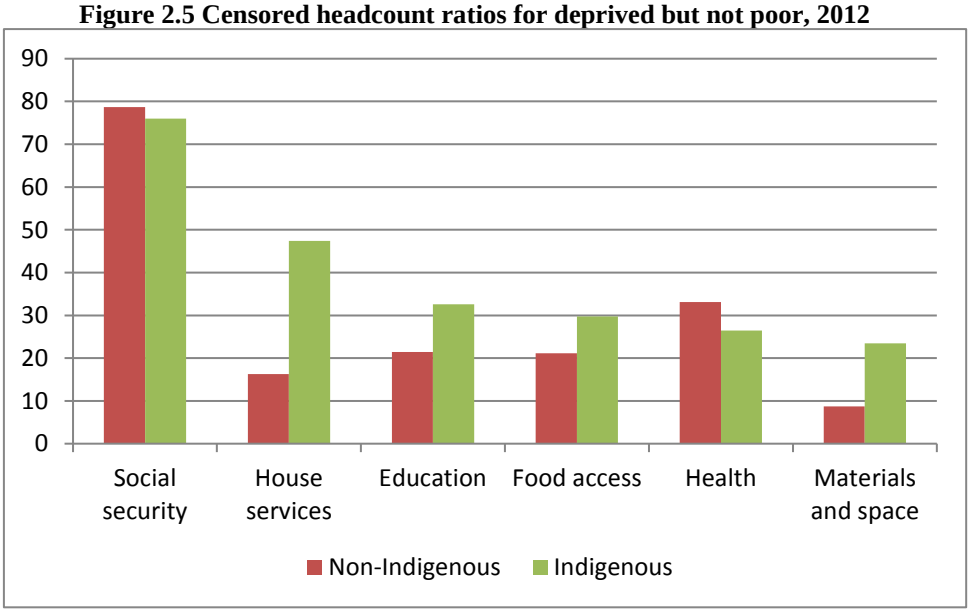
Deprivation observed in at least:	Poverty cut-off k=	Total Population (mill)	Indigenous (%)	Headcounts (H)			Adjusted headcounts (M_0)		
				Indigenous	Non-Indig.	Total	Indigenous	Non-Indig.	Total
1 social right	7/12	86.9	12.07	0.9270	0.7206	0.7405	0.5860	0.3368	0.3608
Any 2 social rights	14/12	57.8	15.70	0.8021	0.4598	0.4928	0.5402	0.2512	0.2791
Any 3 social rights	21/12	28.1	22.68	0.5629	0.2049	0.2394	0.4130	0.1360	0.1627
Any 4 social rights	28/12	11.3	28.45	0.2840	0.0763	0.0963	0.2296	0.0577	0.0742
Any 5 social rights	35/12	3.2	32.39	0.0929	0.0207	0.0277	0.0820	0.0173	0.0235
All 6 social rights	42/12	0.5	34.62	0.0154	0.0031	0.0043	0.0140	0.0030	0.0040
Income or 6 social rights	42/12	60.7	13.93	0.7470	0.4925	0.5171	0.5573	0.3260	0.3483
Income and 1 social right *	49/12	53.3	15.37	0.7245	0.4260	0.4548	0.5461	0.2928	0.3172
Income and any 2 social rights	56/12	39.0	18.95	0.6536	0.2983	0.3326	0.5048	0.2183	0.2459
Income and any 3 social rights	63/12	21.6	25.07	0.4789	0.1528	0.1843	0.3883	0.1213	0.1470
Income and any 4 social rights	70/12	9.3	30.73	0.2515	0.0605	0.0789	0.2177	0.0520	0.0680
Income and any 5 social rights	77/12	2.7	34.71	0.0837	0.0168	0.0233	0.0779	0.0156	0.0216
Income and all 6 of social rights	84/12	0.4	37.22	0.0141	0.0025	0.0037	0.0141	0.0025	0.0037
Min. income or 6 social rights	42/12	23.7	20.45	0.4287	0.1780	0.2022	0.3283	0.1238	0.1435
Min. income and 1 social right	49/12	22.3	21.32	0.4206	0.1657	0.1903	0.3243	0.1176	0.1375
Min. income and any 2 social rights	56/12	18.2	24.57	0.3962	0.1299	0.1556	0.3100	0.0967	0.1173
Min. income and any 3 social rights**	63/12	11.5	30.13	0.3070	0.0760	0.0983	0.2506	0.0608	0.0791
Min. income and any 4 social rights	70/12	5.5	35.11	0.1709	0.0337	0.0470	0.1485	0.0291	0.0406
Min. income and any 5 social rights	77/12	1.8	38.70	0.0611	0.0103	0.0152	0.0569	0.0096	0.0142
Min. income and all 6 of social rights	84/12	0.3	43.81	0.0116	0.0016	0.0026	0.0116	0.0016	0.0026
1 social right, but not income	7/12	14.7	4.15	0.0540	0.1332	0.1255	0.0045	0.0111	0.0105
2 social rights, but not income	14/12	12.3	5.92	0.0645	0.1094	0.1051	0.0107	0.0182	0.0175
3 social rights, but not income	21/12	4.4	13.12	0.0514	0.0363	0.0378	0.0129	0.0091	0.0095
4 social rights, but not income	28/12	1.5	17.36	0.0233	0.0118	0.0129	0.0078	0.0039	0.0043
5 social rights, but not income	35/12	0.4	19.42	0.0075	0.0033	0.0037	0.0031	0.0014	0.0016
6 social rights, but not income (a)	42/12	0.1	19.87	0.0013	0.0006	0.0006	0.0007	0.0003	0.0003
1 social & income, but not min income	7/12***	10.3	5.13	0.0465	0.0918	0.0875	0.0039	0.0077	0.0073
2 social & income, but not min income	14/12***	10.7	9.06	0.0855	0.0917	0.0911	0.0143	0.0153	0.0152
3 social & income, but not min income	21/12***	6.3	16.31	0.0913	0.0500	0.0540	0.0228	0.0125	0.0135
4 social & income, but not min income	28/12***	2.8	23.34	0.0579	0.0203	0.0239	0.0193	0.0068	0.0080
5 social & income, but not min income	35/12***	0.8	27.99	0.0202	0.0055	0.0070	0.0084	0.0023	0.0029
6 social & income, but not min income	42/12***	0.1	21.82	0.0025	0.0009	0.0011	0.0012	0.0005	0.0005
Income but not social rights (b)	42/12	7.2	3.30	0.0211	0.0659	0.0616	0.0105	0.0330	0.0308
Either a or b	42/12	7.3	3.47	0.0224	0.0665	0.0623	0.0112	0.0333	0.0311

Source: Own estimations with CONEVAL data. * is the standard multidimensional poverty estimation; ** represents the extreme poverty.
*** Assuming extreme poverty weights are used

Those who are social rights vulnerable or deprived in any of the social rights but not in income can be seen the first six rows in the last section of Table 2.14. 33.5 million people are social right vulnerable, most of them non-indigenous - 93.2 percent - and only 6.8 percent are indigenous. However, the percentage of indigenous in the social rights vulnerable category increases with the higher the number of social deprivations. For example, only 4.1 percent of those vulnerable with only one social right are indigenous, but almost 20 percent of those non-poor with six social deprivations are indigenous.

The most common deprivation for those who are not poor is social security for both the indigenous and non-indigenous. The second, however, is different. In the case of the non-poor indigenous, dwelling basic services is the second most common deprivation, while for the non-indigenous, it is access to health. Quality of the dwelling and space is the least common deprivation among the non-poor - either indigenous or non-indigenous. (See Figure 2.6)

Figure 2.5 Censored headcount ratios for deprived but not poor, 2012



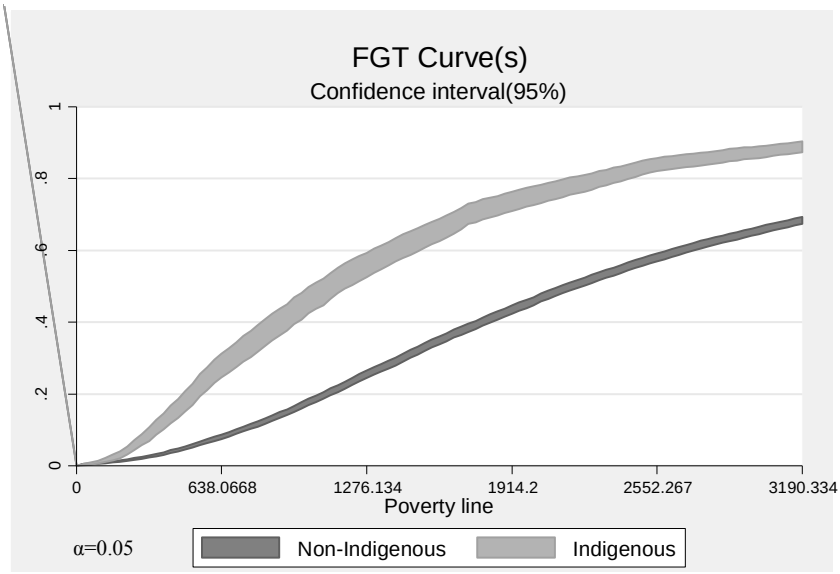
Source: Own estimations with CONEVAL data

Also in the last section of Table 2.14, figures can be seen in the following six rows for those who are poor but not extremely poor. 31 million people are in this case

and 10.3 percent of them are indigenous. In this case the participation of the indigenous also increases with the higher the number of deprivations, except for those with six deprivations where a reduction in the percentage of the indigenous population is observed.

A special case in the robustness analysis is $k = \frac{42}{12}$. In this case the poor are identified if they have 50 percent of the deprivations or more. In order to be considered poor, the measure, as published by CONEVAL, requires one to be deprived in income plus at least one of the social rights. This could be interpreted as having strictly more than 50 percent of the deprivations. The change from strict to weak is important because it affects whether 7.3 million people – or 6 percent of the population – are considered to live in, poverty - as can be seen in the last row of Table 2.14. Those whose weighted sum of deprivations is equal to the cut-off, that is $c_i = \frac{42}{12}$, are deprived in either income only, or six social rights only, but not in both. Of them, 99 percent are deprived in income and one percent are deprived in all six social rights – 75.5 thousand people – but not identified as poor. Of those who are deprived in six social rights, 19.9 percent are indigenous.

Figure 2.6 Income Stochastic Dominance with 95% confidence interval



Source: Own estimations using ENIGH-MCS-CONEVAL 2012 data

In the particular case of the income variable, it might be useful to study its stochastic dominance to different income poverty lines separately from the other indicators. At the lowest possible income poverty line the non-indigenous headcount ratio appears to be slightly higher than the indigenous one, but this dominance is not significant in a 95 percent confidence interval; there is an overlap between both cumulative density function curves. From 120 pesos up to the average current income for the total population – 3,190.33 pesos per capita – the headcount ratio of the indigenous population is significantly higher, considering an alpha of 0.05. (See Figure 2.5)[40]

From this section it is possible to conclude that: a) the indigenous are poorer in this survey and the differences between indigenous and non-indigenous are significant; b) the finding is robust to changes in k and robust by dominance results within income and across deprivations, and c) many indigenous and non-indigenous people have social deprivations although they are not poor, although this is relatively higher among non-indigenous.

In previous sections it was also possible to see how the multidimensional poverty measure gives insight into how deprivations of the indigenous vary from non-indigenous, as well as how decompositions of poverty show similarities and differences between both groups. All these results are valid at the national level. In the following sections, the chapter moves towards the study of data collected during fieldwork. While findings from fieldwork are not representative of the national context, and are not

[40] Bear in mind that the lowest income line in CONEVAL's measure (2010; 2013) is the basic rural, which is $800.26 pesos per equivalent adult per month, and the highest is standard urban set at $2,328.65 pesos per adult equivalent, as shown in Table 2.1 earlier in the chapter.

intended to do that, they put a face and a place to the comparative study of the indigenous and non-indigenous populations in Mexico.

2.8 Spatial Distribution of Indigenous Poverty

In this section the spatial distribution of poverty is discussed. The analysis of indigenous poverty by state faces the problem of not being representative of all states. Despite the fact the ENIGH-MCS 2012 is representative of indigenous and non-indigenous populations at the national level, and by state for both groups together, when indigenous and non-indigenous populations are broken down by state, the sample is not large enough.[41] This includes Chihuahua, Guanajuato, Michoacán and Sinaloa, where the number of indigenous people interviewed is not big enough. Table 2.15 summarizes the analysis by state.

In some other cases, the sample is good enough to estimate the indigenous population, but not to break that population into poor, extreme poor, social deprivation vulnerable, income vulnerable and non-poor, non-vulnerable. Only seven states have large enough samples to break the indigenous population into five categories: Campeche, Hidalgo, México, Oaxaca, Quintana Roo, Tlaxcala and Yucatán. However, in some states, poverty and extreme poverty estimates are significative and, thus, could be used for the analysis. These are Baja California Sur, Chiapas, Morelos, Nayarit, Nuevo León, Puebla, Querétaro, San Luís Potosí and Veracruz.

[41] A state was classified as undersampled when the percentage of the indigenous population could be zero within the 95% confidence interval or, in other words, the null hypothesis of zero indigenous population could not be rejected, given the standard errors.

Table 2.15 Number of Indigenous Cases Interviewed in the Sample, ENIGH-MCS 2012

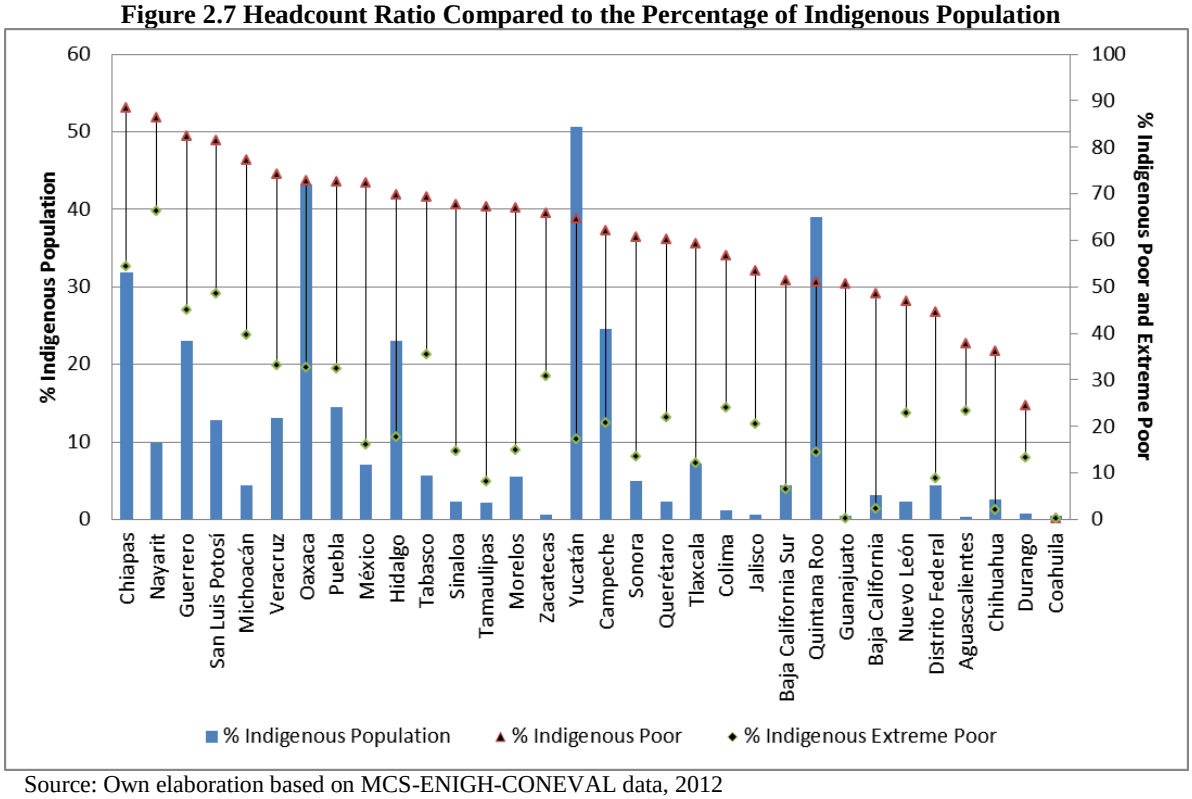
	State	Poor	Extreme Poor	Soc. Dep. Vuln.	Income Vuln.	Non-poor, Non-vul.	Total Cases	Result
1	Aguascalientes	14*	10*	13*	0	4*	31	Not Significative
2	Baja California	92	5*	81	0	12*	185	Poor Only
3	Baja California Sur	147	20	117	1*	21*	286	Poverty Est.
4	Campeche	1,071	358	416	45	145	1,677	OK
5	Coahuila	0	0	11	0	15	26	Special
6	Colima	48*	18	21	0	6*	75	Ext. Poor Only
7	Chiapas	2,437	1,506	251	12*	29	2,729	Poverty Est.
8	Chihuahua	38	2	58	9*	20*	125*	Undersampled
9	Distrito Federal	90	19*	77	24	24	215	Poor Only
10	Durango	8*	4*	4	6*	19	37	Not Significative
11	Guanajuato	10*	0	12*	0	0	22*	Undersampled
12	Guerrero	1,267	721	216	0	39	1,522	Special
13	Hidalgo	901	229	317	27	82	1,327	OK
14	Jalisco	32	13*	15*	2*	0	49	Poor Only
15	México	404	90	87	20	13	524	OK
16	Michoacán	203	103	33	6*	18*	260*	Undersampled
17	Morelos	205	51	108	3*	16*	332	Poverty Est.
18	Nayarit	485	371	61	1*	20*	567	Poverty Est.
19	Nuevo León	70	32	31	4*	30	135	Poverty Est.
20	Oaxaca	2,447	1,116	664	24	158	3,293	OK
21	Puebla	990	439	217	20*	29	1,256	Poverty Est.
22	Querétaro	79	34	37	13	9*	138	Poverty Est.
23	Quintana Roo	1,186	324	639	120	320	2,265	OK
24	San Luis Potosí	765	453	123	1*	23	912	Poverty Est.
25	Sinaloa	104	23	46	2*	2*	154*	Undersampled
26	Sonora	135	31*	78	11*	31*	255	Poor Only
27	Tabasco	176	94	82	3*	22*	283	Poverty Est.
28	Tamaulipas	97	10*	19	6*	11*	133	Poor Only
29	Tlaxcala	267	47	154	21	30	472	OK
30	Veracruz	540	254	144	15*	36	735	Poverty Est.
31	Yucatán	2,581	735	1,000	97	175	3,853	OK
32	Zacatecas	25	14*	1*	6*	3*	35	Poor Only
	National	**16,914**	**7,126**	**5,133**	**499**	**1,362**	**23,908**	

* Shows that null hypothesis is not rejected for the indicator in a 95 percent confidence interval.
Source: Own elaboration based on MCS-ENIGH-CONEVAL data, 2012

In Baja California, on the other hand, the sample is large enough for analysing the data in terms of poverty but not for extreme poverty. The same happens in Distrito Federal, Jalisco, Sonora, Tamaulipas and Zacatecas. In Colima the sample is only valid for the extreme poor. In Aguascalientes and Durango neither poverty, nor extreme

poverty are significative. And, finally, two states are special cases; Coahuila and Guerrero show zeros in the categories, but their results are significative and, thus, are suitable for estimation. Over all, six states are not suitable for poverty estimation of the indigenous population, six more are only suitable for poverty estimation, and one only for extreme poverty. For the remaining 19 states the sample allows for both poverty and extreme poverty estimations for the indigenous populations.

Figure 2.7 Headcount Ratio Compared to the Percentage of Indigenous Population



Source: Own elaboration based on MCS-ENIGH-CONEVAL data, 2012

This geographical pattern is accentuated in the headcount ratio for the extreme poor. When ranked in terms of extreme poverty, the top states are Chiapas, Guerrero, Oaxaca, Puebla and Michoacán. But when seen in terms of extreme poverty, the headcount ratio amongst the indigenous population, the top states are Nayarit, Chiapas, San Luis Potosí and Guerrero. Once again, the extreme poverty headcount ratio in Michoacán is also high, but as mentioned before, the indigenous population is undersampled. Oaxaca is ranked eighth, despite the fact that it is the state with the

second largest share of indigenous population at 41.8 percent of its overall/total population. Furthermore, the state with the largest share of indigenous population is Yucatán (49.1 percent) while it does not even feature amongst the top ten states with the largest number of indigenous people living in poverty or extreme poverty.

Table 2.16 Total Population, Poor and Extreme Poor for Indigenous and Non-Indigenous

State	Non Indigenous			Indigenous		
	% of Population	Poor (%)	Extreme poor (%)	% of Population	Poor (%)	Extreme poor (%)
Aguascalientes	99.65	37.76	3.32	0.35	37.66*	23.21*
Baja California	96.95	29.57	2.75	3.05	50.51	2.24*
Baja California Sur	95.75	29.16	3.55	4.25	51.40	6.56
Campeche	76.05	39.01	7.34	23.95	62.63	20.33
Coahuila	99.49	28.07	3.26	0.51	0.00	0.00
Colima	98.87	34.13	3.74	1.13	59.89*	25.24
Chiapas	68.47	68.25	21.75	31.53	88.65	54.81
Chihuahua	97.46	35.28	3.82	2.54*	34.18	1.97
Distrito Federal	95.95	28.15	2.17	4.05	46.85	9.52*
Durango	99.42	50.24	7.45	0.58	18.81*	9.34*
Guanajuato	99.68	44.50	6.92	0.32*	34.53	0.00
Guerrero	77.50	65.95	27.77	22.50	82.61	45.27
Hidalgo	77.71	47.66	7.60	22.29	70.61	18.19
Jalisco	99.44	39.68	5.73	0.56	58.67	22.35*
México	93.24	43.30	5.09	6.76	73.41	16.36
Michoacán	95.70	53.31	13.27	4.30*	77.81	40.62
Morelos	94.96	44.37	6.04	5.04	65.93	11.48
Nayarit	90.51	43.44	5.93	9.49	87.52	69.13
Nuevo León	97.85	22.69	1.94	2.16	48.64	23.66
Oaxaca	58.16	53.93	16.23	41.84	73.07	33.17
Puebla	86.99	62.68	15.11	13.01	76.45	34.29
Querétaro	98.08	36.45	4.76	1.92	60.62	25.11
Quintana Roo	62.74	30.62	4.84	37.26	52.56	14.42
San Luis Potosí	87.51	46.02	7.65	12.49	82.13	48.90
Sinaloa	97.74	35.52	4.25	2.26*	68.29	13.99
Sonora	95.33	27.60	4.50	4.68	60.09	14.25*
Tabasco	94.95	48.70	13.07	5.05	68.29	37.48
Tamaulipas	97.97	37.68	4.59	2.04	71.26	8.48*
Tlaxcala	93.70	57.91	8.88	6.30	57.37	12.76
Veracruz	87.11	49.44	11.50	12.89	74.27	32.92
Yucatán	50.93	32.87	2.53	49.07	65.44	17.41
Zacatecas	99.39	54.11	7.32	0.61	71.80	33.44*
Total	**90.35**	**42.60**	**7.60**	**9.65**	**72.45**	**30.70**

* Shows that null hypothesis is not rejected for the indicator in a 95 percent confidence interval.
Source: Own elaboration based on MCS-ENIGH-CONEVAL data, 2012

This means that despite the fact the indigenous are, in general, poorer than the non-indigenous in states such as Yucatán, Oaxaca and Quintana Roo, a relatively large percentage of the indigenous are better off compared to those living in other states in terms of the percentage of poor. In contrast, Nayarit has a disproportionally high

percentage of extremely poor indigenous people given the percentage of the indigenous population in the state. San Luis Potosí also shows high extreme indigenous poverty rates - 48.9 percent - given that it has a relatively low percentage of indigenous population - 12.5 percent. Surprisingly, Chiapas' indigenous population is not as large as one would think at only 31.5 percent . The same is the case with Guerrero which has an indigenous population of 22.5 percent and an indigenous extreme poverty rate of 45.3 percent . Table 2.16 shows the poverty and extreme poverty headcount ratios for indigenous and non-indigenous populations.

While Chiapas is the state with the highest headcount ratio for the indigenous population, in terms of intensity it is ranked eighth. Intensity of poverty, or the weighted proportion of deprivations, for the indigenous population is higher in Nayarit, Colima and Zacatecas. Sinaloa and Michoacán also have high intensities of poverty although the indigenous population in these states is undersampled. Intensity of the non-indigenous is higher in Guerrero, Oaxaca, Tabasco and Chiapas. States with relatively low non-indigenous intensity of poverty are Nuevo Leon, Distrito Federal, Baja California, Chihuahua and Aguascalientes.

On the other hand, intensity of the extreme poor is also higher in Nayarit, Tlaxcala and Colima. In this case, Baja California Sur and Zacatecas are among the states with a higher intensity of the extreme poor but their figures are not significative. Non-indigenous intensity for the extreme poor is higher in Chiapas, Guerrero, Oaxaca, Veracruz, Sinaloa and Michoacán. And similarly, states with relatively lower intensity for the extreme poor are Distrito Federal, Aguascalientes, Durango, Zacatecas and Baja California.

Table 2.17 Poverty Indicators for Indigenous and Non-Indigenous

State	Poverty Indicators						Extreme Poverty Indicators					
	Non-Indigenous			Indigenous			Non-Indigenous			Indigenous		
	H	A	MPI	H	A	MPI	H	A	MPI	H	A	MPI
Aguascalientes	0.3776	0.6536	0.2468	0.3766	0.7227	0.2722	0.0332	0.7811	0.0259	0.2321	0.7576	0.1758
Baja California	0.2957	0.6579	0.1945	0.5051	0.6910	0.3490	0.0275	0.7714	0.0212	0.0224	0.8167	0.0183
Baja Cal. Sur	0.2916	0.6701	0.1954	0.5140	0.7426	0.3817	0.0355	0.7879	0.0280	0.0656	0.8789	0.0576
Campeche	0.3901	0.6881	0.2684	0.6263	0.7266	0.4551	0.0734	0.7886	0.0578	0.2033	0.7823	0.1590
Coahuila	0.2807	0.6634	0.1862	0.0000	0.0000	0.0000	0.0326	0.7833	0.0255	0.0000	0.0000	0.0000
Colima	0.3413	0.6706	0.2289	0.5989	0.7903	0.4733	0.0374	0.8027	0.0300	0.2524	0.8384	0.2116
Chiapas	0.6825	0.7231	0.4935	0.8865	0.7759	0.6878	0.2175	0.8144	0.1771	0.5481	0.8200	0.4494
*Chihuahua**	*0.3528*	*0.6549*	*0.2310*	*0.3418*	*0.6666*	*0.2278*	*0.0382*	*0.7901*	*0.0302*	*0.0197*	*0.7500*	*0.0148*
Distrito Federal	0.2815	0.6597	0.1857	0.4685	0.7049	0.3302	0.0217	0.7821	0.0170	0.0952	0.8156	0.0777
Durango	0.5024	0.6657	0.3345	0.1881	0.7274	0.1368	0.0745	0.7797	0.0581	0.0934	0.8303	0.0775
*Guanajuato**	*0.4450*	*0.6846*	*0.3046*	*0.3453*	*0.6826*	*0.2357*	*0.0692*	*0.7934*	*0.0549*	*0.0000*	*0.0000*	*0.0000*
Guerrero	0.6595	0.7450	0.4913	0.8261	0.7770	0.6419	0.2777	0.8143	0.2261	0.4527	0.8240	0.3730
Hidalgo	0.4766	0.6783	0.3233	0.7061	0.7157	0.5054	0.0760	0.7886	0.0599	0.1819	0.7984	0.1452
Jalisco	0.3968	0.6761	0.2683	0.5867	0.7213	0.4232	0.0573	0.7909	0.0453	0.2235	0.8100	0.1810
México	0.4330	0.6650	0.2879	0.7341	0.7167	0.5261	0.0509	0.7841	0.0399	0.1636	0.7839	0.1282
*Michoacán**	*0.5331*	*0.7147*	*0.3810*	*0.7781*	*0.7869*	*0.6123*	*0.1327*	*0.8037*	*0.1067*	*0.4062*	*0.8364*	*0.3398*
Morelos	0.4437	0.6909	0.3065	0.6593	0.7120	0.4694	0.0604	0.7981	0.0482	0.1148	0.7943	0.0912
Nayarit	0.4344	0.6666	0.2896	0.8752	0.8429	0.7377	0.0593	0.7841	0.0465	0.6913	0.8680	0.6000
Nuevo León	0.2269	0.6606	0.1499	0.4864	0.7467	0.3632	0.0194	0.7870	0.0153	0.2366	0.8161	0.1931
Oaxaca	0.5393	0.7270	0.3921	0.7307	0.7604	0.5556	0.1623	0.8121	0.1318	0.3317	0.8180	0.2713
Puebla	0.6268	0.7089	0.4443	0.7645	0.7596	0.5807	0.1511	0.8043	0.1215	0.3429	0.8159	0.2798
Querétaro	0.3645	0.6751	0.2461	0.6062	0.7234	0.4385	0.0476	0.7949	0.0378	0.2511	0.8173	0.2052
Quintana Roo	0.3062	0.6799	0.2082	0.5256	0.7076	0.3719	0.0484	0.8003	0.0388	0.1442	0.7929	0.1143
San Luis Potosí	0.4602	0.6829	0.3143	0.8213	0.7767	0.6379	0.0765	0.8026	0.0614	0.4890	0.8097	0.3960
*Sinaloa**	*0.3552*	*0.6773*	*0.2406*	*0.6829*	*0.7977*	*0.5448*	*0.0425*	*0.8070*	*0.0343*	*0.1399*	*0.8337*	*0.1166*
Sonora	0.2760	0.6790	0.1874	0.6009	0.7626	0.4582	0.0450	0.7984	0.0360	0.1425	0.8371	0.1193
Tabasco	0.4870	0.7240	0.3526	0.6829	0.7700	0.5258	0.1307	0.7981	0.1043	0.3748	0.8131	0.3048
Tamaulipas	0.3768	0.6681	0.2518	0.7126	0.6817	0.4858	0.0459	0.7981	0.0366	0.0848	0.7500	0.0636
Tlaxcala	0.5791	0.6779	0.3925	0.5737	0.7087	0.4066	0.0888	0.7911	0.0703	0.1276	0.8431	0.1076
Veracruz	0.4944	0.7171	0.3546	0.7427	0.7681	0.5705	0.1150	0.8106	0.0932	0.3292	0.8161	0.2687
Yucatán	0.3287	0.6734	0.2214	0.6544	0.7461	0.4883	0.0253	0.7859	0.0198	0.1741	0.8116	0.1413
Zacatecas	0.5411	0.6613	0.3578	0.7180	0.7793	0.5595	0.0732	0.7793	0.0571	0.3344	0.8500	0.2842
Total	0.4260	0.6873	0.2928	0.7245	0.7537	0.5461	0.0760	0.8000	0.0608	0.3070	0.8161	0.2506

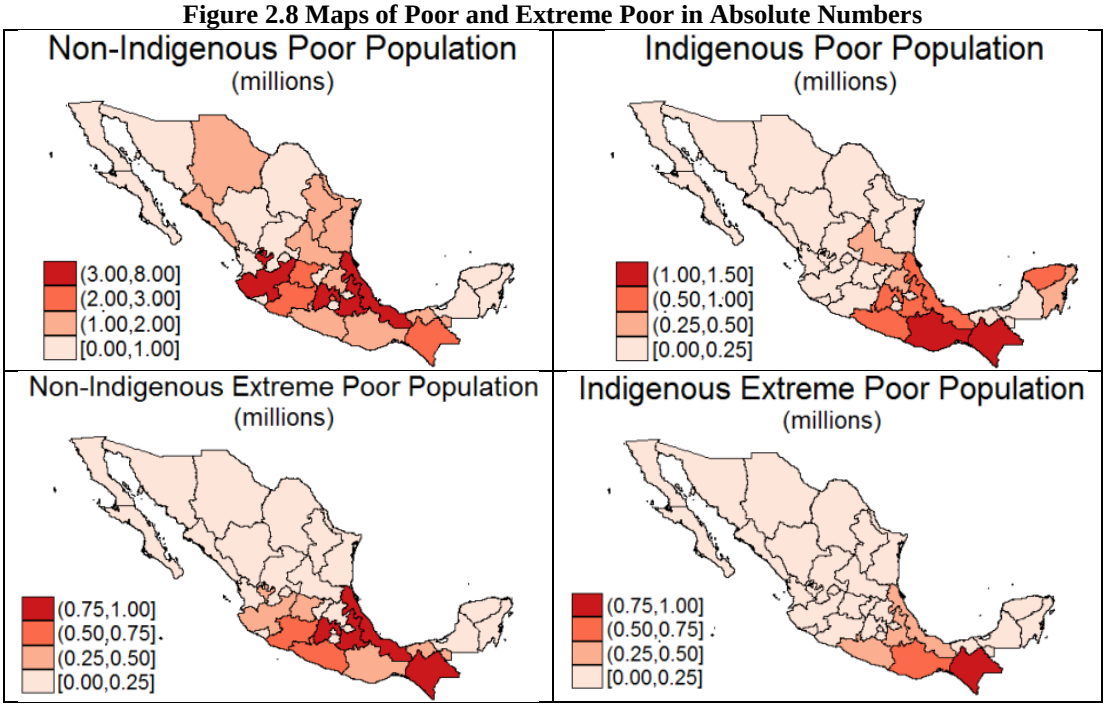
Note: Grey cells shows that null hypothesis is not rejected for the indicator in a 95 percent confidence interval. States in italics and with * are those where the indigenous were undersampled.
Source: Own elaboration based on MCS-ENIGH-CONEVAL data, 2012

As a result, the M_0, the product of the headcount ratio and intensity, is not highest in Chiapas for the indigenous population, but in Nayarit. The same happens for the extreme poor - the M_0 is higher for Nayarit than for Chiapas by quite a bit. This result is up to certain point surprising given that Chiapas is the poorest state if one looks only to the poverty headcount ratio. However, in terms of the extreme poverty

headcount ratio, as well as the intensity of poverty, both standard and extreme, Nayarit's indigenous population is poorer.

For the non-indigenous though, Chiapas is the poorest state in terms of M_0 while Guerrero has the highest M_0 for extreme poverty. For the non-indigenous, Nayarit does not figure amongst the top states. For standard poverty, Nayarit is ranked 15 and 16 for extreme poverty, out of 32. Sates with the lowest M_0 for the non-indigenous population for standard poverty are Baja California, Sonora, Coahuila, Distrito Federal and Nuevo León; and Coahuila, Baja California, Yucatán, Distrito Federal and Nuevo León for extreme poverty.

Figure 2.8 Maps of Poor and Extreme Poor in Absolute Numbers



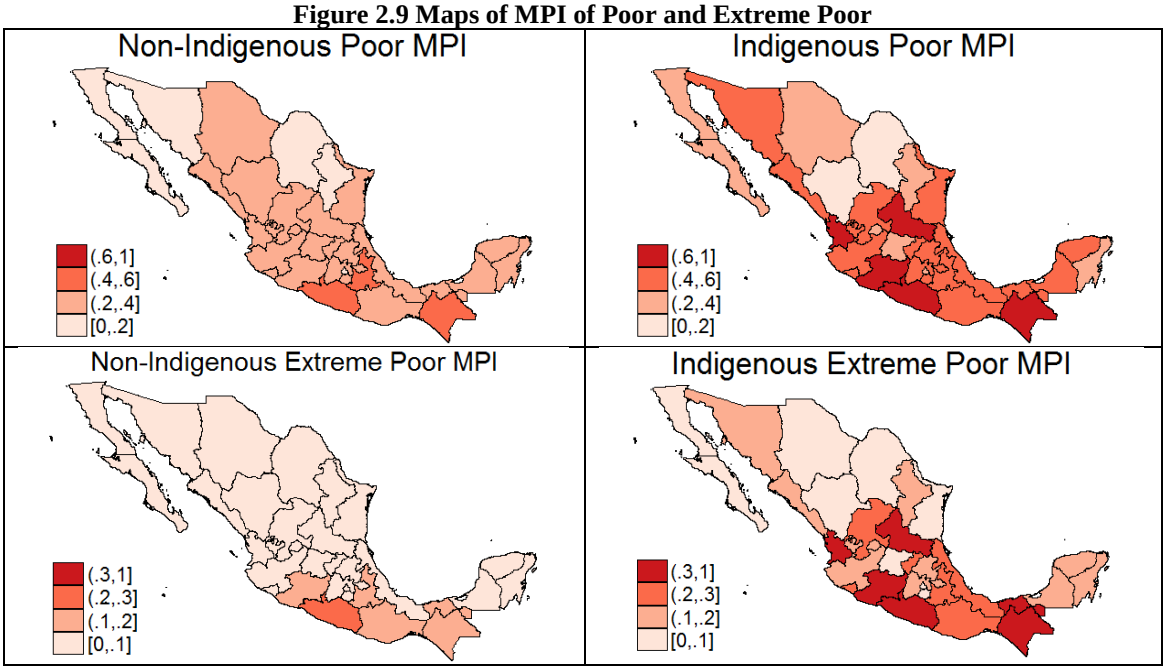
Source: Own elaboration based on MCS-ENIGH-CONEVAL data, 2012

To have a clearer picture of how poverty is distributed in Mexico, especially among indigenous and non-indigenous populations, several maps are put forward. The first set of maps (Figure 2.8) corresponds to the absolute number of poor at the national level. The second refers to the M_0 for indigenous and non-indigenous populations, showing both standard poverty and extreme poverty M_0s. The third map shows the

distribution of the referred population - that is, the percentage of the poor in each state for each subgroup: indigenous, non-indigenous and total. The fourth contains the share of indigenous and non-indigenous in relation to the total number of poor people in each state.

In general, poverty maps show that extreme poverty is more prevalent in southern states for both indigenous and non-indigenous populations, but more accentuated in the case of the indigenous population. Oaxaca, for example, is lighter in colour for the non-indigenous populations in the absolute and distribution of extreme poverty maps, in comparison with other southern states. However, the same maps for the indigenous are darker in colour.

Figure 2.9 Maps of MPI of Poor and Extreme Poor

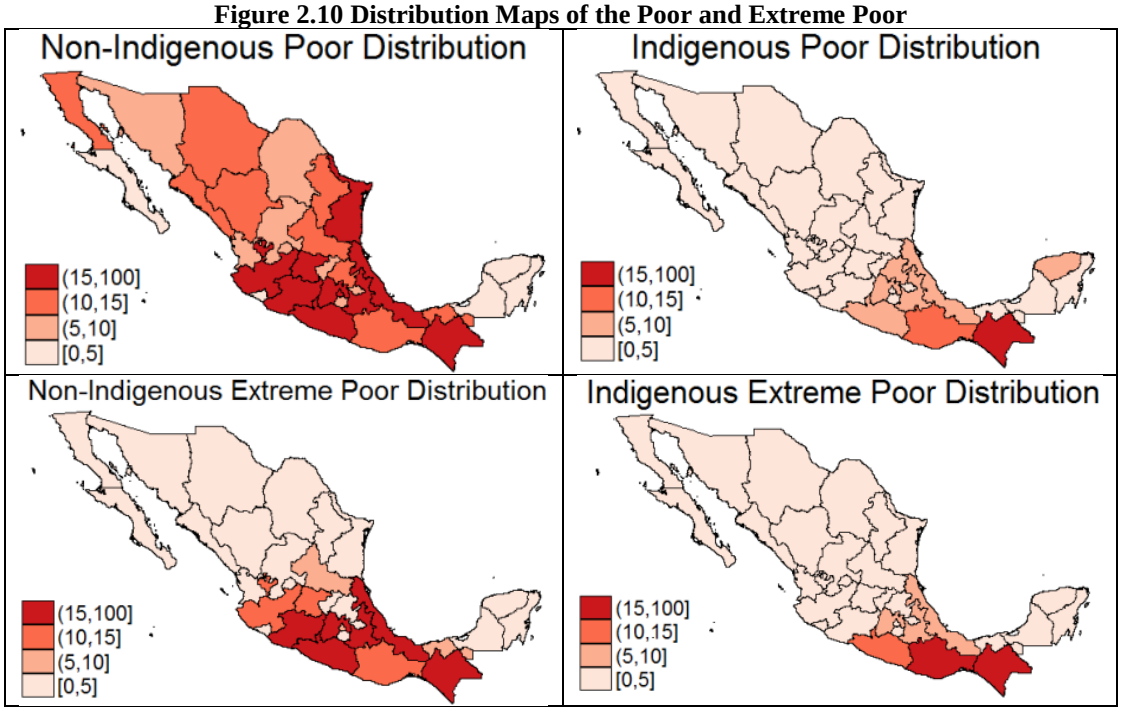


Source: Own elaboration based on MCS-ENIGH-CONEVAL data, 2012

In terms of the M_0, results show a greater contrast between indigenous and non-indigenous populations compared to the absolute number of poor people . For example, in terms of extreme poverty only Guerrero stands out for the non-indigenous, while the indigenous map is much darker coloured. The same happens for the standard poverty M_0 and is important to recall the case of Nayarit, the poorest indigenous state, placed

north in the Pacific Ocean. In the indigenous map, Michoacán also prominent in both standard and extreme poverty, however, figures are questionable due to undersampling of the indigenous population.

Figure 2.10 Distribution Maps of the Poor and Extreme Poor



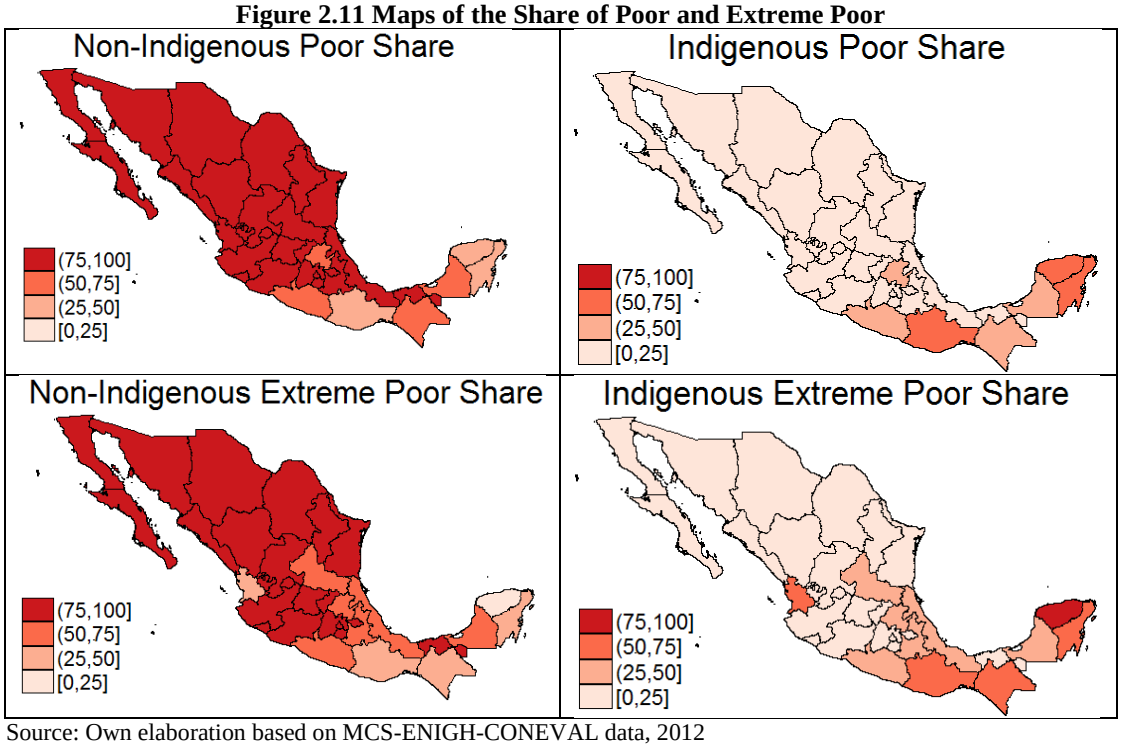
Source: Own elaboration based on MCS-ENIGH-CONEVAL data, 2012

When observing the distribution of the poor and the extremely poor in Mexico, it is evident that most of the poor are in the south of the country. Some states have a high concentration of poor, regardless of whether they have a large population of non-indigenous. Veracruz, Estado de Mexico and Chiapas are good examples of this and Guerrero is a pertinent example for the extremely poor. Jalisco, on the other hand, has a high concentration of poor but they are mainly non-indigenous. While, Yucatán, and to some degree Quintana Roo and Campeche, the other two states in the peninsula, have a high concentration of indigenous poor.

A noteworthy fact to be observed is how there is a clear divide between the north and south in the contribution of the two subgroups, indigenous and non-indigenous, to

total poverty. In the north, the contribution of the non-indigenous group is the highest, whereas it is very low in the south. Meanwhile, in the south the contribution of the indigenous is noticeable, even in Chiapas where the volume of the non-indigenous poor is significant, as can be seen in the previous maps.

Figure 2.11 Maps of the Share of Poor and Extreme Poor



Source: Own elaboration based on MCS-ENIGH-CONEVAL data, 2012

2.9 Mixing methods to analyse multidimensional poverty

This section will continue with the analysis of multidimensional poverty but uses a different approach. Instead of the broad results at the national level, it will focus on the data collected in 2011 during fieldwork in Mexico. Unfortunately, not all of the questions worked that well in the fieldwork survey. In particular, income questions were not clear enough; interviewees raised concerns and were frequently evasive. Without the income part of the survey, it is impossible to replicate CONEVAL's multidimensional poverty measure.

However, all other indicators had good proxies in the fieldwork survey, which means that a pseudo-measure can be estimated. In addition, results from the survey are assumed to be representative for each municipality.[42] Table 2.18 shows the differences in terms of thresholds for each indicator. Education and health are the same, while dwelling indicators have minimal changes. Food access could be considered as an oversimplified version of the original and it is social security indicators that have the greatest differences between the pseudo-measure from the fieldwork and CONEVAL's.

In both fieldwork municipalities the deprivation with the highest incidence is social security. However, the second and third places are inverted. While in the indigenous municipality the second and third deprivations are dwelling services and education, in the non-indigenous municipality it is the other way around. Materials and space are the fourth in both, and access to food the fifth.

Table 2.18 Comparative of Indicators Thresholds for CONEVAL and Fieldwork Survey

Indicators	CONEVAL'S threshold, deprived if:	Fieldwork survey's threshold, deprived if:
Education	- For 3-15 year olds: not attending school - For 16-29 year olds: less than complete secondary (9) - For 30+: less than complete primary (6)	- For 3-15 year olds: not attending school - For 16-29 year olds: less than complete secondary (9) - For 30+: less than complete primary (6)
Health access	Not having access to a health care institution	Not having access to a health care institution
Social security	- For salaried: not having work benefits - For independent: not voluntary enrolled - For elderly: no pension, subsidies - For other: no access to health by a third	- Not having work benefits - Unemployed, for those whose benefit status is not defined
Dwelling materials & space	Dwelling has any of the following: - Floor: earth - Roof: cardboard, asbestos or waste - Walls: mud, wood sticks, bamboo, palm, laminate of metal - More than 2.5 people per room	Dwelling has any of the following: - Floor: earth, sand or dung - Roof of cardboard, fabric, wood sticks, palm or waste, asbestos or metallic laminate - Walls cardboard, fabric, wood sticks, palm or waste, asbestos or metallic laminate - More than 2.5 people per room
Dwelling services	Dwelling has any of the following: - Water from a well, surface water, tanker truck, or from other dwelling or public tap - No drainage or flushes to a lake, river or cliff - No electricity - Cooking fuel: wood or charcoal, with no chimney	Dwelling has any of the following: - Water from a well, rain, surface water, tanker truck, or from other dwelling - Toilet: latrine, bucket or no toilet - No electricity - Cooking fuel: wood or charcoal, straw, dung, or no food cooked at home
Food access	- Moderate or severe food insecurity, measured with a composite index	- Any member skipped a meal due to lack of resources

Source: Own elaboration

[42] Please see Chapter 1 for more details on the fieldwork sample.

Health shows no deprivation at all, in any of the municipalities. This is not because there are no health problems in the municipalities, but because of the way the indicator is constructed. Since both municipalities have a clinic, everyone has access to a health care institution in theory. More about this will be discussed later in this section. In terms of gaps, it is noticeable how food access deprivation is almost double in Coatepec, as well as the 40 percentage point difference in dwelling services and 20 percentage point in dwelling materials and space.

For all indicators, Coatepec has higher deprivation incidence, and it is reflected in the average intensity among the poor. Although, with the union approach in social rights, as used by CONEVAL, the headcount ratio in both places is very high: 98.2 percent in Coatepec and 96.9 in San Martín Totoltepec.[43] With a higher intensity, the adjusted headcount ratio (M_0) is thus higher in Coatepec than in San Martín Totoltepec. If extreme poverty is defined as those with three or more deprivations, as in CONEVAL's measure, then the headcount ratio shows a wider gap - 81.2 percent of the population for Coatepec and 49 percent for San Martín Totoltepec - and, as a result, Coatepec's M_0 for extreme poverty is considerably higher than the one for San Martín Totoltepec - 0.5164 compared to 0.2795.

Table 2.19 Indicators and Measures for Fieldwork Survey and CONEVAL's Measure Without Income

Indicator/measure	Fieldwork survey, 2011			National, 2010		
	Coatepec	San Martín Totoltepec	Both	Indigenous	Non-Indigenous	Total
Education*	0.7917	0.7379	0.7671	0.3634	0.1891	0.2064
Health*	0.0000	0.0000	0.0000	0.3716	0.3119	0.3178
Social security*	0.9569	0.8889	0.9260	0.8155	0.5841	0.6072
Materials and space*	0.4667	0.2621	0.3734	0.4029	0.1243	0.1520
Services*	0.8917	0.4854	0.7065	0.4487	0.1331	0.1645
Food access*	0.2966	0.1569	0.2327	0.3976	0.2321	0.2486
H	0.9821	0.9688	0.9760	0.9332	0.7282	0.7486
A	0.5742	0.4301	0.5091	0.5000	0.3604	0.3777
M_0	0.5640	0.4167	0.4969	0.4666	0.2624	0.2827
H extreme	0.8125	0.4896	0.6654	0.5767	0.2311	0.2655
A extreme	0.6355	0.5709	0.6139	0.6393	0.5817	0.5942
M_0 extreme	0.5164	0.2795	0.4085	0.3687	0.1344	0.1578

* Uncensored headcount ratios.

[43] It is important to note that with the intersection approach, there would be no poverty in these municipalities.

In comparison with the national figures without income, Coatepec and San Martín Totoltepec are closer than the indigenous and non-indigenous populations at the national level, except in dwelling services because the gap in the fieldwork municipalities is wider. In the case of extreme poverty measured with the adjusted headcount ratio (M_0), while the gap between Coatepec and San Martín Totoltepec is slightly wider than the gap between indigenous and non-indigenous population at national level, it is less than double in the fieldwork municipalities. At national level the extreme poverty is almost three times larger for the indigenous population. The same is the case for the dwelling indicators on materials and space, as well as for services.

The most noticeable difference between the fieldwork municipalities and the national results is in the health deprivation indicator, which is the second highest at national level but in the fieldwork municipalities nobody is deprived. Health is one of the most important dimensions in measuring well-being. One of the survey questions asked interviewees about what is important for a good life and the most popular answer was health – 30.2 percent of those surveyed, followed by work with 24.8 percent. Measuring deprivation in health via access to a health care institution might be a good representation of how access to health institutions has reached the poorest, but it is a bad indicator of the health of the population.

A different approach to health measurement is the incidence of different diseases, which was included in the fieldwork questionnaire. The most common illness is diabetes, which is particularly high in San Martín Totoltepec. In contrast, respiratory and gastrointestinal problems where of a considerably higher incidence in Coatepec. Alcoholism was accepted as more serious problem in San Martín Totoltepec, but some reticence to talk about it was found and sometimes even denial in both places.

There are at least three indicators that can be generated with the data in the fieldwork survey. One is an illness indicator if someone in the household has any of the health problems mentioned above. The second one is an infant or child mortality indicator, if a child up to 15 years old died in the household. A third option could be child nutrition, or a knowledge or suspicion of undernutrition, since anthropometrics in my fieldwork were taken in the survey.

Headcount ratios with these indicators show very different results for Coatepec and San Martín Totoltepec, compared to the supposedly inexistent health deprivation when measured by access to health services. For example, with the illness indicator about 40 percent would be deprived, a little higher for San Martín Totoltepec due to the diabetes effect. With the other two indicators, Coatepec gets higher headcount ratios, 40 percent higher in terms of mortality and one third for undernutrition; 18 points more than San Martín in the case of mortality and 12 points more in the case of undernutrition.

Table 2.20 Selected Health Indicators (% deprived)

	Illness	Mortality	Undernutrition
Coatepec	38.98	40.00	33.33
SMT	42.16	22.33	21.36

Source: Own elaboration with fieldwork data

Health was a recurrent issue during the interviews. For example, in Coatepec, 'Delfino' told me that they had a measles epidemic a few months before fieldwork data collection. This means that despite having a clinic in town, a disease that could have been prevented by vaccination became an epidemic, which is one more argument against using access to health institution as a health indicator. In Rafa's account, also in Coatepec, he told me that the local clinic did not have enough medicines and that the medical care was not the best.

In San Martín Totoltepec, the clinic doctor Ernesto told me that those kinds of clinics were well equipped, according to the type of medical attention that they provide. He explained how the public health system is organized in levels and first level clinics are mainly preventive and for surgeries, rehabilitation and other more complicated treatments people are transferred to second level or even third level hospitals. Among other things he explained that hygiene education was one of the main tasks the clinic had as it is very important for preventing infections. While providing access to health care for everyone is undeniably important, having access to health institutions is not equivalent to not being non-deprived in health.

The rest of the indicators had some problems, although not to the same extent as the heath indicators. In the case of social security, given the fact that most people work in the fields as peasants, usually without formal contracts almost nobody had employment benefits in the fieldwork municipalities. Exceptions to this are the *jornaleros*, like the ones interviewed in Veracruz, who sometimes have some work benefits, like compensation in case of accident. Instead of pension, the elderly receive a cash transfer subsidy called *70 y más* (or 70 and more), which was the third most talked about programme in the interviews, after *Oportunidades* and *Seguro Popular*.

Two specific points might be worth commenting about this programme. One is that peasants usually age faster - as opposed to the non-indigenous population - and their physical condition might be unsuitable for hard work earlier than that of urban counterparts. Flor who is 57, for example, complained that it will be long time before she can start to get the subsidy; she said, *"it used to be 60 and more, now it is 70 and more, one day is going to be 80 and more* […] *with all these crises and illnesses, how are we going to reach that age?"*. The second point worth mentioning is that some people think the elderly programme is a politicized one, and highly dependent on

politicians' will. Dominga complained that her husband, who was already 71, had not yet started to receive payments. She stated that the money is spent on political campaigns instead.

Education was acknowledged as a key element to improve the standard of living. As Don Milio, a lumberman in the Orizaba Peak forest put it: *"I think that if our children keep on studying then tomorrow, in the future, in ten years, we must move forward* […] *I think that in the future, if the kids are still preparing themselves, we should be able change the way of life, and maybe, if they study, they can bring a new idea to do something here in our community".* However, education measured as schooling level or years of schooling has its problems. In rural areas, for example, full primary schools and secondary schools have been introduced only recently. For example, according to Rafa, before 1986, the municipality's primary school had less than six grades and before 1999 there was no secondary school.

An alternative measure of education is literacy since it measures the ability to read, which is a very important functioning.[44] The problem with literacy is that the threshold could be considered to be too low and then only a few would appear as educationally deprived. However, the illiterate figure for San Martín Totoltepec and Coatepec is not that low. In Coatepec 27.3 percent of those surveyed declared not being able to read, while in San Martín Totoltepec the figure was 16.5 percent.

One the most fascinating life stories captured during fieldwork was told by Juan, who is a farmer and a cattle trader who learnt how to use a calculator in order to receive payments, but he struggles to do the mathematical calculations on paper. He considers himself illiterate although he can read simple texts when he has plenty of time. He did

[44] Another indicator for education is the number of books in the household, in particular for studies of social mobility (Torche and Spilerman 2009; Torche 2007; Torche and Lopez-Calva 2010). However, the number of books is a measure of achievement, more than deprivation. This indicator will be used later in the social mobility chapter.

not have chance to study but motivates his children to go to school since he acknowledges its importance. Among the interviewees, better education for their children was a common aspiration for the future.

Also a very common aspiration for the future was owning a house. When people already own a house, their aspiration is to improve it to one made of "*materiales*" to summarize in one Spanish word which encompasses: bricks, cement and steel rods. Amelia, Carmina, Teodoro, Micaela, Beatriz, Juan, Emilia, Ricardo, and Julia all mentioned a house amongst their aspirations. Others have been building their houses for many years, like Delfino, Antonio and Dominga, or Agustina, who started building her house 25 years ago, just after her husband was murdered because it was a promise she made for his soul to find peace.

For Coatepec and San Martín Totoltepec the cement fashion might be pulling down deprivation figures, but its aesthetics are highly questionable. In many rural areas of Mexico the landscape is changing from the traditional tile roofs and mud walls painted in white, to unfinished grey squared houses made of ugly grey blocks. Teodoro, for example, said he wanted a modern house for his children, made of red bricks because they are beautiful and much better quality in comparison to the grey block that is ugly and absorbs water. This, however, is more the exception than the rule.

Access to food was not one of the greatest concerns during the interviews. People mentioned that they had at least *quelities* to eat, meaning herbs and plants that can be gathered in the wilderness; none of the interviewees said had nothing to eat. Some of them told me that they cannot afford to eat meat or chicken often - only from time to time. Delfino told me that hunting was, and for some still is, a more or less cheap way to get some meat. Those who shared stories of hunger were always speaking of the past. The most illustrative was probably Juan's story. He told me that during his

childhood he used to go to the markets and wait for the sellers of fruit and vegetables to throw away the rotten product and then eat it.

However, it looks like food access also has a political component, in particular relating to social programmes, either because some of them provide food or because not having food is one of the questions for the selection process. In the first case there used to be a programme in Coatepec that gave a basic set of food items like oil, rice, beans and sugar, but the authorities ended that subsidy. Aurelio, Dominga and Josefina complained about it. In the second case, Oralia told me one of the questions they ask her when they were looking for beneficiaries of Oportunidades was how often she and her family skipped a meal. She said that she could not lie because she is afraid of God and told them that she said never skipped a meal because they always have something, at least beans, but that cost her not getting into the programme.

Not precisely income, but a lack of money was a common deprivation associated with poverty in the survey. The survey included the question: *In one word, what does being poor mean?* The idea was to capture a quick first answer on the meaning of poverty in as few words as possible. 74.6 percent defined poverty in reference to being deprived of something; 14.7 percent gave a different answer and 10.7 percent did not know or did not answer. Of those who consider poverty to be the deprivation of something, the most common answer was a deprivation in terms of money - 30.5 percent - followed by not having anything, or in Spanish *no tener nada* - 20.4 percent . The lack of food was third - 8.4 percent.

During the interviews though, people did not talk much about money or at least not directly. Nevertheless, when the topic of money was raised in an interview people in general acknowledged its importance. For example, Don José, a blacksmith in San

Martín Totoltepec said in a metaphorical way that, *"water makes the plant live, and water is money, that is what keeps the plant alive, that represents the family*".

In general, income was a constant concern in the background; for example, when they talked about better income opportunities, either as a demand or as a reason to migrate. However, it was a serious concern for those with debt problems. For example, Agustina in Coatepec had debt problems that created a lot of anxiety and sadness. But debts are not part of the income measure; it is one of the missing dimensions that will be discussed further in the chapter.

2.10 Poverty for the indigenous: similarities and differences

There are several aspects of well-being that are frequently left behind when measuring poverty. These are called missing dimensions by Sabina Alkire (2007). From the analysis made with the data collected during fieldwork there are missing dimensions affecting both the indigenous and non-indigenous group; some dimensions of well-being are particularly important for the indigenous population. This section discusses the similarities and differences relating to poverty between the indigenous and non-indigenous populations.

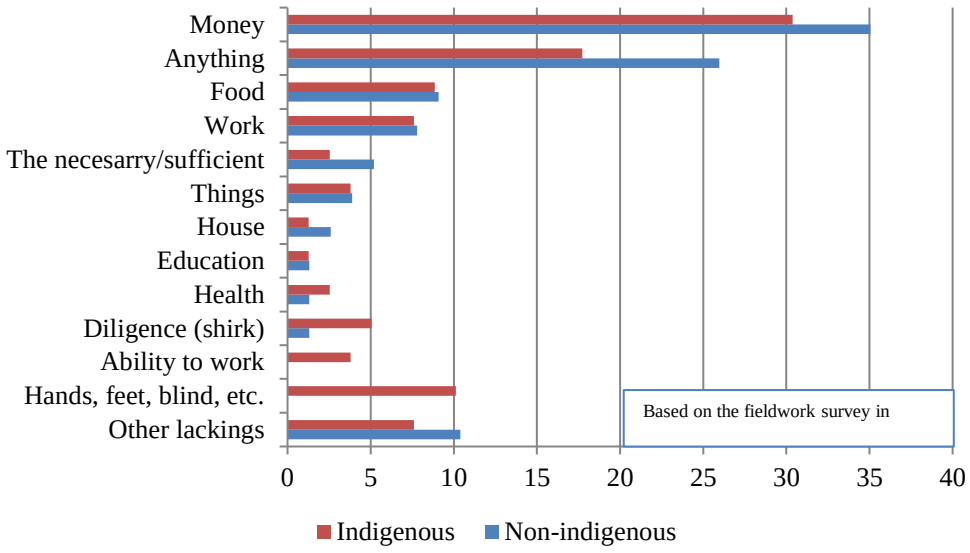
Work, ability to work and disability

Probably the most evident missing dimension in CONEVAL's measure is work in a very broad way, not only because it is a means to achieve income, but because work is a fulfilling activity that creates a sense of self-respect (Lugo 2007). In the fieldwork municipalities, the ability to work, the quality of work, or work itself were key elements in what people conceived as well-being. For example, deprivation of work itself,

understood as the lack of employment opportunities, was the fourth most common deprivation associated to poverty in the fieldwork survey.

However, there are other categories related to work, such as diligence, the ability to work and physical disabilities that may prevent some people from working. Diligence, or hard work, refers to the opposite of laziness, which has been discussed since Oscar Lewis' *Culture of Poverty* (1966) which could easily slip into blaming the poor for their poverty - a theory that does not hold much support nowadays and is considered politically incorrect. However, there is a very interesting fact about the other two categories, the ability to work and disabilities like blindness, is that these were only mentioned by the indigenous.

Figure 2.12 Poverty defined as being deprived of something (%)



Source: Own elaboration with fieldwork data

One of the interviewees who could help to exemplify how impediments to work are strongly linked to poverty in Coatepec is Micaela´s. When I asked her about how she would define poverty, she replied: *those who have nothing, a place to live, to raise their children. Or if they don't have* [money] *to pay the rent, as we said before, if you don't work you have nothing… poverty* [is being] *blind or unable to see*. In her answer

she included being homeless, a lack of money to pay the rent, not working and being disabled. Because I wanted her to clarify and add a little more I asked: *When someone cannot work then?* And she said: *yes, or if you cannot walk, because that person is poor as well - If you have a disability then?* – I asked again- *poor or cannot speak, mute, not always… cannot work or see* – she added and I tried to summarize - *if they cannot see or talk or walk* – to what she added again - *or if I am a person pretending, lazy, "I'm poor and have nothing to support my house"* – she said, making the voice of someone who feels sorry for him or herself, and continued - *If the person has hands, or eyes, is whole, complete, sees, but says that he is poor, but it is not true. If he sees, talks, walks, I think, he claims to be poor, he is pretending* (to be poor)…Micaela´s reply is not only a good example of how the inability to work plays an important role in some people´s understandings of poverty, but also how they combine different perspectives that could even contradict each other.

Assets and debts

Work, the ability to work, and the quality of work are dimensions that characterize one's earning capacity. Therefore, they could be part of the economic well-being dimension although their contribution to well-being goes further than income. In addition to work, qualitative data collected during fieldwork suggests two additional dimensions that belong to economic well-being: assets and debt. In terms of assets CONEVAL's measure focuses only on the dwelling, its materials and services. Real estate *ownership*, such as the ownership of the inhabited dwellings or other real estate is not considered important.

House ownership is a common aspiration, as mentioned before, but 13 percent of the interviewed did not live in a house they owned but somebody else's.

Furthermore, 63.2 percent did not own any land, which is particularly important for people in rural areas, and less than one percent owned a second property. But even smaller assets are not part of CONEVAL's multidimensional poverty measure. While some of the assets could be argued to be unnecessary, some are very important for the rural lifestyle, such as farm animals, which 68.6 percent of the fieldwork interviewees lacked. The gap in terms of economic well-being of someone with and without cattle in the rural areas is huge.

Figure 2.13 Main asset deprivation headcount (%)

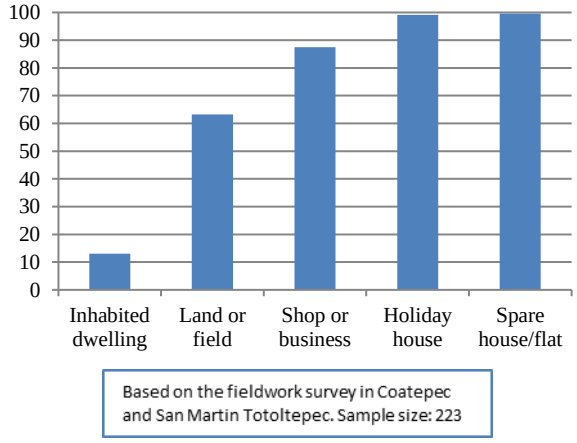
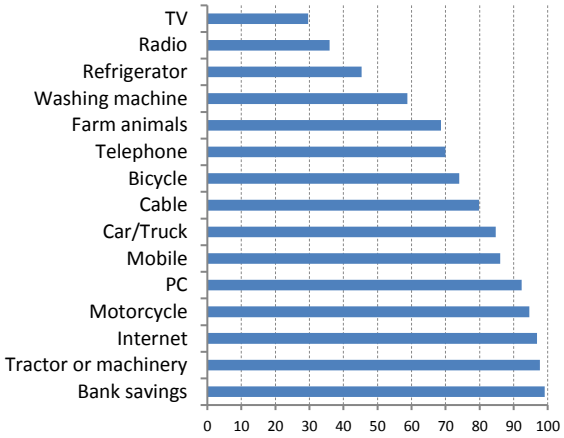


Figure 2.14 Small assets deprivation headcount (%)



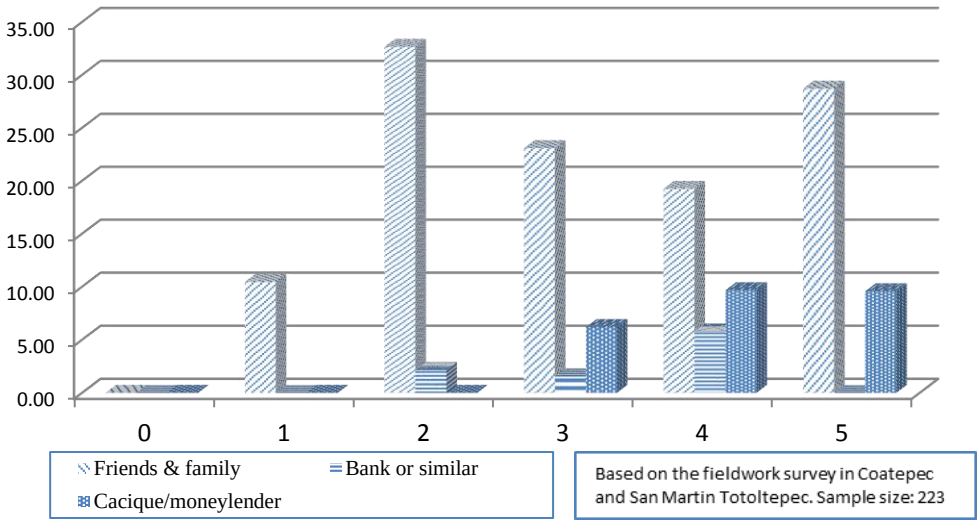
Source: Own elaboration with fieldwork data

Regarding debt, it is surprising how this has been ignored in terms of poverty analysis, in particular in Mexico where there is very important historical background to consider. Before the revolutions of 1910, big *haciendas* in Mexico used to have the infamous "tienda de raya" where only corresponding *hacienda* workers could buy their food and other groceries (Cosío Villegas et al. 1959). Peasants could not buy products anywhere else since they never had any cash, so they only could buy things using their "account" at the hacienda. Since their earnings were never enough to pay their debts,

they could not leave the hacienda to work somewhere else and their debt would always increase.

When peasants died or would be too old to work, their debts were inherited by their offspring. This mechanism was one of the triggers of the revolution in the early 20th Century and since then different policies have been implemented to prevent it, for example through social programmes to create local building societies.[45]

Figure 2.15 Source of money borrowing to face unforseen problems, for each k value (%)



Source: Own elaboration with fieldwork data

However, in a still very imperfect Mexican rural credit market (Paxton 2006) there is room for caciques, landlords, abusive moneylenders and pawnbrokers to take advantage of their monopolistic power. In the fieldwork survey, 31 percent reported borrowing money when they had an unforeseen problem - mostly from friends or other family members. However, Figure 2.15 shows that those who borrow from caciques or moneylenders are deprived in at least three dimensions or social rights in this case. The story of Agustina that was mentioned before is a good example of how debts affect well-being. She owed money to many people and felt a terrible anxiety and sadness

[45] There is actually a debate about the role "tiendas de raya" played in the 1910 Mexican Revolution. For more about this please refer to Cross (1979) and Cerda (1991).

because every month instead of decreased her debt, it increased. In San Martín Totoltepec, José told me that everyone in town owed money to the bank.

Crime, insecurity and other forms of violence

News reports have made evident people's vulnerability to criminal acts, mainly in relation to the war on drugs. An estimated 60,000-100,000 murders have occurred in the 2006-2012 period, related to this war (Tuckman 2012). Deprivation of public security is an obvious dimension of poverty in present-day Mexico. One of the direct victims of the violence was Calixto, a *jornalero* from Veracruz who shared his life story. He was working in Sinaloa when got an offer of a better paid job to work in Sonora. Unfortunately, the job turned out to be a scam. He was held by force for three years in a marijuana farm with no payment. His only source of food was instant soup. He managed to escape one night when the landlords were celebrating closing a big deal. He sneaked out through the mountains and mostly walked back to Veracruz. He did not want to hitchhike because he was afraid his captors were looking for him on the roads. It is hard to speculate about what would have happened if he had not escaped, but most likely he would still be in captivity, or dead.

In addition to the direct victims of the violence, there are displaced persons who leave their places of origin or work due to the increasing violence. This was the case of Amelia who returned to her hometown in Veracruz because she was afraid of the violence in Ciudad Juarez, a city in the border with the USA and famous from before the war on drugs for the unsolved murders of young women (Prieto-Carrón, Thomson, and Macdonald 2007; Livingston 2004). The fight against violence and organized crime are among the issues that Mexico is trying to lead in the Latin American region, according to Diego Sánchez-Ancochea (2013).

Fortunately, none of the municipalities where the fieldwork took place were exposed to drug war violence. Crime in general was low in both places, although perception of insecurity was higher in San Martín, the non-indigenous municipality. Juan told me the story of a hit-man who was caught recently and had been a very dangerous man that used to extort, rob and kill in the surrounding areas of San Martín; he also told me of the assassination attempt against the municipal president in the neighbouring municipality of San Felipe. Although scary, these examples of violence are not related to the war on drugs.

Criminals are not the only ones taking victims of violence; some of that violence also originates from police and armed forces. Because of the war on drugs, innocent people have been victims of army and police abuse, sometimes in the form of fabricated evidence but some others were shot because they were mistaken for criminals, or at least that is what offenders say (Díaz 2012a; 2012b; 2012c).

Stories of police and army abuse are not limited to the war on drugs. The armed forces have been used to repress popular organizations more than once. Recent examples of this are the 2009 repression of the dissenting group Popular Assembly of Peoples of Oaxaca, APPO in Spanish, and in 2006 in San Salvador Atenco, in Mexico State, when the then-governor and current president, Enrique Peña Nieto, commanded the police to dissolve a commoner´s protest. Social fighters, journalists and students have been also victims of deliberate state violence; the most astonishing events are probably the students' massacres of 1968 and 1971 (Knight 2010; Poniatowska 1998).

In addition to official use of the armed forces, civil society has also been a victim of paramilitary forces. Paramilitary forces are private illegal armed forces frequently paid by politicians or caciques that want to control, create fear or violently repress the antagonistic groups in their area of influence. A famous case of paramilitary

repression occurred in 1995 when in Aguas Blancas, Guerrero, 17 unarmed peasants were killed by paramilitary forces (Cornelius 2000).Two years later in Acteal, Chiapas, 45 unarmed indigenous Zapatista commoners where shot dead by paramilitary forces (Stahler-Sholk 1998; Prashad 1998).[46]

Despite the fact there was a ceasefire in 1994 just after couple of weeks of combat between the army and the Zapatista National Liberation Army, EZLN in Spanish, Zapatistas had to get used to live under constant threat, not only from the army and the police, but also from the paramilitary.

Violence affects both indigenous and non-indigenous in Mexico. From the data collected during fieldwork, it is impossible to claim one of the groups experience more violence than the other. However, it is important to keep in mind two things. One is that some forms of violence against them are rooted in colonial times and that its practice is not completely forgotten today. Second, the indigenous have unequal access to institution in charge of the rule of law, for example, because they tend to live in more remote isolated areas where the state has less presence.

Agency, representation, satisfaction and subjective well-being

Social demands, protests and other similar social activism, as well as some of the organized violence in response, are related to feeble political representation which could also be considered a missing dimension. In both municipalities where the fieldwork survey took place, political representation is a moderate problem. Most people believe in elections – 60.1 percent – but, at the same time, most people do not feel represented by any political party – 58.3 percent.

[46] Relatives to the victims of this massacre legally charged the former president Ernesto Zedillo with being intellectual author of the crimes, but Zedillo, who now lives in United States, obtained immunity from this country to avoid facing the charges (J. Hernández 2012).

Weak political representation was also reflected by their level of satisfaction with the government. When asked about their satisfaction regarding 16 issues, the lowest level of satisfaction accrued to the government: 15.2 percent said they were not satisfied at all and 45.3 percent only a little satisfied. This was closely followed by public security, which is also related to government performance. Conversely, spirituality, family and the ability to help others had the highest satisfaction level; dignity, education, freedom and control over their lives and friends all had at least a 50 percent level of satisfaction.

Figure 2.16 How satisfied are you about...?

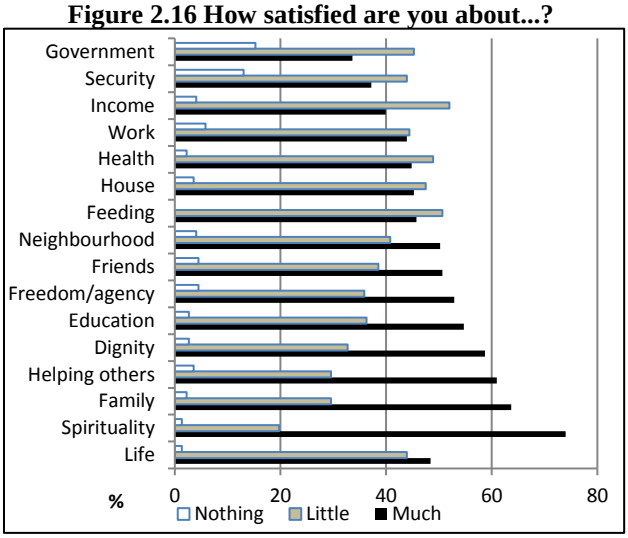
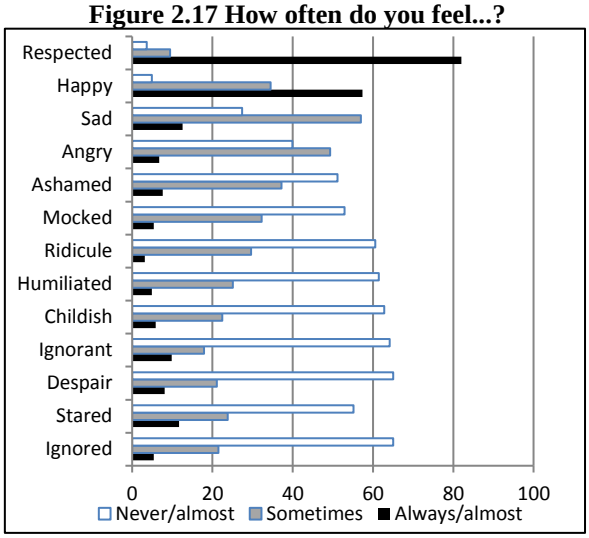


Figure 2.17 How often do you feel...?



Based on the fieldwork survey in Coatepec and San Martín Totoltepec. Sample size: 223

Agency does not seem to be a serious problem in the municipalities where the fieldwork took place. Only 6.7 percent claimed to have little or no control over decisions in their lives. The same finding occurred regarding happiness - only 0.9 percent consider themselves to not be happy at all and 10.8 percent claimed to be only a little happy. In terms of the frequency of happiness, 56.9 percent argued they were always, or almost always happy, while only 4.9 percent said they were never or almost never felt happy. Furthermore, most people felt respected all the time or almost all the time – 82.1 percent– and only 3.6 percent felt they were never or almost never

respected. On the other hand, 12.6 percent always, or almost always, felt sad. While it is impossible to claim that all sadness is related to poverty, Agustina's story tell us that at least some of it is.

Statistics regarding feelings like being ashamed, mocked, ridiculed and humiliated show some consistency between them and only 4.9 percent of those surveyed felt humiliated always or almost always. Shame, at least in the form of stigma related to poverty, might not be adequately reflected in the survey, although the semi-structured interviews draw some more information. For example, when I asked Teodoro about his concept of poverty he started by saying: *Well, here, poverty, I understand, means that one does not have any money, one. Two, you feel bad for not having money; you would like to reach those who have it, for example, if you don't have a field, then you would like a field too*. But then he changed his mind and added: *but we are not poor, you know why? Because we have good sight, we have hands, talk all right and walk.* Teodoro showed deprivation in five dimensions, so he was definitely one of the poorest in the municipalities, but he did not want to include himself in the category of poor through elaborating a definition of poverty in which he would not be included. Teodoro's second definition actually matches what was mentioned before about poverty being defined as not being able to work because of a disability. This suggests a link between poverty stigma and a conception of poverty based on not being able to work adopted by some indigenous people.

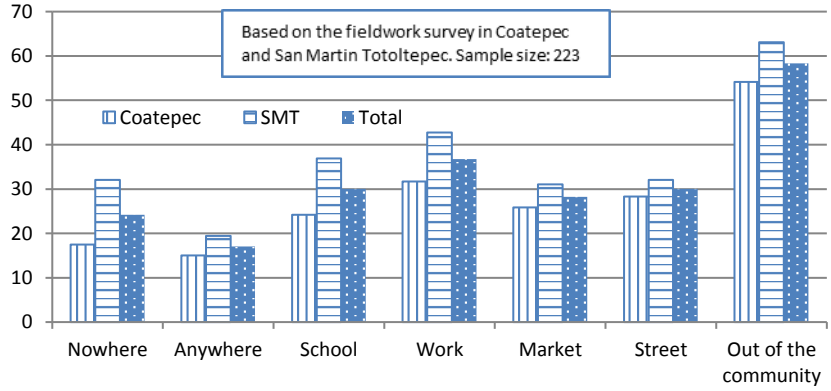
Discrimination

Discrimination is another missing dimension. There are many types of discrimination, for example, by gender, age, sexual orientation, career or social class. However, this research is more interested in ethnic discrimination. At least in the

fieldwork municipalities where the survey took place, the perception is that the indigenous population face more problems than the non-indigenous one – 60 percent in Coatepec and 55.3 in San Martín Totoltepec. Nevertheless, some of the indigenous that I interviewed disagreed, for example, Marcela. She is an indigenous Nahuatl from the Zongolica Sierra in Veracruz who graduated with a degree in Mechanical Engineering. She quit her job at the university because she was harassed by her boss for wearing traditional indigenous clothes at work. To me she was obviously an object of ethnic discrimination but, when I asked her if she thought that in Mexico the indigenous population has a disadvantage compared to the non-indigenous, she said no and that we all have chances and it depends on us if we take the opportunity or not.

Rene was another indigenous graduate student who told me that, in his opinion, discrimination was greater within the indigenous community than outside, in particular social class discrimination, but denied or minimized the role of ethnic discrimination. Surprisingly, the survey more or less confirms that the indigenous population tends to deny or lessen the effect of ethnic discrimination because it was in San Martín Totoltepec, the non-indigenous municipality, where a higher percentage of the population acknowledged that the indigenous population is discriminated against in several places (See Figure 2.18).

Figure 2.18 Where are the indigenous discriminated against? (%)



Source: Own elaboration with fieldwork data

In addition to being discriminated against, there is the fear of being discriminated against. When asked whether people should be afraid of being treated badly outside the community, 28.2 percent of those surveyed in San Martín Totoltepec said yes, while the figure for the indigenous municipality is 15 points higher at 43.3 percent. Of those who reported to be afraid of being treated badly - 46.2 percent had ethnic or racial concerns, for example, they felt that they could be treated badly out of their communities because they do not speak Spanish, because they are indigenous or because of their skin colour.

This is a key result because it supports the hypothesis that the risk of discrimination is an inhibiting factor for geographical mobility. While it is true that it is not a widespread sentiment among the indigenous population, some did raise the issue when asked. It is also interesting that no one in San Martín Totoltepec had ethnic discrimination concerns; the factors they mentioned as potential motives for bad treatment out of the community were mainly being an outsider – 79.3 percent – and being a woman – 27.6 percent. It must be mentioned that people could have had more than one concern.

On the other hand, women's concerns were higher in Coatepec where 48.1 percent were are afraid of being treated badly outside the community. Finally, the social class concern was also higher in Coatepec - 17.3 percent versus 3.4 percent in San Martín Totoltepec. In short, in addition to ethnic discrimination, gender and social class discrimination is more of an issue in Coatepec.

Geographical isolation

The last of the missing dimensions I want to discuss is geographical isolation. Social isolation has been studied as deprivation of social connectedness as one of the missing dimensions of poverty by the Oxford Poverty and Human Development Initiative (Zavaleta, Samuel, and Mills 2014). Social isolation is experienced by individuals who lack social interaction, e.g. the elderly. Geographical isolation or physical isolation, on the other hand, is experienced by social groups or communities and affects their well-being in at least two ways. First, lack of social interaction with people outside their community and, second, disconnection from state institutions that protect people's rights.

For example, small dispersed human settlements of only few families in the middle of the mountains, away from roads and other means of communication are plenty in Mexico. Coatepec and San Martín Totoltepec were small rural municipalities but had roads that connected them with other localities, public transportation and state institutions like local police force. Therefore, they were not precisely the prototypes of geographical isolation, however, the survey questionnaire included few questions that allow some analysis in terms of their willingness to stay or move somewhere else.

In both places, Coatepec and San Martín Totoltepec, most people feel happy in their communities - only 17.5 and 13.6 percent respectively said they wanted to live somewhere else. In San Martín those who wanted to move stated that the United States was their preferred destination – 57.1 percent – or another city, but not Mexico City. For Coatepec the most desired destinations were Zacatlán and Puebla, the closest intermediate city and the State capital respectively, but not the United States of America or Mexico City. Likewise, the motivation to move somewhere else was quite similar in both places. Work or income opportunities were the most important - 61.1 in Coatepec and 69.2 in San Martín; and family the second - 16.7 percent in Coatepec and 15.4

percent in San Martín. Conversely, for those who responded that they were happy in the community, when asked why they preferred to stay, the most important motivation was family, followed by work.

Geographical isolation could be also studied in parallel with geographical mobility or migration. A few examples of studies about migration include: how migrants tend to go places where they have someone they know so they can help them to get a job; how migrants create networks and links between their origin and destination locations; or how money flows into rural communities through remittances (Munshi 2003; Winters, De Janvry, and Sadoulet 1999; Lucas and Stark 1985).

The data collected during fieldwork suggests that migration, in particular to the United States, has increased migrant's economic well-being.[47] This is not so much for those who only receive remittances, but more notably for those returning to the communities with money to build houses and buy trucks. According to Rafa and Fidel, in Coatepec, youngsters wish to leave to the United States just after finishing secondary school. Even if it is a common aspiration, only 5 percent of those interviewed had been in the US at least once in Coatepec, but for San Martín Totoltepec the figure is 22.3 percent.

2.11 Conclusions

This chapter has shown how the indigenous population is poorer than the non-indigenous population. Departing from CONEVAL's multidimensional poverty measure as a general framework, the indigenous population has a higher headcount

[47] One of the pending issues in this chapter, and in general in the thesis, is the analysis that free trade policies adopted in Mexico have changed migration flows to the United States and if there is a difference between indigenous and non-indigenous populations. For reference on free trade policies see, for example, Martinez Molyneaux and Sánchez-Ancochea (2009) and Rugraff, Sánchez-Ancochea and Sumner (2008)

ratio, a higher average number of deprivations, and a higher M_0, which is almost double for the indigenous compared to the non-indigenous. Furthermore, the adjusted headcount ratio in the case of extreme poverty is four times greater for the indigenous than for the non-indigenous.

In all poverty dimensions the indigenous show higher deprivation rates than the non-indigenous. These dimensions of poverty require state intervention to be satisfied, which means that the indigenous, and their well-being, rely more on the state than the non-indigenous. This is a particularly important result in the chapter since will be a key in chapter six to explain the vicious cycle of indigenous poverty.

The result is statistically significant and robust to changes in weights, since for each dimension of the measure, the indigenous population shows higher deprivation headcount ratios. In the specific case of economic well-being, for a wide range of income poverty lines there is stochastic dominance, which means that indigenous population has a higher income headcount ratio too, regardless of where the line is set. It is also robust to changes in the poverty cut-off, which is the number of deprivations required to be considered poor. Also, it is possible to conclude that many indigenous and non-indigenous people have social deprivations despite not being poor, although this is relatively higher among non-indigenous.

In terms of the fieldwork survey, despite both being small rural communities with similar living standards, the indigenous municipality of Coatepec showed higher adjusted headcount ratios. The most noticeable difference between the fieldwork municipalities and the national results is in the health deprivation indicator, which is the second highest at national level but in the fieldwork municipalities nobody is deprived.

Social security, on the other hand, was confirmed to be of the greatest relevance at all levels and for all subgroups. The rest of the dimensions vary in terms of their

relevance when the analysis shifts from national to fieldwork municipalities, or from indigenous to non-indigenous. For example, education is the dimension with the second highest headcount ratio in both municipalities, but at the national level it is lowest for the indigenous and fourth for the non-indigenous. And still, at national level the deprivation headcount ratio in education is almost double for the indigenous compared to the non-indigenous. Another interesting case is food access, which is the dimension with the lowest headcount ratio in both fieldwork municipalities, after health whose headcount ratio was zero. However, at the national level food access deprivation is more relevant; it is third highest for the non-indigenous and fourth for the indigenous.

The qualitative analysis of the missing dimensions offers a good insight as well. An important finding is that, on the ground, differences between indigenous and non-indigenous populations are not that obvious in the rural areas. To the naked eye poverty seems to be the same for the indigenous and the non-indigenous, however, the analysis of the data shows some differences. One of the differences is that for some indigenous people, poverty is linked to the inability to work, mainly due to having a physical disability. Some of interviews suggest that this conception of poverty could be a reaction to the stigma of poverty and thus a way to deny their precarious living conditions.

The lack of access to credit and debt are very important missing dimensions with undeniable links to the historical background in Mexico. The story of Agustina and the sadness and anxiety she expressed, is a good example of how debt affects also other dimensions of well-being. Even though Agustina is indigenous, debt is not an exclusive problem of the indigenous population, although further research might be needed to see whether debt has a different effect in indigenous and non-indigenous populations.

Insecurity and crime is another missing dimension that indigenous and non-indigenous share, as well as political repression and organized violence against civil society. However, the Zapatista experience suggests that for the indigenous this kind of violence has its roots in colonial times and that its practice is not completely forgotten today.

Ethnic discrimination affects indigenous well-being considerably. The majority of people surveyed in the fieldwork agreed that the indigenous face more challenges in life, but it also looks like it is a hard topic to talk about and is sometimes denied by the indigenous, even by those who have experienced discrimination. Ethnic discrimination is one of the topics that will be studied further in the thesis.

Another topic will be indigenous poverty from a geographical point of view. This will include an analysis of the distribution of indigenous poverty across Mexico, as well as its relationship with dispersion, isolation and migration patterns. More isolated communities tend to have fewer services such as electricity, water or communications. Migration is frequently a mechanism to increase income opportunities and move out of poverty. However, if the indigenous find that their language, culture or way of life do not fit in in the destination places, there will be a trade-off between preserving their indigenous identity and geographical mobility.

In addition, the thesis will also look at indigenous well-being from the perspective of social mobility. It is important to acknowledge that the study of indigenous poverty is challenging and not free of questioning. One of the main critiques that this study could have is that membership of the indigenous group is self-reported. This could bring problems of identification since a person could report the ability to speak an indigenous language at some points, but deny it in others.

An interesting further question is the effect of Zapatismo in indigenous communities. At this point, it is hard to say whether Zapatista communities are more or less poor than other indigenous communities, but at least they have prioritized their dignity and autonomy. Even if development is not as fast according to western society standards, it is happening the way they want. It is important to read data and results carefully. From definitions of indigenous poverty to development policies, there are a lot of ideas that could make us believe that in order to stop being poor it is necessary to stop being indigenous and, more importantly, avoid blaming the indigenous for their poverty. This is not an example of a "culture of poverty"; indigenous groups are not lazy, stupid or social anomalies. They are a diverse group, with different lifestyles, challenges and worldviews that share something in common: they have resisted for centuries assimilation by the mainstream society.

3. Remoteness

While the availability of data limits our analysis, we should not allow our analytic tools to be more limiting than our data.
(Rick Grannis, 2002)

In the previous chapter it was shown how the indigenous population in Mexico is multidimensionally poorer than the non-indigenous population. This chapter focuses on studying the geographical isolation of the indigenous population. One of the main hypotheses of this thesis is that indigenous poverty is strongly linked to the fact that indigenous people live in more remote localities compared to the non-indigenous people; however, there is little empirical support for this. Furthermore, the literature on spatial disparities has focused on issues of urban segregation or spatial inequalities but, since there is no measure that summarizes geographical isolation or remoteness, I am going to propose a new measure based on locality size and proximity to other localities to compare remoteness patterns between the indigenous and non-indigenous populations.

Finally this chapter will analyse the qualitative data collected during my fieldwork conducted in 2011 in relation to geographical isolation and remoteness of the indigenous population. In addition, this should also add to the discourse of why indigenous people do not migrate to more urbanized areas where better employment opportunities could be available to them. Fieldwork testimonies attest to how migration works as one - if not the main - driver of moving up the socioeconomic ladder. This also links with the next chapter which focuses on comparing the social mobility of the indigenous and non-indigenous populations.

3.1 Literature on Geographical Isolation, Segregation and Spatial Disparities

The interest in geographical isolation arises from the fact that many indigenous communities are located in remote places. These communities usually lack roads and basic services and the indigenous people living in them are mostly poor. Some of them migrate to more urbanized places or the United States of America, but many of them remain in those isolated communities.[48]

The spatial dimension is important for development, for example, Anthony J. Venables[49] says "far from being a process of smooth convergence, development is highly spatially differentiated. This suggests that thinking in development economics needs to be better informed by insights from economic geography" (Venables 2005, 4). However, most of the literature that takes into account the spatial dimension focuses on segregation, specifically the residential allocation of minorities in the urban context.

Karl Taeuber and Alma Taeuber (1972) argued that inequality measures could be easily applied to measuring segregation. In particular, they propose that the Lorenz curve can be understood as a segregation curve when the respective proportions of the population for two ethnic groups can be graphed on the axis. Applying their approach to

[48] Migration from rural areas to cities can be explained using the Harris and Todaro (1970) two sector model. But that model is not enough to explain the behaviour of the indigenous population that prefers to stay in the community. More than focusing on migration patterns and remittances, topics in which other migration models could be useful (Munshi 2003; Lucas and Stark 1985) I am interested in studying the isolation patterns.

[49] Venables (2005) presents a model of optimal size of the city, not precisely relevant to this study making an important point regarding the importance of taking into account spatial disparities in the development process.

this case, we can analyse the cumulative proportion of one group's population in relation to the cumulative proportion of the other, instead of income.[50]

Similarly, the Gini (G) coefficient can be utilized as a segregation index, as well as the dissimilarity index (D), which is equal to the maximum distance between the diagonal and the segregation curve. Later on, David R. James and Karl Taeuber (1985) discuss a set of segregation indexes in terms of the axioms that they satisfy, including D and G but also the variance ratio index from information theory (H), which is a derivation Theil index, and finally the Atkinson index (A).[51]

All these measures of racial segregation are usually applied in the context of certain units of social organization. Specifically, James and Tauber define segregation as "the differences in the distribution of social groups, such as blacks and whites, among units of social organization such as schools" (James and Taeuber 1985, 4). In principle, it would be possible to use that methodology to estimate the segregation of the indigenous and non-indigenous in Mexico using locality as a unit of social organization. This method, however, does not measure remoteness or how people are dispersed in geographically isolated settlements.

So, let us consider other measures of segregation. Sean Reardon and Glenn Firebaugh (2002) claim that, when the number of groups is larger than 2, 'D' and 'G', among other indexes, fail to comply with important axioms such as transfer, additive organizational decomposability and additive group decomposability. For this reason, Reardon and Firebaugh recommend the use of H, the variance ratio index mentioned

[50] Prior to Tauber and Tauber, Wendell Bell (1954) proposed a residential segregation index that he called isolation index. The relationship between segregation and isolation has been noted a long time ago. For example, Reymon Bernard (1949) starts his religious analysis of racial segregation claiming "Sociologist define segregation as that form of isolation in which social distance is based on physical separation." Nevertheless, the author was not referring to the physical separation that remoteness implies, but to the American Jim-Crow laws that segregated the African-American population until the mid-20th Century.

[51] Please be aware that the notation here is original from the source and could be confused with the poverty indicators used in the previous section. I apologise for that.

earlier in this section – not the poverty headcount ratio used in the previous chapter - to study multigroup segregation. Furthermore, Rick Grannis (2002) also reviews several multigroup indexes and proposes a spatial proximity index in which distance is added to the analysis.

If spatial proximity is incorporated in the measurement of segregation, Sean Reardon and David O'Sullivan (2004) argue that spatial segregation can be studied in two dimensions. One is the degree of clustering or even distribution of ethnic groups within a spatial area, while the other dimension refers to the extent of their isolation or exposure. They propose a general spatial exposure/isolation index and a set of multigroup spatial evenness/clustering indexes. Note that Reardon and O'Sullivan use the term "isolation" as a social phenomenon that can apply in the urban context; it does not designate how geographically remote and isolated some human settlements are.[52]

Sanjoy Chakravorty (1996), argues that inequality is manifested and perceived spatially and proposes a measure of spatial disparity that is linked to various income inequality measures. In his literature review he argues that most of the literature regarding spatial disparities focuses on how ethnic groups are segregated in cities.[53] Chakravorty actually presents a classification of spatial inequality measures based on Coulter (1989) as follows:

1. Based on deviations from a standard (Gini Coefficient, Dahl's Index, Nagel's Index)

[52] Maurizio Pisati (2013) presents a collection of commands in STATA to estimate residential segregation measures that incorporates spatial proximity.

[53] Chakravorty's measure sees the difference of a parcel's income compared to its neighboring parcels. This methodology is applicable to rural and urban areas, since you can select bocks or polygons as units of reference. It has potential of a measure of spatial-income inequality linked to subgroups, like indigenous and non-indigenous, when parcels can be identified as belonging to one group or the other. Nevertheless, in this case this again not a measure of remoteness.

2. Based on combinatorics or the mathematics of probability distributions (Hirschman-Herfindahl Index, Index of Concentration)
3. Based on information theory (Theil Index)
4. Based on normative social welfare models (Atkinson Index, Kolm Index)
5. Segregation measures (such as the Dissimilarity Index)

Among the spatial measures surveyed by Chakravorty are: Morgan's Index of Interaction (1983); White's Index of Spatial Proximity (1983); Morril's Boundary-modified Dissimilarity Index (1991); Wong's Shape-modified Dissimilarity Index (1993) and; Waldorf's Index of Relocation Effort (1993). Despite the different approaches taken by these papers to study segregation, the focus is on racial/ethnic segregation in the urban context instead of on the issue of remoteness of localities in terms of geographical isolation.

There is a wide range of literature on the project "Spatial Disparities in Human Development" sponsored by the World Institute for Development Economics Research of the United Nations University (UNU-WIDER) led by Ravi Kanbur and Anthony J. Venables. The project involved five conferences covering methodological aspects as well as case studies. About 40 peer reviewed articles have been published in six volumes (Kanbur and Venables 2003; Kanbur and Venables 2005b; Kanbur and Venables 2005a; Kanbur, Venables, and Wan 2005a; Kanbur, Lopez-Calva, and Venables 2004; Kanbur, Venables, and Wan 2005b). Among the published papers of this collection is one by Luc Christiansen, Liones Demery and Stefano Paternostro (2005) who conclude that economic growth is relatively slower in remote areas of Ethiopia and Uganda due to, firstly a dearth of roads and secondly a lack of electricity. They build this argument on findings of a previous paper by Stefano Paternostro, Jean Razafindravonona and David Stifel (2001), who use an index of remoteness, and a

proxy, to correlate with poverty rates in Madagascar. They argue that in general the poverty rates rise monotonically with increases in the degree of remoteness.

Their remoteness index is based on the weighted sum of a set of indicators summarizing access to roads, bus stops, agricultural extension services, modern fertilizers and distance to the nearest school and health clinic. The weights are derived through a factor analysis of the covariance in the indicators, following the methodology suggested by David E. Sahn and David C. Stifel (2000), which is intended to estimate a welfare index. The proxy is simply distance to the health clinic. While this is an interesting alternative in terms of providing a methodology to measure remoteness, it does not create a summary figure showing whether a subgroup is in general more or less geographically isolated than another.

Another paper about remoteness, that is not related to the WIDER project but is related to the indigenous population, is one by Andrew Sharpe and Simon Lapointe (2011). It focuses on the educational attainment of Canadian Aborigines. The authors engage in measuring the importance of remoteness to explain labour market performance and economic performance. They use an indicator of remoteness based on the distance to a service centre, but they do not take into account the size of that centre. One of their conclusions is that "A better indicator of remoteness could also provide a better understanding of this variable in determining educational attainment and labour market outcomes […] While some reserves may be situated close to a large city, other may only be close to a small town" (Sharpe and Lapointe 2011, 51).

Another paper, by Chris Gibson, Susan Luckman and Julie Willoughby-Smith (2010), studies the importance of remoteness and proximity for a community of creative workers (artists) in Darwin, Australia. This paper is a qualitative study based on

interviews and the authors do not even attempt to have a measure of remoteness or geographical isolation.

Finally, Diego Zavaleta, Kim Samuel and China Mills (2014) propose a measure for social isolation, in the context of the study of missing dimensions of poverty. For them, social isolation is the deprivation of social connectedness. While social isolation is experienced by individuals, regardless of where they are, geographical isolation is experienced by groups or communities who are deprived of social interaction with people outside their communities. Since the measure proposed by Zavaleta et. al. has no spatial component, it is not the appropriate measure for the purpose of the thesis.

In sum, there is abundant literature concerning the measurement of spatial disparities but no reference has been found which compares two or more subgroups in terms of their concentration in remote localities using a simple and consistent theoretical framework. Addressing this gap is the intention of the measure proposed in the next section.

3.2 Geographical Isolation (Remoteness)

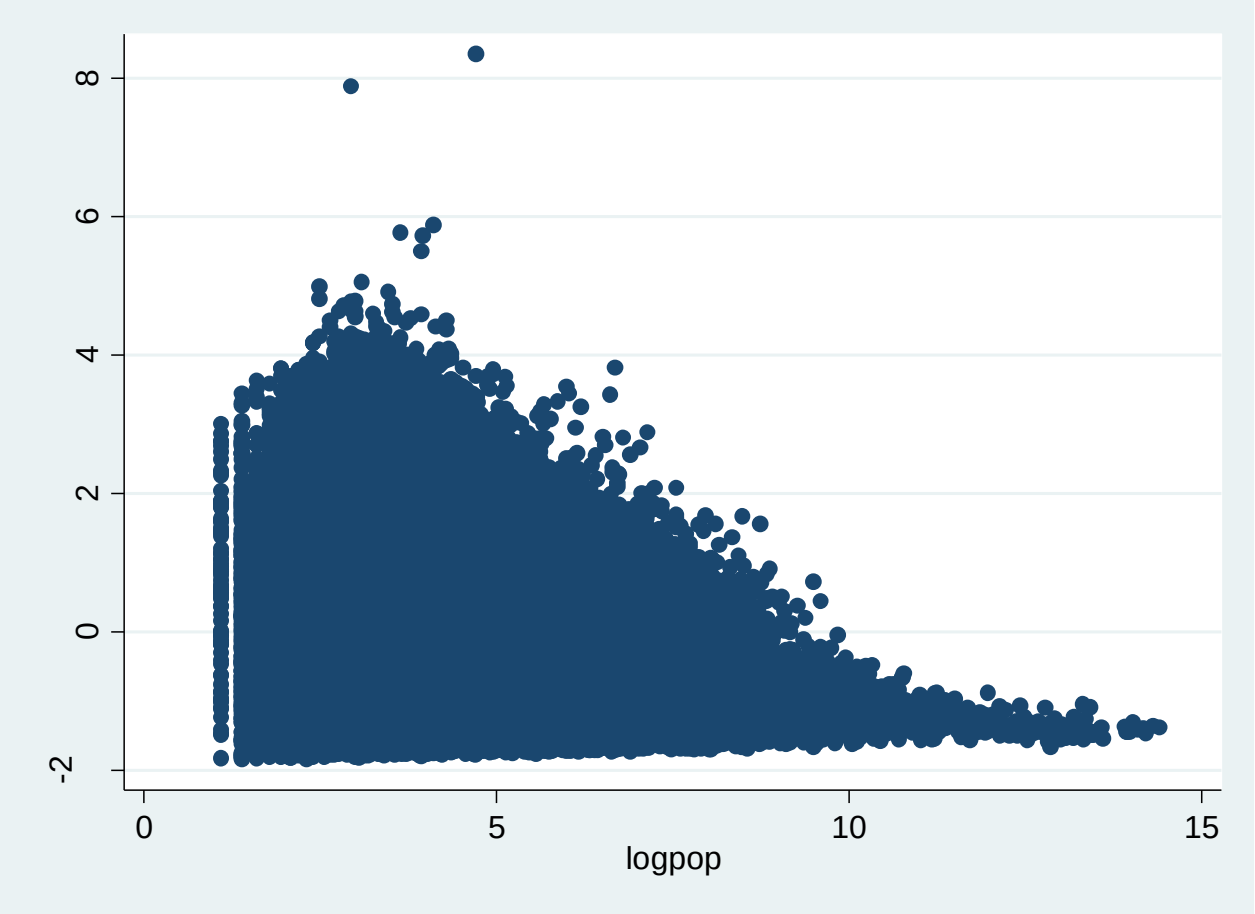
This section considers existing measures of geographical isolation of localities and their population. It does not deal with urban segregation of social groups or with social isolation. Geographical isolation of localities and their population refers to the remoteness of localities and the implicit difficulty of living there, for example because of the difficulties in providing public services such as electricity, water, schools and clinics.

The relationship between poverty and remoteness is easy to comprehend but hard to prove. This is because poverty figures are representative for rural and urban areas, at state level and sometimes at municipal level, but they are not representative at locality level and much less for small remote localities. There is a marginalization index, however, that is representative at locality level (de la Vega Estrada, Téllez Vázquez, and López Ramírez 2012). This index is estimated by the National Population Council (CONAPO in Spanish) in Mexico, with aggregated figures at locality level using principal component analysis. Marginalization index indicators are:

- Percentage of the population 15 years old and older illiterate
- Percentage of the population 15 years old and older without completed primary school
- Percentage of inhabited particular dwellings without toilet
- Percentage of inhabited particular dwellings without electricity
- Percentage of inhabited particular dwellings without tubed water
- Average occupants per room in inhabited particular dwellings
- Percentage of inhabited particular dwellings with ground floor
- Percentage of inhabited particular dwellings without refrigerator

The Marginalization Index has a mean of zero and its range goes from -1.83197 for the least marginalized locality to 8.34515 to the most marginalized one. In a graph for all 107,458 localities for which statistical data is available, it is possible to see how as population size increases the upper limit of marginalization decreases. This means that the larger a locality is in terms of population, the least likely it is to be marginalized. As a matter of fact, as can be seen in the figure 3.5, there are no large localities with high marginalization.

Figure 3.1 Marginalization Index 2010 by Locality Size



Source: Own elaboration based on Census-CONAPO data, 2010

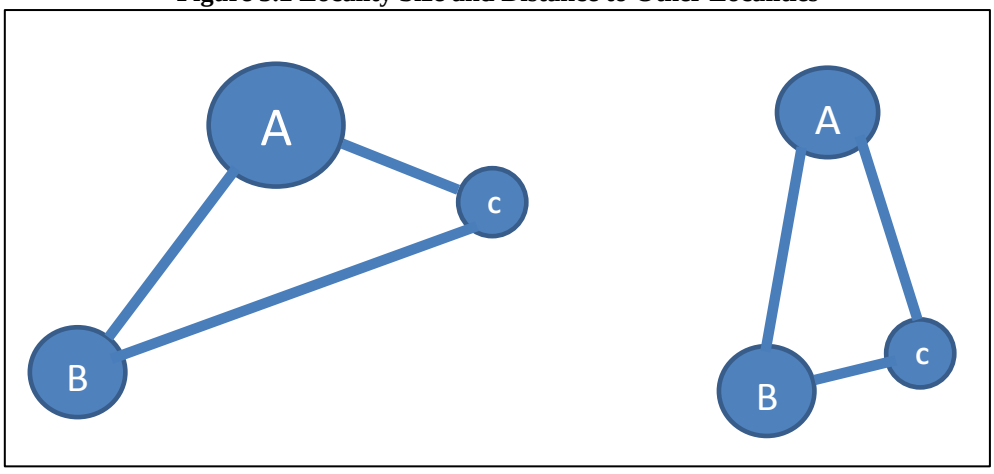
While locality size is an important indicator of remoteness, there is at least one more important element: proximity to other localities. Next in this section, a new method for measuring remoteness of localities is introduced. There is a risk of oversimplifying a remoteness measure by considering only locality size and proximity. Geographical isolation could be measured by taking into account a multiplicity of other factors such as access to roads, quality of roads and availability of public transportation, etcetera - such extensions are topics for further research. However, as a starting point, the aim was to generate a measure keeping things as simple as possible.

Measurement of geographical Isolation

In order to create a measure of geographical isolation it is necessary to have more than one locality. In the simplest case we have two localities: A and B. Since the distance from A to B is the same as from B to A, distance cannot be the starting point to determine geographical isolation; instead, it should be population size. If the population size of A is bigger than the population size of B we could say that B is more isolated geographically than A. We could express this as $S_A > S_B$, and thus for a measure of isolation that only takes into account population size the expression would be $I(S_B) > I(S_A)$.

If we then have three localities - A, B and C - where $S_A > S_B > S_C$, a measure of isolation based only on population size would say that isolation in C is greater than in B and at the same time also greater than in A. However, such a measure would not truly reflect the situation in the case that locality C is really close to A, and therefore is not as isolated as B, or even when B and C are very close to each other and have a larger combined population than A. Therefore, in addition to the size of the populations, proximity should be added to the analysis as well.

Figure 3.2 Locality Size and Distance to Other Localities



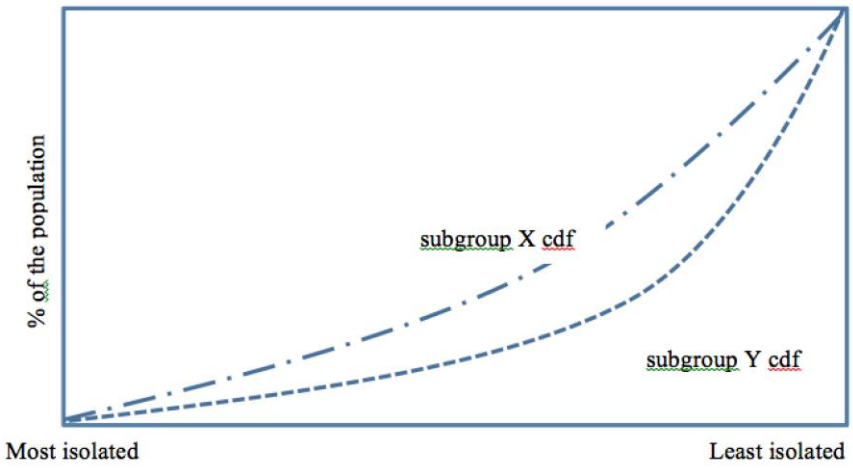
Source: Own elaboration

Proximity is represented as the perimeter or area of the circle with radius p, whose centre is the central coordinates of each locality. In a more general case the neighbouring population of locality i would then be population of locality i plus the sum of population in all other localities within the perimeter of radius p.

$$N_{i,p}(l_i, p) = S_i + \sum_{\forall j \in p} l_j$$

In extreme cases, p=0 and p=∞, proximity would not be important for geographical isolation; in the first case, when p=0, because neighbouring population would be equal to population size of each locality, while in the second case, when p=∞, because the neighbouring population would be the total population for all localities and thus would not be informative anymore. Decision on the length of the radius is practical, not theoretical. For any locality A whose neighbouring population with radius p is greater than neighbouring population of locality B with the same radius p, then it is possible to say that B is more isolated than A: $I(N_{B,p}) > I(N_{A,p})$. With their neighbouring population, localities can be ranked from the most isolated to the least isolated, i.e. from the one with the smallest neighbouring population to the one with the biggest neighbouring population given a certain radius p.

Figure 3.3 Geographical Isolation Curves



Source: Own elaboration

Once we have the ordering of localities it is possible to graph a cumulative distribution function, not using the neighbouring population but rather only the population size for each locality. This can be done by subgroups to compare graphically if a subgroup is more or less isolated than the other. These curves would be similar to Lorenz curves but with a different interpretation. If the curve for subgroup X remains above the curve for subgroup Y for the whole distribution, then it can be said that that subgroup X is more isolated than subgroup Y.

Furthermore, the area under each isolation curve could be measured to obtain an isolation index. A geographical isolation index that goes from 0 to 1, where 0 is no isolation at all and 1 the maximum possible, this index have the following formula:

$$\mathrm{GII} = \frac{\beta - \mathrm{P}}{\mathrm{P}(\mathrm{N} - 1)}$$

Where P is the total population, N is the number of localities and β is the sum of all cumulative populations ordered from most isolated to least isolated. That is, for locality 1, the most isolated, the cumulative population is its population size S_1 and for locality 2 the cumulative population is $S_1 + S_2$ and so on. Therefore, the sum of all cumulative populations is:

$$\beta = \mathrm{N}S_1 + (\mathrm{N} - 1)S_2 + \cdots + 2S_{\mathrm{N}-1} + S_{\mathrm{N}}$$

If the whole population of subgroup Y lives in the least isolated locality, then $\beta_Y = P_Y$ resulting in an index with value zero. If the whole population of subgroup X lives in the most isolated locality, then $\beta_X = NP_X$ resulting in an index with value one. The Geographical Isolation Index allows comparisons across subgroups and of any particular subgroup with the total population.

Remoteness of the Indigenous and Non-Indigenous Populations in Mexico

The Mexican national population census in 2010 has information at locality level with geographical coordinates. It also includes information about indigenous language speakers as it is the usual way the indigenous population is identified in México. It is common knowledge that the indigenous population lives in more remote places than the non-indigenous. However, without a geographical isolation index it has been hard to show the extent of this claim.

In order to apply the methodology suggested here it is necessary to sort out a number of issues. Firstly, the length of radius p needs to be determined in order to estimate the perimeters and then the neighbouring population for each locality. Secondly, a method to estimate the perimeters needs to be devised, since the earth is not flat. It is not even a sphere although its shape resembles a sphere. Then there is the problem of running the estimates. With something close to 200,000 localities, it could take more than three weeks to complete the process if a regular PC takes about 10 seconds, for example, to estimate the neighbouring population for each locality.

Estimating the length of radius p will be relatively easy in a city where there are cars or public transport or covering distances is not much of a trouble. A radius of 25 kilometres around the Zocalo will result in a perimeter which covers maybe the whole of Mexico's city metropolitan area. However, in remote localities in the middle of the mountains, with no roads or public transport, walking two or three kilometres can be challenging. Besides, paths in remote places are almost never linear, which means that something that looks close in the map can actually be much further away when you walk along it.

Without a more precise way to determine the radius p, I have decided to use a 5 kilometre threshold, which is a walkable distance and neither too short nor too long. But in order to be sure that the choice of the threshold does not greatly affect the results, estimates are also shown for 2.5 and 10 kilometres thresholds.

Regarding the method to measure the perimeter with radius p, there are at least two options. The simplest method to estimate it is probably Haversine, which assumes the earth to be a sphere.[54] A more accurate method is Vincenty.[55] With Vincenty the earth is assumed to be an ellipsoid. Again, to get robust results I ran estimates on both.

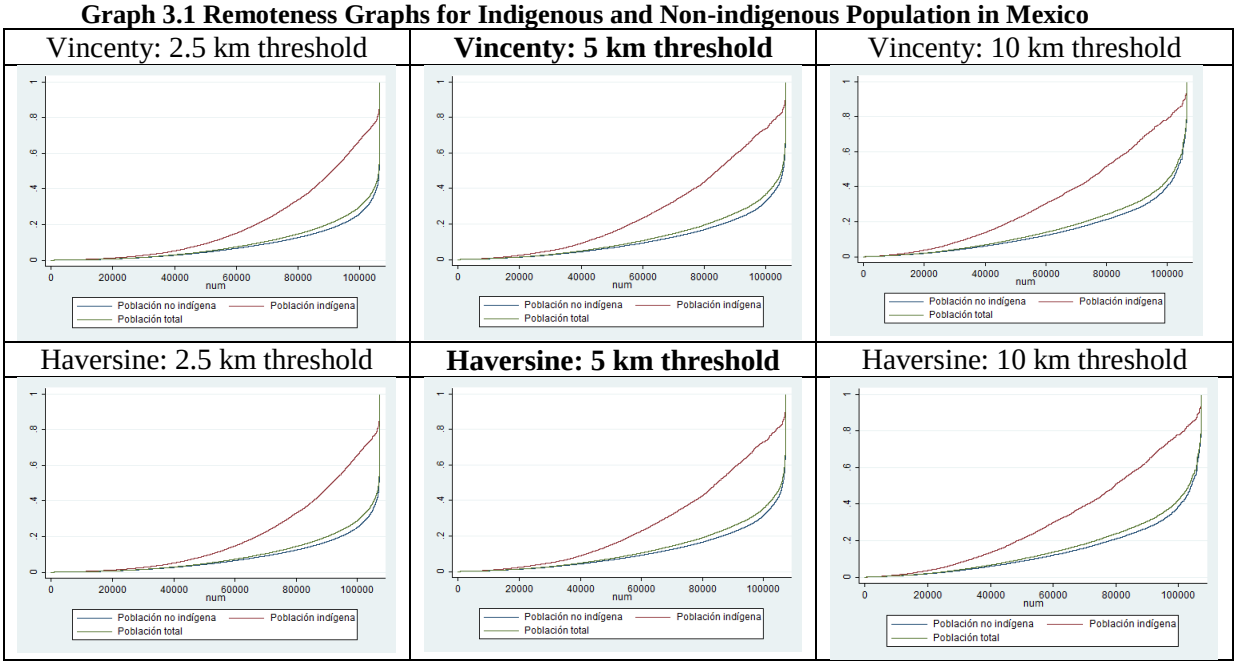
Finally, there is an issue of confidentiality of information since the census dataset at locality level blocks information for localities with only one or two dwellings. Therefore, while the estimate for the total population can be performed, when it is split into indigenous and non-indigenous the information is not available for those localities. This represents a tough step back since many of those one and two dwelling localities are precisely remote and isolated.

To sort out the problem of time to complete the estimation, it was performed using STATA on multiple computers simultaneously, each estimating the neighbouring population of a block of localities. The robustness estimations ran in C++ using Julia Studio which saved a lot time compared to STATA.

With all that taken into account Graph 3.1 are the Geographical Isolation Graphs, following Vincenty and Haversine methods. In all of them the indigenous population is more isolated than the non-indigenous one, regardless of the method of estimating perimeters or the radius p selected.

[54]According to the Oxford English Dictionary the term Haversine was introduced by Prof. J. Inman, D.D., in his Navigation & Naut. Astron. ed. 3, 1835.
[55] For further references on the Vincenty method see Vincenty (1975).

Graph 3.1 Remoteness Graphs for Indigenous and Non-indigenous Population in Mexico



Source: Own elaboration based on Census 2010 data

Likewise, the Geographical Isolation Index also shows that for each threshold, Vincenty and Haversine methods show consistent results, with only small variations. Also, for both methods and all three thresholds, the indigenous population is more isolated than the non-indigenous. In all results the indigenous populations have a GII more than twice that of the non-indigenous. The GII shows higher values for both subgroups with higher thresholds, but the gap between indigenous and non-indigenous is relatively smaller for the 10 km threshold and relatively bigger for the 2.5 one.

Table 3.1 Geographical Isolation Index (Remoteness)

	Vincenty		Haversine	
Radius *p*	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
2.5 km threshold	0.2062	0.0844	0.2055	0.0842
5 km threshold	**0.2622**	**0.1117**	**0.2612**	**0.1115**
10 km threshold	0.3076	0.1416	0.3064	0.1413

Source: Own elaboration based on census 2010 data

This index is important in the context of the rest of the thesis since the cost of provision of goods and services by the state increases in remote dispersed areas. The fact that the indigenous are settled in relatively more remote areas than the non-indigenous, means that for the state is also more expensive to reach them. If authorities

want to optimise their scarce resources, for example, to reach as many people with the least money, remote localities would be the last to be attended.

These results are relevant to understanding the nature of social and economic differences between indigenous and non-indigenous populations in Mexico, but the methodology presented here goes beyond that. This method could be replicated in other countries for similar purposes but it could also be applied to studies of other phenomena in which geographical isolation or remoteness plays an important role. For example, the measure could be replicated in provinces to see if geographical isolation has a regional component. It could also be replicated over a period of time to see if remoteness is increasing or decreasing.

With a measure of remoteness, other studies could be done. For example, relating isolation with other socioeconomic indicators, like education or undernourishment. Furthermore, remoteness could also be considered to be another indicator of deprivation and possibly taken into account as one of the missing dimensions of poverty. While geographical isolation analysis has great potential, it of course depends on the availability of data and finding datasets with geographical coordinates which is not easy, but is becoming increasingly common.

As mentioned before, this is a remoteness index that fills a considerable gap in the measure of spatial disparities in the literature. Previous approaches to measure remoteness either use a composite index that combines or proxies such as distance to clinics or schools. However, no previous index used the concept of neighbouring population before for the study of geographical isolation.

It is important to acknowledge the limitations of this index of remoteness. First and foremost, its advantage of simplicity is also a shortcoming when the phenomena of

remoteness is recognized to be a complex one and that complexity is desired to be reflected in the measure. For example, a small locality could be very close in distance to a medium city, but with a deep cliff between them with no bridge. That would be a false proximity or a case of remoteness ignored by the index proposed here.

Furthermore, because the index tries to reach the smallest of the localities, it needs census data instead of households surveys. This limits its periodicity of estimation. Another limitation is that the index unit of analysis is the locality, not the individual or the household. This could represent a shortcoming to include remoteness as a dimension in a measure of poverty that uses the individual or the household as unit.

3.3 Qualitative Analysis

The previous section showed that the indigenous population is more geographically isolated than the non-indigenous. It is however interesting to know some of the reasons behind this phenomenon. The data collected during fieldwork offers good insights despite the fact information is not country representative and testimonies may be limited. As stated earlier, in terms of the survey municipalities, Coatpec and San Martín Totoltepec are similar, as both are small and reliant on agriculture as their main economic activity, but Coatepec is a municipality where almost everyone is indigenous while San Martín is a municipality where almost everyone is non-indigenous.

There are two topics from the survey and the interviews that are related to the geography of indigenous and non-indigenous poverty in Mexico. The first is people's attachment to their communities, in particular to explain the reasons to stay there instead of migrating, and the second is their aspiration to migrate somewhere else to

improve their living conditions. Since both municipalities are very similar it would be expected that people have similar motivations to stay or move somewhere else. However, the question is whether the indigenous population has additional motivations either to remain in their communities or to migrate.

Before presenting the analysis here, it is important to note here that the data has a very important part of the puzzle missing: the testimony of those who already left. With data collected from fieldwork it is not possible to know the reasons they had to migrate and if there were any differences between the indigenous and non-indigenous in this regard. Furthermore, it is not possible to know if they have any nostalgia or desire to return and how satisfied they are about their decision to leave their community.

Attachment to their communities

People may have different reasons to stay or to move away from their hometowns. For Alberta, a wool artisan in Zongolica, Veracruz, the prospective of better earnings is not enough to move to the city: "It is like I could not identify myself there, we already live here, we were born here, and I would not really like to go to the city for working, I could not be there for 20 days or a month" she said.

A better job with higher income is not the only variable in the equation when it comes down to deciding whether to stay or leave the community. For some people, like Artemio and Delfino, both peasants in Coatepec, Puebla, living in the city is not a good business since in the city they earn more but also spend more. Public transport and water are examples of things they do not have to pay for in their community. For them, the increase in their earning does not compensate for the additional cost of life in the city. Furthermore, Delfino says that they do not even need money to buy food in the

community; they can just go to the wilderness to find something to eat. In the city that is not possible.

When asked whether they were happy to live in their communities or would rather live somewhere else, 78.6 percent in San Martín Totoltepec and 77.5 percent in Coatepec answered they were happy living in their communities, while 13.6 percent in San Martín Totoltepec and 16.7 percent in Coatepec said they would like to live somewhere else. Interestingly, the aspiration to live somewhere else is slightly higher for the indigenous municipality. The remaining percentages belong to "don't know/didn't answer" (DK/DA) options.

For those who felt happy in their communities, the main reason was because their families were there. Beatriz, for example, was born in Coatepec. She spent two years in Mexico City working with her aunt as a nanny. She said that nothing bad had happened to her there but she missed her family and preferred to live in Coatepec where her family is. Like Beatriz, some people actually had tried living in the city but they were not convinced and returned to their hometowns.

Several things can put people off from moving away, such as crime and insecurity. For example, Maria Helena from San Felipe Xochiltepec, Puebla, argues that "the city has lots of violence, lots of theft, and that is what scares me more; children are stolen, they rob houses, and if they see you leaving the bank, take away your money and that is what scares me".

The community offers a sense of belonging and security: 87.5 percent of the population in Coatepec and 83.5 percent in San Martin Totoltepec felt secure in their communities. The danger of a city is not a false perception. In many cities in Mexico crime has increased due to the war on drugs. Amelia told me a story of how she

witnessed a shooting in the streets of Ciudad Juarez, a city over the Mexican border with the United States. After that she decided to go back to her hometown in Veracruz.

But crime happens also in rural areas. As mentioned before, Calixto, a former seasonal worker, was kidnapped by a drug cartel and forced to work in a Marijuana plantation in Chihuahua for three years. He escaped miraculously but acknowledges that "the situation is very critical now, it is not like in the past, organized crime has extended, there is no trust within society, there is mistrust; harmony has gone along with respect for humanity".

Despite perceptions of violence, most people do not feel afraid of leaving their communities. In Coatepec merely 23 percent of the population surveyed declared that they felt afraid to leave their community and only 17 percent of the respondents in San Martín Totoltepec answered likewise. According to this survey then, the indigenous population has slightly higher aspirations of living somewhere else, but they are also a bit more afraid of leaving their communities.

Some scholars have argued that living conditions of the indigenous living in urban centres are more favourable than the ones in rural areas. However, they also claim that ethnic inequities in cities are sometimes intensified by discrimination and social exclusion of indigenous people living in cities (Del Popolo et al. 2007).

It looks like an important deterrent to leaving in the community is the education gap between rural and urban areas. María Elena, a housewife from San Felipe Xochiltepec, Puebla, said that she was afraid of moving to the city because she wasn't educated enough. In her words, she said: "Now, there are only computers in stores and I did not even finish the elementary school… so why would I go? What would I do or where would I work?"

A similar opinion was expressed by Joaquina, from San Martín Totoltepec, Puebla. Joaquina claimed that "The city is for people who are prepared, who studied; I think it is easy for them, but for those who are not prepared I think is hard […] like here, we are looking after animals." Some people in rural areas think that jobs in the city are not for them. Mr. Milo who lives near the Pico de Orizaba in the state of Veracruz, thinks that "In the city, to succeed, you have to be a professional, maybe a lawyer, a doctor or even a politician".

When asked if they were afraid of being treated badly outside their communities, 28.1 percent of respondents in San Martín Totoltepec answered yes, while 43.3 percent did in Coatepec. The fear of being treated badly outside the community is 15 points higher in the indigenous municipality. In the survey, the follow up question asked people to name the reasons why they think they could be treated badly outside their communities. People could mention as many as they wanted and there were 133 reasons mentioned in total.

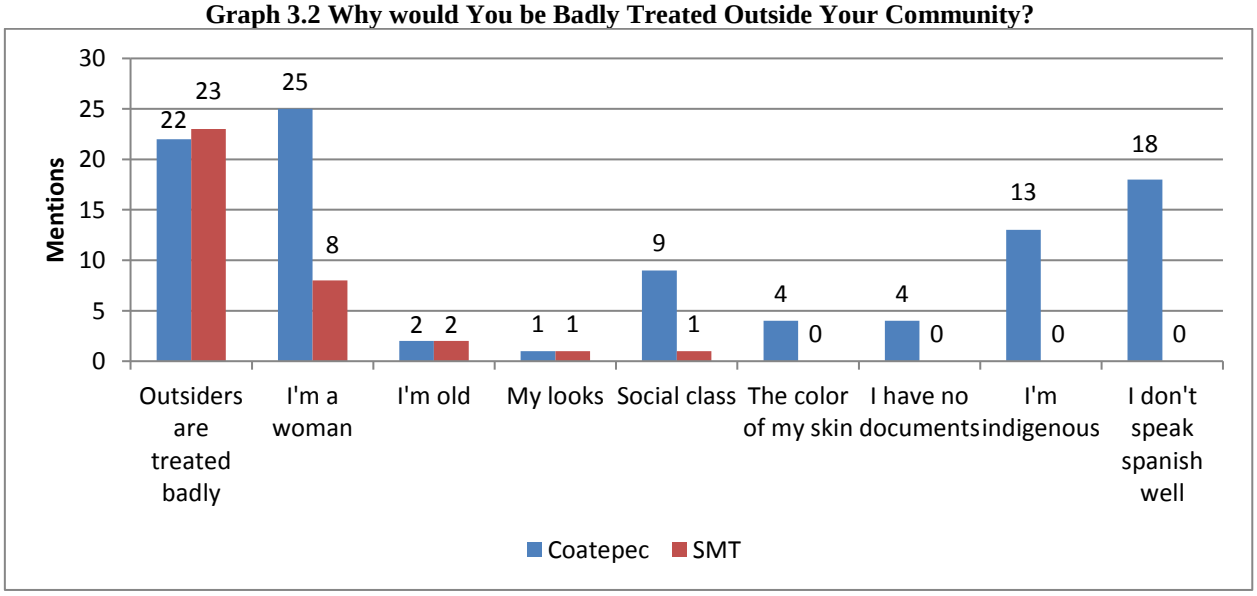
An interesting finding is that three out of four reasons mentioned were given by people in Coatepec, which is an indicator that being treated badly is a greater concern for the indigenous municipality. The most cited reason given was that "outsiders are treated badly". The number of mentions for this reason was quite even for both municipalities. The second main concern for people to be treated badly was "being a woman". However, this is a concern more widespread in Coatepec, the indigenous municipality. Age and looks were of little concern in both municipalities, but social class is something people seemed to worry about a lot more in Coatepec. Only one person mentioned it in San Martín Totoltepec and nine did in Coatepec.

Then there are a set of reasons that had no mention in San Martín Totoltepec. These are specific concerns for the indigenous population. The most important one is

because “I don’t speak Spanish well”. It is actually the third main reason why people think they could be treated badly outside their communities with 18 mentions, with none of them coming from the non-indigenous municipality. The fourth main reason given was that “I am indigenous”, which was mentioned 13 times. Skin color and no documentation were mentioned four times each.

Information from the survey suggests that people in rural areas may have reasons to be afraid of leaving their communities, but the indigenous population has far more reasons compared to the non-indigenous. Also, language is definitely a strong barrier that prevents indigenous people from moving out of their communities, but there are more barriers. Qualitative analysis of the data collected from the fieldwork suggests discrimination against the indigenous population also plays a role in their preference to stay in their small rural isolated communities.

Graph 3.2 Why would You be Badly Treated Outside Your Community?



Source: Information obtained through fieldwork survey

Two testimonies actually mention directly discrimination as a reason to stay in their communities. Marcela, an indigenous electrician mechanical engineer from the

Zongolica Sierra in the state of Veracruz, was working at the Universidad Veracruzana when her supervisor asked her to stop wearing the traditional indigenous attire at work. He claims that it was not appropriate because it seemed unprofessional. Marcela holds a masters degree, her ability to communicate in Spanish is superb, but in order to practice her profession she was asked to detach part of her indigenous identity. Hence, she decided to quit realizing that "the incident had put her off and that it was better to leave." Marcela was made the object of blunt discrimination but at most times discrimination is a lot subtler, less evident and more embedded in people's everyday behavior.

According to Timoteo, an indigenous peasant in Mitziton, Chaipas, a community influenced by the Zapatista movement, the indigenous population is discriminated against by many actors: the government, businessmen, and non-indigenous people, among others. He argues that when some of his indigenous colleagues go to the city looking for a job, they do not get it simply because they are indigenous. Communities where the Zapatista movement has some influence, political awareness has grown in the last twenty years. That has helped people see things more critically and question the institutions that formally or informally support ethnic discrimination in Mexico.

Migration

Migration in rural communities is an important driver of social mobility. People with relatives in the United States of America receive remittances which let them increase their living standard in comparison to those who do not. For example, Silvestre in Coatepec, Puebla told me that he had nine children - five sons and four daughters. All of his children, except one son, live in the United States of America. Silvestre is a

candid person and one of the community leaders. He was the municipal president for a while and definitely one of the richest people in town. Despite that, he lives humbly, probably because of his past as a peasant. He is actually a local money lender, although he said he does not do it for profit but to support people in need. His sons and daughters have houses for when they visit, which is not usually for more than one week per year. All of them have attained a socioeconomic status that is not commonly observed in rural communities.

Having a family member in the Unites States of America allows many families in rural Mexico to access higher rungs in the socioeconomic ladder and some of them actually depend on what their relatives send from abroad. Remittances to Mexico reached 21.9 billion dollars in 2013, half of what Mexico got from crude oil exports (42.7 billion) but a lot more than the income from the tourism industry in the same year (13.9 billion).

International indigenous migration has increased recently to the United States, both in urban and in rural areas of California, as wells as in the states like Texas, Florida, New York and Oregon. Indigenous international migration was relatively low until de 1980s, although some indigenous groups have migrated to United States since the 1940s, when the *bracero* programme started (Fox and Rivera-Salgado 2005).

There are also those who have returned after living abroad. They are frequently more affluent, own trucks - a clear symbol of wealth in emigrant communities in Mexico - and have bigger and sometimes more extravagant houses to show off their hard-earned success. One such example was Don Milio who after working for seven months in the USA made US$22,000.00 and saved about half of it to take back home. That amount of money is rarely seen in the hands of a peasant in Mexico.

Others are not that lucky. For example, Ricardo was deported. Ricardo was actually 'scape-goated' for a murder and put into prison for one year and eight months. When Ricardo's case was dropped due to lack of proof he was not released immediately. He travelled by air and land in chains and was escorted to the Mexican border where he was finally set free. In the process he lost the savings he had accumulated to build a house in Mexico. Despite all that, at the time of the interview he wished to return. I asked him why and he said because "there, people live well, one does not have to worry that whether there is enough money to buy soap, shampoo or food."

Ricardo's aspiration is shared by many. Joaquina, who was also deported, wishes to return to the USA. Rafa, Fidel, Juan Manuel and Ernesto all told me the same thing in different interviews. They professed that most youngsters upon finishing secondary school at 15 or 16 years of age try to cross the border and many of them succeed. Maria Helena told me that her husband went to the USA when he was 14 years old. He lived in New York for six years and then went back to Mexico. With the money he saved abroad he built a house and bought a car before marrying Maria Helena.

For some people their aspiration is just to leave the community and go to the city, mostly to attend college. Amelia, for example, a young woman in charge of the library in Coatepec, says she would like to study tourism or gastronomy. She would like to live in a city because she feels that there are more job opportunities for those careers in a city than in her community. Fabiana del Popolo et. al. (2007) claim that the indigenous population in Latin America have strong incentives to migrate to cities, that they are creating networks that feed back into more migration and they move to urban centres closer to their places of origin, instead big metropolises.

Those who have left their communities to study have a different vision of the world, compared to those who have gone to work temporarily. For example, Rene and

Isidro had pursued graduate studies. They are both originally from rural communities; Rene is indigenous and Isidro non-indigenous. They did not, however, aspire to go abroad. Isidro was a secondary teacher and councillor at the municipality, while Rene was still finishing his degree but had academic aspirations. Both of them had a strong sense of improving their communities.

Finally, the survey conducted in two municipalities reveals something that could not be observed by the naked eye. From the interviews it was not noticeable that there was a difference in terms of proclivity to migrate. The impression was that in both municipalities the indigenous and the non-indigenous populations aspired to migrate to Unites States, had people whose families sent back money, and had people who went to the United States and returned home. However, the non-indigenous municipality was the one which actually had a higher percentage of people who lived in the United States - 22.3 percent - compared to only 5 percent in Coatepec, the indigenous municipality.

A study based on the 2003 Mexico National Rural Household Survey found that households in which an indigenous language was spoken had a significantly lower likelihood of having an international migrant (Pfeiffer and Taylor 2007). This suggest that indigenous households in rural Mexico are less prone to migrate internationally than the non-indigenous.

This shows again that, while aspirations are shared, the actual experience of moving abroad is something that happens with more frequency in the non-indigenous population. While it is clear that leaving rural communities is an option to advance in terms of socioeconomic status, it is also clear that there are forces that prevent the indigenous population from doing so.

3.4 Conclusions

One of the main hypotheses of the thesis is that indigenous poverty is linked to the fact that indigenous people live in more remote localities compared to the non-indigenous people. In order to prove this point a literature review of measures of spatial deprivation was done. Spatial deprivation measures with ethnic components refer to urban segregation. Spatial disparities literature was also reviewed. While in this case some alternatives could be handy, such as measuring remoteness as distance to the nearest clinic, it does not provide a summary figure for subgroups as the measurement proposed in this chapter does.

The method to measure remoteness presented in this chapter departs from locality size and proximity to other localities. For each locality a neighbouring population is estimated based on the sum of populations within a radius of each locality. Localities are then ranked from the one with the smallest neighbourhood population to the largest or, in other words, from the most remote to the least remote locality. Adding up the localities in the order of their remoteness, a cumulative density function (cdf) is obtained. The area under the cdf represents the value of the remoteness index which has a range that goes from zero, when all the population of a particular subgroup is concentrated in the least populated locality, to one when all the population of a particular subgroup lives in the most remote locality.

To estimate the neighbouring population for each locality an important decision had to be made: the radius that will serve as a threshold to determine who is part of a neighbouring population and who is not. For the estimation of the remoteness index in

Mexico, I decided to use a 5 kilometres radius as the main reference, but ran estimations for 2.5 and 10 kilometres in order to check for robustness. Also, two methods to estimate the neighbourhood were used: Haversine and Vincenty. The first one assumes planet Earth to be a sphere, while the second assumes Earth to be an ellipsoid. Results for the indigenous and non-indigenous populations show that results are consistent regardless of the estimation using Haversine or Vincenty methods.

As expected, the indigenous population is more dispersed in remote localities than the non-indigenous population. The result is consistent for all three radius thresholds but the magnitude of the difference varies slightly. For the 2.5 kilometre threshold the value of the remoteness index for the indigenous population is 2.4 times the value of the non-indigenous. For the 5 kilometre threshold the figure lowers to 2.3 and 2.2 for the 10 kilometre radius threshold.

Finally this chapter analysed the qualitative data collected during fieldwork in 2011 in relation to geographical isolation and remoteness of the indigenous population, in order to explain why indigenous people do not migrate to more urbanized areas where better employment opportunities could be offered to them. Fieldwork testimonies show that the indigenous population who are unwilling to move to urban areas have a strong attachment to their communities, land, family and friends. They also think that the extra income that could be earned in the city will be balanced out with a more expensive cost of living. Besides, good jobs in the city require better education and training, which they do not have. Crime and violence in the cities also plays a role.

Regarding discrimination as an incentive to remain in the community, people in the indigenous municipality reported more frequently that they were afraid of being treated badly outside their community. The fieldwork survey actually asks about the reasons they think they could be treated badly outside their community and the top three

answers were: because “outsiders are treated badly”, because “I am a woman” and because “I don’t speak Spanish well”. Language was the third reason mentioned for being treated badly, but only mentioned in the indigenous municipality.

While migration is one of the major drivers for moving up the socioeconomic ladder, the indigenous population have more incentives to remain in their communities and one of them is ethnic discrimination. This result links with the next chapter about social mobility, as well as the following one that studies discrimination. This is an important piece of the vicious cycle of indigenous poverty since it is more expensive for the state to reach remote localities. Thus, the indigenous have less access to state support.

All in all, this chapter made two main contributions to knowledge. One is a new way to measure remoteness that allows comparisons between subgroups. The other is to prove that the indigenous population in Mexico is more dispersed than the non-indigenous.

4. Intergenerational Social Mobility [*]

Social mobility is fundamental to create efficiency and equality dynamics. Immobility distorts resource assignments and generates exclusion.
(Luis Felipe López-Calva, 2015)

4.1 Introduction

Social mobility is understood as movement within the socioeconomic structure and can be studied using different approaches. One approach looks at the individual or family movement over time, for example, for the analysis of chronic poverty (Foster and Santos 2012), which is called intra-generational mobility. Another approach is what is called inter-generational social mobility, that is, the comparison between one generation and the previous one in terms of their living standards.

This chapter is focused on intergenerational mobility - comparing the indigenous and non-indigenous populations. The question to be answered is whether the indigenous population has higher or lower social mobility in Mexico, compared to the non-indigenous. The question is relevant since it has already been proved that the indigenous are poorer. Thus, in order to close the poverty gap between the indigenous and non-indigenous, social mobility for the indigenous should be faster since otherwise the gap will remain the same or even get wider.

Centro de Estudios Espinosa Yglesias (CEEY) has become a leading institution in the study of intergenerational social mobility in Mexico. Their report (Vélez Grajales 2013) is now a constant reference for researchers and policy makers. While the report adopts a measure of social mobility in relative terms – in relation to the rest of the

[*] This chapter was motivated and sponsored by the CEEY. Thanks for their support and patience.

society- in this chapter, a measure of absolute social mobility based on the Alkire-Foster methodology is proposed.[56]

The measure departs from the notion of attainment as a mirror of deprivation. An individual or a household can observe improvements or regressions in multiple dimensions. If data is available for the current household and their parents, then attainments can be calculated for the household's previous generation. The difference in attainment between the current and previous generations is the absolute social mobility figure for that household.

Average attainment figures are estimated for each generation and absolute social mobility is calculated for the society. The absolute intergenerational social mobility index has a range from -1 to 1, where -1 represents absolute negative mobility, or loss of attainment in 100 percent of the dimension, while 1 represents total positive mobility, i.e. a gain or attainment of 100 percent in all dimensions. Absolute intergenerational social mobility is estimated for the indigenous and non-indigenous populations using the Mexican Social Mobility Survey for 2006 and 2011, although, unfortunately, questions asked in order to identify the indigenous population were not the same in both surveys.

Regardless of the way the indigenous population is identified in these two surveys, it is possible to say that the indigenous population has systematically less attainment than the non-indigenous population. An important finding is that for 2006, the measure of absolute social mobility for the indigenous is lower than for the non-indigenous. This means that in 2006 the gap between indigenous and non-indigenous in

[56] A more recent book edited by Vélez Grajales, Huerta and Campos (2015) is also published by CEEY. Chapters presents diverse research with different approaches regarding social mobility in Mexico, but using the EMOVI 2011 as the basic data source. None of the chapter refer to the study of indigenous' social mobility or a comparative study. The prologue is by Luis Felipe López Calva (2015) and where the opening statement of this chapter was found.

terms of social attainment was still increasing. However, the measure of social mobility in 2011 for the indigenous population is higher than for the non-indigenous one, despite having lower attainment in past and present generations. This suggests that in 2011 the attainment gap between indigenous and non-indigenous in Mexico is finally closing, at least based on data from the 2011 survey.

This apparent contradiction is resolved at least for fieldwork municipalities because the fieldwork survey contemplated both questions. That way, it is possible to know who among the indigenous are speeding up improvements in their living conditions. This is going to be a key finding to explain the dynamics within the indigenous population.

The rest of the chapter is organized as follows: in the next section a brief review of the study of social mobility is presented. Then, the method of measuring relative social mobility applied to the Mexican case is explained. Subsequently, the absolute social mobility measure is introduced followed by results for both the indigenous and non-indigenous populations. Finally, some findings from the fieldwork conducted in 2011 are presented.

4.2 The Study of Social Mobility

The literature on social mobility is enormous, especially as it is a topic that has been approached by multiple disciplines. In sociology, for example, methods range from merely the impression of the observer of a particular phenomenon, to highly

complex mobility tables in empirical studies.[57] It has also been an area of discussion between liberal and Marxist sociologists. For example, Robert Erikson and John H. Goldthorpe (1992) have challenged liberal theorists that believe industrialism has pushed towards upward social movement steadily.[58]

In terms of empirical measures, Erikson and Goldthorpe introduced the use of matrices to identify people's movement within a class structure, for example, between white and blue collar workers. These matrices do not necessarily have a specific order, for example, but rather classify their cohorts by occupation. Two classic studies of this type are the "Oxford inquiry" and the "Wisconsin inquiry". The first is a study undertaken by John H. Goldthorpe, Clive Payne and Catriona Llewell in (1978) in which they used data from an occupational mobility survey in England and Wales carried out by the University of Oxford in 1972. The second is a research conducted by David L. Featherman and Robert M. Hauser (1978) using a longitudinal survey in Toronto, Canada, but carried out by the University of Wisconsin. Both have similarities, such as using occupational classes and a year of reference to identify father's occupation.[59]

Economists have also used transition matrices but they are somewhat different; they are usually based on an indicator with which members of a society can be ranked, for example, income or educational attainment. In terms of income, A. B. Atkinson

[57] An impressionistic and speculative analysis is the one by Ralph H. Turner (1960), who argues that social mobility in the in the USA could be represented as a contest in which the prize is gained through aspirant´s effort, while in the UK social mobility is sponsored on merit by those who are already in elite in a paternalistic way.

[58] They made three solid arguments against the liberal defence of industrial societies. One is that in the long run mobility rates will show no continuous directions, but only trendless fluctuations. The second is that industrialization may have a threshold effect on mobility rates, rather than a continuous one. And a third critique is that more industrialized countries fail to show more equal relative mobility rates than less developed ones. They also claim that social mobility is not confined to liberal democracies and that other regimes have benefited from it, sometimes even demonstrating a better ability to promote such mobility.

[59] It is important to mention that some sociologists have also made approaches to transition matrices where there is some order or rank, but they are less common. For example, Keith Hope (1981) studied mobility in Britain trying to work out the same dataset of the "Oxford inquiry".

(1980) questions why income mobility is important and offers two possible answers: one is that income mobility affects the degree of income inequality, and thus, a society with more income mobility would lead to higher income equality. In this case, mobility is an intermediate goal or rather, a means to achieve equality. The second one is when income mobility is considered an indicator of openness or equality of opportunity; in this case income mobility is a goal on its own.[60]

One basic contribution to the study of mobility is offered by Anthony Shorrocks' (1978), who puts forward a proposal on desirable characteristics of transition matrices and axioms of measures based on these. One of the characteristics of transition matrices proposed by Shorrocks is the property of rows summing the unit, or stochastic matrices as they are referred technically. In this type of matrices non-negative cells represent the probability of transferring from one state to the other. Total immobility is thus represented by the identity matrix, while perfect mobility occurs when rows are identical (having exactly the same distribution) because that way no matter what the state of origin is, everyone has the same probability of ending in a particular state.

Another important contribution in this area, again, Atkinson (1980). The argues that when the transition matrix is bi-stochastic, which means columns also sum the unit, one can perform a stochastic dominance analysis, such as with the Lorenz curves, to compare mobility in two societies. According to Atkinson, if one matrix named 'A' can be reached from another 'B', by a consequence of diagonalising transformations, then we can say unambiguously that B is superior on welfare grounds for all social welfare

[60] There is an interesting literature of inequality of opportunity that I am not surveying here, starting with Roemer (1998) but also Fleurbaey (1995; 2001), Fleurbaey and Peragine (2013), and empirical studies such as Bourguignon and Ferreira (2007), Lefranc et. al (2008) Trannoy et. al. (2010), Ferreira and Gignoux (2011), Ferreira et. al. (2012), among others. Gaston Yalonetzky (2009; 2010) not only has a good review of that literature but he also proposes two dissimilarity indexes.

functions. The alternative to transition matrices, Atkinson claims, is a normalized log linear regression model in which lifetime earnings of one generation are estimated as a function of the previous one.

A very good introduction to economists' work on the regression models or modelling can be found in the chapter by Gary Solon (1999) of the *Handbook of Labour Economics*. Solon presents a variant of Gary Becker and Nigel Tomes' (1979) model of intergenerational mobility to show how income mobility depends on the importance that family decision-makers place on children's future earnings, or their willingness to invest in future generations; the return to human capital investment; the strength of intergenerational transmission of endowments; and the relative variance in market luck and endowment luck.

A major methodological issue however, exemplified very well by Solon, is that the basic equation of earnings, $y_t = \beta y_{t-1} + \alpha E_t$ could be a first order autoregressive process, in which the ordinary least squares estimator of the correlation β between parent and child's earnings, would be upward biased.[61]

To deal with the problem of an autoregressive process, economists have made use of econometric tools such as instrumental variables, for example Solon's (1992) empirical study of the United States of America. On the other hand, some economists think that the problem of estimating the intergenerational elasticity of earnings lies not in the autoregressive process, but in how lifelong earnings are estimated using short-term averages. For example, Bhashkar Mazumder (2005) claims that when

[61] One way to test how family and community background matter in explaining inequality of earnings is through studies of sibling correlation in earnings, which is what the rest of Solon's chapter is about. Nevertheless, while empirical studies show that there is something about family and community background that accounts for a substantial share of earnings inequality, Solon explains, that something remains a puzzle.

measurement error is high, and lifetime earnings are estimated with short-term data, instrumental variable estimators can be biased downwards.

Actually, Chul-In Lee and the same Gary Solon (2009) have recognized this weakness and have used all available data in their common study to estimate lifetime earnings with an ordinary least square method. Lee and Solon use the Panel Study of Income Dynamics (PSID), administrated by the University of Michigan and began in 1968, with almost 5,000 American families. The sample has been interviewed annually through 1997, and every other year since then.

Within the literature on social mobility, some distinguish between absolute and relative social mobility. For example, in her study of Switzerland's intergenerational social mobility, Julie Falcon (2012) explains that, based on mobility tables *a la* Erikson and Goldthorpe (1992), total (absolute) mobility is the percentage of cases that do not fall in the main diagonal of the mobility table or the proportion of people located in a class different from than that of their father. Relative social mobility, on the other hand, is estimated by the odds ratio in order to capture changes in social mobility, net of structural changes. Relative social mobility is thus a measure of society's degree of openness, according to Falcon.[62]

A different approach to relative and absolute social mobility is given by März et. al (2015) in their study of intergenerational social mobility in the United States of America. They argue that measures of absolute intergenerational social mobility assess

[62] Another study that uses this distinction of absolute and relative social mobility is Brown (2013), who supported on Goldthorpe (2013) argues that observable increases in absolute intergeneration social mobility in the second half of the twentieth century in Britain are due to changes in the occupational structure, rather than from narrowing inequalities in life-chances (relative mobility). Other studies about social mobility in Britain are Payne (2012), who argues that policies for social mobility in the UK are focused in the lower classes, while ignoring the position (immobility) of the most advantaged classes; and, Chan and Boliver (2013) who, for their study of social mobility in Britain, respondents with more advantaged grandparents had lower rates of total and upward mobility, in absolute sense.

whether the current generation is financially better off than the previous one in terms of income or wealth; while measures of relative social mobility focus on the rank order. Further in the thesis, relative social mobility will be referred to as changes in the rank order, while absolute social mobility to changes in attainment.

Other studies with a focus on absolute social mobility are, for example: the study of social mobility and class identity in 33 countries by Josh Curtis (2015) in which he concludes that national-level absolute mobility does not meaningfully shape class identification; and, the study of social mobility and health in European countries by Campos-Matos and Kawachi (2015) where they claim that on a relative and absolute scale, upward mobility was associated with better health, regardless of the welfare regime.

Most studies of social mobility in Mexico have been conducted following the sociological tradition of using occupational classes, but many of them also assume some kind of hierarchy among classes to deduce upward and downward mobility. This is the case in the studies conducted by Fernando Cortés and Agustín Escobar Latapí (2005), Patricio Solís (2005), René Zenteno and Patricio Solís (2006) and Emilio A. Parrado (2006).

Another group of studies have used econometric methods to estimate the intergenerational correlation of educational attainment, such as the analysis conducted by Rafael de Hoyos, Juan M. Martínez de la Calle and Miguel Székely (2009), Alejandro Gaviria (2006), Jere R. Behrman, Alejandro Gaviria and Miguel Székely (2001) as well as Melissa Binder and Christopher Woodruff (2002).

Not much has been written comparing social mobility between different ethnic groups in Mexico, however, there is a study by Hugo Ñopo and Natalia Windler (2008) that found that non-indigenous individuals in urban areas seem to accumulate human capital more rapidly than indigenous ones. Also, they found that instead of behaving as complements, for the indigenous, human capital accumulation and wealth accumulation seem to work as substitutes.

Another very interesting model of social mobility where ethnic background is of high importance is Georges Borjas' (1992). In his model ethnic skill differentials are transmitted across generations. According to his empirical study, today's generation skills depend not only on the skills of their parents but also on the average skills of the ethnic group in their parent's generations. This model helps to explain why the social mobility of blacks is slower than whites in the US, he claims.

There is a whole literature on the middle class in Latin America that relates to social mobility.[63] The book by Ferreira et. al. (2012) is a good example. Economic mobility for the authors is correlated with public health, educational spending and targeted conditional cash transfers. Intergenerational mobility is mostly limited to educational attainment in the region. Children born to disadvantaged households are less likely to be delayed in school today than they were in the 1990s, according to the authors. Although, upward mobility within generations has dramatically increased in last two decades, their findings are astonishing: 43 percent change their economic status, 23 percent exited poverty and 18 percent entered the middle class and only 2 percent worsened their status.

[63] Some of this literature does not deal specifically with social mobility but with inequality and middle class. For example Cruces, López-Calva and Bettistón (2011), Lustig and López-Calva (2012), Lustig, López-Calva and Ortiz-Juarez (2011; 2013) and López-Calva, Rigolini and Torche (2012).

Finally, there is another group of studies that combine different methods. For example, instead of using earnings as a proxy for lifetime income of different generations, Florencia Torche *et. al.*(2010; 2009; 2007) estimates a welfare index based on assets and dwelling characteristics. The method followed by Torche is particularly important for this thesis, since the dataset she used is the same one used here.

4.3 Relative Social Mobility in Mexico

Recently there has been an increasing interest in exploring the association between parental wealth and adult children's economic well-being in Mexico. With that objective, Torche and Spilerman (2009) use the 2006 Mexican Social Mobility Survey (MSMS), conducted by the ESRU Foundation. The MSMS contains detailed information on respondent's social background, characteristics of the parental household, migration, ethnicity, education and occupation, as well as household assets and living standards.

Specifically, Torche and Spilerman investigate the association between parental wealth and four characteristics of their children: educational attainment, consumption level, wealth holdings, and home ownership. In that sense, and given the difficulties associated with measuring the monetary value of a household's wealth holdings, the authors inquire about the ownership of different kinds of assets, constructing an asset index using an application of the Principal Components Analysis (PCA).

Analogously, Torcheand and Spilerman measure consumption levels also using a PCA of twelve measures of household services and consumer durables: inside toilet, stove, electricity, hot water, refrigerator, washer, telephone, cellular phone, television,

cable, computer, and hired housekeeper. And finally, the authors measure parental wealth holdings when respondent and spouse or partner were in their adolescence and construct the household wealth index by combining seven wealth indicators—financial assets, business, land, other real estate, residential property, saving accounts, and cars—and using a PCA.

Three main findings emerge from the analysis. First, parental wealth is a strong determinant of educational attainment, net of the standard indicators of socioeconomic advantage. Furthermore, the influence of parental wealth appears to be stronger among the most disadvantaged children—those with low cultural capital residing in rural areas. Second, the mechanism of parental influence on adult children's economic well-being differs depending on the outcome: in the case of consumption level, the influence is largely indirect, mediated by offspring's human capital, while the opposite is true for children's asset holdings, where a direct transfer of resources predominates. Third, access to homeownership is only weakly stratified by economic resources, but parental wealth significantly affects home value (Torche & Spilerman, 2009).

With similar purposes, Vélez-Grajales, Vélez-Grajales, Stabridis (2012) use an application of the Multiple Correspondence Analysis (MCA) to construct a wealth index using categorical data that allows for analysis of relative mobility between two generations (parents and children) to do that, and they also use the MSMS.

Velez *et al*. indicate that, for the study of intergenerational social mobility, it is difficult to find data sources that provide information about the income of both parents and children throughout the productive age for both; it is a challenge to estimate a comparable indicator between generations that reflects the best possible standard of living. That is why the level of wealth, which has lower short-term fluctuations, is employed. An index widely used is the one proposed by Filmer and Pritchett (1999),

which is a wealth index and can also be constructed using a PCA. If only categorical (not continuous) variables are included in the performance, the method to be used is MCA (Alkire et al. 2015).

Hence, and since the index built by Vélez-Grajales *et al.* is based on a group of categorical variables, the MCA is chosen. As in the case of PCA, the MCA seeks to reduce the dimensionality by combining and transforming a group of variables on one or two variables (components). However, in the case of MCA the relative frequencies of each category in each of the variables to be employed are used.

The multiple correspondence analysis produces components that are linear combinations of the variables called "dimensions". Each dimension explains a certain percentage of variability, also called "inertia". The authors set a lower bound of 80 percent as the minimum amount of explained inertia. For each of the categories of the variables, two concepts are discussed: (1) the quality of approximation of the category, which is a number between zero (no adjustment) and one (perfect adjustment); (2) and contribution, which measures the percentage of inertia explained by each of the categories.

For each dimension, called coordinates (positive or negative) of the categories, it is analysed how they relate to the index. Velez *et. al.* mention that only those variables should be included of which categories are related in the same way when they are presented in the same dimension. Finally, as regards to the choice of the number of dimensions used to construct the index, it depends on the percentage which these dimensions contribute to inertia.

The authors construct two indices from the MSMS data, one for: a) father/household head of the respondent, and b) direct respondents. For the first case, in

the analysis of correspondences, the first two dimensions explain, together, 90 percent of the inertia; while for the second case, the first two explain 88 percent of the inertia. From the index values, a classification of social class is constructed based on quintiles, for which it is considered that the lowest index values correspond to the richest people, and the highest to the poorest people.

To perform a descriptive analysis of the results, Vélez et al. built intergenerational transition matrices for two age groups of respondents in order to identify the degree of association between the socioeconomic status of the respondent's father/household head and the respondent. In addition, to compare the degree of mobility between age groups, Vélez at al. estimate, based on the transition matrices, a comprehensive Index of Social Mobility (ISM). The latter is constructed based on the following formula, proposed by Hernández Licona and Hernández Scharrer (2010):

$$ISM = \frac{Maximum\ value - Actual\ value}{Maximum\ value - Minimum\ value} = \frac{2 - (Q_5 - Q_1)}{2 - (0.2 + 0.2)}$$

Where Q_5 ratio refers to the proportion of respondents who come from a home in the highest quintile and remained there. Similarly, Q_1 ratio refers to the proportion of those from a home in the lowest quintile and remained there. The 0.2 values in the denominator are a benchmark of perfect mobility when the analysis is done by quintiles. The values of 2 in the numerator and denominator are a benchmark of total immobility. As a result, the index can take values between zero and one, where zero refers to a society with absolute lack of mobility, and one to one where mobility is perfect.

The results show that the ISM is higher for the younger cohort (0.61) than for the older cohort (0.58). These results indicate that the older group presents greater

upward mobility options for respondents with an origin at the lower end of the distribution. However, this same age group shows greater immobility for those respondents from the upper end of the distribution.

Social Mobility between indigenous and non-indigenous in Mexico

Following the methodology of Vélez et al., the index of social mobility was estimated for the total indigenous and non-indigenous populations. Table 4.1 presents the results. For the total population it was found that the quintiles corresponding to the richest and the poorest people presented the highest immobility. Meanwhile, middle-income people showed relatively higher mobility. The ISM was also calculated for the total population, which had a value of 0.69; this result means that Mexicans experience certain social mobility, the figure will serve as reference later.

The situation of indigenous people is analogous to the former case, given that the first and the last quintile present the highest immobility. Meanwhile the second, third and fourth quintiles appear to behave in the opposite way. There is a big difference when comparing the ISM: indigenous people obtained an index of 0.64, which suggests that indigenous people have less mobility than the total population. This result is exacerbated when the populations compared are the indigenous and non-indigenous; the intergenerational transition matrix constructed for the non-indigenous suggest a higher mobility among quintiles and the ISM is 0.72, which shows more social mobility compared to the indigenous population.

Table 4.1 Social Mobility Transition Matrices and Index of Social Mobility, MSMS 2011

Non-Indigenous	Current generation				**IMS = 0.7201**	
Previous generation	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
Quintile 1	0.3592	0.2747	0.1834	0.1240	0.0586	1.000
Quintile 2	0.2755	0.2750	0.1902	0.1751	0.0842	1.000
Quintile 3	0.1842	0.2525	0.2316	0.1966	0.1350	1.000
Quintile 4	0.0808	0.2008	0.2434	0.2439	0.2310	1.000
Quintile 5	0.0256	0.0544	0.1610	0.2704	0.4886	1.000

Indigenous	Current generation				**IMS = 0.6367**	
Previous generation	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
Quintile 1	0.5369	0.2325	0.1304	0.0926	0.0076	1.000
Quintile 2	0.4412	0.2297	0.1718	0.1049	0.0524	1.000
Quintile 3	0.2317	0.2413	0.2508	0.1714	0.1048	1.000
Quintile 4	0.0901	0.1803	0.2532	0.2790	0.1974	1.000
Quintile 5	0.0351	0.0702	0.1871	0.2632	0.4444	1.000

Total	Current generation				**IMS = 0.6903**	
Previous generation	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
Quintile 1	0.4102	0.2626	0.1682	0.1150	0.0440	1.000
Quintile 2	0.3146	0.2643	0.1858	0.1586	0.0767	1.000
Quintile 3	0.1914	0.2508	0.2345	0.1928	0.1305	1.000
Quintile 4	0.0818	0.1987	0.2444	0.2476	0.2276	1.000
Quintile 5	0.0263	0.0556	0.1629	0.2698	0.4853	1.000

Source: Own elaboration based on MSMS 2011

4.4 Alternative measure of social mobility using AF methodology

Intergenerational mobility or social mobility has been measured with reference to different underlying variables. One method is to use income and another, more recent one, is to use a welfare index based on the multiple correspondence method. In the case of Mexico, Velez et. al. (2012) estimate a welfare index for the surveyed and another one for their parents. Then they create quintiles for both generations and compare relative positions of one generation with respect to the other.

The main problem with this way of measuring social mobility is that it is only a relative - not an absolute - measure. That is, one generation could be better off than the

previous one in terms of welfare, but if everyone maintains his or her relative position, then no mobility would be observed in the quintile welfare transition matrix. While using the welfare index instead of income has some advantages, an alternative to the MCM is to use the Alkire-Foster methodology to estimate social mobility.

The Alkire-Foster methodology was originally developed to measure multidimensional poverty (Alkire and Foster 2007; 2011b) but can easily be adapted to measure social mobility. The methodology builds on Atkinson's (2003) *counting approach* for the measurement of multidimensional poverty. For the measurement of absolute social mobility, a union approach is assumed and instead of deprivations, the measure is centred on attainments. In other words, the measure of social mobility mirrors the Alkire-Foster deprivation analysis into attainment analysis. Following Alkire and Foster (2011) notation, assume that n represents the number of individuals and $d \geq 2$ the number of dimension to be considered in the social mobility indicators. Also let $y = [y_{ij}]$ be the $n \times d$ matrix of attainments of present generation, where attainments can have a value of zero or one. A value of zero means that there is no attainment observed, while a value of one means the opposite. Thus, attainment $y_{ij} \in \{0,1\}$ represents the attainment of individual $i = 1,2, \dots n$ in dimension $j = 1,2, \dots d$. As explained by Alkire and Foster, each row vector lists individual i's attainment, while each column vector represents the distribution of attainments in dimension j across individuals.

Now assume that for each individual i there is data regarding the previous generation. There is then a $n \times d$ matrix of attainment of the previous generation $g = [g_{ij}]$.[64] The previous generation matrix of attainments has exactly the same

[64] Note that this is not the deprivation matrix in the Alkire-Foster (2011) notation since there is no need for a deprivation matrix in this case.

characteristics as the present generation one. Also, assume there is a vector of weights $w = (w_1, \dots, w_d)$ that represents the relative weight of each dimension in the aggregated measure of social mobility. For convenience, assume that each element of the vector of weights is non-negative and they add up to one. And again, following Alkire and Foster (2011), take $|v|$ as the sum of all elements of the vector or matrix v; and $\mu(v)$as the mean of v, that is $|v|$ over the total number of elements in v.

Attainment of individual i in present generation would be:

$$a_{0i} = |y_i \cdot w|$$

That is the weighted sum of individual i's attainment. Equivalently, attainment of previous generation individual i's is:

$$a_{-1i} = |g_i \cdot w|$$

Since w adds up to one, then attainment in both generations range from zero to one. Zero when the individual has no attainment in any dimension and one when attainment is observed in all dimensions. Absolute social mobility (asm) for individual i's is then the difference in attainment of both generations, simply:

$$asm_i = a_{0i} - a_{-1i}$$

The social mobility indicator for individual i goes from -1 to 1. It is -1 when an individual losses attainment in all dimensions and 1 when he or she achieves it in all dimensions, in relation to the previous generation.

For illustration purposes, assume a society with three dimensions and four individuals, $n = 4$ and $d = 3$. The respective attainment matrices would be the following:

$$g = \begin{pmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 1 & 0 \end{pmatrix};\ y = \begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 1 \end{pmatrix}$$

If there is a vector of weights $w = (w_1, w_2, w_3)$ such that, $\sum_{d=1}^{3} w_d = 1$ and $w_d \geq 0$, then weighted attainment matrices would be:

$$g \cdot w = \begin{pmatrix} w_1 & 0 & w_3 \\ 0 & w_2 & 0 \\ 0 & 0 & w_3 \\ w_1 & w_2 & 0 \end{pmatrix};\ y \cdot w = \begin{pmatrix} 0 & 0 & w_3 \\ 0 & w_2 & w_3 \\ w_1 & 0 & w_3 \\ w_1 & w_2 & w_3 \end{pmatrix}$$

Then, the vector of individual's attainments in past and present generations would be:

$$a_{-1} = \begin{pmatrix} w_1 + w_3 \\ w_2 \\ w_3 \\ w_1 + w_2 \end{pmatrix}; a_0 = \begin{pmatrix} w_3 \\ w_2 + w_3 \\ w_1 + w_3 \\ w_1 + w_2 + w_3 \end{pmatrix}$$

Then, individual's absolute social mobility indicator would be:

$$asm = \begin{pmatrix} -w_1 \\ w_3 \\ w_1 \\ w_3 \end{pmatrix}$$

The average individual social mobility in this society would be simply $^{w_3}/_{2}$. If all weights are equal then $w_d = {}^{1}/_{3}$, which means that the average individual's social mobility would be $^{1}/_{6}$.

Likewise, it is possible to estimate the average social attainment for each dimension (dsa). In the previous example it would be:

$$dsa_{-1} = \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{pmatrix};\ dsa_0 = \begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 1 \end{pmatrix}$$

The average social attainment for the past and present generations could be defined as:

$$A_{-1} = dsa_{-1} \cdot w;\ A_0 = dsa_0 \cdot w$$

In the previous example, average social attainment would then be:

$$A_{-1} = \left(\frac{w_1}{2} + \frac{w_2}{2} + \frac{w_3}{2}\right);\ A_0 = \left(\frac{w_1}{2} + \frac{w_2}{2} + w_3\right)$$

The average social mobility is then $ASM = A_0 - A_{-1}$, or in the previous example $\frac{w_3}{2}$, the same as in the individual calculation. This suggests that this measurement of social mobility is path independent, that is, social mobility is the same if it is estimated first for individuals and then aggregated as an average, or if the average attainment for each dimension is estimated first, then the social average attainment for each generation and lastly the subtraction between present and past generations.[65]

With path independence, attainment of the present generation is:

$$A_0 = \frac{1}{n}|y \cdot w|$$

While attainment of the previous generation is:

$$A_{-1} = \frac{1}{n}|g \cdot w|$$

Present and past attainments are analogues of welfare indexes estimated by Torche and Vélez-Grajales. An absolute measure of intergenerational social mobility is then:

$$ASM = A_0 - A_{-1}$$

This multidimensional social mobility measure inherits the range for only one individual, acquiring a value of -1 when everyone has total negative mobility in all

[65] Path independent measures as Foster, López-Calva and Szekely (2005) did for the human development index.

dimensions, 1 when all individuals have positive mobility in all dimensions, and zero when positive and negative attainments are compensated in the weighted sum of the particular social mobility indicators, or when there is immobility in all social mobility dimensions. In other words, the multidimensional social mobility index is the average of the individual social mobility measures, but also could be estimated as the difference between present and past average attainments.

This social mobility measure has the advantage of measuring absolute mobility, but also allows for cardinally meaningful comparison across populations. For the purpose of this thesis, multidimensional absolute social mobility will be estimated at the national level, but also for the indigenous and non-indigenous populations.

Absolute Social Mobility in Mexico based on the EMOVI 2006 and 2011

The first challenge in measuring indigenous social mobility using the Mexican Social Mobility Survey (MSMS) is the dissimilar questions to identify the indigenous population in the 2006 and 2011 surveys. For the 2006 survey, there are two questions that are the ones usually used in surveys and censuses, which are as follows: 'Do you speak an indigenous language?' and, 'Do you belong to an indigenous group or community'? In the case of the 2011 survey, the questions do not directly apply to the interviewee but to his or her parents and are as follows: 'Does (did) your father speak an indigenous language?' and 'Does (did) your mother speak an indigenous language?'

The difference in the method to identify the indigenous population is not trivial. For the 2006 case, the share of the population is estimated to be 7.3 percent if both questions related to language and belonging and 6.5 percent if only the language question applies. However, for the 2011 survey, the share of the indigenous population

increases to 14.5 percent , which is practically double that of 2006. Moreover, these estimations are below and above, respectively, the estimate around ten percent obtained from the Income and Expenditure National Household Surveys for 2008 and 2010. Ideally, the survey should have both definitions in order to see how different definitions of indigenous draw different results in terms of social mobility. While this is not possible for the MSMS 2006 and 2011, it is possible with the small survey conducted during fieldwork, which is not representative at national level but could help to think of the effect of changing the definition of the indigenous population.

The second challenge is the choice of indicators. The next table is a summary of the indicators available for both surveys, with information for the interviewee and their parents. It is only a selection of the indicators, since it does not include indicators about education, work or other areas. These indicators represent the pool of indicators available to build a welfare index that allows ranked comparison between one generation and the previous one, following the methods presented by CEEY in their reports: Torche (2007) for the 2006 survey and Vélez-Grajales, Vélez-Grajales, Stabridis (2012) for the 2011 survey.

For the purpose of keeping some degree of comparability, the rest of the indicators are not included. Also, I am going to limit the analysis to indicators or variables available for all observations, current and past, in both surveys.[66] In this case, rather than the selection of particular variables, the importance relies on the method of measuring multidimensional social mobility. Thus the indicators are: ownership of dwelling; business (premises); land; vacation house; house/apartment to rent; dwelling services; WC in house; electricity; gas or electric cooker; hot water (boiler); telephone;

[66]Number of rooms is not included despite the fact of it being available for all. The reason is that the idea is have all dichotomous variables to show attainment or not. The indicator could be overcrowding, but the household size was not asked when interviewees were 14 years old in the 2006 survey.

maid; car(s); washing machine; TV; livestock; agricultural machinery; shares, bonds or funds; savings account; and current account.

Table 4.2 Selected Indicators in the Social Mobility Survey, 2006 and 2011

2011		2006	
Present	At 14 years old	Present	At 14 years old
Property			
Ownership of dwelling	Ownership of dwelling[1, 2]	Ownership of dwelling	Ownership of dwelling[4]
Number of rooms	Number of rooms[1]	Number of rooms	Number of rooms
Business (premises)	Business (premises)[1]	Business (premises)[3]	Business (premises)[4]
Land	Land[1]	Land	Land[4]
Vacation house[1]	Vacation house[1, 2]	Vacation house[3]	Vacation house[4]
House/apartment to rent	House/apartment to rent[1]	House/apartment to rent[3]	House/apartment to rent[4]
Dwelling services			
Tubed water	Tubed water[1, 2]		Tube water
WC in house[1, 2]	WC in house[1, 2]	WC in house[3]	WC in house[4]
Electricity[1, 2]	Electricity[1, 2]	Electricity[3]	Electricity[4]
Gas or electric cooker[1, 2]	Gas or electric cooker[1, 2]	Gas or electric cooker[3]	Gas or electric cooker[4]
Hot water (boiler)[1, 2]	Hot water (boiler)[1, 2]	Hot water (boiler)[3]	Hot water (boiler)[4]
Telephone[1, 2]	Telephone[1, 2]	Telephone[3]	Telephone[4]
Cell phone[1]	Cell phone	Cell phone[3]	
Part time maid[1]	Part time maid	Part time maid	
Permanent maid[1]	Permanent maid[1]	Permanent maid[3]	Maid[4]
Cable[1]	Cable	Cable[3]	
Internet[1]	Internet	Internet[3]	
Assets			
Car(s) [1]	Car(s) [1, 2]	Car(s) [3]	Car(s) [4]
Refrigerator[1, 2]	Refrigerator	Refrigerator[3]	
Washing machine[1, 2]	Washing machine[1, 2]	Washing machine[3]	Washing machine[4]
TV[1, 2]	TV[1, 2]	TV[3]	TV[4]
VCR or DVD	VCR or DVD		
Computer[1]	Computer	Computer[3]	
Hoover	Hoover		
Microwave oven	Microwave oven		
Toaster	Toaster		
Productive assets			
Livestock	Livestock[1]	Livestock	Livestock[4]
Agricultural machinery	Agricultural machinery[1]	Agricultural machinery	Agricultural machinery[4]
Financial capacity			
Shares, bonds, funds[1]	Shares, bonds, funds[1]	Shares, bonds, funds[3]	Shares, bonds, funds[4]
Savings account[1]	Savings account[1]	Savings account[3]	Savings account[4]
Current account[1]	Current account[1]	Current account[3]	Current account[4]
Credit card[1]	Credit card	Credit card[3]	

Source: Own elaboration, considering the following notes:
1/ Reviewed for multiple correspondence analysis in Vélez-Grajales et. al. (2012) methodology.
2/ Included in the final welfare index in Vélez-Grajales et. al. (2012) methodology.
3/ Included in the welfare index in Torche (2007) and Torche and Spilerman (2009).

For 2006, the number of observations is 8,520 but there is only information for 7,288 of them, which means information is missing for all variables in 1,232 observations. In two more cases, the information regarding ethnicity is also missing,

leaving a dataset of 7,286 observations. For 2011, the survey has 11,001 observations of which 9,266 have information for all variables, including ethnicity. The number of non-indigenous observations is 8,870, indigenous observations is 1,821 and 310 cases have no information regarding their ethnicity. Information is complete for 86.16 percent of the indigenous and 86.78 percent of the non-indigenous in 2011.

Table 4.3 Past and Present Attainments, and Social Mobility Indicators

2006 Survey	Attainment at 14 years old	Attainment at present	Absolute Social Mobility
Non-indigenous (92.7%)	0.2337	0.3935	0.1597
Indigenous (7.3%)	0.1474	0.2736	0.1263
Total (100%)	0.2263	0.3832	0.1569

2011 Survey	Attainment at 14 years old	Attainment at present	Absolute Social Mobility
Non-indigenous (85.5%)	0.2642	0.3982	0.1340
Indigenous (14.5%)	0.1996	0.3471	0.1475
Total (100%)	0.2544	0.3905	0.1361

Source: Own elaboration based on MSMS 2006 and 2011 surveys

Running estimations only for those with complete information, in the 2006 survey, the attainment index of the total population for the past generation is 0.2263, which means that the previous generation had attainments in 22.6 percent of the dimensions. For the same survey, the present generation has attainments in 38.3 percent of dimensions. That means there was a positive social mobility of 0.1569, or a gain of attainments in 15.7 percent. For the 2011 survey, the previous generation has attainment of 22.4 percent, while the present generation attainment is observed at 39.1 percent of the dimensions. Social mobility thus increased in 13.6 percent of the dimensions.

The indigenous population has systematically less attainment than the non-indigenous population - for both surveys and both generations. The gap is greater between generations included in the 2006 survey, where there is a 12 percentage point difference. The gap is lowest between the generations included in the 2011 survey, with a 5.1 percentage points difference. For 2006, the measure of absolute social mobility for

the indigenous population is smaller than for the non-indigenous - by 3.3 percentage points. This means that in 2006, the gap between indigenous and non-indigenous in terms of social attainments was still increasing.

However, the measure of social mobility in 2011 for the indigenous population is higher than for the non-indigenous one, despite having a lower attainment measure for both generations in comparison with the non-indigenous population. This could suggest that in 2011 the attainment gap between indigenous and non-indigenous in Mexico is closing.

Two hypothesis could explain this divergence in results from 2006 and 2011, one is that from 2006 to 2011 the rate of gaining attainments by the indigenous increased, resulting in higher social mobility. The second is that there is a group of people with indigenous origin but who are not speakers of an indigenous language anymore, whose attainment level is higher at present and thus, have a relative much higher social mobility. The fieldwork survey has both questions, regarding indigenous language speaker and ancestors. While the survey is not representative at national level, its results are no less important for the purpose of this study.

To begin with, the number of indigenous in the fieldwork survey with complete information to estimate social mobility increases from 106 who are identified as such due to their ability to speak an indigenous language, to 120 due to the ability to speak an indigenous language by their ancestors (parents or grandparents). However, the increase of 14 is not straightforward since 31 people in the survey claim to not to be able to speak an indigenous language but had an ancestor who did. That means between those who speak and those who had an ancestor add up 137, however, there are 17 who currently speak an indigenous language did not report an ancestor.

Table 4.4 Social Mobility using 2011 Fieldwork Survey

Speaker (current indigenous)	Attainment at 14 years old	Attainment at present	Absolute Social Mobility
Non-indigenous (N=96)	0.1563	0.3849	0.2286
Indigenous (N=106)	0.1241	0.2597	0.1356
Total (N=202)	0.1394	0.3192	0.1798

Ancestor (indigenous origin)	Attainment at 14 years old	Attainment at present	Absolute Social Mobility
Non-indigenous (N=82)	0. 1624	0. 3659	0.2035
Indigenous (N=120)	0. 1237	0. 2873	0.1636
Total (N=202)	0.1394	0.3192	0.1798

Source: Own elaboration based on 2011 fieldwork survey

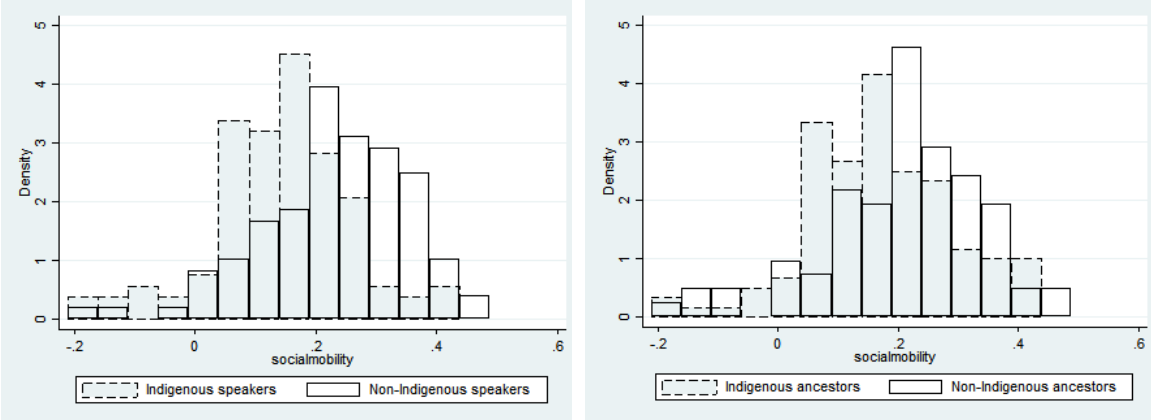
For both, indigenous identified as language speakers and with indigenous origin, attainment level is similar 0.1241 and 0.1237. As a matter of fact, attainment for those identified with the ancestors definition attainment is slightly lower due to the effect of stop counting 17 speakers without ancestors as indigenous, who had the highest attainment at 14 (0.1764) even higher that the non-indigenous (0.1587). This could be the case of people with no indigenous background who married an indigenous partner and learnt the language later.

On the other hand, attainment at the moment of the survey is higher for the group with indigenous ancestors, 0.2873 versus 0.2597 of the indigenous language speakers group. In this case the main effect is due to the high level of attainment of those with indigenous background who do not speak the language since their attainment is 0.3718, the second highest, just after the non-indigenous group, 0.3911.

As a result, with lower baseline and higher attainment at present, the group with indigenous origin show higher absolute social mobility. The group with highest social mobility is still the non-indigenous (0.2324) but closely followed by the subgroup of indigenous with indigenous background who do not speak the language anymore (0.2207). Indigenous who speak and with indigenous background have substantially

lower social mobility (0.1437) and for those who speak the language but had no indigenous ancestor report the lowest social mobility (0.0929).

Graph 4.1 Social Mobility Distribution by Ethnic Group in Fieldwork Municipalities, Using Two Definition of Indigenous Population



Source: Own elaboration with 2011 fieldwork survey data

In Graph 4.1 the figure in the left hand side is the distribution of social mobility for indigenous and non-indigenous, when the indigenous are identified by their ability to speak, while the figure on the right hand side the indigenous are represented by origin (ancestors). The indigenous group in the right hand side is closer to the non-indigenous to the right.

Hence, at least for the fieldwork municipalities, there is a group with indigenous origin, who no longer speak an indigenous language and whose social mobility is on average higher than the rest of the indigenous. This could be seen from two perspectives at least. The first is that those indigenous who blend in the mainstream society, not as indigenous anymore but as typical mestizo, the strategy is producing returns in terms of social mobility. One has to be careful to state things like this, since people could take these findings to support *indigenista* assimilation policies as effective. Conversely, he second perspective is that keeping an indigenous identity has a cost in terms of social

mobility. Mainstream society imposes this cost by making it harder for those decide not to blend in harder to attain their goals.

Analysis by Indicator

The method allows the comparison of indigenous and non-indigenous populations in each attainment dimension. For example, electricity is the most widespread attainment for the present generation in the 2006 survey for both, indigenous and non-indigenous. Nevertheless, for the previous generation electricity was not the most widespread attainment, it was dwelling ownership. Actually, a higher percentage of the indigenous population had ownership than the non-indigenous.

Dwelling ownership is one of the three attainment dimensions for which the indigenous population records higher; the other two are land and livestock. This means that a vector of attainments formed by only these three variables would have shown an indigenous population that is better off than the non-indigenous population.

With respect to the absolute social mobility, owning a TV is where the greatest improvement is observed, for both ethnic groups. This was made possible by the massive increase in electric power distribution in the second half of the 20th Century Mexico. Positive social mobility is not observed in all dimensions; land, livestock, house ownership and agricultural machinery show a decline. These figures suggest that over the course of one generation less people work in agricultural activities and/or those in agricultural activities have suffered from impoverishment. While negative mobility is larger for the non-indigenous population, three of these indicators were the ones where the indigenous population had a higher attainment in the previous generation. The

indigenous population also has negative mobility in terms of shares, bonds and funds, although the figure is close to zero in both generations.

Table 4.5 Average Attainment and Social Mobility, by Indicator and Ethnic Group in 2006

2006 Survey	Non-indigenous			indigenous			Total		
	At 14	At present	ASM	At 14	At present	ASM	At 14	At present	ASM
Ownership	0.7674	0.6905	-0.0769	0.8630	0.8061	-0.0569	0.7756	0.7004	-0.0752
Business (premises)	0.0956	0.1336	0.0379	0.0252	0.0822	0.0571	0.0896	0.1291	0.0396
Land	0.2922	0.1734	-0.1188	0.4545	0.3739	-0.0806	0.3062	0.1907	-0.1155
Vacation house	0.0106	0.0143	0.0037	0.0036	0.0041	0.0005	0.0100	0.0134	0.0034
House/apt. to rent	0.0101	0.0264	0.0163	0.0002	0.0040	0.0038	0.0092	0.0245	0.0153
WC in house	0.4237	0.8214	0.3976	0.1186	0.4586	0.3400	0.3975	0.7902	0.3927
Electricity	0.6525	0.9856	0.3331	0.4029	0.9229	0.5200	0.6310	0.9802	0.3492
Gas or electric cooker	0.4849	0.9205	0.4356	0.1332	0.5703	0.4371	0.4546	0.8904	0.4357
Hot water (boiler)	0.2708	0.5916	0.3208	0.0597	0.1938	0.1341	0.2527	0.5574	0.3047
Telephone	0.1547	0.6484	0.4937	0.0349	0.2555	0.2206	0.1444	0.6146	0.4702
Maid	0.0404	0.0456	0.0052	0.0047	0.0152	0.0106	0.0373	0.0430	0.0056
Car(s)	0.1865	0.4398	0.2532	0.0404	0.1839	0.1435	0.1739	0.4177	0.2438
Washing machine	0.2226	0.7091	0.4864	0.0678	0.2827	0.2149	0.2093	0.6724	0.4631
TV	0.4185	0.9222	0.5037	0.1559	0.6901	0.5342	0.3959	0.9022	0.5063
Livestock	0.2735	0.1329	-0.1406	0.3792	0.2675	-0.1117	0.2826	0.1445	-0.1381
Agricultural machinery	0.0534	0.0323	-0.0211	0.0379	0.0149	-0.0230	0.0520	0.0308	-0.0213
Shares, bonds, funds	0.0077	0.0181	0.0104	0.0053	0.0006	-0.0048	0.0075	0.0166	0.0091
Savings account	0.0433	0.1000	0.0567	0.0106	0.0533	0.0427	0.0404	0.0959	0.0555
Current account	0.0325	0.0705	0.0381	0.0022	0.0192	0.0171	0.0298	0.0661	0.0363

Source: Own elaboration

Social mobility is higher for the indigenous population in 2006 in a number of indicators, namely: ownership, business (premises), land, electricity, gas or electric cooker, maid, TV and livestock. A vector of attainment represented only by these variables would have shown higher social mobility for the indigenous population.

In 2011 some of the indicators show a change. Electricity, TV and gas, or electric cookers, are still the most widespread attainments in the current generation. House ownership, land, livestock and agricultural machinery show negative social mobility. Although the attainment where the greatest progress is observed is not TV anymore but rather the telephone; 57.3 percent of population gained access to telephone,

either landline or cell-phone, over the course of one generation. While this is a great attainment in terms of improving communications in Mexico, it also says a lot regarding the powerful companies and their owners that have obtained a profit as a result of social mobility.

Table 4.6 Average Attainment and Social Mobility, by Indicator and Ethnic Group in 2011

2011 Survey	Non-indigenous			Indigenous			Total		
	At 14	At present	ASM	At 14	At present	ASM	At 14	At present	ASM
Ownership	0.7122	0.6840	-0.0282	0.7839	0.7304	-0.0535	0.7231	0.6910	-0.0321
Business (premises)	0.0827	0.1250	0.0423	0.0490	0.1031	0.0542	0.0776	0.1217	0.0441
Land	0.1662	0.0745	-0.0918	0.3101	0.1840	-0.1261	0.1881	0.0911	-0.0970
Vacation house	0.0091	0.0136	0.0045	0.0094	0.0119	0.0025	0.0092	0.0134	0.0042
House/apt. to rent	0.0086	0.0192	0.0106	0.0096	0.0304	0.0209	0.0087	0.0209	0.0122
WC in house	0.5457	0.8692	0.3235	0.3288	0.6803	0.3516	0.5127	0.8405	0.3278
Electricity	0.8356	0.9827	0.1470	0.6735	0.9650	0.2915	0.8109	0.9800	0.1690
Gas or electric cooker	0.6978	0.9549	0.2571	0.4007	0.8680	0.4673	0.6526	0.9417	0.2891
Hot water (boiler)	0.2797	0.5555	0.2759	0.1164	0.3303	0.2138	0.2548	0.5212	0.2664
Telephone	0.1574	0.7420	0.5846	0.0588	0.5659	0.5071	0.1424	0.7152	0.5728
Maid	0.0419	0.0612	0.0193	0.0186	0.0380	0.0195	0.0383	0.0576	0.0193
Car(s)	0.2362	0.4859	0.2498	0.1242	0.3208	0.1966	0.2191	0.4608	0.2417
Washing machine	0.3095	0.7822	0.4727	0.1404	0.5646	0.4242	0.2838	0.7491	0.4653
TV	0.7110	0.9776	0.2666	0.4652	0.9396	0.4744	0.6735	0.9718	0.2983
Livestock	0.1343	0.0471	-0.0872	0.2304	0.1174	-0.1130	0.1489	0.0578	-0.0912
Agricultural machinery	0.0224	0.0062	-0.0162	0.0249	0.0116	-0.0132	0.0227	0.0070	-0.0157
Shares, bonds, funds	0.0040	0.0137	0.0097	0.0080	0.0114	0.0035	0.0046	0.0133	0.0087
Savings account	0.0462	0.1332	0.0870	0.0306	0.0888	0.0583	0.0438	0.1264	0.0826
Current account	0.0199	0.0388	0.0189	0.0108	0.0341	0.0233	0.0185	0.0380	0.0196

Source: Own elaboration

In 2006, TV companies were the ones capitalising on the Mexican boom where as, in 2011 it was the telecommunication companies. Improvement in TV in 2011 is actually the third greatest improvement in the total and non-indigenous populations; in second place is the ownership of a washing machine, clearly linked to the expansion of furniture and appliances' stores targeting the lower socioeconomic segments.

Nevertheless, for the indigenous population, TV in 2011 was still the second greatest improvement.

In terms of the greatest gaps between indigenous and non-indigenous populations, hot water (boiler), washing machine, WC in house and telephone, are areas where the difference in current attainments between the indigenous and the non-indigenous population is considerable. In comparison with 2006, areas where the gaps have narrowed are gas or electric cooker, car(s) and TV.

The methodology suggested here to measure absolute social mobility is complementary to the measures of relative social mobility developed elsewhere. In this case the aim was to be able to compare the indigenous and non-indigenous populations but it is equally applicable to other stratifications, such as rural/urban, regions, industries, and etcetera.

4.5 Qualitative analysis of social mobility

Julia and José live in San Martín Totoltepec, a small municipality in Puebla. José is a blacksmith and Julia is a housewife. They have three children but take care of two children of Julia's sister as well, who went to the USA to work. It is a family of seven without counting those who are living abroad and a teenager from Julia's sister who moved away with her boyfriend. They look happy together, with lots of aspirations; Julia wishes to put together a pig farm and José would like their children to go to college to study mechanics. He would like to see his children "move forward" in life.

One of their main concerns is how their low income will affect achieving what they want. José thinks that if he takes the initiative in his business, things will improve but at the same time, he is aware that one of the main problems in their community is debt. He exaplined that people have low incomes and they acquire debts to sustain their expenses.

Julia considers that their family is one of the poorest in town and she feels bad about it. She says she feels low - lower than the rest. But she ignores a very important fact, which is that hers is one of the households with the greatest absolute social mobility in town. They moved from having an attainment index of 0.1053 in the previous generation to an attainment index of 0.4737; that is an absolute social mobility index of 0.3684.

Following exactly the same methodology described before to estimate absolute social mobility in the fieldwork municipalities, the numbers take a whole different role when one, as a researcher, can put a face and a story behind them. The fieldwork experience offers a complementary, if not alternative, vision of social mobility. It provides a clearer and closer look at the phenomenon, not only because it particularly focuses on two municipalities, one indigenous and one non-indigenous, but also because of the intimacy of the interviews conducted.

In the case of Julia and José, one of the drivers of their social mobility was the fact that José migrated to the United States on three occasions to work at restaurants in Chicago, Illinois. He knows that wages in the US, especially for low skilled workers, are several times the wages obtained in Mexico. As he mentioned: “if you earn the equivalent of a pair of trousers here in one day, there you earn the equivalent of seven”.

In rural Mexico, international migration to the United States is one of the most influential factors in being able to climb the social ladder, but not in all cases. Antonio who is 27 years old and lives in Coatepec, spent about ten years in the United States. He does not advise people to leave their hometowns; but rather encourages people to stay where their family is. When the interview was conducted he had returned from the United States after a year and had a wife and a baby, which certainly increased his attachment to Coatepec. He is a peasant, working in the coffee fields. His aspiration is to get a fixed job. As compared to his parents, he considers he is doing slightly better, but from an objective perspective, that is doubtable.

According to an absolute measure of social mobility, he is one of the few who gets negative mobility at -0.1053. His parents had only a few of the indicators considered in the measure of absolute social mobility, namely the house they lived in, land, livestock, electricity and a WC in the house, which is considered a luxury in such households. Antonio, on the other hand, has less than that. He neither owns land, nor livestock. He said that when he was a child people were barefoot and now people have *huaraches.* Examples like this one support his assertion of positive social mobility.

Antonio on one hand, and Julia and José on the other, are extremes in a diversity of life stories. Not all the indigenous are like Antonio, nor all non-indigenous are like Julia and José. There are failures and successes on both sides. Silvestre, for example, is an indigenous in Coatepec with a social mobility indicator of 0.4211, one of the highest. On the other hand, Ricardo is a non-indigenous with negative social mobility.

International migration and remittances are also more mentioned as drivers of social mobility. Teodoro, for example, is a smart and talkative indigenous peasant in Coatepec who did not migrate to the United States but spent a short time in Mexico City. However, he claims that the big houses in town belong to people who went to the

United States or have relatives who send them money there. In terms of the indicators included in the absolute social mobility measure, Teodoro owns his property, has some livestock, owns a TV and has a WC and electricity. It is not much by some standards, but it is more than what his parents had, except for the land his parents had and which he does not.

Adela is non-indigenous and has a social mobility close 0.2, quite typical figure for the non-indigenous group in fieldwork municipalities. She is a housewife and her husband is a peasant; they have three children. She would like to work but looking after the children is a full time job for her. She thinks that her lifestyle has improved a little in comparison to her parents. For example, the food they eat is the first thing she mentions. However, she also argues that some things are the same, as money is still not enough. Pavements, water supply and drainage are some of the things she also sees as improvements in the community. Adela and her husband own their house; it was a present from her parents in law. They also have a car, land and livestock, among the things included in the social mobility indicators. Moreover, in comparison to her parents they have a washing machine, electricity, WC in house and a cooker, although they do not have a business as her parents did.

When I was collecting data and conducting interviews in the fieldwork municipalities, I was under the impression that living conditions were quite similar in both municipalities. The use of quantitative and qualitative methods simultaneously makes it easier to see the gaps between groups. For example, international migration is a notorious driver for social mobility in rural Mexico for both ethnic groups. However, the indigenous population showed greater attachment to their land, family and traditions. Some of them also mentioned their concerns of being treated badly outside

their communities and the risks and dangers of living in the city as reasons not to migrate.

Finally, regarding the hypothesis of how social mobility results change depending on how the indigenous population is identified, three cases who answered the survey and also an interview fell on singular categories. Flor and Mariana in the fieldwork survey reported to have an indigenous ancestor but did not speak the language anymore. On the other hand, Ofelia claimed to speak an indigenous language although had no indigenous ancestors. All three cases are from San Martín Totoltepec.

These cases are not representative of the group they belong to. For example, Ofelia who is a speaker of indigenous language with no background would be expected to have a low social mobility indicator but is the other way around, hers is 0.3684, one of the highest in the fieldwork survey. Meanwhile, Flor and Mariana would be expected to have a social mobility indicator higher than the average for the indigenous, but once again, is the opposite. Rosa's social mobility indicator is 0.1053 and Mariana's 0.0526. Should be said, though, that in Mariana's case her attainment was already higher usual at 14. Thus, she did not gain much but remained in a high level of attainment, compared to the rest of the municipality.

Regarding the methodology applied to measure social mobility, it is evident that it offers certain versatility to zoom in, not only in terms of the indicators but also from a holistic perspective from a region, to a municipality and even an individual basis. Furthermore, since the measure addresses absolute mobility, each individual's mobility is independent of whatever happens to everybody else's. Relative measures of social mobility rely on rankings, thus, individual mobility depends on what happens to the rest of the society.

4.6 Conclusions

The analysis in the previous two chapters showed how the indigenous population is poorer than the non-indigenous in Mexico. It also proved that the indigenous population is relatively more dispersed and more likely to be living in remote localities than the non-indigenous and how this might explain the gap in living standards between indigenous and non-indigenous populations. This chapter contributes to the analysis by studying intergenerational social mobility in a comparative way. If there is a gap in living standards between the indigenous and non-indigenous populations, intergenerational social mobility should be faster for the indigenous in order to close that gap.

Intergenerational social mobility is the comparison between a present generation and the previous one in terms of their living standards. Intra-generational social mobility is understood as a movement in the socioeconomic structure over a period of time, for example, for when analysing people moving in and out of poverty within a lifetime. Methodologically, transition matrices are the starting point. Education and occupation transition matrices have been used by sociologist, while income transition matrices have been more popular amongst economist, as well as regression models of lifetime earnings.

Social mobility studies in Mexico have followed the sociological tradition of using occupational classes, but many of them also assume some kind of hierarchy among classes to deduce upward and downward mobility. Recently Florencia Torche *et. al.* (2007; 2009; 2010) estimated a welfare index based on assets and dwelling

characteristics that substituted the traditional income estimation. Roberto Velez-Grajales *et. al.*(2012) modified Torche's methodology to use Multiple Correspondence Method, instead of principal components, when estimating the welfare index.

With this methodology, and using the 2011 Mexican Social Mobility Survey (MSMS), the Centro de Estudios Espinosa Yglesias (CEEY) published a report called "Informe Movilidad Social en México 2013" (Vélez Grajales 2013). The report takes a relative approach in the study of intergenerational social mobility. That is, the aim is to observe changes in the rankings of individuals and their parents. Using quintiles they built an Index of Social Mobility (ISM) with a range from zero to one, where zero is total immobility and one is total mobility. ISM has a value of 0.67 for the total population but the indigenous population has an ISM of 0.53, which is considerably lower than the figure for the non-indigenous of 0.71.

However, relative social mobility has analytical limitations. A person could move forward in his or her standard of living but if the improvement is slower than the rest of the society, a measure of relative social mobility would show negative mobility, since in the ranking the person would loses places instead of gaining them. In order to overcome these limitations, a measure of absolute intergenerational social mobility was developed in this chapter, based on the Alkire-Foster methodology for multidimensional poverty.

The measure departs from the notion of attainment as a mirror of deprivation. An individual or a household can gain or not attainments in multiple dimensions. A vector of attainments can be estimated for a household and, considering the relative weight of each dimension, a summary figure of household attainment can be obtained. If data is available for the current household head and their parents, then the same can be done for the household's previous generations. The difference in attainments

between the current and previous generations proves the absolute social mobility figure for the referred household.

Likewise, average attainment figures can be estimated for each generation and absolute social mobility calculated for the whole of society. Furthermore, average attainment figures can be estimated for subgroups, in this case for the indigenous and non-indigenous population, since the measure allows for cardinally meaningful comparisons between subgroups. The absolute intergenerational social mobility index ranges from -1 to 1, where -1 represents total negative mobility or loss of attainment in 100 percent of the dimensions, while 1 represents total positive mobility, or gain of attainment in 100 percent of dimensions.

Using similar indicators as the ones used by Torche and Vélez-Grajales, absolute social mobility was estimated using the MSMS for the years 2006 and 2011. As mentioned before, unfortunately, questions to identify indigenous population in both surveys were not the same. In 2006, questions asked directly about the ability to speak an indigenous language, as well as self-ascription to an indigenous community. In 2011, on the other hand, the questionnaire referred to the respondent's parent's ability to speak an indigenous language. In 2006 the indigenous population is estimated to be 7.3 percent if both questions are used (language and belonging) and 6.6 percent if only the language question applies. For 2011 the share of the indigenous population increases to 14.5 percent - practically double that of 2006.

Taking into consideration the difference in terms of how the indigenous population is identified in each survey, it is still possible to say that the indigenous population has systematically less attainments than the non-indigenous population. For 2006 the measure of absolute social mobility for the indigenous population is smaller than the non-indigenous. This would mean that in 2006 the gap between indigenous and

non-indigenous in terms of social attainments was still increasing. However, the measure of social mobility in 2011 for the indigenous population is higher than the non-indigenous one, despite having lower attainment measure in the previous generation and at present in comparison with the non-indigenous population. This could suggest that in 2011 the attainment gap between indigenous and non-indigenous in Mexico is finally closing.

The apparent contradiction was resolved, at least for the fieldwork municipalities since the fieldwork survey had both questions, regarding indigenous language speaker and ancestors. While the survey is not representative at national level, its results are no less important for the purpose of this study. What was found is that there is a group with indigenous origin, who no longer speak an indigenous language and whose social mobility is on average higher than the rest of the indigenous. This suggests that society is imposing a cost to those indigenous who keep , while making things easier for those who blend into the mainstream society.

Finally, as in the previous chapter about remoteness, this chapter made two main contributions to this study. The first is a methodological one: an innovation in the way intergenerational social mobility is measured. The second is regarding the analysis of the differences in terms of the standard of living, and specifically a comparison regarding social mobility between the indigenous and non-indigenous populations. A relatively lower social mobility among the indigenous population is key to understand the difference in terms of poverty figures between indigenous and non-indigenous in Mexico. In the next chapter, the last of the empirical chapters, there is analysis of ethnic discrimination.

5. Discrimination

5.1 Introduction

In previous chapters it has been shown how the indigenous population in Mexico is poorer than the non-indigenous and how much that poverty is related to geographical isolation since the indigenous population tends to live in more remote areas. While it is evident that there is a gap in terms of well-being between the indigenous and non-indigenous populations, a pertinent question is how much of this gap can be attributed to discrimination? Answering this question is the main objective of this chapter.

In the next section a brief literature review is presented regarding the study of ethnic discrimination within economics. It is clear that the study of discrimination goes beyond ethnicity, for example, gender, sexual orientation, religion, education, occupation, social class, nationality, accent, height and weight are all areas where someone could be discriminated against. Also, discrimination is an area of study that can be approached from many perspectives, such as the psychological impact of being discriminated against, the ways discrimination and segregation 'feed' each other, the legal framework that prevents or promotes various forms of discrimination, and how some informal institutions remain and depend on the perpetuation of discriminatory practices.

The literature review presented here, however, focus only on the debates in economics. Is not that the academic literature in other areas is less important, but because I have a professional bias as a trained economist. Besides, since one of the aims

of the chapter is to quantify ethnic discrimination in Mexico, the economic literature is a good departure point. Therefore, the next section concentrates on the ways to measure it. At the end of the section a review of empirical studies conducted regarding ethnic discrimination in Mexico is presented.

Further in the chapter, the Oaxaca-Blinder decomposition is explained and results for the Mexican case presented. The Oaxaca-Blinder decomposition is a very creative way of breaking down and combining income or wage econometric regressions to explain gaps between groups. Part of that gap is explained by differences in covariates of both groups, for example, schooling and work experiences, while the remaining, unexplained, part could be attributed to discrimination. Two versions of this methodology are used in this chapter: one in which for the indigenous population group coefficients are used as reference and, a second, where coefficients estimated from a pooled regression are used as reference.

Two important results are found with the Oaxaca-Blinder decomposition when income and wage gaps are estimated for the indigenous and non-indigenous populations in Mexico. The first is that there are important geographical components that explain the income gap; in particular, locality size explains the impact on income by the fact that the indigenous are relatively more concentrated in rural areas. Also when regional differences are taken into account, income gaps are better explained. The second result, however, shows how when wage gaps are estimated, instead of income, the gap almost doubles in size, which suggests that the indigenous population works much harder to compensate for lower wages.

This finding is important also for the rest of the thesis. The fact that they are discriminated in the labour markets is an important piece in the vicious cycle of indigenous poverty in Mexico. On the one hand, they rely on state interventions for

non-market dimensions of their well-being, while on the other hand, in the markets they do not get a fair payment for their job. Failure in the labour markets reduces their incentives to migrate in search for better opportunities outside their communities, adding up their reasons to remain in remote rural areas. Also, findings in chapter four regarding the higher social mobility of those with indigenous background but who do not speak anymore an indigenous language could be explained by ethnic discrimination, if once the indigenous are assimilated by mainstream society, discrimination against them stops, allowing them to improve their living conditions faster.

An innovative way of estimating discrimination is presented in section 5.5, in this case based on the probability of being multidimensionally poor. As shown before, the proportion of the poor indigenous is higher than the non-indigenous, but the gap could also be explained by regional differences, type of household, and so on. As in the Oaxaca-Blinder decomposition, there is a share of the gap that remains unexplained and could be attributed to discrimination. In this case, the methodology is a Propensity Score Match (PSM). This method, originally developed for the medical sciences, compares individuals of similar characteristics to see whether a treatment is having an effect or not, although in this particular case the term has a very peculiar interpretation since the indigenous are the treated while the non-indigenous the untreated populations.

After controlling for a number of variables, including geography, characteristics as dwelling, characteristics of the household, and more, the *treatment effect* is 44.4 percent of the gap between indigenous and non-indigenous. That means that an average indigenous has a 11.9 percentage points higher probability of being multidimensionally poor than an average non-indigenous individual with similar characteristics. This is strong empirical evidence that discrimination against the indigenous population in

Mexico explains why poverty is higher for them, but also reflects the horizontal inequalities between these two groups.

Testimonies and qualitative analysis drawn from the data collected during fieldwork is presented in section 5.6. Collected during 2011, fieldwork data consists of 60 interviews and more than 200 questionnaires, held mainly in two municipalities in the state of Puebla. One of the municipalities is predominantly indigenous, Coatepec, while the other is primarily non-indigenous. Some of the interviews, on the other hand, where conducted also in Chiapas and Veracruz.

Among the findings in the qualitative analysis is that ethnic discrimination is not an easy topic to talk about. Despite that, discrimination against the indigenous exists and more policies and institutions to prevent it are needed. Another finding is that there seems to be little relation between perceptions of ethnic discrimination and poverty level, although class discrimination exists as well.

5.2 Literature review on discrimination

Two dissertations have been very important in the theory, analysis and measurement of discrimination. The first is Gary Becker's which was later published as *The Economics of Discrimination* (Becker 1957) and the second is by Ronald Oaxaca, whose summarized version was published in the journal *International Economic Review* (Oaxaca 1973). While Becker's is the cornerstone of economic theory regarding discrimination, Oaxaca is its equivalent for empirical purposes.[67]

[67] Becker's thesis started an important debate in economic theory, in a time when discrimination against black people was legal in the US, as Ashenfelter and Oaxaca (1987) noted. Krueger (1963) argued against

In terms of measuring discrimination, the most famous methodology is the Oaxaca-Blinder decomposition, which will be explained in the next section. Other ways of measuring discrimination are the audit method and the laboratory experiments. A well-known audit study is the one conducted by Marianne Bertrand and Sendhil Mullainathan (2004) in which they sent résumés in response to help-wanted adverts in Chicago and Boston, USA. They assigned typically white names to one half of the resumes, and typically African-American names to the other half, and then analysed the response ratio. They found that African-American names required 50 percent more applications than white names to be called back, which represents evidence of differential treatment.

Other audit studies have used different strategies, for example, sending trained actors to job interviews (Fix and Struyk 1993), or blind auditions for orchestras (Goldin and Rouse 2000). However, despite its recent popularity, audit studies have serious shortcomings. James Heckman (1998) has made a series of observations regarding the audit studies' methodology. One is that, based on Becker's (1957) model, economic values are set at the margin, meaning that minority wage is set between the marginal firm or set of firms with which the marginal minority member deals, and not the average or the most discriminatory employer. According to Heckman, many audit studies ignore this and tend to misinterpret individual discrimination as market discrimination.

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the Becker's hypothesis of employers "taste" to discriminate, while Arrow (1972) discussed the market's competitive setting. Joseph Stiglitz (1973) argued that there may be some market failures associated with discrimination such as minimum wage legislation of efficiency wages. Arrow (1998) agreed there is some kind of non-market factors influencing economic behaviour since all market-based explanations of discrimination will tend to predict its elimination, something that was has been questioned by Later Kerwin Kofi Charles and Jonathan Guryan (2007).

A second critique is that auditors could be *coached* so that the study is not as impartial as it was supposed to be. For example trained actors could be acting in ways to get the results researchers and audit agencies are looking for. In this same line of argument, a third critique by Heckman is that there are unobservable characteristics which employers may take into account, but are ignored by auditors. He uses the case of jumpers to exemplify this: how high one can someone jump, depends on how tall he or she is, and how good his or her technique is. Assuming that two jumpers with equal height would have the same chance of clearing the bar, ignores the very important element of technique. In a similar way, two individuals from different backgrounds but equal résumés may have very different chances of getting a job, simply because one is more charming than the other - it does not necessarily imply discrimination.

On the other hand, laboratory experiments are still in their infancy and they are mostly based on game theory.[68] One interesting experiment was conducted by Donna Anderson and Michael Haupert (1999) who found appealing evidence of the statistical discrimination hypothesis. In the experiment, two groups of hypothetical employees were given green and yellow cards with a productivity or skill level written on it. Employers who chose employees with the highest productivity would win. Statistical distribution of productivities was known to all but individual productivity was private to the individual. To know someone's individual productivity, the employer would have to pay an interview fee. When the average productivity of a group was lower than the cost of the interview fee, the group with lower average productivity was discriminated against, but if the fee was reduced the discrimination lowered as well.

[68] For example, one experiment that tried to measure the level of trust to people with different backgrounds using the trust game (Fershtman and Gneezy 2001).

To close this section, a quick word about empirical studies about discrimination in Mexico. There are only a handful of them and they mostly relate to gender discrimination (Pagán and Ullibarri 2000; Mendoza Cota and García Bermúdez 2009; Popli 2013); or if relating to racial or ethnic discrimination, the study is not empirical (Nutini 1997). Jorge Enrique Hobart (2008) measures ethnic discrimination in Mexico but he does not perform a Oaxaca-Blinder decomposition, an audit study or a laboratory experiment.[69] The measures he uses are: the Duncan dissimilitude index, which was developed in the 1950's and now clearly outdated; the Karmel-MacLachlan index, sometimes used by some demographers to measure occupational segregation; and a very feeble wage discrimination index that only compares the wage ratio to the schooling ratio. Finally, Ramirez (2006) uses the classification of indigenous municipalities as a proxy to identify the indigenous population and, with a Oaxaca-Blinder decomposition, shows that between 35 percent and 41 percent of earning differentials amongst residents in these municipalities might be explained by ethnic discrimination.[70] It looks like the debate about indigenous discrimination in the Mexican labour markets and applying different empirical methods is not even in its early infancy - it has not been born yet.[71]

In summary, the standard Oaxaca-Blinder decomposition is the method to be followed for the measurement of discrimination in this thesis because is the point of departure for further debate and the acknowledged standard methodology for measuring discrimination. There are at least two important differences of this Oaxaca-Blinder

[69]George Psacharopoulos' (1993) paper estimates the Mincerian equation to get the returns to education of two groups, the indigenous and the non-indigenous populations, in Guatemala and Bolivia. Despite the fact his aim was not to estimate discrimination he concludes that earning differentials between two groups that remains unexplained, after controlling for human capital endowments, represents the upper bound of labour discrimination. In his study indigenous workers earn 50 percent less than the non-indigenous ones in Guatemala, and 25 percent less in Bolivia. He thinks the difference between countries relies on a higher level of educational attainment for the indigenous in Bolivia.

[70] Ramirez (2006) has been cited in Borja-Vega et. al. (2007) and Ulrichs and Roelen(2012).

[71]Two studies of discrimination in the labour market in the UK are the book by David Wainwright (1979) which mainly takes a legal perspective, and David Smith's (1974) work about Asian and West Indian workers. Both are a little outdated. For a more recent study in the UK see John Carter (2003) which is focused on the role of ethnic minority nurses in the National Health Service.

estimation compared to Ramirez's. The first is the identification of the indigenous population. In Ramirez's case its based on the municipality, ignoring then discrimination within municipalities, specially of the indigenous living in non-indigenous municipalities.

Second, the importance of locality size, which is related to what was studied in Chapter three. An important part the indigenous poverty is related to the fact that they live in more remote rural communities where markets are incomplete and is harder for the state to provide goods and services. It is thus important to know if the gaps between indigenous and non-indigenous close when locality size is added in the controls or, in addition to the geographical isolation, the indigenous are discriminated against in the labour markets.

Finally, it is important to mention that the discussion on decomposition has moved from the mean of income or earnings, to decompose other distributional parameters. The opening chapter of the *Handbook of Labour Economics* by Nicole Fortin, Thomas Lemieux and Sergio Firpo (2011) is precisely about this. Furthermore, they have also discussed not only the aggregate decomposition but also the detailed decomposition, for single covariate. For detailed decomposition Fortin, Lemieux and Firpo argue that it should be *path independent*, that is, regardless of the order in which the decomposition is performed. In order to achieve that, they propose using the *recentered influence function* (RIF).[72] That way, the outcome of the RIF regression is used instead of the usual dependent variable, income or earnings, in the Oaxaca-Blinder decomposition.

This chapter does not go through detailed decomposition or decomposition beyond the mean, such as distributional parameters, although is an important area of

[72] The *recentered influence function* was previously suggested in Firpo, Fortin and Lemieux (2009)

possible further research. However, they have also established a link between decomposition methods and the literature of programme evaluation, in particular with the treatment effect. They sustain that the "unexplained" component in the Oaxaca-Decomposition can be interpreted as a treatment effect.

Fortin, Lemieux and Firpo claim that there are at least three advantages of representing the unexplained component of the decomposition as a treatment effect: 1) the mean independence assumption can be replaced by a weaker ignorability assumption; 2) estimators of average treatment effect on the treated (ATT) are consistent even if the relationship between dependent the dependent variable and the covariates is not linear, and; 3) it is possible to estimate contribution of subcomponents of covariates to the ATT.

In section 5.4 an innovative method of measuring ethnic discrimination is presented, using precisely a propensity score match and interpreting the ATT as the part that is attributable to ethnic discrimination. There is an important difference with Fortin, Lemieux and Firpo, though. The matching exercise is not applied to the income or earnings gap but to the probability of being multidimensionally poor.

5.3 The Oaxaca-Blinder decomposition

This section focuses on the Oaxaca-Blinder decomposition. There is also a short review of some papers that conduct empirical studies of discrimination in Mexico. The lack of reviews of empirical studies is due to the little research done regarding ethnic discrimination in Mexico - most empirical studies belong to other areas of knowledge, e.g. anthropology.

The cornerstone of discrimination measures is the Oaxaca-Blinder decomposition (Oaxaca 1973; Blinder 1973).[73] This methodology starts by defining two social groups for which there is a pre-conceived idea of a wage gap and the objective of the measurement is to asses to what extent that gap is due to discrimination. Assume thus that those groups are *h* and *l*, standing for high wage and low wage respectively, but could be men and women, or white and black people, or any other.

Adapting the notation from Ben Jann (2008), the log-wage w_i for each group (i=*h, l*) is defined as a function of multiple observed productivity characteristics, $X_i$in matrix form, such that:

$$w_i = X_i'\beta_i + v_i$$

Where β_i is a vector of coefficients and v_i is a random error term assumed to be normally distributed with zero mean and σ_i^2 variance. The wage gap *G* is defined as the difference between the group with the higher wage and the group with the lower wage:

$$G = E(w_h) - E(w_l) = E(X_h)'\beta_h - E(X_l)'\beta_l$$

Since $E(w_i) = E(X_i'\beta_i + v_i) = E(X_i'\beta_i) + E(v_i) = E(X_i)'\beta_i$, where $E(\beta_i) = \beta_i$ and $E(v_i) = 0$ by assumption. The biggest step of the Oaxaca-Blinder decomposition is to add and subtract three pieces and rearrange. One of the pieces is the addition and subtraction of the predictors of higher wage group but with the lower wage coefficients. Another piece is the addition and subtraction of the lower wage group predictors but with higher wage group coefficients. And the last pieces corresponds to the addition and subtraction of the low wage group predictors and coefficients. That is:

[73] Simpler regression analysis, without any decomposition, has also been done. In those cases, additional to the set of observable variables related to productivity, such as education and experience, there are binary variables for race or gender. A negative and significant coefficient on race or gender is considered evidence of discrimination. Studies of this type include James E. Long and Albert N. Link (1983) and Carole A. Green and Marianne A. Ferber (1984).

$$[E(X_h)'\beta_l - E(X_h)'\beta_l] + [E(X_l)'\beta_h - E(X_l)'\beta_h] + [E(X_l)'\beta_l - E(X_l)'\beta_l]$$

Rearranging, the wage gap becomes:

$$G = \{E(X_h) - E(X_l)\}'\beta_l + E(X_l)'(\beta_h - \beta_l) + \{E(X_h) - E(X_l)\}'(\beta_h - \beta_l)$$

This is what Jann (2008) calls the "threefold" decomposition - where the wage gap is explained by three elements. The first is an endowment, an (E) element, which represent how much of the gap is explained by the difference in the predictors by both groups. In a way, the endowment part says the amount that the wage gap would be reduced if both groups had the same predictors, for example, schooling or experience.

The second and third components are usually attributed to discrimination; the second component refers to the difference in the coefficients (C), including the intercept, while the third shows the interaction (I) between endowments and coefficients. Thus the wage gap is expressed as:

$$G = E + C + I$$

Where $E = \{E(X_h) - E(X_l)\}'\beta_l$; $C = E(X_l)'(\beta_h - \beta_l)$ and; $I = \{E(X_h) - E(X_l)\}'(\beta_h - \beta_l)$. It is important to note that this decomposition is from the point of view of the lower wage group - in other words, taking their coefficients as reference. The difference in wages could also be explained from the point of view of the higher wage group. Alternatively, it could be assumed that there is a non-discriminatory set of coefficients β^* that could serve as reference. If such coefficients exist, then the wage gap would be:

$$G = \{E(X_h) - E(X_l)\}'\beta^* + \{E(X_h)'(\beta_h - \beta^*) + E(X_l)'(\beta^* - \beta_l)\}$$

This decomposition is called "twofold" by Lann (2008) since there are only two terms: one part explained by the difference in the predictors, or the quantity effect (Q) and a second part that is not explained by the predictors (U). This second part is the one

that could be attributed to discrimination, although it could also be due to variables that are not observed in the estimation.

$$G = Q + U$$

Where $Q = \{E(X_h) - E(X_l)\}'\beta^*$ and; $U = \{E(X_h)'(\beta_h - \beta^*) + E(X_l)'(\beta^* - \beta_l)\}$. Lann (2008) summarizes the possibilities for estimating the twofold decomposition in three methods: relative weights, pooled and omega. Relative weights could be based on the population size, an arbitrary 50-50 or any other relative weight that the researcher would justify as ideal. In the pooled regression the coefficients are estimated for the total population, with the group identifier as one of the explanatory variables. The omega method is the same as the pooled, but without the group identifier. The omega method is not recommended since it overestimates the unexplained part of the wage gap or, in other words, overestimates discrimination.[74]

It is possible to estimate the Oaxaca-Blinder decomposition based on the indigenous and non-indigenous populations using the Module of Socioeconomic Condition of the Income and Expenditure National Household Survey - MCS-ENIGH in Spanish. This survey is the one used to estimate the official multidimensional poverty measure and whilst is not an employment survey it has enough information to run the estimates. Both methods - twofold and threefold - are estimated. For the threefold method coefficients of the indigenous groups will serve as reference, while in for the

[74]In a revision of different ways to perform the Oaxaca-Blinder decomposition, Yana van der Meulen Rodgers (2006) mentions the method proposed by David Neumark (1988) in which there is a non-discriminatory wage structure β^* estimated by a pooled regression with both groups included that can be used to decompose *G* into three elements: the difference due to endowments, the difference due to favouritism (or nepotism) and the difference due to discrimination. The survey of the Oaxaca-Blinder decomposition by Rodgers goes on, for example, reviewing an alternative approach to estimate β^* by Ronald Oaxaca and Michael Ransom (1994); a method for reweighing the lower wage group (Blau and Kahn 1996); the issue of selection bias due to the censored sample of workers (Joshi, Paci, and Waldfogel 1999); the quantile regression technique (Buchinsky 1994; Buchinsky 1998); the analysis of wage structures over time with a trend decomposition technique (Juhn, Murphy, and Pierce 1991); and occupational decomposition (R. S. Brown, Moon, and Zoloth 1980).

twofold the pooled regression, with group identifier as one of the explanatory variables, will be used.

The simplest model would be the estimation of individual labour monthly income as a function of schooling, experience - represented by age - and gender. In this basic model all explanatory variables are significant and coefficients show consistency for both ethnic groups as well as for the pooled regression, although the intercept in the pooled regression is a little higher than the intercepts for both groups. The dummy variable sex has the highest coefficient while age, which represents experience, has the lowest.[75] The group identifier in the pooled regression is also considerably high and negative. The predicted natural logarithm of the monthly labour income draws an income gap of 12.5 percent between indigenous and non-indigenous populations. How the gap is explained depends on if the threefold or twofold method is considered.

In the threefold method, from the perspective of the indigenous group, the income gap is explained at 47.1 percent by the endowments (See Table 5.2). This means that if the indigenous group had the same predictors as the non-indigenous group, mainly schooling, the income gap would be reduced by almost half. On the other hand, the coefficients explain 54.36 percent of the income gap while the interaction component has a negative contribution of -1.4 percent of the income gap.

This means that the unexplained part of the income gap is 52.9 percent, equivalent to 6.6 percent of the average indigenous labour income, which could be attributed to discrimination. Similarly, in the twofold method, when coefficients in the pooled regression are taken as reference, 54.4 percent of the income gap is unexplained, which is equivalent to 6.8 percent of the average indigenous labour income.

[75]The sex dummy variable is specified with zero for feminine and one for masculine. That is why its value is positive in the regression.

These results are not far from Ramirez's (2006) when hr found an earning gap of 59 percent between workers in indigenous and non-indigenous municipalities, in which unexplained factors accounted for 41 percent.

Table 5.1 Basic Model: Monthly Labour Income Based on MCS-ENIGH 2012 (standard error in parenthesis)

	Indigenous	Non-Indigenous	Pooled
Schooling	0.1561	0.1525	0.1534
	(0.0002)**	(0.0000)**	(0.0000)**
Age	0.0184	0.0259	0.0251
	(0.0000)**	(0.0000)**	(0.0000)**
Sex	0.7094	0.5585	0.5722
	(0.0014)**	(0.0004)**	(0.0004)**
Indigenous			-0.4761
			(0.0006)
Intercept	4.8207	5.1345	5.1482
	(0.0026)**	(0.0007)**	(0.0007)**
R^2	0.2046	0.2915	0.3017
Adjusted R^2	0.2046	0.2915	0.3017
ln(labour income)	7.0385	7.9196	
	(0.0008)**	(0.0002)**	
Difference	0.8811		
	(0.0008)**		

Source: Own elaboration. * Significance at 5 percent or less; ** Significance at 1 percent or less

Nevertheless, as was mentioned earlier, the unexplained proportion of the income gap could also be attributed to unobserved variables. In this case, when predictors are added to the equation then the unexplained part is reduced. Table 5.2 shows results for a second model that includes a locality size variable and a third model that adds state dummies. These models two and three take into account the geographical context in two ways: in model two the variable locality size approximates the remoteness or isolation, while in model three, regional differences are also considered. Regression results for models two and three are shown in Annex 5.1.

In all three models, income predictors remain the same and thus the income gap is constant - 0.8811 or 12.5 percent. What changes is the unexplained part which could be attributed to discrimination towards the indigenous population. In the second model, with locality size as an explanatory variable, the percentage of the income gap that is unexplained falls to 25 percent in the threefold case and 40.3 percent in the pooled case. In the third model, taking into account regional differences as well, the unexplained income gap falls even further to 10.1 percent in the threefold case and 31.6 percent if the pooled method is followed. This is equivalent to only 1.3 percent of the average indigenous monthly labour income, under the threefold method, and 4 percent in the twofold method.

Table 5.2 Oaxaca-Blinder Decomposition of Individual Monthly Labour Income for Indigenous and Non-indigenous Populations, 2012

Threefold	Model 1	Model 2	Model 3
Endowments	0.4147	0.6609	0.7919
Coefficients	0.4789	0.3704	0.2975
Interaction	-0.0125	-0.1502	-0.2083
Unexplained	0.4664	0.2202	0.0892
Total	0.8811	0.8811	0.8811
Income gap %	12.52	12.52	12.52
Unexplained %	52.93	24.99	10.12
Discrimination %	6.63	3.13	1.27

Pooled	Model 1	Model 2	Model 3
Quantity effect	0.4050	0.5260	0.6026
Unexplained	0.4761	0.3551	0.2785
Total	0.8811	0.8811	0.8811
Income gap %	12.52	12.52	12.52
Unexplained %	54.04	40.30	31.61
Discrimination %	6.76	5.04	3.96

Source: Own elaboration

So far it looks like labour income differences between indigenous and non-indigenous populations are explained mostly by the differences they show in schooling and the geographical distribution of the indigenous population. However, there is one more twist in this story. The MCS-ENIGH also reports hours worked in the previous week for the main job but also for secondary jobs where applicable. If the individual monthly labour income is divided by the total amount of hours worked in the previous week, adding up hours from main and secondary jobs, then a proxy of the wage is estimated. Models four, five and six are equivalent to the previous models one, two and

three, but instead of the natural logarithm of the individual monthly labour income, on the left hand side of the equation is the natural logarithm of the proxy-wage estimated by the monthly labour income and the total number of hours worked in the previous week.

The first thing to note is that the wage gap between indigenous and non-indigenous populations is a lot bigger than the income gap - 22.6 percent versus 12.5 percent . This means that for the indigenous population to get closer to the income level of the non-indigenous, they need to work much longer hours. A second important result is that the unexplained part of the wage gap is also higher. Even in model six, where locality size and regional differences are taken into account, 23.7 percent of the wage gap remains unexplained in the case of the threefold method and 35.5 percent is unexplained using the pooled method. A third important result is that the part that is unexplained in the wage gap, as a percentage of the indigenous average proxy-wage, the bottom line in Table 5.3 that says discrimination, is twice the value in the monthly income estimate.

Table 5.3 Oaxaca-Blinder Decomposition of Individual Proxy-Wage for Indigenous and Non-Indigenous Populations, 2012

Threefold	Model 4	Model 5	Model 6
Endowments	0.3381	0.5400	0.6199
Coefficients	0.4828	0.3846	0.3034
Interaction	-0.0084	-0.1122	-0.1109
Unexplained	0.4743	0.2724	0.1925
Total	0.8124	0.8124	0.8124
Wage gap %	22.61	22.61	22.61
Unexplained %	58.39	33.53	23.70
Discrimination %	13.20	7.58	5.36

Pooled	Model 4	Model 5	Model 6
Quantity effect	0.3316	0.4396	0.5243
Unexplained	0.4808	0.3728	0.2881
Total	0.8124	0.8124	0.8124
Wage gap %	22.61	22.61	22.61
Unexplained %	59.18	45.88	35.46
Discrimination %	13.38	10.37	8.02

Source: Own elaboration

To conclude this section, it is important to mention that while much of the income or wage gap between indigenous and non-indigenous populations is explained

by locality size and regional disparities, as well as schooling, there is a percentage that remains unexplained which could be attributable to ethnic discrimination in the labour markets. This supports the idea that in addition regional difference, and in particular to the fact that the indigenous are settled in more remote rural areas, markets also play a role in slowing down improvement of indigenous well-being.

In the next section, an innovative way of measuring discrimination is presented. The method combines the results of the multidimensional poverty measure for both groups and the propensity score match methodology.

5.4 The Indigenous "effect" in the Multidimensional Poverty Measure

Chapter two showed how, in the official multidimensional poverty measure in Mexico, the indigenous population is strictly poorer than the non-indigenous. However, it could be argued that the different poverty figures rely on different characteristics, for example, on the fact that most of the indigenous population live in rural areas. A fairer comparison would be to not only compare indigenous and non-indigenous in localities of the same size, but with similar characteristics in as many observable variables as possible. For example, individuals of same sex and age, living in households of the same size and working in the same industry, with the same position. There is no standard methodology for this, but a methodology that is inspired by medical treatment and that is commonly used to evaluate the impact of social programmes could be used: the propensity score match.

The propensity score match has the objective of estimating the effect of a "treatment" on the population. The word treatment is an inherited term from the medical

sciences and it sounds misleading in the social sciences, in particular when the "treatment" is a social programme. However, I am going to stick to the term to explain the methodology. To understand how it works let us assume that we have two subgroups: one "under treatment" and one "not under treatment". The impact of the treatment in an individual i can be observed in the outcome variable y the difference with and without treatment, or formally:

$$\delta = y_{1i} - y_{0i}$$

Where y_{1i} is the outcome of individual i with treatment and y_{0i} without treatment. However, individuals are either in the treatment group or in the non-treatment group, also called the control group. Thus, it is impossible to observe the outcome for the same individual with and without treatment. The propensity score match methodology helps to estimate those counterfactuals by finding people with similar characteristics that are treated and non-treated. A fundamental assumption is that treatment effect satisfies some exogeneity.

As explained by Caliendo and Kopeining, this "implies that systematic differences in outcomes between treated and comparison individuals with the same values for covariates are attributable to treatment" (M. Caliendo and Kopeinig 2008, 35). This assumption is called *unconfoundedness for controls* and it means that the potential outcomes (y) should be independent of treatment, conditional on covariates. The propensity score is the probability of an individual participating in a treatment given some observed covariates. According to Rosembaum and Rubin (1983), if potential outcomes are independent of treatment conditional on covariates, they are also independent of treatment conditional on a balancing score, as it is the propensity score (M. Caliendo and Kopeinig 2008).

Through a probit or logit regression, a score is generated for both the treatment and control groups, and then paired. A second assumption is that there is enough overlap between the treated and control groups in terms of the covariates, also known as common support. If there is no common support then the match is not possible, and if there is little common support, the match will be of poor quality.

A key step when using a propensity score match is the selection of the matching technique. The most common are: nearest neighbours, with or without replacement; caliper and radius; stratification and interval and; kernel and local linear (M. Caliendo and Kopeinig 2008). Once the match has been done, it is possible to estimate the average treatment effect (ATE), the average treatment effect of the treated (ATT) and the average treatment effect of the untreated (ATU).[76]

Good estimation of the ATT depends greatly on the assumptions to be fulfilled. However, there are unobservable characteristics that cannot be included in the covariates. Marco Caliendo, et. al. (2014) enlist personality traits, attitudes, expectations, and job search behaviour among unobservable characteristics that could influence a selection bias into treatment. The indigenous worldview may have an effect into all these unobservable characteristics and then, mistakenly attribute as ethnic discrimination something else. On the other hand, at least in Caliendo et. al. study of the German labour market, taking into account the usual unobservable variables did not make a significant difference in the estimation of the treatment effect.

Three things are necessary to defined for the indigenous effect on multidimensional poverty to be estimated: the treatment, the outcome and the covariates. In this case, the outcome is the multidimensional poverty - an individual is either poor or not poor; and the treatment is the ethnic condition - the treated are the

[76] For further information on propensity score matches see also Dehejia and Wahba (2002).

indigenous, and the control group is the non-indigenous.[77] There are poor and non-poor in both subgroups. The headcount for each subgroup is basically equivalent to the probability of being poor. For the indigenous the probability of being multidimensional poor is about 0.7075, for the non-indigenous it is 0.4407, which means a gap of 0.2667.[78] In this case, the propensity score match is a methodology used to see how much of this gap can be explained by other factors - the covariates that were mentioned before. The proportion that is not explained by the covariates is attributable to the treatment, under the *unconfoundedness* assumption, in this case to being indigenous. A positive treatment effect in this case would suggest certain evidence of discrimination against the indigenous.

Accuracy of the estimation depends greatly on the covariates. In order to preserve the *unconfoundedness* assumption, all variables that have a direct relationship to the multidimensional poverty measure were not included as controls. The covariates include: sex and marital status as demographic characteristics; household characteristics such as size, number of members between 12 and 64 years old, members above 65 years of age and over, number of occupied (employed) members, number of income earners and household type; dwelling type; locality size and state such as geographical characteristics; work related characteristics such as employment status, number of jobs, position and working hours; and finally, firm characteristics such as industry and type of firm. The variables: marital status, type of household, type of dwelling, locality size, state, employment status, number of jobs, industry, type of firm and position were dichotomized.

[77] When these results were presented in the OPHI workshop on Monetary and Multidimensional Poverty the definition of the treatment as being indigenous raised some confusion. To explain the methodology I used a simplistic parallelism with the medical sciences, as if poverty was the illness and the propensity score match would help to see the effect of the *indigenous pill* that some people take and others do not.

[78] These numbers vary a little in comparison with the headcount in Chapter 2 because they are not weighted.

Table 5.4 Probit Regression Output for Propensity Score

Probit regression	Number of obs =	Coef.	Std. Err.	z	P>|z|	[95% Conf. Lower	Interval] Upper
Demographic characteristics							
Sex		-0.0137	0.0097	-1.41	0.159	-0.0328	0.0054
Age		0.0004	0.0004	0.96	0.336	-0.0004	0.0013
Partnership (common law)		0.0952	0.0262	3.63	0.000	0.0437	0.1466
Separated		-0.0459	0.0263	-1.74	0.081	-0.0974	0.0057
Divorced		-0.1137	0.0358	-3.18	0.001	-0.1837	-0.0436
Widow		-0.3196	0.0648	-4.93	0.000	-0.4466	-0.1927
Single		0.0909	0.0370	2.46	0.014	0.0183	0.1634
Married		-0.0142	0.0203	-0.70	0.484	-0.0540	0.0256
Household characteristics							
Household size		0.0759	0.0055	13.89	0.000	0.0652	0.0866
Number of members 12-64 y.o.		-0.0369	0.0062	-5.93	0.000	-0.0491	-0.0247
Number of members 65+ y.o.		0.0239	0.0107	2.24	0.025	0.0030	0.0448
Number of occupied		0.1399	0.0097	14.45	0.000	0.1209	0.1589
Number of earners		0.0742	0.0037	19.83	0.000	0.0668	0.0815
Number of occupied earners		-0.1347	0.0099	-13.56	0.000	-0.1542	-0.1152
One person household		-0.0592	0.0826	-0.72	0.474	-0.2212	0.1027
Nuclear family		-0.1169	0.0773	-1.51	0.131	-0.2685	0.0347
Extended family		-0.1680	0.0777	-2.16	0.031	-0.3204	-0.0157
Composite household		-0.2918	0.0849	-3.44	0.001	-0.4582	-0.1255
Dwelling characteristics							
Detached house		0.6973	0.1772	3.93	0.000	0.3499	1.0447
Apartment		0.6121	0.1805	3.39	0.001	0.2584	0.9658
Slum		1.2197	0.1790	6.82	0.000	0.8689	1.5704
Room in roof		0.3196	0.2329	1.37	0.170	-0.1370	0.7761
Not aimed for accommodation		1.2282	0.2254	5.45	0.000	0.7864	1.6699
Geographical characteristics							
Locality with 100,000+ people		-0.6449	0.0145	-44.46	0.000	-0.6733	-0.6164
Locality with 15,000-99,999 people		-0.3387	0.0146	-23.15	0.000	-0.3674	-0.3100
Locality with less than 2,500 people		0.0707	0.0120	5.89	0.000	0.0472	0.0942
Aguascalientes		-1.2249	0.0719	-17.04	0.000	-1.3657	-1.0840
Baja California		-0.2436	0.0472	-5.16	0.000	-0.3362	-0.1510
Baja California		-0.3081	0.0455	-6.78	0.000	-0.3972	-0.2190
Campeche		0.6983	0.0378	18.47	0.000	0.6242	0.7723
Coahuila		-1.1202	0.0746	-15.02	0.000	-1.2663	-0.9740
Colima		-0.7740	0.0569	-13.60	0.000	-0.8855	-0.6625
Chiapas		0.6738	0.0374	18.00	0.000	0.6004	0.7471
Chihuahua		-0.4397	0.0515	-8.54	0.000	-0.5406	-0.3388
Durango		-1.2373	0.0670	-18.47	0.000	-1.3686	-1.1060
Guanajuato		-1.5361	0.0800	-19.20	0.000	-1.6929	-1.3793
Guerrero		0.4711	0.0383	12.29	0.000	0.3960	0.5462
Hidalgo		0.2753	0.0385	7.14	0.000	0.1997	0.3508
Jalisco		-1.0317	0.0625	-16.52	0.000	-1.1541	-0.9093
México		-0.0626	0.0404	-1.55	0.121	-0.1417	0.0166
Michoacán		-0.5702	0.0449	-12.69	0.000	-0.6582	-0.4822
Morelos		-0.3418	0.0432	-7.91	0.000	-0.4264	-0.2571
Nayarit		-0.1144	0.0413	-2.77	0.006	-0.1953	-0.0335
Nuevo León		-0.3266	0.0492	-6.64	0.000	-0.4229	-0.2302
Oaxaca		1.0132	0.0374	27.08	0.000	0.9399	1.0865
Puebla		0.2192	0.0383	5.73	0.000	0.1442	0.2942
Querétaro		-0.7917	0.0497	-15.92	0.000	-0.8892	-0.6942
Quintana Roo		1.2913	0.0364	35.49	0.000	1.2200	1.3626
San Luis Potosí		0.1352	0.0396	3.41	0.001	0.0575	0.2129
Sinaloa		-0.6660	0.0493	-13.52	0.000	-0.7626	-0.5695
Sonora		-0.2023	0.0447	-4.52	0.000	-0.2900	-0.1146
Tabasco		0.5201	0.0442	11.76	0.000	0.6067	0.4334
Tamaulipas		-0.4203	0.0498	-8.43	0.000	-0.5180	-0.3226
Tlaxcala		-0.3524	0.0414	-8.51	0.000	-0.4335	-0.2713
Veracruz		0.0294	0.0403	0.73	0.466	-0.0495	0.1083
Yucatán		1.5658	0.0374	41.84	0.000	1.4925	1.6392
Zacatecas		-1.3404	0.0675	-19.86	0.000	-1.4727	-1.2081
Employment characteristics							
Not economically active		-0.0250	0.0218	-1.15	0.251	-0.0678	0.0177
Employed		-0.1962	0.0382	-5.14	0.000	-0.2711	-0.1213
Unemployed		-0.0522	0.0376	-1.39	0.165	-0.1259	0.0215
Hours worked		-0.0006	0.0003	-1.80	0.072	-0.0013	0.0001
Number of jobs		0.1585	0.0249	6.38	0.000	0.1098	0.2073
Subordinated job		-0.1543	0.0949	-1.63	0.104	-0.3403	0.0317
Not independent		-0.1699	0.1111	-1.53	0.126	-0.3877	0.0479
Personnel below		0.3016	0.3229	0.93	0.350	-0.3313	0.9344
No personnel below		0.4834	0.3224	1.50	0.134	-0.1485	1.1154
Firm characteristics							
Industrial firm		-0.1021	0.3195	-0.32	0.749	-0.7283	0.5241
Commercial firm		-0.4158	0.3192	-1.30	0.193	-1.0415	0.2098
Services firm		-0.5272	0.3194	-1.65	0.099	-1.1532	0.0989
Agricultural firm		-0.0172	0.3189	-0.05	0.957	-0.6421	0.6078
Animal husbandry firm		-0.3176	0.3208	-0.99	0.322	-0.9464	0.3112
Collecting firm		0.5090	0.3528	1.44	0.149	-0.1826	1.2005
Fishing firm		-0.9380	0.3419	-2.74	0.006	-1.6082	-0.2678
Independent or familiar firm		0.2097	0.0824	2.55	0.011	0.0482	0.3712
Private sector company		0.0682	0.0834	0.82	0.413	-0.0952	0.2317
Government		0.0892	0.0845	1.05	0.291	-0.0765	0.2549
Intercept		-2.1432	0.1968	-10.89	0.000	-2.5288	-1.7575
Log likelihood = -51283.895	Pseudo R2 =	LR chi2(76) = 46957.19		Prob> chi = 0.000			

Source: Own elaboration

The selected matching method was nearest neighbour without replacement, in descending order, eliminating tails in the common support and tying controls as well as the propensity score. With this method the common support was 47,549 - of whom 23,672 were untreated and 23,908 were treated. Off support were 165,091 untreated and only 31 treated, which suggest basically all treated cases had a match to compare with. The difference between the indigenous and the non-indigenous in terms of the average treatment effect on the treated (ATT) is 0.1287. It is worth bearing in mind that this is a counterfactual that does not exist - in other words, this means that, if the indigenous population could stop being indigenous, their probability of being poor would be lower; 12.87 per cent points to be 0.5785 instead of 0.7072 (See Table 5.5).

Table 5.5 Estimated Effects for Treatment and Control Groups

Sample	Treated	Controls	Difference	S.E.	T-stat
Unmatched	0.7075	0.4407	0.2667	0.0034	78.97
ATT	0.7072	0.5785	0.1287	0.0039	32.66
ATU	0.5990	0.7072	0.1082		
ATE			0.1185		

Source: Own elaboration

The average treatment effect (ATE) is 0.1185, as shown in Table 5.5. This means that 44.4 per cent of the gap between the indigenous and non-indigenous populations in terms of multidimensional poverty is explained by ethnicity. The part of the differences that remains unexplained by the controls, the part of multidimensional poverty that is attributable to being indigenous, suggests that there is something not observed by the covariates that makes the indigenous population poorer. This could be considered evidence of discrimination against the indigenous.

These results complement the ones obtained with the Oaxaca-Builder decomposition in the previous section. While in terms of labour earnings the unexplained gap between indigenous and non-indigenous populations closes

significantly when the geographical variables are considered, in the case of the probability of being multidimensionally poor, the share of the gap that could be attributed to discrimination is considerable. These results suggest that ethnic discrimination has a greater effect, in terms of multidimensional poverty, than of labour earnings.

Both PSM and Oaxaca-Blinder studies showed here fill an important gap in the literature of ethnic discrimination in Mexico. While basic Oaxaca-Blinder models resemble what was found by Alejandro Ramirez (2006) – an earning gap of 59 percent between workers in indigenous and non-indigenous municipalities, in which unexplained factors accounted for 41 percent – his method for distinguishing the indigenous from the non-indigenous was flawed.

Also, taking into account the geographic elements to explain income and earning gaps is important. Regional differences and particularly locality size helps complete the circle. Indigenous poverty can be explained because they live in remote rural places and much of their well-being depends on state interventions. However, it is relatively harder and more expensive to reach those remote places. Additionally, the indigenous are discriminated against in the labour markets and about half of the gap in terms of the probability of being poor, between indigenous and non-indigenous, could be attributable to discrimination.

As a result, this chapter is not only innovative in terms of using the Oaxaca-Blinder decomposition with a refined way of identifying the indigenous, it also uses the Propensity Score Match methods to support the study of discrimination and, even more important, completes a narrative of the vicious circle of poverty for the indigenous population in Mexico.

5.5 Qualitative Analysis

When Marcela told me her boss at the university harassed her because she wore her traditional indigenous clothes, I was in shock. She was already a scholar pursuing an academic career, with an amazing ability to express herself. I remember her as a tall robust woman, with a lot personality, and obviously very proud of her indigenous background. If she wanted she could have disguised her indigeneity and blended in as a mestizo in society. Her Spanish was perfect and her looks could be the one of any other average Mexican woman. There was nothing in the way she spoke or her phenotype that could be said to be undeniably indigenous. It seems clear it was her clothes what gave her away - it was her clothes the reason she was harassed at work, but abandon her garments was something she was not willing to do and so she was forced to quit her job.

Not everyone is as outspoken as Marcela. As a matter of fact, if seems that talking about discrimination is an uneasy conversation topic to have with a stranger. For example, data collected from the survey held in Coatepec and San Martín Totoltepec, Puebla, shows that when asked "where do you think the indigenous population is discriminated against?", it is the non-indigenous the group showing higher percentages for “everywhere”. Also, a higher percentage of the non-indigenous answered that the indigenous are discriminated “nowhere”, which could be interpreted as claiming that there is no discrimination against the indigenous. Table 5.6 suggests that the indigenous population rate of response for questions regarding ethnic discrimination is less than for the non-indigenous.[79]

[79] This is also supported by the number of surveyed who did not respond questions about discrimination, 13 indigenous versus only 3 non-indigenous. Some of the respondents contradicted themselves, saying that the indigenous population was discriminated against nowhere and somewhere at the same time. These happened 5 times in the indigenous and 8 times in the non-indigenous respondents. The apparent contradiction, however, could be also due to a flawed question design or imprecision in the collection of data.

Rene, for example, thinks that discrimination exists within the indigenous communities, but it is class discrimination, not ethnicity. Rene is an indigenous graduate student from Veracruz. When asked about the equality of opportunities, he said that sometimes affirmative action policies can play in favour of the indigenous population. For him, ethnic discrimination is not among his concerns.

Table 5.6 Percentage of the Population who Think the Indigenous Populations Discriminated Against, by Ethnic Condition

Where…?	Non-indigenous	Indigenous	Total
Nowhere	44.02	37.40	41.14
Everywhere	31.68	23.79	28.17
At school	41.06	27.10	34.11
At work	47.04	35.38	41.15
In the market	36.07	27.60	31.81
On the street	36.07	31.65	33.85
Out of the community	66.34	61.80	64.02

Source: Own elaboration, using data collected during fieldwork,2011

Marcela, who was clearly discriminated in her job for wearing indigenous clothes, did not feel the indigenous population had less opportunities. On the other hand, what researchers have in mind, in terms of concepts and definitions, do not always matches those of the interviewees'. For example, sometimes my question was if they thought the indigenous population had a disadvantage in comparison to the non-indigenous. To me it was clear that I meant fewer opportunities, but some of them interpreted as if I was suggesting they belonged to an inferior category. In those cases they answered defensively saying that it was not a disadvantage to be indigenous.

In order to build a story of those who think the indigenous are discriminated against, a dummy variable was created, with value zero if they responded nowhere in the discrimination questions, and value one if answered positive to any of the remaining questions. Those who contradicted themselves were reclassified as missing. 41 cases do not believe the indigenous population are discriminated against but 132 do, while 13

cases contradicted themselves. Another group of 37 cases did not answer the questions related to discrimination. Of the total 173 cases with information, 92 are non-indigenous and 81 indigenous. Of the 13 who contradicted themselves, 8 are non-indigenous and 5 indigenous. On the other hand, of the 37 with missing information regarding discrimination, 5 are non-indigenous and 32 are indigenous.

There seems to be some reluctance from the indigenous to talk about discrimination, according to the data from collected during fieldwork. The indigenous, however, are more inclined than the non-indigenous to think that they are discriminated against. Only 16 of 81 indigenous responses answered that they were not discriminated against, versus 25 of 92 non-indigenous responses. Furthermore, of those 92 non-indigenous, 28 declared to have an indigenous background and 24 of them said the indigenous are discriminated against.

During fieldwork, some people commented that being able to speak an indigenous language had been lost at some point in their families or for different reasons, but all of the reasons included an implicit discriminatory element. For example, in an interview in Chiapas, Juan told me that he does not speak an indigenous language, but his ancestors did. He explained that this was because, in order to earn more money, his parents learnt Spanish - stopping the transmission of the indigenous language to the younger generations.

Table 5.7 Perception of Indigenous Discrimination

Indigenous discrimination	Non-indigenous	Indigenous	Total
No	25	16	41
Yes	67	65	132
Total	92	81	173

Source: Own elaboration

The newly created discrimination dummy variable is analyzed in the context of multidimensional poverty. In Chapter 2 the official multidimensional poverty measure was used to study poverty among the indigenous and non-indigenous populations.

However, since income data collected in the fieldwork survey is not good as only six social rights where used to identify the poor in the fieldwork municipalities. In the case of the official poverty measure, the rule is that an individual must be deprived in income and at least one of the six social rights in order to be considered poor. For the fieldwork survey, identification of the poor follows the social rights criterion: if someone is deprived in at least one social right, then they are considered to be poor.

The number of poor is 203 out of 223 in the fieldwork municipalities, although there are 15 cases with missing data, which means that only 5 are non-poor. Eliminating cases with missing data in multidimensional poverty and discrimination, there are 161 cases left. All 5 non-poor cases think that the indigenous are discriminated against. Of the remaining 156 cases, all of them poor, 120 think that the indigenous are discriminated against and only 36 think they are not. In a way, most of the poor, about three quarters, regardless of their ethnic background, think that the indigenous are discriminated against. However, this result is not as strong as it sounds since most people in the municipalities are poor and most people think the indigenous are discriminated against. A stronger link could be found with extreme poverty.

According to the official measure in Mexico, extreme multidimensional poverty is observed when an individual is deprived in three or more dimensions and simultaneously shows an income below the minimum economic well-being line. Without income data, the rule for the fieldwork municipalities is just being deprived in three or more dimensions. In the fieldwork municipalities, 138 households were extremely poor and 70 were not. 47 of them however had missing information regarding discrimination. Considering only with complete information, 99 were extremely poor and 62 were not. Of those in extreme poverty, 76 think that the indigenous are discriminated against, while 23 think otherwise. And for the non-extreme poor, 62

believe the indigenous are discriminated and 13 believe the opposite. In short, the proportion of those who think the indigenous are discriminated is somewhat consistent, regardless of the extreme poverty status.

On the other hand, there could be a relationship between ethnic discrimination and social mobility in the fieldwork municipalities. Using the absolute intergenerational social mobility indicator that was introduced in chapter four, those who think that the indigenous are discriminated against showed achievement improvement in 18.9 percent of the indicators or dimensions, on average, while those who did not think the indigenous are discriminated had achievement improvements in 21.3 percent, on average.

5.6 Conclusions

This chapter showed empirical evidence supporting the hypothesis that the indigenous are discriminated in the labour markets. This is a key piece of information in the vicious cycle of indigenous poverty to be explained in the next chapter. In chapter two it was shown how the indigenous population is multidimensionally poorer than the non-indigenous. A good share of poverty dimensions need state intervention to be surpassed, which means the indigenous well-being depends more on the state.

In chapter four, fieldwork survey showed those with indigenous background but who do not speak the language anymore have higher social mobility that indigenous speaker, which could be related to ethnic discrimination. In chapter three, the measure of remoteness introduced revealed that the indigenous population is more dispersed in geographically isolated localities. But for the state, is more expensive to reach those remote rural localities.

The literature on discrimination in economics was reviewed here. Since one of the aims of the chapter was to quantify ethnic discrimination in Mexico, the economic literature offered a good departure point. In particular, two debates were summarized - one concerning the theoretical formulation to explain why discrimination exists in the labour markets and, the other, regarding the ways to measure it. Empirical studies regarding ethnic discrimination in Mexico were also surveyed, concluding that its study is not in its infancy - it has not born yet.

The following section explained the Oaxaca-Blinder decomposition and presented results for the Mexican case. The Oaxaca-Blinder decomposition is a very creative way of breaking and combining income or wage econometric regressions to explain gaps between groups. There is a share of the gap that is explained by differences in covariates of both groups, for example, schooling and work experiences. The remaining share of the gap, the unexplained part, could be attributed to discrimination. Two versions of this methodology were used in this chapter, one in which the indigenous coefficients were used as reference and, the other, where coefficients estimated from a pooled regression were used as reference.

The analysis of the Oaxaca-Blinder decomposition drew two important results. The first is that there are important geographical components that explain the income gap. In particular, locality size shows that the impact on income is because the indigenous are relatively more concentrated in rural areas, which supports the findings in chapter three on remoteness. Also, when regional differences are taken into account the explained part of the income gap increases. The second result, however, shows how when wage gaps are estimated, instead of income, the gap almost doubles its size, which suggests that the indigenous population works much harder to compensate for lower wages.

As a way to explain the gap between indigenous and non-indigenous in terms of multidimensional poverty, an innovative way of estimating discrimination was also presented. As shown in chapter two, the proportion of the poor indigenous is higher than the non-indigenous, but the gap could also be explained by regional differences, type of household, etcetera. As in the Oaxaca-Blinder decomposition, there is a share of the gap that remains unexplained and could be attributed to discrimination. In this case the methodology is a Propensity Score Match (PSM). This method, originally developed for the medical sciences, compares individuals with similar characteristics to see whether a treatment is having an effect or not - although in this particular case the term has a very particular interpretation since the indigenous are the treated group while the non-indigenous are the untreated group.

The *treatment effect* is 44.4 percent of the gap between indigenous and non-indigenous, after controlling for a number of variables, including geographical, characteristics of the dwelling, characteristics of the household, and more. That means that an average indigenous person has a 11.9 percent points higher probability of being multidimensionally poor than an average non-indigenous individual, with similar characteristics. The fact that almost half of the gap in the probability of being poor is explained by the ethnic background, represents very strong empirical evidence that discrimination against the indigenous population in Mexico has an effect on their living standards, but also reflects the horizontal inequalities between these two groups.

The final section included qualitative analysis derived from the data collected during fieldwork in 2011. Fieldwork data consists on sixty interviews and more than two hundred questionnaires, held mainly in two municipalities in the state of Puebla. One of the municipalities is predominantly indigenous, Coatepec, while the other is

primarily non-indigenous. Some of the interviews, on the other hand, where conducted also in Chiapas and Veracruz.

Among the findings in the qualitative analysis, ethnic discrimination is not an easy topic to address. Researchers need to be careful regarding their interpretation of data, since sometimes concepts are different between interviewer and interviewee. Despite that, discrimination against the indigenous exists and more policies and institutions to prevent it are needed. Another finding is that there seems to be little relation between perceptions of ethnic discrimination and poverty level, although class discrimination is also present. Finally, social mobility and discrimination do have a relationship.

To summarize, this chapter made two main contributions to knowledge. The first was the empirical study of ethnic discrimination in labour markets using the Oaxaca-Blinder decomposition. It would be great to have critics of this work because much more discussion on ethnic discrimination in Mexico is needed. The second is an innovative way to use the PSM as a method for studying discrimination. Findings for the Mexican case are relevant; they suggest that the differences between the indigenous and non-indigenous populations increase as we approach the bottom of the socioeconomic ladder. Additionally, it gave a key piece to form the vicious cycle of indigenous poverty.

Annex 5.1

Model 1: Monthly labour income based on MCS-ENIGH 2012
(Standard errors in parenthesis)

	Indigenous	Non-Indigenous	Pooled
Schooling	0.1561	0.1525	0.1534
	(0.0002)	(0.0000)	(0.0000)
Age	0.0184	0.0259	0.0251
	(0.0000)	(0.0000)	(0.0000)
Sex	0.7094	0.5585	0.5722
	(0.0014)	(0.0004)	(0.0004)
Indigenous			-0.4761
			(0.0006)
Intercept	4.8207	5.1345	5.1482
	(0.0026)	(0.0007)	(0.0007)
R^2	0.2046	0.2915	0.3017
Adjusted R^2	0.2046	0.2915	0.3017
ln(labour income)	7.0385	7.9196	
	(0.0008)	(0.0002)	
Difference	0.8811		
	(0.0008)		

Note: All coefficients are statistically significant at 99 percent or more, except ones marked with * which are not significant at 90 percent of confidence.

Model 2: Monthly labour income, with locality size, based on MCS-ENIGH 2012

(Standard errors in parenthesis)

	Indigenous	Non-Indigenous	Pooled
Schooling	0.1308	0.1378	0.1374
	(0.0002)	(0.0000)	(0.0000)
Age	0.0179	0.0249	0.0241
	(0.0000)	(0.0000)	(0.0000)
Sex	0.7496	0.5740	0.5900
	(0.0014)	(0.0004)	(0.0004)
Locality 100,000+ people	0.7068	0.2680	0.3030
	(0.0019)	(0.0006)	(0.0005)
Locality 15,000-99,999 people	0.4740	0.1203	0.1542
		(0.0007)	(0.0006)
Locality less than 2,500 people	-0.3300	-0.2603	-0.2763
	(0.0017)	(0.0006)	(0.0006)
Indigenous			-0.3551
			(0.0006)
Intercept	4.9177	5.1892	5.1935
	(0.0028)	(0.0008)	(0.0008)
R2	0.2648	0.3088	0.3217
Adjusted R2	0.2648	0.3088	0.3217
ln(labour income)	7.0385	7.9196	
	(0.0008)	(0.0002)	
Difference	0.8811		
	(0.0008)		

Note: All coefficients are statistically significant at 99 percent or more, except ones marked with * which are not significant at 90 percent of confidence.

Model 3: Monthly labour income, with locality size and state, based on MCS-ENIGH 2012 (Standard errors in parenthesis)

	Indigenous	Non-Indigenous	Pooled
Schooling	0.1321	0.1362	0.1359
	(0.0002)	(0.0000)	(0.0000)
Age	0.0188	0.0247	0.0239
	(0.0000)	(0.0000)	(0.0000)
Sex	0.7173	0.5610	0.5759
	(0.0014)	(0.0004)	(0.0003)
Locality 100,000+ people	0.4290	0.1568	0.1839
	(0.0023)	(0.0006)	(0.0006)
Locality 15,000-99,999 people	0.4069	0.1016	0.1328
	(0.0025)	(0.0007)	(0.0006)
Locality less than 2,500 people	-0.3289	-0.2337	-0.2446
	(0.0017)	(0.0006)	(0.0006)
Aguascalientes	-0.2337	-0.2825	-0.2920
	(0.0296)	(0.0017)	(0.0017)
Baja California	0.2309	0.2666	0.2610
	(0.0076)	(0.0012)	(0.0012)
Baja California	0.3528	-0.0467	-0.0278
	(0.0117)	(0.0022)	(0.0022)
Campeche	-0.5112	-0.3438	-0.3541
	(0.0060)	(0.0022)	(0.0020)
Coahuila	0.1370	-0.2928	-0.3032
	(0.0156)	(0.0012)	(0.0012)
Colima	-0.0153	-0.0952	-0.1018
	(0.0255)*	(0.0021)	(0.0022)
Chiapas	-0.3428	-0.4291	-0.3836
	(0.0045)	(0.0012)	(0.0011)
Chihuahua	0.5328	-0.0717	-0.0662
	(0.0084)	(0.0011)	(0.0012)
Durango	0.1660	-0.3657	-0.3667
	(0.0231)	(0.0016)	(0.0016)
Guanajuato	-0.1799	-0.1372	-0.1444
	(0.0151)	(0.0010)	(0.0010)
Guerrero	-1.0179	-0.6035	-0.6753
	(0.0047)	(0.0013)	(0.0012)
Hidalgo	-0.3271	-0.3534	-0.3201
	(0.0048)	(0.0014)	(0.0013)
Jalisco	-0.0555	-0.2132	-0.2222
	(0.0104)	(0.0009)	(0.0009)
México	-0.2594	-0.0107	-0.0190
	(0.0042)	(0.0008)	(0.0008)
Michoacán	-0.7356	-0.1737	-0.1958
	(0.0063)	(0.0011)	(0.0011)
Morelos	-0.1835	-0.3520	-0.3367
	(0.0075)	(0.0014)	(0.0014)
Nayarit	-0.3934	-0.3810	-0.3789
	(0.0091)	(0.0018)	(0.0018)
Nuevo León	0.0742	0.1032	0.0950
	(0.0073)	(0.0010)	(0.0010)
Oaxaca	-0.7017	-0.4489	-0.5155
	(0.0044)	(0.0014)	(0.0012)
Puebla	-0.5400	-0.4172	-0.4148
	(0.0046)	(0.0010)	(0.0010)
Querétaro	-0.5719	-0.0995	-0.1082
	(0.0115)	(0.0014)	(0.0014)
Quintana Roo	-0.2636	0.0071	0.0066
	(0.0046)	(0.0018)	(0.0016)
San Luis Potosí	-0.9496	-0.3976	-0.4557

	Indigenous	Non-Indigenous	Pooled
	(0.0057)	(0.0013)	(0.0013)
Sinaloa	-0.4800	-0.2622	-0.2703
	(0.0095)	(0.0012)	(0.0012)
Sonora	-0.3063	-0.2207	-0.2254
	(0.0069)	(0.0012)	(0.0012)
Tabasco	-0.4928	-0.3635	-0.3636
	(0.0079)	(0.0014)	(0.0014)
Tamaulipas	-0.3777	-0.2103	-0.2191
	(0.0090)	(0.0011)	(0.0012)
Tlaxcala	-0.2591	-0.3644	-0.3392
	(0.0083)	(0.0018)	(0.0018)
Veracruz	-0.6168	-0.3281	-0.3548
	(0.0046)	(0.0009)	(0.0009)
Yucatán	-0.5713	-0.3727	-0.3830
	(0.0043)	(0.0017)	(0.0014)
Zacatecas	-0.5008	-0.5713	-0.5704
	(0.0233)	(0.0016)	(0.0017)
Indigenous			-0.2785
			(0.0006)
Intercept	5.4535	5.4721	5.4857
	(0.0048)	(0.0011)	(0.0011)
R2	0.2885	0.3246	0.3374
Adjusted R2	0.2885	0.3246	0.3374
ln(proxy-wage)	7.0385	7.9196	
	(0.0008)	(0.0002)	
Difference	0.8811		
	(0.0008)		

Note: All coefficients are statistically significant at 99 percent or more, except ones marked with * which are not significant at 90 percent of confidence.

Model 4: Proxy-wage based on MCS-ENIGH 2012
(Standard errors in parenthesis)

	Indigenous	Non-Indigenous	Pooled
Schooling	0.1188	0.1175	0.1180
	(0.0001)	(0.0000)	(0.0000)
Age	0.0076	0.0138	0.0131
	(0.0000)	(0.0000)	(0.0000)
Sex	0.1920	0.1886	0.1888
	(0.0012)	(0.0003)	(0.0003)
Indigenous			-0.4808
			(0.0005)
Intercept	2.3573	2.6090	2.6305
	(0.0024)	(0.0006)	(0.0006)
R2	0.1560	0.2397	0.2614
Adjusted R2	0.1560	0.2397	0.2614
ln(labour income)	3.5933	4.4057	
	(0.0006)	(0.0002)	
Difference	0.8124		
	(0.0007)		

Note: All coefficients are statistically significant at 99 percent or more, except ones marked with * which are not significant at 90 percent of confidence.

Model 5: Proxy-wage, with locality size, based on MCS-ENIGH 2012
(Standard errors in parenthesis)

	Indigenous	Non-Indigenous	Pooled
Schooling	0.0965	0.1039	0.1033
	(0.0000)	(0.0000)	(0.0000)
Age	0.0071	0.0128	0.0121
	(0.0000)	(0.0000)	(0.0000)
Sex	0.2351	0.2051	0.2079
	(0.0012)	(0.0003)	(0.0003)
Locality 100,000+ people	0.5064	0.2366	0.2528
	(0.0016)	(0.0005)	(0.0004)
Locality 15,000-99,999 people	0.2828	0.1105	0.1237
	(0.0021)	(0.0005)	(0.0005)
Locality less than 2,500 people	-0.3938	-0.2389	-0.2697
	(0.0014)	(0.0005)	(0.0005)
Indigenous			-0.3728
			(0.0005)
Intercept	2.5233	2.6683	2.6946
	(0.0025)	(0.0007)	(0.0007)
R2	0.2283	0.2637	0.2885
Adjusted R2	0.2283	0.2637	0.2885
ln(proxy-wage)	3.5933	4.4057	
	(0.0006)	(0.0002)	
Difference	0.8124		
	(0.0007)		

Note: All coefficients are statistically significant at 99 percent or more, except ones marked with * which are not significant at 90 percent of confidence.

Model 6: Proxy-wage, with locality size and state, based on MCS-ENIGH 2012
(Standard errors in parenthesis)

	Indigenous	Non-Indigenous	Pooled
Schooling	0.0960	0.1027	0.1021
	(0.0001)	(0.0000)	(0.0000)
Age	0.0077	0.0129	0.0122
	(0.0000)	(0.0000)	(0.0000)
Sex	0.2203	0.1978	0.2001
	(0.0012)	(0.0003)	(0.0003)
Locality 100,000+ people	0.3519	0.1449	0.1585
	(0.0019)	(0.0005)	(0.0005)
Locality 15,000-99,999 people	0.2553	0.0883	0.1018
	(0.0021)	(0.0005)	(0.0005)
Locality less than 2,500 people	-0.3673	-0.2186	-0.2423
	(0.0015)	(0.0005)	(0.0005)
Aguascalientes	-0.2418	-0.0853	-0.0935
	(0.0239)	(0.0014)	(0.0014)
Baja California	0.2061	0.2267	0.2217
	(0.0064)	(0.0010)	(0.0010)
Baja California	0.2814	0.1312	0.1381
	(0.0099)	(0.0018)	(0.0018)
Campeche	-0.2996	-0.1514	-0.1598
	(0.0051)	(0.0018)	(0.0017)
Coahuila	-0.1167	-0.1420	-0.1521
	(0.0136)	(0.0010)	(0.0010)
Colima	0.0050	-0.0143	-0.0215
	(0.0216)*	(0.0018)	(0.0018)
Chiapas	-0.4294	-0.3507	-0.3503
	(0.0038)	(0.0010)	(0.0009)
Chihuahua	0.4306	-0.0063	-0.0031
	(0.0070)	(0.0009)	(0.0009)
Durango	-0.0350	-0.2506	-0.2522
	(0.0187)*	(0.0013)	(0.0013)
Guanajuato	-0.3785	-0.0695	-0.0761
	(0.0122)	(0.0008)	(0.0008)
Guerrero	-0.8987	-0.5081	-0.5772
	(0.0040)	(0.0011)	(0.0010)
Hidalgo	-0.2911	-0.2749	-0.2554
	(0.0041)	(0.0011)	(0.0010)
Jalisco	-0.3195	-0.0046	-0.0152
	(0.0087)	(0.0007)	(0.0007)
México	-0.3234	-0.0716	-0.0808
	(0.0036)	(0.0006)	(0.0006)
Michoacán	-0.4882	-0.0391	-0.0557
	(0.0054)	(0.0009)	(0.0009)
Morelos	-0.1489	-0.1927	-0.1858
	(0.0066)	(0.0012)	(0.0012)
Nayarit	-0.3745	-0.1345	-0.1481
	(0.0078)	(0.0015)	(0.0015)
Nuevo León	0.0951	0.1459	0.1395
	(0.0061)	(0.0008)	(0.0008)
Oaxaca	-0.5207	-0.3703	-0.4014
	(0.0037)	(0.0011)	(0.0010)
Puebla	-0.4317	-0.3817	-0.3725
	(0.0039)	(0.0008)	(0.0008)
Querétaro	-0.0410	0.0254	0.0229
	(0.0105)	(0.0012)	(0.0012)
Quintana Roo	-0.2715	-0.0223	-0.0267
	(0.0039)	(0.0015)	(0.0013)
San Luis Potosí	-0.6524	-0.2654	-0.3070

	Indigenous	Non-Indigenous	Pooled
	(0.0048)	(0.0011)	(0.0010)
Sinaloa	-0.2298	-0.0766	-0.0836
	(0.0082)	(0.0010)	(0.0010)
Sonora	-0.0874	-0.0293	-0.0324
	(0.0061)	(0.0010)	(0.0010)
Tabasco	-0.3824	-0.1741	-0.1788
	(0.0067)	(0.0012)	(0.0012)
Tamaulipas	-0.3191	-0.1353	-0.1432
	(0.0075)	(0.0009)	(0.0009)
Tlaxcala	-0.1707	-0.3024	-0.2814
	(0.0071)	(0.0015)	(0.0015)
Veracruz	-0.3465	-0.2680	-0.2711
	(0.0039)	(0.0008)	(0.0008)
Yucatán	-0.3502	-0.1499	-0.1717
	(0.0037)	(0.0014)	(0.0011)
Zacatecas	-0.6162	-0.2982	-0.2988
	(0.0199)	(0.0014)	(0.0014)
Indigenous			-0.2881
			(0.0005)
Intercept	2.9279	2.8436	2.8753
	(0.0042)	(0.0009)	(0.0009)
R2	0.2516	0.2827	0.3068
Adjusted R2	0.2516	0.2827	0.3068
ln(proxy-wage)	3.5933	4.4057	
	(0.0006)	(0.0002)	
Difference	0.8124		
	(0.0007)		

Note: All coefficients are statistically significant at 99 percent or more, except ones marked with * which are not significant at 90 percent of confidence.

6. Conclusions

This chapter summarizes this thesis. In the first section the vicious cycle of indigenous poverty is explained. It is based on the evidence found in the previous chapters. The narrative explains why the gaps between indigenous and non-indigenous have persisted. One of the main conclusions of this thesis is that stronger and decisive state intervention are needed to empower the indigenous population. Such interventions should promote the creation of indigenous-made institutions. The last two sections summarize the thesis contributions and point out areas for further research.

6.1 The Vicious Cycle of Indigenous Poverty

While each thesis chapter has its own theme, discussion, findings and conclusion, the thesis, as a whole, has a story to tell. It is the story of a vicious cycle of indigenous poverty in Mexico. In chapter two it was shown that the indigenous population is poorer than the non-indigenous, using the official multidimensional poverty measure. Also, for each dimension in the measure, the indigenous present higher rates of deprivation. The proposed measure has six social rights in addition to economic well-being, or income poverty; these are: are access to food, education, access to health care, social security, dwelling materials and space, dwelling basic services, such as electricity, water and drainage.

Some of these dimensions require strong state intervention in order to be fulfilled. Water, electricity, schools and clinics, are hardly accessed if it not by the state provision, especially for the poor. Social security deprivation, as measured by CONEVAL, can be provided either by formal jobs or by social protection programmes, such as non-contributory pension for the elderly. In this case, the state also has an

important role to play when markets are not generating enough formal jobs. This suggests that for the indigenous to move out of poverty, stronger state interventions are required.

Income, in the form of conditional cash transfers are also state sponsored while it is understood that most of the household income is generated in the markets. However, as seen in chapter five, the indigenous population is discriminated against in labour markets. The unexplained income gap between indigenous and non-indigenous in the Oaxaca-Blinder decomposition could be attributable to discrimination against the indigenous. When wage gaps are estimated, instead of income, the gap almost doubles in size, which suggests that the indigenous population works much harder to compensate for lower wages.

Also in chapter five, the propensity score matching applied to estimate the "indigenous effect" in the probability of being multidimensionally poor, half of the probability gap between indigenous and non-indigenous is explained as the treatment effect on the referred group. This suggests that ethnic discrimination could explain much of the unbalance between indigenous and non-indigenous in terms of poverty. If this is correct, ethnic discrimination is then a cause of indigenous poverty. Although, it could also be a consequence.

Poverty could motivate discrimination, for example, in case of statistical discrimination. This happens in the labour markets when firms infer workers' productivity based on the expected value of the group they belong to, instead of looking at workers personal productivity (Phelps 1972). If lower schooling, less access to health care, less access to food, lower quality of public services, etc, is reflected on lower productivity on average for the indigenous, then it could be a case of statistical discrimination when employers do not see the set of skills of an individual. While this is

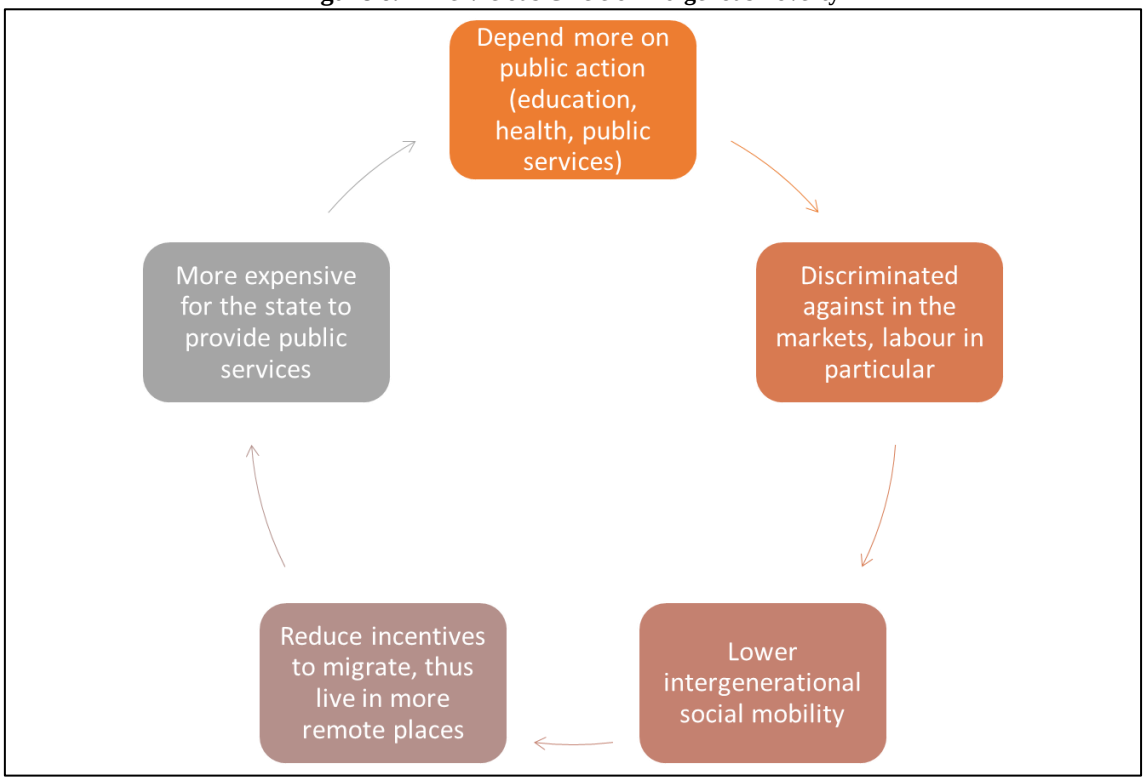
obviously an interesting are for further research, it should not be ruled out that poverty also works as cause for ethnic discrimination in the labour markets.

Then, on the one hand the indigenous require stronger state interventions to move out of poverty and, on the other hand, they are discriminated against in the markets. As a result, it is harder for the indigenous to improve their living conditions. Chapter four shows social mobility for the indigenous is slower than for the non-indigenous. Although when the indigenous are identified not by their ability to speak an indigenous language, but with their parent's ability, then the indigenous speed up their improvements.

The fact that these two ways of identifying the indigenous population are from surveys in two different years and only one identification method is possible in each, questions are raised regarding results at national level. The fieldwork survey, however, offers an interesting hypothesis, since both methods of identification are possible. In the fieldwork survey, those who speed up improvements in their living standard are those who had an indigenous background but no longer speak the language. This suggests society is imposing a cost for those who keep their indigenous identity, while make things easier for those abandon it, which could be interpreted too as ethnic discrimination.

The fact that intergenerational social mobility is lower for the indigenous than the non-indigenous, including those who had an indigenous background, means that gaps between indigenous and non-indigenous are not closing in time, they are widening. It looks like that state interventions to improve indigenous living conditions, have not reach them the way it is required. One way of explaining this is because the indigenous population live in more remote rural areas than the non-indigenous, as was shown in chapter three.

Figure 6.1 The Vicious Circle of Indigenous Poverty



Source: Own elaboration.

Multiple factors can help to explain why the indigenous live in more remote rural places, for example, attachment to their land, but also the relatively safe environment of the community. If the indigenous are discriminated against, they prefer to live with people alike.

People in the countryside possibly face similar challenges in the city, whether they are indigenous or not. The indigenous, though, have one more that is the discrimination for their ethnic condition. This means that they have less incentives to migrate and migration has proved to be an important mechanism to achieve social mobility and move out of poverty.

Remoteness, then, explains quite a bit of the gap between both groups. In the Oaxaca-Blinder decomposition, for example, income and earning gaps were explained considerably by locality size and regional differences.

What closes the vicious cycle of indigenous poverty in Mexico is that it is harder and more expensive for the state to reach remote isolated localities. Those dimensions of poverty that require state intervention, like schools and clinics, are fewer in number in rural areas and their quality is inferior, compared to those the state provide in capital cities. But the absence of the state is not only perceived in the poverty dimensions, there are many more important aspects, such as roads and public transportation, libraries, police force, justice procurement, civil registry, land tenure certificates, etc. The fact that the indigenous live in more remote rural areas leaves them with less access to state support.

6.2 Policy Recommendations

The cycle depicted in Figure 6.1 starts with the dimensions of poverty that depend on state intervention and closed the remote rural areas where it is harder and more expensive for the state to reach. Once this vicious cycle of indigenous poverty is understood, it is easier to think of different types of interventions to reduce indigenous poverty. To start with, creating institutions to safeguard indigenous rights, in particular the right to self-determination, and institutions to protect the indigenous from discrimination.

This means, for example, changing the laws to punish harder those who discriminate against them, train public servants to treat them with due respect, hiring interpreters to guarantee their access to public services, such as the justice system, but also to create indigenous institutions of their own. Some of those institutions already exist out of the state scope. For example, Caracoles and Zapatista Good Government

Committees work in the Zapatista influence areas. Zapatistas have their own schools and their own clinics.

An important step forward, then, would be to honour the San Andres agreements and resume talks between the federal government and the Zapatistas. That would allow later to formalize institutions that are *de facto* functioning and later promote the creation other indigenous institutions and in other places across the country.

Social policies addressed to the indigenous need to change the point of departure. It has not been enough to add an indigenous clause in social programmes operation rules or translate these operation rules into an indigenous language. It has not been enough to be able to tell how many indigenous are beneficiaries of certain social programme. There is always going to be certain scepticism for policies that are designed for the indigenous from the outside.

Affirmative action policies need to be taken to a whole different level. Quotas in congress are fine but a lot more is needed. Quotas of indigenous workers in the public administration, in public companies like Pemex, in big infrastructure projects like the next Mexico City airport, etcetera.

Furthermore, certain permits, licenses and concessions should be given to them in indigenous municipalities. Taxies for example, or casinos, but also the exploitation of natural resources, like the forest and even extractive industries like mines. Much of the indigenous territory is rich in natural resources and their right to exploit them is rarely granted.

It is time stop infantilizing indigenous economic activity. When people think about policies for indigenous livelihoods the common suggestions are their traditional clothes, their food, their handicrafts, their music and their dances. All of these may be important cultural elements that they may or may not want to preserve. But they should

not be though as the backbone of economic prosperity for the indigenous population. All of those things are the things children do in school festivals. To observe real economic indigenous progress they will have to take part in much more serious economic activities. If a road is to be built in an indigenous municipality, an indigenous construction company should be in charge. That might require innovative forms to certify that a company is an indigenous company, but that also should be managed by them.

Stronger, more decisive state interventions in favour of the indigenous does not mean to increase the social programmes budget to reach the indigenous. Even more so, it requires a totally different approach. Breaking the vicious cycle of indigenous poverty in Mexico will require first, to stop designing policies to assimilate the indigenous into the mainstream society. The fact that those who cease to be indigenous improve their living conditions faster should not be interpreted as the success of assimilationists' policies. Indigenous people should be able to improve their living standards without resigning to their identity.

The opposite of assimilationist policies, are empowering policies. And empowering policies are wide range affirmative action policies; policies enabling the indigenous to take part in important economic activities; policies that prioritize them for big investment projects in indigenous municipalities; policies that effectively shield the indigenous against discrimination and, policies that promote and protect indigenous institutions of their own.

6.3 Summary of Thesis Contributions

Highlighting contributions to knowledge is important for an academic document, but is even more for a doctoral thesis. Looking back the contributions can be identified but also the things that were thought to be important but did not end as intended.

This is the case, for example, of the use of mixed methods. When the thesis was just a project in the near future, the use of mixed methods looked like the smartest thing to do. It must be said that it was a lot harder than expected and even with long time the thesis took to be written, the ability to be analyse qualitative data was not developed properly. A tendency to approach data in a quantitative way, acquired in the years of training as economist, was not very helpful.

Nevertheless, fieldwork data collection was a very enriching process and an important element of the training as a researcher in development studies. And while the data could probably be used in better ways, it was fundamental to answer some key questions. The clearest example is the effect of using different definitions of indigenous population in the measure of social mobility and, even more important, that the subgroups improving their living conditions faster are those who have an indigenous background but have lost the ability to speak an indigenous language. This was impossible to find without the fieldwork data.

In terms of the quantitative analysis, findings were important in each chapter. It is not a small thing to put a magnitude to socio-economic phenomena. This is the case, for example, of the Oaxaca-Blinder decompositions. There in not much methodological innovation in using this decomposition, but the fact is that, other than Ramirez (2006) decomposition for workers in indigenous and noon-indigenous municipalities, there has not been a study to properly measure ethnic discrimination in Mexico.

On the other hand, the thesis presented three methodological innovations, two of them new measures. The method to measure remoteness presented in chapter three is one and the other is the absolute social mobility index, presented in chapter four. These two measures help to understand better the indigenous reality in Mexico but the truth is that they have a much broader application, beyond Mexico and beyond the study of the indigenous population.

The third methodological innovation is the use of propensity score match to compare the probability of being poor for indigenous and non-indigenous and link this to the study of ethnic discriminations. The propensity score match method was already there. Even the its application to study discrimination in the labour markets (Fortin, Lemieux, and Firpo 2011). But not linking discrimination with poverty.

Finally, the vicious cycle of indigenous poverty in Mexico is the last contribution to be part of this summary. While its parts were described in each chapter, the thesis has an important narrative that needs to be told. In the first section in this chapter, it was presented. It is an innovative way of thinking that allows to explain persistent gaps between indigenous and non-indigenous in Mexico and, subsequently, to promote policies the break that cycle like those discussed in this chapter too.

6.4 Further Research

The thesis concludes here but there is much more ahead. Several areas of further research have been identified in the thesis. One of them is the implications of the identification of the indigenous population in surveys and censuses. It was a key question in chapter four and the fieldwork survey helped to throw some light about it, but more and better data is needed to start with. As early as 2008 was the first time a

question was included in the household income survey to identify the indigenous population. Before that, studies could roughly estimate the indigenous population based on the municipalities. The CEEY question, on the other hand, changed the identification question that has been discussed in the thesis.

Depending on the data available, quantitative studies could study, in additions to households with indigenous language speaker head or spouse, also in monolinguals, people who consider themselves part of an indigenous community or group, people whose parents spoke indigenous and combinations of them.

Another interesting further research question is the effect of Zapatismo on indigenous communities. At this point is hard to say whether Zapatista communities are more or less poor than other indigenous communities, but at least they have indigenous made institutions, which empower them in a dignified and autonomous way. Even if achievements are not gained as fast the mainstream society, it is happening the way they want. Unfortunately, Zapatistas are sceptics to outsiders and they prefer to keep their communities closed to protect themselves. It is going to be hard for an external researcher to collect any data in the near future. But research of this kind could be conducted by them or requested by them.

As mentioned before, there are issues of statistical discrimination. While the thesis focused on proving there is discrimination against the indigenous population, and how discrimination increases their probability of being poor, the mechanism could also work the other way around. If poverty has an effect on their productivity, and if employers infer the person's productivity by the expected value of the group they belong to, this could lead statistical discrimination. Audit studies could be helpful but also comparatives breaking the indigenous population by subgroups, as done for the social mobility case.

In general, more empirical studies about ethnic discrimination are needed. The issue needs to be discussed extensively in Mexico. The Oaxaca-Blinder decomposition in this thesis had the intention of setting a baseline. Decompositions beyond the mean and detailed decompositions each covariate are only an example.

Hopefully this thesis will motivate further research. A lot more needs to be discussed regarding indigenous groups in Mexico. More hypothesis need to be proven right or wrong. More findings need to be challenged. New policies need to be thought and implemented.

> "what thoughtful rich people call the problem of poverty, thoughtful poor people call with equal justice a problem of riches."
>
> ― Tony Atkinson, Inequality

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8. APPENDIX. FIELDWORK QUESTIONNAIRE

CUESTIONARIO SOBRE MOVILIDAD SOCIAL Y SEGREGACIÓN GEOGRÁFICA

Encuesta parte de la investigación para obtener el grado de

Doctor en Estudios de Desarrollo

de la

Universidad de Oxford

elaborada por el candidato a doctor

Maestro Iván Guillermo González de Alba

Verano 2011

Número de Visita	1		2		3	
	Día	Mes	Día	Mes	Día	Mes
Fecha						
Resultado						

1. Completa
2. Incompleta
3. Ausentes
4. Se negó a dar información
5. fuera del rango de edad
6. Otra _____

Nombre del entrevistador _____ ☐

Número consecutivo de encuesta ☐☐

Estado _____ ☐☐

Municipio _____ ☐☐☐

Localidad _____ ☐☐☐

AGEB ☐☐☐ - ☐☐

Vivienda No. ☐☐☐

Domicilio _____

C.P. ☐☐☐☐☐

Clase de vivienda ☐☐

1. Casa independiente
2. Departamento en edificio
3. Vivienda o cuarto en vecindad
4. Vivienda o cuarto en la azotea
5. Vivienda o cuarto en predio familiar
6. Local no construido para habitación
7. Vivienda móvil
8. Refugio o campamento
9. Lote baldío o predio abandonado
10. Asentamiento irregular

Apreciado de la Vivienda ☐

1. Alto
2. Medio
3. Bajo

Comentarios _____

_____

<u>Observación</u>

Encuestador:
SIN PREGUNTAR, verifique los siguientes datos de la vivienda

A1. El acceso es por: ☐

Opciones:
1. Calle pavimentada con alumbrado
2. Pavimentada sin alumbrado
3. Terracería con alumbrado
4. Terracería sin alumbrado
5. Camino peatonal de tierra
6. Otro (especifique)

_____

A2. Material del techo ☐

1. Material de desecho, cartón o plástico
2. Carrizo, bambú, palma o lona
3. Lámina metálica o de asbesto
4. Teja, madera o similar
5. Material (losa, concreto, etc.)

A3. Material de las paredes ☐

Opciones:
1. Material de desecho, cartón o plástico
2. Carrizo, bambú, palma o lona
3. Lámina metálica o de asbesto
4. Adobe, madera, piedra o similar
5. Material (ladrillo, concreto, etc.)

A4. Material del piso ☐

1. Tierra, arena o estiércol
2. Tablas, ramas, palma o bambú
3. Cemento, duela, *parquet*, loseta, alfombra, etc.

Presentación

Buenos días /tardes. Mi nombre es.....y estoy haciendo una encuesta y su hogar es uno de los que ha salido seleccionado al azar. Sus respuestas serán totalmente anónimas.

¿Me permite por favor hacerle unas preguntas?

1. ¿Es usted el jefe o jefa del hogar? 1. Sí 2. No ☐

Si no es, pedir hablar con el jefe o jefa del hogar. En caso de no encontrarse el jefe o jefa entonces pedir hablar con su cónyuge. Si tampoco está el cónyuge, pedir hablar con algún miembro del hogar que sea adulto entre 25 y 64 años de edad y hacer la presentación de nuevo. Anotar el número de renglón del encuestado.

Renglón ☐☐

2. ¿Cuál es su nombre? _____

Introducción:

Mucho gusto Don/Doña _____. Esta es una encuesta sobre los niveles de vida de los mexicanos en comparación con el nivel de vida de sus padres. Primero le voy a preguntar sobre los miembros del hogar y algunas características de la vivienda. Luego le preguntaré sobre usted, su escolaridad y trabajo, así como algunas cosas sobre migración y otros aspectos relacionados con el bienestar.

3. Su estado civil ☐

1. Soltero
2. Casado(a)
3. Unión libre
4. Divorciado(a)
5. Separado(a)
6. Viudo(a)
9. NS/NC

4. ¿Cuántas personas viven regularmente en este domicilio? ☐☐

Sólo personas que duermen y comen aquí por lo menos seis meses al año, NO visitas ni eventuales

5. Le voy a hacer unas preguntas sobre las personas que viven aquí, empezando con el jefe de hogar ¿Cuál es su nombre? ¿Qué edad tiene? ¿Cuál es su actividad? ¿Vive fuera del hogar temporalmente?...

	Nombre	Sexo	Edad		Relación		Actividad		Educ.		Att.	Fuera	Mot
01					0	1							
02													
03													
04													
05													
06													
07													
08													
09													
10													
11													
12													

Sexo
1. Hombre
2. Mujer

Edad
0. Menor de 1 año

ACTIVIDAD PRINCIPAL
1. Estudiante
2. Desempleado
3. Quehaceres domésticos
4. Jubilado /retirado /pensionado
5. Trabajando
6. Otro (inactivo, etc.)
9. NS/NC

REL. JEFE HOGAR
1. Jefe de hogar
2. Cónyuge o pareja
3. Hijo(a), Hijastro(a)
4. Padre o madre
5. Suegro(a)
6. Yerno o nuera
7. Nieto(a)
8. Hermano(a)
9. Cuñado(a)
10. Otro familiar
11. Servicio doméstico
12. Otro no familiar
99. NS/NC

EDUCACIÓN
0. Sin educación
1. Primaria incompleta
2. Primaria completa
3. Secundaria incompleta
4. Secundaria completa
5. Técnica sin secundaria
6. Prepa, técnica, acad. incompleta
7. Prepa, técnica, academia completa
8. Normal sin preparatoria
9. Normal
10. Normal superior
11. Universidad Incompleta
12. Universidad completa
13. Maestría
14. Doctorado
99. NS/NC

ASISTE A LA ESCUELA
(Personas de 5 a 15)
1. Sí
2. No
3. No aplica

FUERA DEL HOGAR
1. Sí
2. No

MOTIVO
1. Trabajo
2. Estudios
3. Salud
4. Matrimonio
5. Otro
9. NS/NC

Ahora le voy a preguntar sobre algunas características de la vivienda, así como algunos bienes o servicios con los que cuenta.

6. ¿Qué combustible se usa para cocinar aquí en el hogar? ☐

1. Electricidad, gas LP, gas natural, biogás o keroseno
2. Carbón, leña, paja, restos, estiércol, etc.
3. No se cocina en el hogar
9. NS/NC

7. ¿De dónde obtienen el agua para beber aquí en el hogar? ☐

1. De la llave dentro del hogar, en el predio o pública
2. De pozo o manantial protegido (ej. entubado)
3. De lluvia
4. Pozo o manantial no protegido, agua superficial (rio, lago, etc.) o pipa
5. Garrafón o Botellas de agua
9. NS/NC

8. ¿Cuánto tiempo hace a su fuente de agua para beber?

hh:mm _____:_____ Convierta a minutos ☐☐☐

9. ¿Tienen baño exclusivo para la vivienda o es compartido con otras viviendas? ☐

1. Exclusivo
2. Compartido
3. No tiene baño (hacen del baño en el monte, río, etc.)
9. NS/NC

10. ¿Qué tipo de baño es? ☐

1. Excusado con arrastre de agua
2. Letrina mejorada (ej. de material con ventilación)
3. Letrina simple, ojo ciego, colgante, cubeta o similar
4. Sin baño (campo, río, etc.)
9. NS/NC

11. Por favor dígame si en esta vivienda cuentan con lo siguiente:

		Si	No	N/C	
11.01	Luz (electricidad)	1	2	9	
11.02	Baño dentro de la casa	1	2	9	
11.03	Estufa de gas o eléctrica	1	2	9	
11.04	Agua caliente	1	2	9	
11.05	Refrigerador	1	2	9	
11.06	Lavadora	1	2	9	
11.07	Teléfono fijo	1	2	9	
11.08	Celular (algún miembro)	1	2	9	
11.09	Radio	1	2	9	
11.10	Televisor	1	2	9	
11.11	Televisión de paga	1	2	9	
11.12	Computadora	1	2	9	
11.13	Internet	1	2	9	
11.14	Servicio doméstico eventual	1	2	9	
11.15	Servicio doméstico permanente	1	2	9	

Encuestador, pregunte si alguna de esas cosas que el hogar NO tiene es porque no pueden costearlo o porque no les interesa Si no lo tiene por gusto cambie a 3

12. Por favor dígame si usted o algún otro miembro del hogar es propietario de

		Si	No	N/C	
12.01	Un local comercial o negocio (parte)	1	2	9	
12.02	Un terreno o campo	1	2	9	
12.03	Una casa de vacaciones	1	2	9	
12.04	Una casa/ departamento para rentar	1	2	9	
12.05	Acciones, bonos o fondos mutuos	1	2	9	
12.06	Ahorros en una cuenta de ahorro	1	2	9	
12.07	Cuenta corriente en un banco	1	2	9	
12.08	Animales (vacas, caballos, etc.)	1	2	9	
12.09	Tractor u otra maquinaria agrícola	1	2	9	
12.10	Bicicleta	1	2	9	
12.11	Motocicleta	1	2	9	
12.12	Automóvil / camioneta	1	2	9	

Encuestador, pregunte si alguna de esas cosas que el hogar NO tiene es porque no pueden costearlo o porque no les interesa Si no lo tiene por gusto cambie a 3

13. ¿Cuántos cuartos dormitorios tiene esta vivienda?
No cuente cocina, baños, sala o comedor ☐☐

14. Esta vivienda es: ☐

1. Casa propia (pagada o pagándose)
2. Ocupación de hecho (invasión)
3. Uso sin ser dueño (prestada, cedida por trabajo, etc.)
4. Vive con algún pariente o amigo
5. Rentada o alquilada
9. NS/NC

15. ¿Cuándo la compró o la empezó a pagar? (año)
¿o se mudó aquí si no es propia? ☐☐☐☐

16. Si vendiera esta casa ¿cuánto le cree usted que le pagarían? (aproximadamente)

Encuestador: Si no es propia la vivienda ponga ceros

$						

en pesos y sin centavos

Si no sabe ponga 999,998

17. Sin contar los libros de texto,

¿Aproximadamente cuántos libros hay en aquí en este hogar? | | | |

Ahora le voy a preguntar por el lugar en donde usted vivía cuando tenía 14 años.

18. A los 14 años Usted vivía con: |

1. Padre y madre
2. Madre y padrastro
3. Madre sola o con otros parientes
4. Padre y madrastra
5. Padre solo o con otros parientes
6. Otros parientes, sin sus padres
7. Otras personas, no parientes
8. Sola
9. NS/NC

19. ¿Cuántas personas compartían vivienda cuando usted tenía 14 años? | |

20. ¿Qué combustible se usaban para cocinar en el hogar? |

1. Electricidad, gas LP, gas natural, biogás o keroseno
2. Carbón, leña, paja, restos, estiércol, etc.
3. No se cocina en el hogar
9. NS/NC

21. ¿De dónde sacaban el agua para beber? |

1. De la llave dentro del hogar, en el predio o pública
2. De pozo o manantial protegido (ej. entubado)
3. De lluvia
4. Pozo o manantial no protegido, agua superficial (rio, lago, etc.) o pipa
5. Botellas de agua
9. NS/NC

22. ¿Cuánto tiempo hacían a su fuente de agua para beber?

hh:mm _____:_____ Convierta a minutos | | | |

23. ¿Tenían baño exclusivo para la vivienda o era compartido con otras viviendas? |

1. Exclusivo
2. Compartido
3. No tiene baño (hacen del baño en el monte, rio, etc.)
9. NS/NC

24. ¿Qué tipo de baño era? |

1. Escusado con arrastre de agua
2. Letrina mejorada (ej. de material con ventilación)
3. Letrina simple, ojo ciego, colgante, cubeta o similar
4. Sin baño (campo, rio, etc.)
9. NS/NC

25. Por favor dígame si en esa vivienda contaban con lo siguiente:

		Si	No	N/C	
25.01	Luz (electricidad)	1	2	9	
25.02	Baño dentro de la casa	1	2	9	
25.03	Estufa de gas o eléctrica	1	2	9	
25.04	Agua caliente	1	2	9	
25.05	Refrigerador	1	2	9	
25.06	Lavadora	1	2	9	
25.07	Teléfono fijo	1	2	9	
25.08	Celular (algún miembro)	1	2	9	
25.09	Radio	1	2	9	
25.10	Televisor	1	2	9	
25.11	Televisión de paga	1	2	9	
25.12	Computadora	1	2	9	
25.13	Internet	1	2	9	
25.14	Servicio doméstico eventual	1	2	9	
25.15	Servicio doméstico permanente	1	2	9	

26. Por favor dígame si algún miembro del hogar era propietario de:

		Si	No	N/C	
26.01	Un local comercial o negocio (parte)	1	2	9	
26.02	Un terreno o campo	1	2	9	
26.03	Una casa de vacaciones	1	2	9	
26.04	Una casa/ departamento para rentar	1	2	9	
26.05	Acciones, bonos o fondos mutuos	1	2	9	
26.06	Ahorros en una cuenta de ahorro	1	2	9	
26.07	Cuenta corriente en un banco	1	2	9	
26.08	Animales (vacas, caballos, etc.)	1	2	9	
26.09	Tractor u otra maquinaria agrícola	1	2	9	
26.10	Bicicleta	1	2	9	
26.11	Motocicleta	1	2	9	
26.12	Automóvil / camioneta	1	2	9	

27. ¿Cuántos cuartos dormitorios tenía esa vivienda?

No cuente cocina, baños, sala o comedor

28. Esa vivienda era:

1. Casa propia (pagada o pagándose)
2. Ocupación de hecho (invasión)
3. Uso sin ser dueño (prestada, cedida por trabajo, etc.)
4. Vive con algún pariente o amigo
5. Rentada o alquilada
9. NS/NC

29. ¿Sabe usted leer un recado? 1. Sí 2. No ☐

30. ¿Cuál fue el último grado que usted aprobó? Nivel ☐☐ Grado ☐☐

Nivel

1. Sin estudios
2. Primaria Incompleta
3. Primaria Completa
4. Secundaria o equivalente Incompleta
5. Secundaria o equivalente Completa
6. Preparatoria o equivalente Incompleta
7. Preparatoria o equivalente Completa
8. Normal o profesional después de preparatoria incompleta
9. Normal o profesional después de Preparatoria completa
10. Licenciatura Incompleta
11. Licenciatura Completa
12. Post grado
99. NS/NC

31. ¿A qué tipo de escuela asistió... en la Primaria ☐ en la Secundaria ☐

1. Escuela Pública 2. Escuela Privada 3. Ambas 4. No asistió

32a. ¿Cómo le iba en la escuela cuando era niño? ☐ **32b. ¿Y cuando tenía 14 años?** ☐

1. Uno de los peores
2. Un poco debajo del promedio
3. En el promedio
4. Un poco arriba del promedio
5. Uno de los mejores
9. NS/NC

Ahora le voy a preguntar por la educación de SUS padres, primero su padre y después su madre

33. ¿Sabe o sabía su padre (o padrastro) leer un recado? 1. Sí 2. No ☐

34. ¿Cuál fue el último grado que su padre aprobó? Nivel ☐☐ Grado ☐☐

Nivel

1. Sin estudios
2. Primaria Incompleta
3. Primaria Completa
4. Secundaria o equivalente Incompleta
5. Secundaria o equivalente Completa
6. Preparatoria o equivalente Incompleta
7. Preparatoria o equivalente Completa
8. Normal o profesional después de preparatoria incompleta
9. Normal o profesional después de preparatoria completa
10. Licenciatura Incompleta
11. Licenciatura Completa
12. Post grado
99. NS/NC

35. ¿A qué tipo de escuela asistió su padre... en la Primaria ☐ **en la Secundaria** ☐

1. Escuela Pública 2. Escuela Privada 3. Ambas 4. No asistió

36. ¿Sabe o sabía su madre (o madrastra) leer un recado? 1. Sí 2. No ☐

37. ¿Cuál fue el último grado que su madre aprobó? Nivel ☐☐ Grado ☐☐

Nivel

1. Sin estudios
2. Primaria Incompleta
3. Primaria Completa
4. Secundaria o equivalente Incompleta
5. Secundaria o equivalente Completa
6. Preparatoria o equivalente Incompleta
7. Preparatoria o equivalente Completa
8. Normal o profesional después de preparatoria incompleta
9. Normal o profesional después de preparatoria completa
10. Licenciatura Incompleta
11. Licenciatura Completa
12. Post grado
99. NS/NC

38. ¿A qué tipo de escuela asistió su madre... en la Primaria ☐ **en la Secundaria** ☐

1. Escuela Pública 2. Escuela Privada 3. Ambas 4. No asistió

39. ¿Tuvo usted un trabajo pagado la semana pasada? ¿Tiene un trabajo pagado pero estuvo ausente? ¿o tuvo trabajos esporádicos en la semana pasada?

1. Sí (salte a la 42) 2. No ☐

40. ¿Buscó trabajo la semana pasada? 1. Sí (salte a la 42) 2. No ☐

41. ¿Ha trabajado alguna vez? 1. Sí 2. No (salte esta sección) ☐

42. ¿Cuál es su trabajo principal? (O su último trabajo si no está trabajando ahora)

43. ¿Qué hace (hacía) Ud. en este trabajo?, ¿cuáles son sus principales tareas y funciones?

44. ¿A qué se dedica o qué produce la empresa, servicio o negocio donde usted trabaja (trabajó)?

NS 9998

45. En su ocupación principal ¿usted trabaja (trabajó) como:

1. Empleador (dueño o socio)
2. Trabajador por cuenta propia (independiente)
3. Empleado u obrero privado
4. Empleado u obrero público o municipal
5. Servicio doméstico
6. Soldado u otro cargo militar
9. NS/NC

46. ¿A cuántas personas supervisa (o supervisó) en su trabajo principal?

47. ¿Cuántas personas trabajan (o trabajaban) ahí permanentemente?

48. ¿Cuántas horas a la semana trabaja (trabajaba) usted en una semana normal? horas

NS 98 NC 99

49. ¿Tiene su trabajo beneficios de salud u otros beneficios como aguinaldos, vacaciones, etc.?

1. Sí, solamente salud
2. Salud y otras prestaciones
3. No tiene beneficios de salud, pero si otras prestaciones
4. No (Ninguno)
8. NS
9. NC

50. ¿En qué año empezó a trabajar en su trabajo actual?

o en su último trabajo si no está trabajando ahora

NS 9998 NC 9999

51. Además de su propio esfuerzo, ¿de quién recibió información o ayuda para conseguir ese trabajo?

1. Un miembro de su hogar
2. Un familiar cercano, pero que no vive en el hogar
3. Un familiar lejano
4. Un amigo cercano
5. Un amigo lejano o conocido
6. Vecinos
7. Ex – empleador (ex patrón)
8. Municipio, agencia de gobierno
9. Agencia de empleo
10. Nadie
11. Otro
99. NS/NC

Ahora le voy a preguntar sobre el primer trabajo pagado que Ud. tuvo, después de terminar de estudiar.

(No cuente trabajos esporádicos, trabajos mientras su principal actividad era estudiar, ni servicio militar)

52. ¿Qué edad tenía usted cuando empezó a trabajar? Edad ☐☐ NS/NC (99)

53. ¿Cuál fue su primer trabajo?

54. ¿Qué hacía usted en ese trabajo?, ¿cuáles eran sus principales tareas y funciones?

55. ¿A qué se dedicaba?, ¿qué producía la empresa, servicio o negocio en que usted trabajaba?

56. En su primer trabajo, ¿usted trabajaba como?: ☐

1. Empleador (dueño o socio)
2. Trabajador por cuenta propia (independiente)
3. Empleado u obrero privado
4. Empleado u obrero público o municipal
5. Servicio doméstico
6. Soldado u otro cargo militar
9. NS/NC

57. ¿A cuántas personas supervisaba en su primer trabajo? ☐☐☐

58. ¿Cuántas personas trabajaban ahí permanentemente? ☐☐☐

Ahora le voy a preguntar por la ocupación de sus padres

59. ¿En qué año nació su padre? (o jefe de hogar en su defecto) ☐☐☐☐

Si el encuestado no recuerda pida un año aproximado o pregunte ¿qué edad tiene o tendría al día de hoy?

NS 9998 NC 9999

60. ¿Cuál era el trabajo principal de su padre (o JH) cuando usted tenía alrededor de 14 años?
O cualquier trabajo si el encuestado no recuerda el trabajo de su padre a esa edad.

61. ¿A qué se dedicaba?, ¿qué producía la empresa, servicio o negocio en el que trabajaba su papá?

NS 9998 NC 9999 ☐☐☐☐

62. En ese trabajo, su papá trabajaba como: ☐

1. Empleador (dueño o socio)
2. Trabajador por cuenta propia (independiente)
3. Empleado u obrero privado
4. Empleado u obrero público o municipal
5. Servicio doméstico
6. Soldado u otro cargo militar
9. NS/NC

63. ¿A cuántas personas supervisaba su papá en ese trabajo? ☐☐☐

64. ¿Cuántas personas trabajaban ahí permanentemente? ☐☐☐

65. ¿En qué año nació su madre? (o cónyuge del JH en su defecto) ☐☐☐☐

Si el encuestado no recuerda pida un año aproximado NS 9998 NC 9999

66. ¿Cuál era el trabajo principal de su madre cuando usted tenía alrededor de 14 años?
O cualquier trabajo si el encuestado no recuerda el trabajo de su padre a esa edad.

NS 9998 NC 9999 ☐☐☐☐

67. ¿A qué se dedicaba?, ¿qué producía la empresa, servicio o negocio en trabajaba su mamá?

NS 9998 NC 9999 ☐☐☐☐

68. En ese trabajo, su mamá trabajaba como: ☐

1. Empleador (dueño o socio)
2. Trabajador por cuenta propia (independiente)
3. Empleado u obrero privado
4. Empleado u obrero público o municipal
5. Servicio doméstico
6. Soldado u otro cargo militar
9. NS/NC

69. ¿A cuántas personas supervisaba su mamá en ese trabajo? ☐☐☐

70. ¿Cuántas personas trabajaban ahí permanentemente? ☐☐☐

71. ¿Dónde vivía Ud. cuando tenía 14 años?

(Si estaba temporalmente fuera de casa registre donde vivía habitualmente)

		NS	NC
Estado (o país)	☐☐	98	99
Municipio	☐☐☐	998	999
Localidad	☐☐☐☐	####	9999

72. ¿Qué tipo de lugar era ese cuando Ud. vivía allí? ☐

1. Caserío Aislado
2. Ranchería
3. Ejido
4. Pueblo
5. Ciudad
6. Otro
9. NS/NC

73. Ahora le preguntaré por todas las veces en que se ha mudado, es decir que se ha movido a otra ciudad, pueblo, localidad o país desde que nació. Incluya sólo lugares en que ha vivido por 1 mes o más. Empecemos por la primera: ¿dónde nació? ¿En qué año se mudó? ¿Cómo se llamaba la ciudad, pueblo o localidad donde se mudó? ¿En qué estado o país era eso? ¿Qué tipo de lugar era ese?

	Año	Localidad	Municipio				Estado o país			Tipo de lugar
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										

74. ¿Ha ido Ud. alguna vez a trabajar a Estados Unidos por 1 mes o más? ☐

1. Sí 2. No (salte a la 80) 9. NS/NC

75. ¿Cuántas veces en total? ☐☐ 99 NS/NC

76. ¿Qué año fue la primera vez? ☐☐☐☐ NS 9998 NC 9999 NA 7777

77. ¿Qué año fue la última vez? ☐☐☐☐ NS 9998 NC 9999 NA 7777

78. La última vez que fue a Estados Unidos por trabajo, ¿cruzó con algún documento legal? ☐

1. Sí 2. No 7. NA 9. NS/NC

79. La última vez, ¿tenía permiso legal para trabajar en Estados Unidos? ☐

1. Sí 2. No 7. NA 9. NS/NC

80. ¿Ha ido o fue su padre alguna vez a trabajar a Estados Unidos por 1 mes o más? ☐

1. Sí 2. No (salte a la 82) 9. NS/NC

81. ¿Cuántas veces en total? ☐☐ 99 NS/NC

82. ¿Ha ido o fue su madre alguna vez a trabajar a Estados Unidos por 1 mes o más? ☐

1. Sí 2. No (salte a la 84) 9. NS/NC

83. ¿Cuántas veces en total? ☐☐ 99 NS/NC

84. ¿Está Usted contento aquí o le gustaría ir a vivir a otra parte? ☐

1. Está contento (pase a la pregunta 87) 2. Le gustaría vivir en otra parte 9. NS/NC

85. ¿A qué tipo de lugar le gustaría ir? ☐

1. Estados Unidos 3. Su lugar de origen 5. Otra ciudad _____ 8. MS
2. Ciudad de México 4. Otro país _____ 7. No aplica 9. NEC

86. ¿Por qué motivo le gustaría mudarse? ☐

1. Por trabajo, empleo o dinero
2. Porque ahí está la familia o pareja
3. Por los amigos
4. Por salud o tratamiento
5. Por educación
6. Por seguridad
7. Aquí lo tratan mal
8. Otra _____
9. NS/NC

87. Entonces prefiere quedarse en esta comunidad ¿Por qué?

1. Por trabajo, empleo o dinero
2. Porque aquí está la familia o pareja
3. Por los amigos
4. Por salud o tratamiento
5. Por educación
6. Por seguridad
7. Aquí lo tratan bien
8. Otra _____
9. NS/NC

88. ¿Se siente seguro en esta comunidad? 1. Sí (pase a la 90) 2. No ☐

89. ¿Qué es lo que lo hace sentir inseguro? marque todas las que apliquen

1. Los robos, asaltos, etc.	
2. La guerra contra el narco	
3. La policía o el ejército	
4. Los fenómenos naturales	

5. La situación política	
6. La discriminación	
7. La falta de empleo	
8. Otra _____	

9. Nada	

90. ¿Le da miedo salir de su comunidad? 1. Sí 2. No ☐
(pase a la 91b)

91a. ¿Qué es lo que le da miedo? marque todas las que apliquen

1. Los robos, asaltos, etc.	
2. La guerra contra el narco	
3. La policía o el ejército	
4. Los fenómenos naturales	

5. La situación política	
6. La discriminación	
7. Otra_____	
8. Ninguna	

91b. ¿Le da miedo que lo traten mal fuera de su comunidad? 1. Sí 2. No (pase a la 93) ☐

92. ¿Por qué habrían de tratarlo mal fuera de su comunidad? marque todas las que apliquen

1. Por mi clase social	
2. Porque no hablo bien el español	
3. Porque soy indígena	
4. Por mi color de piel	
5. Porque soy homosexual	

6. Porque soy mujer	
7. Porque estoy viejo	
8. Tratan mal a los de fuera	
9. Por mi aspecto (gordo, feo, etc.)	
10. Porque no tengo papeles	

93. Durante los últimos 6 meses, recibió algún miembro de este hogar ingresos por lo siguiente...
marque todas las que apliquen

A. Trabajo remunerado y negocios	
B. Programa Oportunidades (Progresa)	
C. Otro programa del gobierno	
D. Dinero enviado por familiares que viven en México	
F. Dinero enviado por familiares que viven en el extranjero	
G. Dinero de amigos, instituciones, u otros	
H. Arriendos	
I. Otros (ventas, indemnizaciones, seguros, herencias, etc.)	

Encuestador: Si el hogar no percibe ingresos por familiares en otras partes de México o del extranjero salte a la pregunta 95

94. ¿Para qué uso el dinero enviado por familiares? Por favor indique el primer y segundo uso más importante.

Primer uso ☐
Segundo uso ☐

1. Comprar tierras, elementos agrícolas
2. Establecer, ampliar, comprar un negocio
3. Para la vivienda (mejora, compra)
4. Comprar carros, aparatos eléctricos
5. Pagar deudas
6. Comer, pagar la renta
7. Financiar estudios
8. Otro
9. NS/NC

95. ¿Qué parte del ingreso mensual de este hogar lo recibe de familiares que no están en el hogar? ☐

1. Casi todo
2. Más de la mitad
3. Aproximadamente la mitad
4. Menos de la mitad
5. Una parte pequeña
6. Nada
9. NS/NC

96. ¿Qué parte de la comida sin preparar, y otros bienes o servicios, que consume este hogar, por ejemplo ropa, se producen dentro del hogar? ☐

1. Casi todo
2. Más de la mitad
3. Aproximadamente la mitad
4. Menos de la mitad
5. Una parte pequeña
6. Nada
9. NS/NC

97. ¿Qué parte de la comida sin preparar, y otros bienes o servicios, que consume este hogar, por ejemplo ropa, se obtienen por trueque o intercambio? ☐

1. Casi todo
2. Más de la mitad
3. Aproximadamente la mitad
4. Menos de la mitad
5. Una parte pequeña
6. Nada
9. NS/NC

98. ¿Qué parte de la comida sin preparar, y otros bienes o servicios, que consume este hogar, por ejemplo ropa, se obtienen por pagos en especie? ☐

1. Casi todo
2. Más de la mitad
3. Aproximadamente la mitad
4. Menos de la mitad
5. Una parte pequeña
6. Nada
9. NS/NC

99. ¿Qué parte de la comida sin preparar, y otros bienes o servicios, que consume este hogar, por ejemplo ropa, se obtienen por prestaciones NO monetarias de su empleo, por ejemplo vales de gasolina o despensa? ☐

1. Casi todo
2. Más de la mitad
3. Aproximadamente la mitad
4. Menos de la mitad
5. Una parte pequeña
6. Nada
9. NS/NC

100. Contándose usted, ¿cuántos miembros del hogar aportan ingresos al hogar? ☐☐

NS 98 NC 99

101. Contando TODAS las fuentes de ingreso, y todas las personas que aportan ingresos, ¿Cuál es el total de ingresos que recibe este hogar en un mes normal?

En pesos $ ☐☐☐,☐☐☐

NS 999998 NC 999999

Encuestador: Salte a la pregunta 104, solo si el entrevistado no proporciona ningún ingreso continúe

102. ¿Cuál es el rango aproximado de su ingreso familiar mensual?

$0	0
$1 - $1,500	1
$1,501 – $4,500	2
$4,501 – $7,000)	3
$7,001 – $10,000)	4
$10,001 – $14,000)	5
$14,001 –$42,000)	6
$42,001 – $100,000)	7
$100,001 - $+	8
NS-NC	9

Encuestador: Salte a la pregunta 104. Sólo si la respuesta es cero ingresos preguntar la 103.

103. ¿Entonces de qué viven en este hogar?

1. Como lo que producimos (autoconsumo)
2. Del autoconsumo y el trueque
3. De lo que nos regalan los vecinos o familiares
4. De lo que me encuentro en la calle
5. Otra _____
9. NS/NC

104. Y, ¿cuál es el ingreso total suyo por trabajo en un mes normal?
(cuente sueldos, salarios, ingresos por negocios propios, aguinaldos, etc.)

En pesos $ | | | | , | | |

NS 999998 NC 999999

Encuestador: Preguntar sólo si el entrevistado no proporciona ningún ingreso

105. ¿Cuál es el rango aproximado de su ingreso mensual?

$0	0
$1 - $1,500	1
$1,501 – $4,500	2
$4,501 – $7,000)	3
$7,001 – $10,000)	4
$10,001 – $14,000)	5
$14,001 –$42,000)	6
$42,001 – $100,000)	7
$100,001 - $+	8
NS-NC	9

106. El último mes ¿Usted o algún otro miembro del hogar ha dejado de comer porque no les alcanza?

1. Sí 2. No (pase a la 108)

107. ¿Qué tan seguido le pasa eso? ¿Qué tienen que dejar de comer porque no les alcanza? ☐

1. Diario
2. Dos o tres veces por semana
3. Un vez por semana
4. Dos o tres veces al mes
5. Una vez al mes
6. Una vez cada dos meses
7. Tres o cuatro veces al año
8. Muy rara vez (una vez al año)
9. NS/NC

108. Le voy a hacer una pregunta muy triste y muy delicada, pero muy importante para el estudio. ¿Se les ha muerto algún niño o niña? Por favor considere desde recién nacidos hasta 15 años de edad

☐

1. No, ninguno
2. Sí, un recién nacido
3. Sí, un menor de 5 años
4. Sí, un menor de entre 5 y 15 años
5. Más de uno, todos menores de 5
6. Más de uno, todos entre 5 y 15
7. Varios, algunos de menos de 5 y otros mayores
8. No, únicamente abortos y niños que nacen muertos
9. NS/NC

109. ¿Sabe si alguno de los niños y niñas de este hogar está desnutrido o desnutrida? ☐

Por ejemplo, está bajo de peso y/o talla, o tiene manchas blancas en la piel

1. No que yo sepa
2. Sí, me lo dijeron en la clínica
3. Alguno le parece muy flaquito
4. Alguno le parece muy bajito
5. Tiene manchas blancas en la piel
9.NS/NC

Encuestador: Marque 7 si usted considera que algún menor está desnutrido, pero el encuestado lo negó

110. ¿Tiene Seguro Social? ¿A dónde van generalmente cuando tienen problemas de salud? ☐

1. Tengo IMSS o ISSSTE y es en donde me atiendo la salud
2. Voy al médico particular y no tengo seguro (ej. Dr. Simi)
3. Tengo Seguro Popular
4. Voy al hospital de la institución donde trabajo (PEMEX, SEDENA, etc.)
5. Tengo un seguro privado
6. Voy al IMSS Solidaridad u otra clínica de gobierno (gratuita)
7. Voy a la clínica gratuita NO de gobierno (Cruz Roja, ONG, Zapatista, etc.)
8. Voy con el chamán, hierbero, curandero, huesero, partera, etc.
9. NS/NC

111. ¿En dónde nacieron sus hijos? ☐

1. En la clínica u hospital público
2. En clínica u hospital privado
3. En la casa, con partera
4. En la casa, sin partera
5. No tuve/tengo hijos
8. No sabe
9. NS/NC

112. ¿Hay alguien en el hogar con alguna de las siguientes enfermedades? Marque las que apliquen

1. Cáncer		5. Parálisis cerebral		9. Respiratorias		13. Adicto al juego	
2. Diabetes		6. Retraso mental		10. Gastrointestinales		14. Otra discapacidad	
3. Del corazón		7. Ceguera		11. Alcoholismo		15. Otra _____	
4. Deformidad		8. Sordera		12. Drogadicción		16. Ninguna	

113. ¿Tiene contratado algún seguro? ☐

1. No, ninguno
2. De vida únicamente
3. De automóvil
4. De casa
5. El negocio o la cosecha
6. Negocio o cosecha y otro
7. Varios pero no negocio o cosecha
8. Otro_____
9. NS/NC

114. ¿Cómo resuelve problemas imprevistos no asegurados? ☐

Ejemplos: enfermedad, accidentes, desastres o viajes

1. Con ahorros
2. Reciprocidad en la comunidad
3. Familiares o amigos prestan dinero
4. Piden prestado al banco, caja o similar (tarjeta de crédito)
5. Piden prestado al agiotista o cacique
6. Otra _____
9. NS/NC

115. ¿Cómo piensa pagar sus gastos en la vejez, cuando ya no pueda trabajar? ☐

1. Con mi pensión de mi fondo de ahorro
2. Con otro tipo de pensión
3. Con mis ahorros o mis rentas
4. Mis hijos velarán por mi
5. Algún otro familiar se encargará de mi
6. No sé, no he pensado en eso
7. Otra_____
9. No contestó

116. En términos generales ¿Siente que tiene el control de las decisiones importantes en su vida? ☐

1. Tengo el control sobre TODAS las decisiones importantes
2. Tengo el control sobre LA MAYORÍA de las decisiones
3. Tengo el control sobre ALGUNAS POCAS cosas
4. NO tengo control sobre ninguna decisión
8. N/S
9. N/C

117. ¿Cree que cualquier persona, como usted, puede contribuir para mejorar su comunidad? ☐

1. Sí, fácilmente
2. Sí, pero con dificultad
3. No, es imposible
9. NS/NC

118. En general ¿Qué tan feliz se considera? ☐

1. Muy feliz
2. Feliz, pero podría estar mejor
3. Poco feliz, casi todo está mal
4. Nada feliz
9. NS/NC

119. ¿Qué tan satisfecho esta sobre lo siguiente?

1. Mucho
2. Poco
3. Nada
9. NS/NC

a. Su vida en general	
b. Alimentación	
c. Vivienda	
d. Ingreso	
e. Salud	
f. Trabajo	
g. Gobierno o autoridades	
h. Seguridad pública	
i. Amigos	
j. Familia	
k. Educación	
l. Libertad de elección y control sobre su vida	
m. Dignidad	
n. Vecindario/comunidad	
o. Habilidad para ayudar a otros	
p. Espiritual o religiosamente	

120. ¿Qué tan frecuentemente se siente así?

1. Todo el tiempo
2. Casi siempre
3. Algunas veces
4. Casi nunca
5. Nunca
9. NS/NC

a. Contento	
b. Triste	
c. Avergonzado	
d. Enojado	
e. Ridículo o torpe	
f. Con miedo	
g. Gracioso o chistoso (la gente se burla)	
h. Humillado	
i. Infantil	
j. Desamparado	
k. Ignorado (desapercibido)	
l. Que todo el mundo lo mira	
m. Ignorante	
n. Que la gente lo trata con respeto	

121. En los últimos 12 meses ¿Usted o algún otro miembro del hogar ha sido de víctima algún crimen? ¿Cuál?

1. No, ninguno
2. Hurto o algún otro delito sin violencia
3. Asalto o agresión (con violencia)
4. Secuestro
5. Violación
6. Extorsión
7. Homicidio
8. Otro con violencia _____
9. NS/NC

122. En los últimos 12 meses ¿Este hogar ha sufrido los efectos de algún desastre natural? ¿Cuál?

123. ¿Se siente usted vulnerable por la situación política del país? 1. Sí 2. No 9. NS/NC

124. ¿Se siente usted vulnerable por la situación económica del país? 1. Sí 2. No 9. NS/NC

125. ¿La gente en la comunidad habla alguna lengua indígena? ¿Alguno de sus vecinos?

1. No, nadie
2. Sí, todos
3. La mayoría
4. Muy pocos, casi nadie
5. Tal vez alguien, pero no lo conozco

126. ¿Qué tanto se usa la lengua indígena en la vida diaria? Ejemplos, en la calle, en el mercado, etc.

1. Nada, todo el mundo habla Español
2. Poco, pero la mayoría es en español
3. Mucho, es como mitad y mitad
4. Todo el mundo habla en lengua
8. No sé
9. No contesta

127. ¿Algún miembro del hogar habla alguna lengua indígena? ¿Quiénes?

1. No, nadie
2. Sí, todos
3. Sí, todos menos los hijos
4. Únicamente el encuestado
5. Cónyuge
6. Algún abuelo
7. Otro_____
8. N/S
9. N/C

Encuestador: Pregunte sólo si la respuesta fue todos menos los hijos

128. ¿Por qué no hablan alguna lengua los hijos?

1. Para que se integren más fácilmente
2. Para que no sufran abusos
3. Porque nadie la usa
4. Porque quieren que salgan
5. Para que entiendan la TV
6. Por la escuela
7. Otro_____
8. No sabe
9. No contestó

129. ¿Hay algún miembro que no hable español? Es decir, que hable únicamente lengua indígena

1. No, todos son bilingües
2. Sí, todos son monolingües
3. Sí, nadie habla español
4. Únicamente el encuestado
5. Todos excepto hijos
6. Algún abuelo
7. Otro_____
8. No sabe
9. No contestó

130. ¿Sus padres o algún otro ancestro habla o hablaba alguna lengua indígena?

1. No, nadie
2. Sí, alguno de nuestros padres
3. Sí, alguno de nuestros abuelos
4. Sí, pero no sé quién
5. Otro_____
9. NS/NC

131. Si es que tiene algún origen ¿Se siente orgulloso de su origen indígena?

Si no tiene origen ¿le gustaría tenerlo?

1. No tiene origen y no le gustaría tenerlo
2. No tiene, pero le gustaría tenerlo
3. Sí tiene y se siente orgulloso
4. Sí tiene, pero no se siente orgulloso
5. Otro_____
9. NS/NC

132. ¿Usted cree que los indígenas tienen que librar más problemas para salir adelante?

¿O tienen las mismas oportunidades que el resto de la gente?

1. Tienen las mismas oportunidades
2. Tienen que sortear más problemas
9. NS/NC

133. ¿Cree Usted que los indígenas son discriminados? ¿Dónde? Conteste todas las que apliquen

133.1 En ninguna parte	
133.2 En todas partes	
133.3 En la escuela	
133.4 En el trabajo	
133.5 En el mercado	
133.6 En la calle	
133.7 Fuera de la comunidad	

1. Sí
2. No
9.NS/NC

134. ¿Cree usted que los indígenas tienen una cosmovisión diferente?
Por ejemplo, de mayor armonía con la naturaleza, etc.

1. No
2. Sí, pero no es buena
3. Sí, es una buena visión del mundo

135. ¿Qué factores cree Ud. que son los más importantes para tener éxito económico en la vida?
Por favor indique el más importante y el segundo más importante.

1. Iniciativa personal
2. Suerte
3. Fe en Dios
4. Trabajo responsable
5. Contactos o conocidos
5. Educación
6. La ayuda del Estado
7. Tener una familia que ayude
8. Tranzas, negocios deshonestos o incorrectos
9. NS/NC

Más importante

Segunda más importante

136. Y qué factores cree Ud. que son las dos causas más frecuentes para que las personas sean pobres?
Indique el más importante y el segundo más importante.

1. La mala suerte
2. La flojera y falta de iniciativa
3. La falta de educación
4. La falta de ayuda del gobierno
5. Los vicios y el alcoholismo
6. La falta de generosidad de los que tienen más
7. El venir de una familia pobre
8. Las pocas oportunidades de empleo
9. Errores del gobierno
10. Los abusos e injusticias
11. Las políticas neoliberales
99. NS/NC

Más importante

Segunda más importante

137. A continuación le diré unas frases sobre la desigualdad, y quiero que me diga si Ud. está muy de acuerdo, de acuerdo, en desacuerdo o muy en desacuerdo con lo siguiente

	MA	A	-	D	MD	NC/ NC	
Las diferencias de ingreso en México son demasiado grandes	1	2	3	4	5	9	
Es responsabilidad del gobierno reducir las diferencias de ingresos entre ricos y pobres	1	2	3	4	5	9	
Para triunfar en la vida es necesario venir de una familia con dinero	1	2	3	4	5	9	
Hoy en día, para llegar hasta el nivel más alto en México, hay que ser corrupto	1	2	3	4	5	9	
La desigualdad sigue existiendo porque beneficia a los ricos y poderosos	1	2	3	4	5	9	
Grandes diferencias de ingreso son necesarias para la prosperidad de México, es decir, para que haya desarrollo económico	1	2	3	4	5	9	

138. ¿Cree Usted en la elecciones? 1. Sí 2. No ☐

139. ¿Se siente representado por algún partido político? 1. Si 2. No ☐

140. En una palabra ¿Qué significa el desarrollo? _____

141. En una palabra ¿Qué significa ser pobre? _____

142. ¿Qué es lo más importante para vivir bien? _____

143. ¿Qué es lo que le hace más falta para vivir mejor? _____

144. ¿Practica Usted alguna religión? ¿Cuál? ☐

1. No, soy ateo
2. No, soy agnóstico
3. Sí, católico
4. Sí, protestante (anglicano o luterano)
5. Sí, adventista
6. Sí, otro evangélico
7. Testigo de Jehová
8. Otro_____
9. NS/NC

CONCLUSIÓN.

Muchas gracias por su ayuda. ¿Hay algo más que Ud. quisiera contarnos, y que no hemos cubierto en esta encuesta, especialmente sobre cosas que le han abierto o cerrado oportunidades, o ha cambiado su vida?

_____

_____

_____

_____

☐

F. ¿Estaría dispuesto a tener una charla informal (una entrevista) sobre estos temas? 1. Sí 2. No